



1
00:01:40,710 --> 00:01:09,590

[Music]

2
00:01:47,280 --> 00:01:43,670
discovery clears the tower

3
00:01:47,290 --> 00:02:09,990
[Music]

4
00:02:14,070 --> 00:02:11,670
and you're looking live at the crew

5
00:02:16,470 --> 00:02:14,080
dragon spacecraft on top of a falcon 9

6
00:02:18,309 --> 00:02:16,480
rocket set to launch four astronauts to

7
00:02:20,470 --> 00:02:18,319
the international space station in a

8
00:02:23,430 --> 00:02:20,480
little less than four hours

9
00:02:25,430 --> 00:02:23,440
but right now they're live inside the

10
00:02:28,309 --> 00:02:25,440
room right here crew 4 astronauts

11
00:02:30,150 --> 00:02:28,319
getting their spacesuits on and this is

12
00:02:31,990 --> 00:02:30,160
a live look inside that suit up room

13
00:02:35,190 --> 00:02:32,000

where the crew of three americans and

14

00:02:39,350 --> 00:02:35,200

one european astronaut are completing

15

00:02:40,949 --> 00:02:39,360

their checkouts of their spacesuits

16

00:02:42,949 --> 00:02:40,959

welcome everybody to the kennedy space

17

00:02:45,430 --> 00:02:42,959

center in florida for live coverage of

18

00:02:47,990 --> 00:02:45,440

nasa and spacex's launch of crew 4. i'm

19

00:02:50,550 --> 00:02:48,000

daryl nail and i'm with megan macarthur

20

00:02:52,150 --> 00:02:50,560

astronaut from crew 2 you were the pilot

21

00:02:53,430 --> 00:02:52,160

in that mission so it's great that you

22

00:02:54,949 --> 00:02:53,440

have that experience and that you're

23

00:02:57,110 --> 00:02:54,959

here to share it with us because you

24

00:02:59,110 --> 00:02:57,120

know this mission well but you also flew

25

00:03:00,869 --> 00:02:59,120

the space shuttle absolutely um it's

26
00:03:02,149 --> 00:03:00,879
always exciting to be at kennedy space

27
00:03:03,910 --> 00:03:02,159
center uh

28
00:03:05,430 --> 00:03:03,920
space center on a launch day i'm super

29
00:03:07,030 --> 00:03:05,440
excited to see my friends getting ready

30
00:03:08,630 --> 00:03:07,040
to fly they all have big smiles on their

31
00:03:09,990 --> 00:03:08,640
faces and it's going to be a great time

32
00:03:11,589 --> 00:03:10,000
watching them get ready tonight

33
00:03:14,790 --> 00:03:11,599
absolutely it all started when they woke

34
00:03:16,790 --> 00:03:14,800
up today at 8 37 p.m

35
00:03:18,710 --> 00:03:16,800
yesterday because we just rolled over

36
00:03:20,949 --> 00:03:18,720
midnight into wednesday but it was

37
00:03:22,790 --> 00:03:20,959
tuesday just a few hours ago and that

38
00:03:25,190 --> 00:03:22,800

gets everything rolling that's right

39

00:03:27,589 --> 00:03:25,200

it's uh we think of the day is starting

40

00:03:29,350 --> 00:03:27,599

sort of at launch time but in fact

41

00:03:30,309 --> 00:03:29,360

they've been up for many hours going

42

00:03:31,910 --> 00:03:30,319

through

43

00:03:33,830 --> 00:03:31,920

some weather briefings some last minute

44

00:03:35,750 --> 00:03:33,840

checks and as we see them right now

45

00:03:37,430 --> 00:03:35,760

going through the suit check out um

46

00:03:38,869 --> 00:03:37,440

before they take the next steps to head

47

00:03:40,229 --> 00:03:38,879

out toward the rockets

48

00:03:41,509 --> 00:03:40,239

and we'll jump back into the room here

49

00:03:43,910 --> 00:03:41,519

in just a second to get more of your

50

00:03:46,309 --> 00:03:43,920

insight on that we want to invite you at

51
00:03:48,630 --> 00:03:46,319
home who are participating you you can

52
00:03:51,110 --> 00:03:48,640
participate really by

53
00:03:52,949 --> 00:03:51,120
hashtag

54
00:03:54,630 --> 00:03:52,959
the advanced team is in the lightroom

55
00:03:56,550 --> 00:03:54,640
and we are on schedule

56
00:03:57,670 --> 00:03:56,560
there you'll hear the operational audio

57
00:03:59,190 --> 00:03:57,680
we'll have that playing in the

58
00:04:01,830 --> 00:03:59,200
background from time to time we'll try

59
00:04:03,910 --> 00:04:01,840
to make sure our comments are

60
00:04:04,869 --> 00:04:03,920
down and low when they talk so you can

61
00:04:06,630 --> 00:04:04,879
hear that

62
00:04:08,630 --> 00:04:06,640
but in addition to megan's analysis we

63
00:04:10,309 --> 00:04:08,640

also have teams around the country

64

00:04:12,070 --> 00:04:10,319

covering all the action and there you

65

00:04:13,670 --> 00:04:12,080

see them now we'll get updates from

66

00:04:15,830 --> 00:04:13,680

spacex headquarters in hawthorne

67

00:04:18,150 --> 00:04:15,840

california as well as nasa's mission

68

00:04:19,909 --> 00:04:18,160

control center in houston and of course

69

00:04:21,270 --> 00:04:19,919

right here in florida and there's dan

70

00:04:22,790 --> 00:04:21,280

and jesse mugging for the camera

71

00:04:24,629 --> 00:04:22,800

appreciate that

72

00:04:27,110 --> 00:04:24,639

and of course the rocket is on the pad

73

00:04:30,150 --> 00:04:27,120

we'll talk with crew 3 astronaut raja

74

00:04:33,749 --> 00:04:30,160

chari who is in space right now

75

00:04:35,909 --> 00:04:33,759

making preparations for crew 4.

76
00:04:38,390 --> 00:04:35,919
now let's go back out live there is the

77
00:04:41,430 --> 00:04:38,400
rocket in the spacecraft and this

78
00:04:43,670 --> 00:04:41,440
is the suit-up room a historic room

79
00:04:46,070 --> 00:04:43,680
inside the operations and checkout

80
00:04:47,990 --> 00:04:46,080
building the neil armstrong operations

81
00:04:50,150 --> 00:04:48,000
and checkout building at the kennedy

82
00:04:51,830 --> 00:04:50,160
space center where astronauts have been

83
00:04:54,469 --> 00:04:51,840
getting ready for launch going all the

84
00:04:55,430 --> 00:04:54,479
way back to apollo 7 and then in this

85
00:04:57,510 --> 00:04:55,440
building

86
00:04:59,189 --> 00:04:57,520
back to gemini 3.

87
00:05:00,790 --> 00:04:59,199
it's a remarkable it's a great feeling

88
00:05:02,629 --> 00:05:00,800

when you walk into the room and you

89

00:05:04,150 --> 00:05:02,639

recognize the history that's taken place

90

00:05:05,830 --> 00:05:04,160

in that room

91

00:05:07,830 --> 00:05:05,840

visually it looks it does look different

92

00:05:09,350 --> 00:05:07,840

than when it uh when we use the room for

93

00:05:10,790 --> 00:05:09,360

shuttle not tremendously different

94

00:05:12,950 --> 00:05:10,800

because the purpose is still the same

95

00:05:14,469 --> 00:05:12,960

you're still getting into your spacesuit

96

00:05:17,270 --> 00:05:14,479

making sure everything fits where it's

97

00:05:19,110 --> 00:05:17,280

supposed to making sure the suit has its

98

00:05:20,550 --> 00:05:19,120

pressure integrity checked and that's

99

00:05:22,310 --> 00:05:20,560

what they're going through right now so

100

00:05:23,830 --> 00:05:22,320

this is really kind of the beginning of

101
00:05:25,110 --> 00:05:23,840
that buildup of excitement that's going

102
00:05:27,350 --> 00:05:25,120
to continue for them throughout the

103
00:05:30,390 --> 00:05:27,360
night absolutely and each one of the

104
00:05:32,950 --> 00:05:30,400
crew 4 astronauts is in a seat that is

105
00:05:34,870 --> 00:05:32,960
molded exactly as it is in the

106
00:05:36,950 --> 00:05:34,880
spacecraft right that's right so the the

107
00:05:39,350 --> 00:05:36,960
cushioning that you see is can be

108
00:05:40,950 --> 00:05:39,360
changed out based on the size of each

109
00:05:43,510 --> 00:05:40,960
individual astronaut and the idea is

110
00:05:45,189 --> 00:05:43,520
that that seat is going to cradle you

111
00:05:47,029 --> 00:05:45,199
through the various dynamic phases of

112
00:05:48,310 --> 00:05:47,039
flight so you want it to fit it fit you

113
00:05:50,629 --> 00:05:48,320

pretty well

114

00:05:52,469 --> 00:05:50,639

and you can see the spacex suit text

115

00:05:55,189 --> 00:05:52,479

there with them

116

00:05:57,510 --> 00:05:55,199

monitoring both on laptops but then also

117

00:05:59,110 --> 00:05:57,520

interacting with the astronauts can you

118

00:05:59,990 --> 00:05:59,120

believe it megan that you were in that

119

00:06:02,150 --> 00:06:00,000

room

120

00:06:03,990 --> 00:06:02,160

just about one year ago it is it's hard

121

00:06:05,670 --> 00:06:04,000

to believe in some sense it feels like

122

00:06:07,670 --> 00:06:05,680

it was yesterday but in other ways it

123

00:06:09,029 --> 00:06:07,680

feels like it was a lifetime ago but

124

00:06:10,550 --> 00:06:09,039

watching them go through this now

125

00:06:12,150 --> 00:06:10,560

definitely brings back all of those

126

00:06:13,990 --> 00:06:12,160

memories and those feelings from being

127

00:06:18,710 --> 00:06:14,000

in that room and having that excitement

128

00:06:22,950 --> 00:06:21,189

you can see the uh the equipment against

129

00:06:26,150 --> 00:06:22,960

the wall the gray

130

00:06:27,830 --> 00:06:26,160

colored equipment with the the dials

131

00:06:29,510 --> 00:06:27,840

and uh

132

00:06:32,469 --> 00:06:29,520

and the switches and knobs that's

133

00:06:35,189 --> 00:06:32,479

original from uh the the shuttle and

134

00:06:38,710 --> 00:06:35,199

apollo era they left it there as kind of

135

00:06:40,390 --> 00:06:38,720

a an homage to the the era of past space

136

00:06:41,990 --> 00:06:40,400

flight i think that's right and it

137

00:06:43,430 --> 00:06:42,000

really does you know having been in

138

00:06:45,189 --> 00:06:43,440

there before

139

00:06:47,189 --> 00:06:45,199

um i i'm definitely a person who

140

00:06:49,430 --> 00:06:47,199

appreciates history um and i think it's

141

00:06:50,469 --> 00:06:49,440

a nice like you said homage to that the

142

00:06:52,550 --> 00:06:50,479

history of that room and the

143

00:06:54,309 --> 00:06:52,560

achievements that started you know the

144

00:06:56,070 --> 00:06:54,319

day started in in that room so it's neat

145

00:06:58,070 --> 00:06:56,080

to still see that there

146

00:06:59,749 --> 00:06:58,080

the spacex team of course runs a very

147

00:07:01,510 --> 00:06:59,759

efficient process

148

00:07:03,189 --> 00:07:01,520

they've done this now several times and

149

00:07:04,629 --> 00:07:03,199

they'll continue to improve their

150

00:07:07,189 --> 00:07:04,639

process and get better as they learn

151
00:07:08,950 --> 00:07:07,199
things from every mission i was thinking

152
00:07:11,589 --> 00:07:08,960
it's actually this will be the seventh

153
00:07:13,510 --> 00:07:11,599
time that they've launched people on a

154
00:07:15,029 --> 00:07:13,520
crew dragon and that may seem like a big

155
00:07:16,790 --> 00:07:15,039
number but in a way it's actually still

156
00:07:18,390 --> 00:07:16,800
quite a small number so we do expect to

157
00:07:20,870 --> 00:07:18,400
continue to learn things every single

158
00:07:23,110 --> 00:07:20,880
time we do it and we are on an increase

159
00:07:25,110 --> 00:07:23,120
of that pace right as it's really

160
00:07:27,749 --> 00:07:25,120
starting to pick up just got that

161
00:07:28,950 --> 00:07:27,759
commercial crew back um and the private

162
00:07:31,430 --> 00:07:28,960
crew

163
00:07:34,390 --> 00:07:31,440

that axiom one just came down

164

00:07:36,070 --> 00:07:34,400

so let's get to know crew four uh just a

165

00:07:37,909 --> 00:07:36,080

little bit more this is the fourth

166

00:07:40,230 --> 00:07:37,919

rotational crew to fly on a commercial

167

00:07:42,790 --> 00:07:40,240

spacecraft and each astronaut brings a

168

00:07:44,150 --> 00:07:42,800

diverse set of experiences to today's

169

00:07:46,309 --> 00:07:44,160

flight and that astronaut that you see

170

00:07:48,790 --> 00:07:46,319

right there sitting in the chair let's

171

00:07:51,029 --> 00:07:48,800

start with him that is dr lindgren he

172

00:07:52,550 --> 00:07:51,039

was born in taipei taiwan but spent most

173

00:07:54,390 --> 00:07:52,560

of his childhood overseas in england

174

00:07:56,629 --> 00:07:54,400

which he very much appreciated you'll

175

00:07:58,710 --> 00:07:56,639

hear more from him about that he was an

176

00:08:00,790 --> 00:07:58,720

instructor and jump master with the u.s

177

00:08:02,710 --> 00:08:00,800

air force academy and also has a

178

00:08:05,029 --> 00:08:02,720

doctorate in medicine

179

00:08:06,070 --> 00:08:05,039

and he served as a flight surgeon for

180

00:08:08,070 --> 00:08:06,080

nasa

181

00:08:11,510 --> 00:08:08,080

after he was chosen as an astronaut

182

00:08:14,309 --> 00:08:11,520

lindgren flew on soyuz and spent 141

183

00:08:16,950 --> 00:08:14,319

days in space during expedition 44 and

184

00:08:19,830 --> 00:08:16,960

45. he has a wife and three children and

185

00:08:20,950 --> 00:08:19,840

today megan he is the commander of true

186

00:08:22,309 --> 00:08:20,960

dragon

187

00:08:25,029 --> 00:08:22,319

that's right he is going to make an

188

00:08:27,110 --> 00:08:25,039

outstanding commander he's a wonderful

189

00:08:29,510 --> 00:08:27,120

talented person obviously experienced at

190

00:08:30,950 --> 00:08:29,520

living and working in space but also

191

00:08:32,469 --> 00:08:30,960

just a really good human he's going to

192

00:08:35,110 --> 00:08:32,479

be looking out for his

193

00:08:36,709 --> 00:08:35,120

crewmates in three hours 45 minutes the

194

00:08:38,709 --> 00:08:36,719

side hatch is now open and we are on

195

00:08:39,909 --> 00:08:38,719

schedule

196

00:08:41,589 --> 00:08:39,919

and they're very lucky to have him as

197

00:08:44,149 --> 00:08:41,599

their leader

198

00:08:46,550 --> 00:08:44,159

up next is fellow airman bob hines there

199

00:08:48,710 --> 00:08:46,560

he is with his visor open

200

00:08:50,470 --> 00:08:48,720

communicating with his suit tech he was

201
00:08:52,310 --> 00:08:50,480
born in fayetteville north carolina he

202
00:08:54,630 --> 00:08:52,320
has a wife and three daughters

203
00:08:56,710 --> 00:08:54,640
he has a master of science in aerospace

204
00:08:59,030 --> 00:08:56,720
engineering and served 21 years in the

205
00:09:01,350 --> 00:08:59,040
u.s air force as a test pilot

206
00:09:03,190 --> 00:09:01,360
he was also a fighter pilot he flew the

207
00:09:05,350 --> 00:09:03,200
f-15e

208
00:09:07,870 --> 00:09:05,360
he came to nasa as a research pilot

209
00:09:11,030 --> 00:09:07,880
where he flew science missions in our

210
00:09:13,670 --> 00:09:11,040
wb-57 today he's going into space for

211
00:09:16,230 --> 00:09:13,680
the very first time as the pilot for

212
00:09:18,310 --> 00:09:16,240
nasa spacex's crew for megan you were

213
00:09:19,590 --> 00:09:18,320

the pilot for crew 2. it's a position

214

00:09:24,550 --> 00:09:19,600

you know well that's right it's well

215

00:09:28,470 --> 00:09:26,470

i first got to interact actually with

216

00:09:31,030 --> 00:09:28,480

bob um when he was an instructor pilot

217

00:09:32,949 --> 00:09:31,040

for t-38 for the astronaut corps and so

218

00:09:35,030 --> 00:09:32,959

flying with him was always a pleasure

219

00:09:36,710 --> 00:09:35,040

he's always calm and collected no matter

220

00:09:38,790 --> 00:09:36,720

what the circumstances which is exactly

221

00:09:40,790 --> 00:09:38,800

the person that you want uh piloting any

222

00:09:42,949 --> 00:09:40,800

vehicle that you're in and they're gonna

223

00:09:44,710 --> 00:09:42,959

make a great team today he did look

224

00:09:47,430 --> 00:09:44,720

quite calm in that shot

225

00:09:49,509 --> 00:09:47,440

quite steady this guy has flown so many

226

00:09:52,150 --> 00:09:49,519

aircraft and we'll hear more about that

227

00:09:53,670 --> 00:09:52,160

in his bio a little bit later on now

228

00:09:55,750 --> 00:09:53,680

let's introduce you to the two mission

229

00:09:58,790 --> 00:09:55,760

specialists jessica watkins and there

230

00:10:01,030 --> 00:09:58,800

she is looking calm and collected and

231

00:10:02,550 --> 00:10:01,040

not moving very much but very focused i

232

00:10:04,550 --> 00:10:02,560

imagine

233

00:10:07,269 --> 00:10:04,560

she considers lafayette colorado her

234

00:10:09,030 --> 00:10:07,279

hometown a talented rugby player in

235

00:10:12,550 --> 00:10:09,040

college her team won the national

236

00:10:16,069 --> 00:10:12,560

championship in 2008 when she was with

237

00:10:18,389 --> 00:10:16,079

her university i believe it was sanford

238

00:10:20,630 --> 00:10:18,399

watkins was a postdoctoral fellow in the

239

00:10:22,630 --> 00:10:20,640

division of geological and planetary

240

00:10:24,790 --> 00:10:22,640

sciences at the california institute of

241

00:10:26,790 --> 00:10:24,800

technology she completed several

242

00:10:29,190 --> 00:10:26,800

internships with nasa including one

243

00:10:32,230 --> 00:10:29,200

testing system designs for the mars

244

00:10:34,550 --> 00:10:32,240

perseverance mission at jpl she became

245

00:10:37,190 --> 00:10:34,560

an astronaut in 2017

246

00:10:39,590 --> 00:10:37,200

a turtle we'll talk more about that

247

00:10:42,069 --> 00:10:39,600

and now just like bob she's going into

248

00:10:44,150 --> 00:10:42,079

space for the very first time this is a

249

00:10:45,990 --> 00:10:44,160

brand new experience for her yep it's a

250

00:10:48,230 --> 00:10:46,000

bit of a turtle takeover i think is what

251

00:10:50,389 --> 00:10:48,240

we're experiencing on space station

252

00:10:52,389 --> 00:10:50,399

right now but jessica is an outstanding

253

00:10:53,750 --> 00:10:52,399

crew member it's been fun to get to know

254

00:10:55,430 --> 00:10:53,760

her since she arrived with her

255

00:10:57,030 --> 00:10:55,440

classmates

256

00:10:58,470 --> 00:10:57,040

just tremendous amount of knowledge that

257

00:11:00,069 --> 00:10:58,480

she brings

258

00:11:02,069 --> 00:11:00,079

can be very focused and serious on the

259

00:11:03,350 --> 00:11:02,079

task at hand but uh boy when she smiles

260

00:11:04,710 --> 00:11:03,360

it really lights up the room i think

261

00:11:06,790 --> 00:11:04,720

this crew is gonna have a lot of fun

262

00:11:08,949 --> 00:11:06,800

together it sure does and as she motions

263

00:11:11,110 --> 00:11:08,959

towards her suit calling over the suit

264

00:11:13,430 --> 00:11:11,120

tech what what is what are you

265

00:11:14,870 --> 00:11:13,440

communicating with them about um so it

266

00:11:16,069 --> 00:11:14,880

depends a little bit they're going to be

267

00:11:18,630 --> 00:11:16,079

asking you

268

00:11:19,910 --> 00:11:18,640

how things fit how they feel how you can

269

00:11:22,150 --> 00:11:19,920

hear

270

00:11:24,870 --> 00:11:22,160

if you're having any problems with

271

00:11:26,550 --> 00:11:24,880

with the communications system

272

00:11:28,069 --> 00:11:26,560

as well as with the cooling system so

273

00:11:30,069 --> 00:11:28,079

there's a variety of things that they

274

00:11:32,069 --> 00:11:30,079

could be checking at this point the

275

00:11:34,389 --> 00:11:32,079

second mission specialist is samantha

276

00:11:36,470 --> 00:11:34,399

christopher reddy she was born in milan

277

00:11:38,470 --> 00:11:36,480

italy but now lives in cologne germany

278

00:11:41,030 --> 00:11:38,480

with her partner and two children in

279

00:11:43,750 --> 00:11:41,040

2006 she earned her fighter pilot wings

280

00:11:45,590 --> 00:11:43,760

and flew the am x attack fighter at a

281

00:11:47,910 --> 00:11:45,600

base in italy

282

00:11:49,910 --> 00:11:47,920

in 2013 christopher freddie launched

283

00:11:51,350 --> 00:11:49,920

into space aboard a soyuz for a long

284

00:11:53,829 --> 00:11:51,360

duration space flight to the

285

00:11:56,629 --> 00:11:53,839

international space station so she has

286

00:11:58,389 --> 00:11:56,639

quite a bit of experience aboard station

287

00:12:00,629 --> 00:11:58,399

several years later she was awarded the

288

00:12:03,509 --> 00:12:00,639

night grand cross of the order of merit

289

00:12:05,670 --> 00:12:03,519

from the president of italy and today

290

00:12:08,150 --> 00:12:05,680

she returns to space and the space

291

00:12:10,470 --> 00:12:08,160

station with crew 4.

292

00:12:12,389 --> 00:12:10,480

another very impressive resume um but

293

00:12:14,310 --> 00:12:12,399

also a really just a great person to be

294

00:12:16,470 --> 00:12:14,320

around so they're going to really work

295

00:12:17,829 --> 00:12:16,480

well together they've gotten to spend

296

00:12:19,590 --> 00:12:17,839

several months together training and

297

00:12:21,670 --> 00:12:19,600

getting to know one another and i think

298

00:12:23,430 --> 00:12:21,680

this mix of experience and skills is

299

00:12:25,829 --> 00:12:23,440

going to blend really well and make for

300

00:12:27,430 --> 00:12:25,839

a successful crew

301
00:12:28,710 --> 00:12:27,440
we've got a couple astronauts standing

302
00:12:32,150 --> 00:12:28,720
up and you can see they're still

303
00:12:34,069 --> 00:12:32,160
attached um to a blue box that's sitting

304
00:12:35,750 --> 00:12:34,079
there right next to their seat what is

305
00:12:37,990 --> 00:12:35,760
that megan and what what purpose does it

306
00:12:40,389 --> 00:12:38,000
serve that blue box is providing a

307
00:12:43,350 --> 00:12:40,399
cooling air for them as they're moving

308
00:12:45,430 --> 00:12:43,360
around you do get um you do can get

309
00:12:47,110 --> 00:12:45,440
quite warm in that suit um and so

310
00:12:48,470 --> 00:12:47,120
they're sort of preemptively making sure

311
00:12:53,190 --> 00:12:48,480
that the crew members are not going to

312
00:12:55,110 --> 00:12:53,200
get overheated during this wait time

313
00:12:57,990 --> 00:12:55,120

and each of these four crew members will

314

00:12:59,670 --> 00:12:58,000

be part of expedition 67 once they

315

00:13:01,350 --> 00:12:59,680

arrive at the international space

316

00:13:03,829 --> 00:13:01,360

station getting some final fit checks

317

00:13:05,670 --> 00:13:03,839

there for chell as his suit tech has

318

00:13:07,350 --> 00:13:05,680

taken care of it making sure there's as

319

00:13:09,350 --> 00:13:07,360

you said making no hot spots want to be

320

00:13:10,710 --> 00:13:09,360

comfortable when you're getting ready to

321

00:13:12,470 --> 00:13:10,720

launch

322

00:13:14,550 --> 00:13:12,480

so now let's check in with our team

323

00:13:16,310 --> 00:13:14,560

monitoring preparations for launch at

324

00:13:18,550 --> 00:13:16,320

spacex headquarters in hawthorne

325

00:13:21,030 --> 00:13:18,560

california we're going to nasa's dan

326
00:13:23,750 --> 00:13:21,040
hewitt and spacex's jesse anderson take

327
00:13:27,590 --> 00:13:25,670
hey thanks daryl and hi everybody good

328
00:13:29,590 --> 00:13:27,600
evening i'm dan hewitt thrilled to be

329
00:13:31,829 --> 00:13:29,600
back here at hawthorne for another crew

330
00:13:33,590 --> 00:13:31,839
launch yeah and i'm jesse anderson a

331
00:13:36,629 --> 00:13:33,600
production engineering manager here at

332
00:13:39,509 --> 00:13:36,639
spacex and per usual super excited about

333
00:13:41,509 --> 00:13:39,519
crew 4 today welcome to mission control

334
00:13:43,509 --> 00:13:41,519
in hawthorne this is where the teams are

335
00:13:45,750 --> 00:13:43,519
staffed around the clock as we count

336
00:13:47,590 --> 00:13:45,760
down to liftoff now on console or

337
00:13:49,750 --> 00:13:47,600
headset and mission controller six key

338
00:13:51,990 --> 00:13:49,760

positions the mission director is in

339

00:13:53,829 --> 00:13:52,000

charge of the room and tasked with

340

00:13:55,910 --> 00:13:53,839

making real-time decisions to ensure

341

00:13:57,750 --> 00:13:55,920

mission success the person that you'll

342

00:14:00,230 --> 00:13:57,760

hear talking to the astronauts is the

343

00:14:01,670 --> 00:14:00,240

crew operations and resources engineer

344

00:14:03,430 --> 00:14:01,680

which you'll hear us refer to as the

345

00:14:05,030 --> 00:14:03,440

core throughout the broadcast the

346

00:14:07,030 --> 00:14:05,040

additional positions are focused on

347

00:14:08,949 --> 00:14:07,040

vehicle systems including avionics

348

00:14:10,470 --> 00:14:08,959

navigation and control software

349

00:14:12,470 --> 00:14:10,480

propulsion life support and

350

00:14:14,949 --> 00:14:12,480

communication with ground support teams

351
00:14:16,389 --> 00:14:14,959
and nasa has its own team members back

352
00:14:17,910 --> 00:14:16,399
in mission control houston we're going

353
00:14:19,269 --> 00:14:17,920
to check in there a little bit later

354
00:14:21,269 --> 00:14:19,279
where they're preparing the space

355
00:14:22,550 --> 00:14:21,279
station for crew dragon's arrival we're

356
00:14:25,030 --> 00:14:22,560
going to meet several of those key

357
00:14:27,509 --> 00:14:25,040
players when we do check in

358
00:14:30,949 --> 00:14:27,519
now today's ride to the space station

359
00:14:33,750 --> 00:14:30,959
will take about 22 hours with dragon

360
00:14:35,590 --> 00:14:33,760
flying autonomously the entire way and

361
00:14:37,829 --> 00:14:35,600
just like autopilot on a commercial

362
00:14:39,990 --> 00:14:37,839
aircraft the crew always has the ability

363
00:14:43,509 --> 00:14:40,000

to take manual control of the spacecraft

364

00:14:45,509 --> 00:14:43,519

if needed now at t minus 3 hours and 39

365

00:14:46,949 --> 00:14:45,519

minutes until liftoff let's go to andy

366

00:14:49,590 --> 00:14:46,959

tran for an update on the launch

367

00:14:51,430 --> 00:14:49,600

countdown how's it going so far andy

368

00:14:54,069 --> 00:14:51,440

things are going good jesse we are

369

00:14:56,550 --> 00:14:54,079

coming up on t minus three hours and 30

370

00:14:58,790 --> 00:14:56,560

minutes and um things are going well for

371

00:15:01,110 --> 00:14:58,800

launch at t-minus four hours there was a

372

00:15:02,949 --> 00:15:01,120

briefing by the spacex launch director

373

00:15:04,470 --> 00:15:02,959

and good news there's really nothing

374

00:15:05,910 --> 00:15:04,480

significant to report on the rocket

375

00:15:07,030 --> 00:15:05,920

everything is real looking really good

376

00:15:08,629 --> 00:15:07,040

for tonight

377

00:15:10,230 --> 00:15:08,639

earlier in the night the team began

378

00:15:12,870 --> 00:15:10,240

clearing the hazard area and buildings

379

00:15:15,750 --> 00:15:12,880

around pad 39a known as the blast danger

380

00:15:17,590 --> 00:15:15,760

area or bva the only people remaining on

381

00:15:20,230 --> 00:15:17,600

the pad are the ones needed for ingress

382

00:15:22,550 --> 00:15:20,240

of the astronauts and crew arrival is

383

00:15:24,629 --> 00:15:22,560

expected to happen in about an hour at

384

00:15:26,230 --> 00:15:24,639

the launch pad falcon 9 is powered on

385

00:15:28,550 --> 00:15:26,240

and we're currently monitoring telemetry

386

00:15:30,470 --> 00:15:28,560

and pressurizing gas storage vessels

387

00:15:32,790 --> 00:15:30,480

engine and stage checkouts were also

388

00:15:35,350 --> 00:15:32,800

performed several hours ago

389

00:15:37,269 --> 00:15:35,360

on top of falcon 9 the dragon spacecraft

390

00:15:38,870 --> 00:15:37,279

is ready for the crew functional

391

00:15:40,470 --> 00:15:38,880

checkouts were performed and most

392

00:15:42,790 --> 00:15:40,480

recently the dragon propellant system

393

00:15:45,030 --> 00:15:42,800

was pressurized to final flight pressure

394

00:15:47,350 --> 00:15:45,040

about an hour ago currently all

395

00:15:49,509 --> 00:15:47,360

spacecraft systems are go

396

00:15:51,430 --> 00:15:49,519

launch range is also ready to support

397

00:15:53,509 --> 00:15:51,440

and working no issues at the time the

398

00:15:55,509 --> 00:15:53,519

weather is cooperating as we continue to

399

00:15:56,790 --> 00:15:55,519

count down to liftoff so again

400

00:15:58,310 --> 00:15:56,800

everything is looking great for

401
00:15:59,590 --> 00:15:58,320
tonight's liftoff

402
00:16:01,670 --> 00:15:59,600
with that i'm going to send it back over

403
00:16:03,269 --> 00:16:01,680
to daryl and megan

404
00:16:06,389 --> 00:16:03,279
all right thank you very much andy it's

405
00:16:08,470 --> 00:16:06,399
now t-minus three hours and 37 minutes

406
00:16:10,389 --> 00:16:08,480
and counting here at the kennedy space

407
00:16:12,949 --> 00:16:10,399
center in florida as we cruise around

408
00:16:15,749 --> 00:16:12,959
the desk here the crew ate breakfast a

409
00:16:17,990 --> 00:16:15,759
little after 9 p.m last night medical

410
00:16:19,910 --> 00:16:18,000
checks then followed and then less than

411
00:16:21,189 --> 00:16:19,920
an hour ago they got a weather briefing

412
00:16:23,430 --> 00:16:21,199
to make sure they were all good for

413
00:16:25,829 --> 00:16:23,440

launch we heard uh i heard from rob

414

00:16:27,749 --> 00:16:25,839

davies pao over johnson that the launch

415

00:16:29,590 --> 00:16:27,759

corridor that corridor the abort

416

00:16:31,110 --> 00:16:29,600

corridor i should say the weather is

417

00:16:34,470 --> 00:16:31,120

good there and that's a tough one to get

418

00:16:36,790 --> 00:16:34,480

because that's a large swath of area yes

419

00:16:39,749 --> 00:16:36,800

now the the we're looking inside the

420

00:16:41,030 --> 00:16:39,759

room now at uh suit-up room at astronaut

421

00:16:43,590 --> 00:16:41,040

crew quarters and you can see we're

422

00:16:46,470 --> 00:16:43,600

getting ready for a crew walkout um the

423

00:16:47,590 --> 00:16:46,480

techs are now finishing up uh each crew

424

00:16:50,069 --> 00:16:47,600

member

425

00:16:52,069 --> 00:16:50,079

they're in their own custom spacesuit

426
00:16:54,069 --> 00:16:52,079
inside the historic astronaut crew

427
00:16:56,069 --> 00:16:54,079
quarters suit up room

428
00:16:58,069 --> 00:16:56,079
and in a few minutes at t-minus three

429
00:17:00,230 --> 00:16:58,079
hours and 25 minutes the crew will be

430
00:17:02,069 --> 00:17:00,240
making their way out of the famed suit

431
00:17:04,470 --> 00:17:02,079
up room that we see here

432
00:17:06,710 --> 00:17:04,480
they'll go down a hallway and into an

433
00:17:09,110 --> 00:17:06,720
elevator down to the first floor and

434
00:17:11,270 --> 00:17:09,120
then outside to the families where they

435
00:17:12,789 --> 00:17:11,280
will be greeted uh by them and their

436
00:17:14,470 --> 00:17:12,799
loved ones and a small group of

437
00:17:16,870 --> 00:17:14,480
well-wishers there'll be some media on

438
00:17:21,189 --> 00:17:16,880

hand as well before they head out to the

439

00:17:25,829 --> 00:17:23,189

you see there the upper left part of

440

00:17:28,710 --> 00:17:25,839

your camera there a blue flight suit

441

00:17:30,230 --> 00:17:28,720

that's joe acaba

442

00:17:31,990 --> 00:17:30,240

he's the chief of the vehicle

443

00:17:33,590 --> 00:17:32,000

integration test office and he's

444

00:17:35,430 --> 00:17:33,600

managing the crew schedules and all the

445

00:17:37,029 --> 00:17:35,440

crew quarter operations he's the one

446

00:17:38,630 --> 00:17:37,039

keeping them on time in the room right

447

00:17:39,669 --> 00:17:38,640

megan that's right there's a well

448

00:17:41,190 --> 00:17:39,679

there's a team of folks that are

449

00:17:43,990 --> 00:17:41,200

managing that schedule he makes sure

450

00:17:46,470 --> 00:17:44,000

that the operations for the astronaut

451
00:17:48,630 --> 00:17:46,480
quarantine facility runs smoothly that

452
00:17:49,510 --> 00:17:48,640
everybody has everything they need you

453
00:17:51,110 --> 00:17:49,520
know everything from the air

454
00:17:53,029 --> 00:17:51,120
conditioning to the food to you know

455
00:17:55,750 --> 00:17:53,039
everything in between he's making sure

456
00:17:58,070 --> 00:17:55,760
that runs smoothly for everybody there

457
00:18:00,310 --> 00:17:58,080
which is which is an important job and

458
00:18:02,230 --> 00:18:00,320
and boy they sure do feed us really well

459
00:18:03,909 --> 00:18:02,240
um in that time frame and right there is

460
00:18:05,190 --> 00:18:03,919
xena cardman that's right fellow

461
00:18:07,750 --> 00:18:05,200
astronaut

462
00:18:09,510 --> 00:18:07,760
turtle and a turtle as well another

463
00:18:11,750 --> 00:18:09,520

turtle in there yeah

464

00:18:13,669 --> 00:18:11,760

she is supporting the astronauts right

465

00:18:16,549 --> 00:18:13,679

she's in the support role wearing as you

466

00:18:18,549 --> 00:18:16,559

notice the black spacex ninja suit as

467

00:18:20,710 --> 00:18:18,559

they call it yes um and there's a reason

468

00:18:22,789 --> 00:18:20,720

for that well yeah that's i think to

469

00:18:25,350 --> 00:18:22,799

because though the team is um kind of

470

00:18:26,710 --> 00:18:25,360

one team is the idea and uh and she

471

00:18:29,430 --> 00:18:26,720

blends in with the rest of the team but

472

00:18:32,070 --> 00:18:29,440

it is nice for us to have that one nasa

473

00:18:34,310 --> 00:18:32,080

representative knowing that you know

474

00:18:35,750 --> 00:18:34,320

they're holding on to any messages or

475

00:18:40,390 --> 00:18:35,760

any information that we need to pass

476
00:18:44,950 --> 00:18:43,669
so megan you were on both sides of the

477
00:18:47,510 --> 00:18:44,960
stanchions

478
00:18:49,990 --> 00:18:47,520
when this walk out countdown one we're t

479
00:18:51,510 --> 00:18:50,000
minus three hours 35 minutes

480
00:18:53,990 --> 00:18:51,520
crew suit donning and checkouts are

481
00:18:56,070 --> 00:18:54,000
complete we're on schedule

482
00:18:58,470 --> 00:18:56,080
okay they look finished and they're all

483
00:19:01,510 --> 00:18:58,480
ready to go and as i was mentioning um

484
00:19:03,510 --> 00:19:01,520
you were on both sides so uh both

485
00:19:05,110 --> 00:19:03,520
on the inside as an astronaut for crew

486
00:19:07,669 --> 00:19:05,120
two but then also on the outside for

487
00:19:09,750 --> 00:19:07,679
your husband bob benkin who along with

488
00:19:11,590 --> 00:19:09,760

doug hurley flew that historic mission

489

00:19:13,510 --> 00:19:11,600

the first crew dragon to go to the

490

00:19:15,190 --> 00:19:13,520

international space station that's right

491

00:19:17,350 --> 00:19:15,200

and it's a it's a different experience

492

00:19:19,029 --> 00:19:17,360

with some similarities you know as the

493

00:19:21,350 --> 00:19:19,039

family member as the loved ones you're

494

00:19:22,950 --> 00:19:21,360

outside you're very excited for them to

495

00:19:25,190 --> 00:19:22,960

come out you're thinking about how

496

00:19:28,150 --> 00:19:25,200

they're feeling and wanting to give them

497

00:19:29,750 --> 00:19:28,160

you know a good bright joyful send-off

498

00:19:31,990 --> 00:19:29,760

but of course as the family member with

499

00:19:33,590 --> 00:19:32,000

no active role in the process it's a

500

00:19:35,350 --> 00:19:33,600

little nerve-wracking right to realize

501
00:19:37,029 --> 00:19:35,360
that this major thing is about to happen

502
00:19:38,950 --> 00:19:37,039
that you're not participating in my

503
00:19:41,110 --> 00:19:38,960
focus then was just to make sure that my

504
00:19:42,870 --> 00:19:41,120
son was enjoying it that he was gonna

505
00:19:45,590 --> 00:19:42,880
get to enjoy seeing his father in this

506
00:19:47,430 --> 00:19:45,600
moment um and celebrate with him and not

507
00:19:49,110 --> 00:19:47,440
try to climb into the tesla on the on

508
00:19:52,470 --> 00:19:49,120
the way to the launch pad that was my

509
00:19:53,830 --> 00:19:52,480
primary goal as in my mom role right um

510
00:19:55,350 --> 00:19:53,840
and then on the flip side when you're

511
00:19:57,190 --> 00:19:55,360
the crew member you know you know you're

512
00:19:59,110 --> 00:19:57,200
gonna get to see your family really soon

513
00:20:00,310 --> 00:19:59,120

you're hoping that this is a joyful

514

00:20:03,110 --> 00:20:00,320

experience for them that they're

515

00:20:05,270 --> 00:20:03,120

enjoying it that they're excited for you

516

00:20:06,950 --> 00:20:05,280

um and so you do share those kinds of

517

00:20:08,630 --> 00:20:06,960

emotions but i will say it's a much

518

00:20:10,789 --> 00:20:08,640

harder job

519

00:20:12,710 --> 00:20:10,799

as the loved ones that are there kind of

520

00:20:15,270 --> 00:20:12,720

being left behind because you don't have

521

00:20:17,029 --> 00:20:15,280

that active role in the day's activities

522

00:20:19,029 --> 00:20:17,039

you're just kind of a passive bystander

523

00:20:20,390 --> 00:20:19,039

so for somebody like myself that's used

524

00:20:22,230 --> 00:20:20,400

to being very active

525

00:20:23,669 --> 00:20:22,240

that that was a challenge to realize

526

00:20:25,750 --> 00:20:23,679

he's doing this all on his own and i

527

00:20:30,149 --> 00:20:25,760

can't help no matter what so that was

528

00:20:33,750 --> 00:20:31,750

there are three teslas as you can see

529

00:20:35,270 --> 00:20:33,760

there we've been showing you some views

530

00:20:37,270 --> 00:20:35,280

right outside the operations and

531

00:20:38,870 --> 00:20:37,280

checkout building there and those are

532

00:20:41,190 --> 00:20:38,880

the vehicles that will take the

533

00:20:43,350 --> 00:20:41,200

astronauts to the path the second two

534

00:20:45,830 --> 00:20:43,360

teslas they will drive the crew out to

535

00:20:48,230 --> 00:20:45,840

launch complex 39a riding in the first

536

00:20:50,630 --> 00:20:48,240

car will be the sutex and the spacecraft

537

00:20:52,789 --> 00:20:50,640

closeout lead in the second tesla

538

00:20:55,029 --> 00:20:52,799

commander chell lindgren and pilot bob

539

00:20:57,110 --> 00:20:55,039

hines will be sharing a ride with a nasa

540

00:20:59,510 --> 00:20:57,120

flight surgeon and in the third vehicle

541

00:21:01,430 --> 00:20:59,520

will be jessica watkins and samantha

542

00:21:03,669 --> 00:21:01,440

christopher eddie they'll also have

543

00:21:05,909 --> 00:21:03,679

another closeout lead with them in that

544

00:21:08,149 --> 00:21:05,919

vehicle and of course we will follow the

545

00:21:10,470 --> 00:21:08,159

convoy live every step of the way

546

00:21:13,510 --> 00:21:10,480

getting you as close as we can possibly

547

00:21:18,310 --> 00:21:13,520

get you without actually being inside

548

00:21:28,630 --> 00:21:20,870

now let's take a look at the crew's

549

00:21:32,149 --> 00:21:30,149

i think one of the most special things

550

00:21:34,630 --> 00:21:32,159

about this particular space flight are

551

00:21:37,350 --> 00:21:34,640

the people that i get to fly with

552

00:21:39,350 --> 00:21:37,360

bob hines or farmer is a test pilot he

553

00:21:41,669 --> 00:21:39,360

is the the pilot for our spacecraft

554

00:21:46,070 --> 00:21:41,679

samantha christopher reddy is an italian

555

00:21:48,310 --> 00:21:46,080

fighter pilot who flew in 2014 and

556

00:21:50,390 --> 00:21:48,320

jessica watkins is one of our newer

557

00:21:52,310 --> 00:21:50,400

astronauts she is somebody that

558

00:21:53,750 --> 00:21:52,320

absolutely is foundational to our crew

559

00:21:56,789 --> 00:21:53,760

and somebody that can be counted on

560

00:21:59,430 --> 00:21:56,799

chell is our fearless leader always in

561

00:22:01,990 --> 00:21:59,440

command ready for the next move and just

562

00:22:04,549 --> 00:22:02,000

somebody that i deeply respect i knew

563

00:22:07,029 --> 00:22:04,559

chad lindgren our commander very well he

564

00:22:08,789 --> 00:22:07,039

was on the backup crew of my first

565

00:22:11,590 --> 00:22:08,799

flight so we spent quite some time

566

00:22:13,750 --> 00:22:11,600

together so i felt very grateful because

567

00:22:15,190 --> 00:22:13,760

charlie's just a great guy

568

00:22:17,909 --> 00:22:15,200

a little known fact about jessica

569

00:22:18,630 --> 00:22:17,919

watkins is that she has the sixth sense

570

00:22:20,310 --> 00:22:18,640

to

571

00:22:22,390 --> 00:22:20,320

know whenever something is in free

572

00:22:24,390 --> 00:22:22,400

flight around her and catch it

573

00:22:26,070 --> 00:22:24,400

so i am really interested to see how in

574

00:22:27,750 --> 00:22:26,080

zero gravity where everything's in free

575

00:22:30,149 --> 00:22:27,760

flight i really want to see how she

576

00:22:33,190 --> 00:22:30,159

manages that she's phenomenal you know

577

00:22:35,909 --> 00:22:33,200

she joined our crew a little bit late

578

00:22:37,750 --> 00:22:35,919

and for our very first spacex sim she

579

00:22:39,909 --> 00:22:37,760

jumped right in there as if she had been

580

00:22:43,110 --> 00:22:39,919

training with us for months samantha

581

00:22:45,750 --> 00:22:43,120

christopher reddy is an italian issa

582

00:22:48,149 --> 00:22:45,760

astronaut she always brings the italian

583

00:22:49,990 --> 00:22:48,159

culture and energy to the table always

584

00:22:51,750 --> 00:22:50,000

super inquisitive

585

00:22:54,630 --> 00:22:51,760

and just makes us all feel like family

586

00:22:56,149 --> 00:22:54,640

to see her experience and the expertise

587

00:22:58,390 --> 00:22:56,159

that she brings

588

00:22:59,350 --> 00:22:58,400

and her leadership has been very special

589

00:23:02,149 --> 00:22:59,360

and

590

00:23:04,549 --> 00:23:02,159

bob hines or farmer is a test pilot he

591

00:23:06,230 --> 00:23:04,559

is the the pilot for our spacecraft it's

592

00:23:08,390 --> 00:23:06,240

such a privilege to get to work with him

593

00:23:10,390 --> 00:23:08,400

and to lean on his flying

594

00:23:12,870 --> 00:23:10,400

test pilot experience he will always

595

00:23:15,830 --> 00:23:12,880

bring a dad joke so you can always be

596

00:23:18,310 --> 00:23:15,840

prepared for that when we're in space we

597

00:23:20,950 --> 00:23:18,320

100 percent put our lives in the hands

598

00:23:23,270 --> 00:23:20,960

of our crewmates all four of us together

599

00:23:25,029 --> 00:23:23,280

really come together and balance each

600

00:23:27,110 --> 00:23:25,039

other out and

601
00:23:28,549 --> 00:23:27,120
really just coalesce well as a crew

602
00:23:31,050 --> 00:23:28,559
incredibly happy and thought i couldn't

603
00:23:36,950 --> 00:23:31,060
have had a better crew

604
00:23:39,350 --> 00:23:36,960
[Music]

605
00:23:40,789 --> 00:23:39,360
we love to hear how they bond you know

606
00:23:42,390 --> 00:23:40,799
over the two years of training i'm sure

607
00:23:43,990 --> 00:23:42,400
it was the same for your crew as well

608
00:23:45,510 --> 00:23:44,000
it's the best part of the mission really

609
00:23:47,510 --> 00:23:45,520
is that how about that

610
00:23:49,510 --> 00:23:47,520
well this is the operations and checkout

611
00:23:52,789 --> 00:23:49,520
building high above from our helicopter

612
00:23:55,669 --> 00:23:52,799
here at kennedy space center and inside

613
00:23:57,669 --> 00:23:55,679

is some beautiful artwork megan this is

614

00:24:00,630 --> 00:23:57,679

some artwork that came to us from around

615

00:24:02,710 --> 00:24:00,640

the world part of the 2022 children's

616

00:24:04,710 --> 00:24:02,720

international artwork contest winners

617

00:24:06,630 --> 00:24:04,720

ages four through six

618

00:24:08,950 --> 00:24:06,640

and i i love this

619

00:24:11,830 --> 00:24:08,960

they've done such a great job great job

620

00:24:13,830 --> 00:24:11,840

putting these little paintings together

621

00:24:16,149 --> 00:24:13,840

they were in categories as you can see

622

00:24:18,070 --> 00:24:16,159

some were spacecraft some were exploring

623

00:24:19,669 --> 00:24:18,080

the solar system i love the one in the

624

00:24:21,590 --> 00:24:19,679

bottom left-hand corner you see that

625

00:24:23,510 --> 00:24:21,600

living and working in space yes it's got

626

00:24:26,390 --> 00:24:23,520

a space station and it's tethered to the

627

00:24:27,909 --> 00:24:26,400

earth okay yeah

628

00:24:29,990 --> 00:24:27,919

they're living in their own world there

629

00:24:32,230 --> 00:24:30,000

maybe maybe one day we can have plants

630

00:24:34,710 --> 00:24:32,240

and trees like that one thank you to all

631

00:24:37,350 --> 00:24:34,720

the children who participated in our art

632

00:24:39,990 --> 00:24:37,360

contest it is up on the wall and the

633

00:24:41,750 --> 00:24:40,000

astronauts of crew 4 will be walking by

634

00:24:49,669 --> 00:24:41,760

and they'll see that art as they walk

635

00:24:52,950 --> 00:24:50,870

throughout

636

00:24:55,269 --> 00:24:52,960

the mission we want to invite you for

637

00:24:55,990 --> 00:24:55,279

the next three and a half hours to send

638

00:24:57,430 --> 00:24:56,000

us

639

00:25:00,310 --> 00:24:57,440

your questions

640

00:25:02,789 --> 00:25:00,320

for megan we've got the expert on hand

641

00:25:06,630 --> 00:25:02,799

all you have to do is use the hashtag

642

00:25:08,710 --> 00:25:06,640

ask nasa handle on twitter

643

00:25:10,950 --> 00:25:08,720

so tweet it at us and uh

644

00:25:14,710 --> 00:25:10,960

we'll get some of those questions on the

645

00:25:16,070 --> 00:25:14,720

air and asked to her

646

00:25:17,110 --> 00:25:16,080

we got a question right now in fact all

647

00:25:20,230 --> 00:25:17,120

right

648

00:25:22,549 --> 00:25:20,240

from go for space launch

649

00:25:24,870 --> 00:25:22,559

megan how many people can live and work

650

00:25:26,789 --> 00:25:24,880

on the space station at one time that's

651
00:25:28,230 --> 00:25:26,799
a great question so when i arrived

652
00:25:30,470 --> 00:25:28,240
aboard the international space station

653
00:25:33,430 --> 00:25:30,480
there was already crew one was there as

654
00:25:35,350 --> 00:25:33,440
well as a soyuz crew so in total there

655
00:25:37,750 --> 00:25:35,360
were 11 of us on board the international

656
00:25:39,669 --> 00:25:37,760
space station at that time

657
00:25:41,350 --> 00:25:39,679
the space station is large but that does

658
00:25:43,350 --> 00:25:41,360
make it a little crowded it makes it a

659
00:25:44,789 --> 00:25:43,360
little crowded for some of the um

660
00:25:46,870 --> 00:25:44,799
hardware that you need to use for

661
00:25:49,590 --> 00:25:46,880
example the toilet or the the galley to

662
00:25:51,510 --> 00:25:49,600
prepare your food and so um it impedes

663
00:25:53,190 --> 00:25:51,520

our ability to work effectively when

664

00:25:55,269 --> 00:25:53,200

there's that many people on board but we

665

00:25:56,789 --> 00:25:55,279

all live there safely and and we are

666

00:25:58,230 --> 00:25:56,799

teaching one another you know we call it

667

00:26:00,390 --> 00:25:58,240

handover to learn how to operate the

668

00:26:02,230 --> 00:26:00,400

space station it takes more coordination

669

00:26:04,230 --> 00:26:02,240

and more planning and organization

670

00:26:05,750 --> 00:26:04,240

exactly the size of space station is

671

00:26:07,990 --> 00:26:05,760

roughly like i heard it described as a

672

00:26:11,029 --> 00:26:08,000

five-bedroom house i mean outside it's

673

00:26:13,590 --> 00:26:11,039

as large as a football field right it is

674

00:26:16,470 --> 00:26:13,600

massive right orbiting around our earth

675

00:26:18,870 --> 00:26:16,480

on the inside five bedroom house yes so

676
00:26:20,310 --> 00:26:18,880
the living space inside is smaller than

677
00:26:21,909 --> 00:26:20,320
the overall size of the space station

678
00:26:23,430 --> 00:26:21,919
there's a lot of external structure on

679
00:26:26,390 --> 00:26:23,440
the space station that you know the

680
00:26:28,070 --> 00:26:26,400
truss that holds a lot of our equipment

681
00:26:30,230 --> 00:26:28,080
uh power generation and distribution

682
00:26:31,909 --> 00:26:30,240
equipment for example um and we don't

683
00:26:33,269 --> 00:26:31,919
those are not pressurized living spaces

684
00:26:34,870 --> 00:26:33,279
but they are still part of the structure

685
00:26:37,830 --> 00:26:34,880
of space station so the living space

686
00:26:39,909 --> 00:26:37,840
inside five bedroom houses the closer um

687
00:26:42,310 --> 00:26:39,919
a closer number okay very good and about

688
00:26:43,990 --> 00:26:42,320

6000 square feet is what i heard as well

689

00:26:45,990 --> 00:26:44,000

we have another social question as we

690

00:26:48,070 --> 00:26:46,000

are live outside of the crew quarters

691

00:26:49,750 --> 00:26:48,080

waiting for astronaut uh the astronauts

692

00:26:53,590 --> 00:26:49,760

from crew 4 to walk out

693

00:26:55,990 --> 00:26:53,600

what are some of the manual features

694

00:26:57,430 --> 00:26:56,000

on the spacex crew dragon capsule that

695

00:27:00,789 --> 00:26:57,440

comes from william

696

00:27:04,310 --> 00:27:03,190

so the manual features are designed in

697

00:27:05,830 --> 00:27:04,320

the event because the vehicle is

698

00:27:07,990 --> 00:27:05,840

designed to be largely automated and

699

00:27:09,909 --> 00:27:08,000

ground controlled so the manual features

700

00:27:11,750 --> 00:27:09,919

are designed in the event that the crew

701

00:27:14,310 --> 00:27:11,760

has to take over has to take care of

702

00:27:16,549 --> 00:27:14,320

themselves in some way so we think about

703

00:27:18,070 --> 00:27:16,559

manual manual flying as a capability

704

00:27:20,870 --> 00:27:18,080

that we have close into the space

705

00:27:22,230 --> 00:27:20,880

station should that become necessary

706

00:27:24,149 --> 00:27:22,240

we don't expect that to ever become

707

00:27:26,470 --> 00:27:24,159

necessary but it was tested out on the

708

00:27:28,389 --> 00:27:26,480

on the original demo mission and as the

709

00:27:30,470 --> 00:27:28,399

pilot that was something that you had to

710

00:27:32,230 --> 00:27:30,480

know well we had to train shane and i

711

00:27:34,310 --> 00:27:32,240

trained that together

712

00:27:36,230 --> 00:27:34,320

and in the event for example that we had

713

00:27:37,590 --> 00:27:36,240

a an unsuccessful docking we would have

714

00:27:39,350 --> 00:27:37,600

to make sure that the vehicle was

715

00:27:40,870 --> 00:27:39,360

departing the space station

716

00:27:42,310 --> 00:27:40,880

appropriately and safely and if it

717

00:27:44,230 --> 00:27:42,320

wasn't then there was some manual

718

00:27:45,990 --> 00:27:44,240

control that we would take and and do

719

00:27:47,430 --> 00:27:46,000

some maneuvering with the spacecraft but

720

00:27:49,190 --> 00:27:47,440

fortunately we never had to do that but

721

00:27:51,110 --> 00:27:49,200

that's an example of the kinds of things

722

00:27:53,350 --> 00:27:51,120

that we can do manually on space great

723

00:27:56,389 --> 00:27:53,360

capability yeah absolutely it's

724

00:27:58,630 --> 00:27:56,399

autopiloted uh if nothing goes wrong but

725

00:28:00,870 --> 00:27:58,640

you want that ability to jump in and

726
00:28:06,389 --> 00:28:00,880
take it great question keep them coming

727
00:28:12,070 --> 00:28:08,870
jet for me asks what's the launch

728
00:28:13,909 --> 00:28:12,080
trajectory and visibility for the crew 4

729
00:28:15,510 --> 00:28:13,919
launch this is a little bit more of a

730
00:28:17,029 --> 00:28:15,520
complicated question dealing with the

731
00:28:19,830 --> 00:28:17,039
trajectory of this particular launch

732
00:28:22,389 --> 00:28:19,840
it's the same as it was for you where

733
00:28:23,830 --> 00:28:22,399
we're going up and out over the atlantic

734
00:28:26,149 --> 00:28:23,840
seaboard right

735
00:28:27,590 --> 00:28:26,159
so i didn't get to see the last one like

736
00:28:29,510 --> 00:28:27,600
this but i would imagine that it's going

737
00:28:31,190 --> 00:28:29,520
to be a spectacular view for those in

738
00:28:32,870 --> 00:28:31,200

the local area

739

00:28:34,389 --> 00:28:32,880
because it's a night launch and

740

00:28:36,789 --> 00:28:34,399
hopefully the lighting conditions will

741

00:28:38,789 --> 00:28:36,799
be similar and that you can see

742

00:28:40,470 --> 00:28:38,799
the the trajectory for quite quite some

743

00:28:42,230 --> 00:28:40,480
way as it flies up along the atlantic

744

00:28:44,470 --> 00:28:42,240
coast especially at night with the

745

00:28:46,470 --> 00:28:44,480
brightness this exactly rocket gives off

746

00:28:48,710 --> 00:28:46,480
and as we look live here

747

00:28:50,230 --> 00:28:48,720
at uh one of the teslas and uh members

748

00:28:51,750 --> 00:28:50,240
of the media and family members

749

00:28:55,190 --> 00:28:51,760
gathering you can see in the

750

00:28:57,029 --> 00:28:55,200
left hand side administrator bill nelson

751

00:28:59,909 --> 00:28:57,039

nasa's administrator former florida

752

00:29:02,470 --> 00:28:59,919

senator here in the state of florida and

753

00:29:04,549 --> 00:29:02,480

next to him is bob cabana the former

754

00:29:07,190 --> 00:29:04,559

director of the kennedy space center and

755

00:29:09,750 --> 00:29:07,200

current associate administrator

756

00:29:12,789 --> 00:29:09,760

working out of headquarters now helping

757

00:29:14,950 --> 00:29:12,799

administrator nelson lead the agency

758

00:29:16,870 --> 00:29:14,960

see kelvin manning as well to his right

759

00:29:20,710 --> 00:29:16,880

and here comes crew 4 down the hallway

760

00:29:25,990 --> 00:29:22,470

on the left bob hines on the right shell

761

00:29:28,470 --> 00:29:26,000

lindgren giving a good wave

762

00:29:31,510 --> 00:29:28,480

those smiles

763

00:29:33,029 --> 00:29:31,520

great smiles jessica watkins and

764

00:29:34,549 --> 00:29:33,039

samantha christopher ferretti and bear

765

00:29:36,149 --> 00:29:34,559

in the elevator they go look at all

766

00:29:37,669 --> 00:29:36,159

those signatures megan you can see them

767

00:29:39,830 --> 00:29:37,679

on the wall folks who have supported

768

00:29:41,590 --> 00:29:39,840

this program yes i remember that when we

769

00:29:44,310 --> 00:29:41,600

got into the elevator and it's such a

770

00:29:45,990 --> 00:29:44,320

good feeling um we don't often get to

771

00:29:47,190 --> 00:29:46,000

interact with the thousands and

772

00:29:49,990 --> 00:29:47,200

thousands of people that make it

773

00:29:51,430 --> 00:29:50,000

possible and it's so nice to see that um

774

00:29:53,190 --> 00:29:51,440

just tangible evidence that they're

775

00:29:55,029 --> 00:29:53,200

thinking of us and it you know reminds

776

00:29:57,350 --> 00:29:55,039

us of course we all are always thinking

777

00:30:02,549 --> 00:29:57,360

of them too but it's a nice reminder of

778

00:30:06,710 --> 00:30:04,870

got the elevator closed and now they're

779

00:30:09,269 --> 00:30:06,720

on their way down from

780

00:30:11,350 --> 00:30:09,279

the fourth floor to the first floor

781

00:30:12,950 --> 00:30:11,360

and uh we are just now moments away as a

782

00:30:15,430 --> 00:30:12,960

result from seeing the crew four

783

00:30:17,750 --> 00:30:15,440

astronauts exit the operations and

784

00:30:19,510 --> 00:30:17,760

checkout building

785

00:30:21,110 --> 00:30:19,520

yeah so excitement is building i

786

00:30:22,470 --> 00:30:21,120

remember waiting inside you know you get

787

00:30:24,310 --> 00:30:22,480

down off the elevator and then

788

00:30:25,909 --> 00:30:24,320

everything is timed to very precisely so

789

00:30:27,750 --> 00:30:25,919

you get you wait for just a couple

790

00:30:29,510 --> 00:30:27,760

moments and then the spacex team will

791

00:30:30,710 --> 00:30:29,520

give you the cue to start walking out

792

00:30:31,909 --> 00:30:30,720

and that excitement builds pretty

793

00:30:33,110 --> 00:30:31,919

quickly and since you speak of that

794

00:30:34,870 --> 00:30:33,120

megan we want to give you a little

795

00:30:36,549 --> 00:30:34,880

flashback take a look at the screen now

796

00:30:38,789 --> 00:30:36,559

you might remember this

797

00:30:40,789 --> 00:30:38,799

demo two and there you are in the light

798

00:30:42,789 --> 00:30:40,799

blue with your son saying goodbye to

799

00:30:44,630 --> 00:30:42,799

your husband bob bacon on that historic

800

00:30:46,789 --> 00:30:44,640

flight that's right that was a really

801
00:30:49,190 --> 00:30:46,799
special moment and uh it was great to

802
00:30:51,029 --> 00:30:49,200
see how excited my son was to see his

803
00:30:52,950 --> 00:30:51,039
father there were no tears it was all

804
00:30:55,190 --> 00:30:52,960
smiles and cheering

805
00:30:57,590 --> 00:30:55,200
uh my son i think was determined to say

806
00:30:59,190 --> 00:30:57,600
launch america first and loudest and so

807
00:31:01,830 --> 00:30:59,200
that's uh that's what he was doing he

808
00:31:03,990 --> 00:31:01,840
did a great job and then in april crew 2

809
00:31:05,830 --> 00:31:04,000
this was your launch now the role was

810
00:31:07,590 --> 00:31:05,840
reversed you were in the astronaut suit

811
00:31:09,190 --> 00:31:07,600
getting ready to go out and launch and

812
00:31:10,789 --> 00:31:09,200
your husband was there with your son

813
00:31:13,430 --> 00:31:10,799

that's right and i was listening out for

814

00:31:14,710 --> 00:31:13,440

that for that launch america and like

815

00:31:16,549 --> 00:31:14,720

sure enough i could hear it from

816

00:31:19,269 --> 00:31:16,559

probably 20 feet away

817

00:31:21,590 --> 00:31:19,279

that was a wonderful moment

818

00:31:23,669 --> 00:31:21,600

and now we look at the doors for crew 4

819

00:31:25,990 --> 00:31:23,679

awaiting their moment with their

820

00:31:29,430 --> 00:31:26,000

families before they go out to launch

821

00:31:32,710 --> 00:31:29,440

pad 39a a historic pad here

822

00:31:34,950 --> 00:31:32,720

where their rocket awaits them as well

823

00:31:50,789 --> 00:31:34,960

as their spacecraft

824

00:31:53,909 --> 00:31:53,190

usually when the first spacex tech comes

825

00:32:01,990 --> 00:31:53,919

out

826

00:32:05,990 --> 00:32:04,149

you can see on the top there the nasa

827

00:32:07,830 --> 00:32:06,000

meatball the logo and the various

828

00:32:10,470 --> 00:32:07,840

mission patches around it those have

829

00:32:11,669 --> 00:32:10,480

been put there by previous crews that's

830

00:32:13,110 --> 00:32:11,679

right

831

00:32:14,720 --> 00:32:13,120

now you can actually just barely see the

832

00:32:16,389 --> 00:32:14,730

meatball it's almost completely covered

833

00:32:17,909 --> 00:32:16,399

[Laughter]

834

00:32:25,669 --> 00:32:17,919

with mission stickers but that's an

835

00:32:33,909 --> 00:32:28,070

the gull wing doors of the tesla is now

836

00:32:38,870 --> 00:32:36,310

at t minus three hours and 21 minutes

837

00:32:40,630 --> 00:32:38,880

until liftoff

838

00:32:42,950 --> 00:32:40,640

you can see the markings on the ground

839

00:32:44,549 --> 00:32:42,960

the family will not go beyond that rope

840

00:32:46,870 --> 00:32:44,559

and the astronauts will generally stay

841

00:32:49,509 --> 00:32:46,880

behind the yellow but then there will be

842

00:32:50,549 --> 00:32:49,519

a moment as we saw uh from previous

843

00:32:51,909 --> 00:32:50,559

videos

844

00:32:52,870 --> 00:32:51,919

where the family will get to go up to

845

00:32:54,630 --> 00:32:52,880

the car

846

00:32:55,750 --> 00:32:54,640

yes once the windows once the doors are

847

00:32:57,750 --> 00:32:55,760

closed and the windows are up you're

848

00:32:59,509 --> 00:32:57,760

allowed to go up and and look through

849

00:33:07,430 --> 00:32:59,519

the glass a little bit closer which is

850

00:33:14,230 --> 00:33:08,710

i was

851
00:33:17,669 --> 00:33:16,070
getting ready to go to space taking

852
00:33:19,029 --> 00:33:17,679
their first steps off

853
00:33:20,870 --> 00:33:19,039
outside

854
00:33:23,909 --> 00:33:20,880
from left to right

855
00:33:27,350 --> 00:33:23,919
jessica watkins bob hines michelle

856
00:33:31,509 --> 00:33:27,360
lindgren and samantha christopher reddy

857
00:33:47,380 --> 00:33:34,230
and a cheer before they go off

858
00:33:51,269 --> 00:33:48,789
[Music]

859
00:33:53,190 --> 00:33:51,279
and here's that moment

860
00:33:55,509 --> 00:33:53,200
it's a wonderful moment just seeing the

861
00:33:56,870 --> 00:33:55,519
smiles on the faces of your loved ones

862
00:33:58,789 --> 00:33:56,880
knowing that they're there for you that

863
00:34:18,710 --> 00:33:58,799

they're excited for you

864

00:34:22,069 --> 00:34:20,550

listening for

865

00:34:23,669 --> 00:34:22,079

some of the comments

866

00:34:40,479 --> 00:34:23,679

maybe we'll get to hear chels big

867

00:34:40,489 --> 00:34:45,030

[Applause]

868

00:34:50,550 --> 00:34:48,069

big smiles all the way around

869

00:34:51,990 --> 00:34:50,560

i remember you smiling quite a bit as

870

00:34:56,710 --> 00:34:52,000

well

871

00:35:00,630 --> 00:34:58,150

that

872

00:35:02,150 --> 00:35:00,640

you wanted to send the message oh

873

00:35:03,829 --> 00:35:02,160

absolutely yeah so

874

00:35:05,910 --> 00:35:03,839

again you're not really sure how your

875

00:35:08,870 --> 00:35:05,920

family members will react especially if

876

00:35:11,030 --> 00:35:08,880

you have young children and so the main

877

00:35:12,630 --> 00:35:11,040

thing is to just show them that it's a

878

00:35:14,390 --> 00:35:12,640

joyful occasion it's something to be

879

00:35:16,310 --> 00:35:14,400

excited and happy about

880

00:35:18,470 --> 00:35:16,320

my hope was to you know head off any

881

00:35:20,790 --> 00:35:18,480

tears that might be coming or you know

882

00:35:22,710 --> 00:35:20,800

any upset feelings but really um my son

883

00:35:24,390 --> 00:35:22,720

ended up just being a trooper he was so

884

00:35:26,390 --> 00:35:24,400

happy there was so much excitement

885

00:35:28,710 --> 00:35:26,400

around him that that really helped buoy

886

00:35:31,670 --> 00:35:28,720

him up i think for both circumstances

887

00:35:33,589 --> 00:35:31,680

and i was so grateful to see that

888

00:35:35,910 --> 00:35:33,599

and didn't you break free and say like

889

00:35:37,190 --> 00:35:35,920

hey mommy i love you

890

00:35:39,109 --> 00:35:37,200

that sounds right i was worried he was

891

00:35:41,190 --> 00:35:39,119

gonna actually come through the ropes

892

00:35:43,109 --> 00:35:41,200

but uh but he did not do that

893

00:35:44,710 --> 00:35:43,119

um i think for bob's launch there's an

894

00:35:46,390 --> 00:35:44,720

image of him like actually trying to get

895

00:35:48,230 --> 00:35:46,400

through the window

896

00:35:49,750 --> 00:35:48,240

before the vehicles drove away but i

897

00:35:57,349 --> 00:35:49,760

managed to hold on to him he was a

898

00:36:02,069 --> 00:35:59,270

one of our astronauts really soaking it

899

00:36:05,270 --> 00:36:03,990

i believe that's gel

900

00:36:07,829 --> 00:36:05,280

yeah i don't want to miss that picture

901
00:36:10,069 --> 00:36:07,839
that perfect photo

902
00:36:17,910 --> 00:36:10,079
that does look like he's posing

903
00:36:24,310 --> 00:36:20,710
i think that's maybe that's farmer

904
00:36:24,320 --> 00:36:38,310
yes you're right

905
00:36:41,910 --> 00:36:39,829
that shot from above was actually from

906
00:36:47,750 --> 00:36:41,920
one of our photographers

907
00:36:57,109 --> 00:36:48,630
that

908
00:37:00,870 --> 00:36:59,030
our helicopter will follow the entire

909
00:37:02,230 --> 00:37:00,880
way as the convoy pulls out you can see

910
00:37:04,310 --> 00:37:02,240
the swat vehicle in the background and

911
00:37:06,710 --> 00:37:04,320
now the families and loved ones come in

912
00:37:07,670 --> 00:37:06,720
yes they get that up close view one more

913
00:37:10,470 --> 00:37:07,680

time

914

00:37:12,470 --> 00:37:10,480

with their loved ones

915

00:37:14,230 --> 00:37:12,480

and that's really special any last

916

00:37:15,990 --> 00:37:14,240

little messages you want to share

917

00:37:16,710 --> 00:37:16,000

privately or

918

00:37:19,829 --> 00:37:16,720

just

919

00:37:21,750 --> 00:37:19,839

hands up against the glass

920

00:37:22,870 --> 00:37:21,760

it's a special moment and megan the

921

00:37:25,109 --> 00:37:22,880

plate for

922

00:37:26,390 --> 00:37:25,119

uh on every car of the tesla is go for

923

00:37:28,230 --> 00:37:26,400

launch

924

00:37:31,589 --> 00:37:28,240

as we can see the custom

925

00:37:34,150 --> 00:37:31,599

plate this has become a tradition yeah

926
00:37:44,150 --> 00:37:34,160
on the on the ride out to the launch pad

927
00:37:48,150 --> 00:37:45,990
as they get ready to pull out there i'm

928
00:37:49,589 --> 00:37:48,160
i'm wondering megan is there a little

929
00:37:52,310 --> 00:37:49,599
bit of a conflict for the astronauts

930
00:37:53,829 --> 00:37:52,320
seeing your loved ones knowing you are

931
00:37:55,430 --> 00:37:53,839
getting ready to do something that

932
00:37:57,190 --> 00:37:55,440
involves risk right

933
00:37:58,790 --> 00:37:57,200
it's something that obviously you're not

934
00:38:00,230 --> 00:37:58,800
thinking about it for the first time at

935
00:38:01,829 --> 00:38:00,240
that moment but it's certainly present

936
00:38:03,109 --> 00:38:01,839
in your mind it's something that you

937
00:38:05,510 --> 00:38:03,119
ideally have talked about with your

938
00:38:07,510 --> 00:38:05,520

family in the months and weeks

939

00:38:09,270 --> 00:38:07,520

even years really leading up to making a

940

00:38:10,790 --> 00:38:09,280

decision like this and

941

00:38:12,230 --> 00:38:10,800

you know depending on the age of your

942

00:38:14,390 --> 00:38:12,240

family members you do it in an

943

00:38:16,069 --> 00:38:14,400

age-appropriate way and so for us we

944

00:38:18,230 --> 00:38:16,079

wanted to make sure our son had had a

945

00:38:20,310 --> 00:38:18,240

chance to watch a rocket launch with

946

00:38:23,109 --> 00:38:20,320

both of us present so we took him to an

947

00:38:25,030 --> 00:38:23,119

uncrewed cargo launch when he was maybe

948

00:38:27,589 --> 00:38:25,040

three or four and then you know kind of

949

00:38:29,750 --> 00:38:27,599

a build up approach for him and you know

950

00:38:31,510 --> 00:38:29,760

introduced it to him gradually so that

951
00:38:33,109 --> 00:38:31,520
he could get comfortable with the idea

952
00:38:36,310 --> 00:38:33,119
and you know at first when i told him i

953
00:38:38,310 --> 00:38:36,320
was going um he said absolutely not

954
00:38:40,550 --> 00:38:38,320
you're not going and then he said okay

955
00:38:42,390 --> 00:38:40,560
you can go but 180 days is as much too

956
00:38:44,310 --> 00:38:42,400
long so it's it's not really a

957
00:38:46,150 --> 00:38:44,320
negotiation but it's sort of a gradual

958
00:38:47,670 --> 00:38:46,160
introduction of what it is and then you

959
00:38:49,750 --> 00:38:47,680
try to share obviously why you believe

960
00:38:51,349 --> 00:38:49,760
it's important to do these things even

961
00:38:53,270 --> 00:38:51,359
though they're risky and they benefit

962
00:38:56,630 --> 00:38:53,280
mankind they benefit all of us

963
00:38:59,030 --> 00:38:56,640

and there goes our convoy rolling out

964

00:39:01,589 --> 00:38:59,040

to the launch pad

965

00:39:04,150 --> 00:39:01,599

the last 10 miles

966

00:39:07,430 --> 00:39:04,160

a 20-minute drive

967

00:39:09,190 --> 00:39:07,440

they won't see much in the dark but

968

00:39:11,270 --> 00:39:09,200

this is

969

00:39:13,190 --> 00:39:11,280

the way to space yes

970

00:39:14,710 --> 00:39:13,200

this is a nice relaxation moment you've

971

00:39:16,790 --> 00:39:14,720

just gone through

972

00:39:18,470 --> 00:39:16,800

a happy scene hopefully but an emotional

973

00:39:20,470 --> 00:39:18,480

scene nonetheless and this is a little

974

00:39:22,710 --> 00:39:20,480

bit of a time to kind of lean back in

975

00:39:25,670 --> 00:39:22,720

your chair a little bit um for me it was

976
00:39:27,109 --> 00:39:25,680
blaring some favorite songs um and at

977
00:39:28,470 --> 00:39:27,119
nighttime that was fun just because of

978
00:39:29,910 --> 00:39:28,480
the you know the darkness and then the

979
00:39:31,910 --> 00:39:29,920
different lights that you see it was

980
00:39:33,030 --> 00:39:31,920
kind of a neat visual experience but

981
00:39:34,790 --> 00:39:33,040
it's just a time for a little bit of

982
00:39:35,910 --> 00:39:34,800
relaxation before the next phase of the

983
00:39:38,630 --> 00:39:35,920
journey

984
00:39:41,109 --> 00:39:38,640
and now we begin the 20-minute drive

985
00:39:43,510 --> 00:39:41,119
with a full security escort across

986
00:39:46,230 --> 00:39:43,520
nasa's kennedy space center and out to

987
00:39:47,589 --> 00:39:46,240
launch pad 39a and as we follow the

988
00:39:49,190 --> 00:39:47,599

convoy

989

00:39:51,510 --> 00:39:49,200

we'd like to take a closer look at the

990

00:39:53,829 --> 00:39:51,520

crew 4 spacecraft commander and the rest

991

00:39:55,829 --> 00:39:53,839

of the astronauts in this convoy help

992

00:39:58,470 --> 00:39:55,839

you get to know them a little bit and

993

00:40:02,069 --> 00:39:58,480

we'll start off with nasa astronaut shel

994

00:40:05,829 --> 00:40:04,069

why do we explore

995

00:40:07,750 --> 00:40:05,839

you know i think venturing out into low

996

00:40:10,950 --> 00:40:07,760

earth orbit and beyond

997

00:40:12,950 --> 00:40:10,960

helps us to better understand who we are

998

00:40:14,950 --> 00:40:12,960

in our place in the solar system and the

999

00:40:16,630 --> 00:40:14,960

universe

1000

00:40:18,870 --> 00:40:16,640

my name is chella lindgren and i'm the

1001
00:40:20,309 --> 00:40:18,880
commander for nasa's spacex crew 4

1002
00:40:21,990 --> 00:40:20,319
mission to the international space

1003
00:40:23,910 --> 00:40:22,000
station

1004
00:40:26,390 --> 00:40:23,920
i grew up in an air force family and so

1005
00:40:28,069 --> 00:40:26,400
i was born in taiwan and spent the first

1006
00:40:30,470 --> 00:40:28,079
two years of my life there

1007
00:40:32,550 --> 00:40:30,480
we lived in kansas in illinois

1008
00:40:34,309 --> 00:40:32,560
and then we were transferred to england

1009
00:40:36,230 --> 00:40:34,319
it was a phenomenal

1010
00:40:38,390 --> 00:40:36,240
upbringing the opportunity to experience

1011
00:40:41,670 --> 00:40:38,400
different cultures it really opened my

1012
00:40:43,430 --> 00:40:41,680
eyes to what it means to be an american

1013
00:40:46,069 --> 00:40:43,440

i wanted to be an astronaut for as long

1014

00:40:48,230 --> 00:40:46,079

as i can remember i think i was inspired

1015

00:40:54,410 --> 00:40:48,240

by the very first space shuttle launch

1016

00:41:01,109 --> 00:40:58,710

[Music]

1017

00:41:03,829 --> 00:41:01,119

and that i think is really when this

1018

00:41:05,190 --> 00:41:03,839

this dream was was uh just burned into

1019

00:41:08,069 --> 00:41:05,200

my consciousness

1020

00:41:10,069 --> 00:41:08,079

and so i chartered out a path i went to

1021

00:41:12,630 --> 00:41:10,079

the air force academy maybe to become a

1022

00:41:14,630 --> 00:41:12,640

test pilot and then ultimately to join

1023

00:41:16,710 --> 00:41:14,640

nasa as an astronaut

1024

00:41:18,710 --> 00:41:16,720

that path took some twists and curves

1025

00:41:20,710 --> 00:41:18,720

and i ultimately did not become a pilot

1026

00:41:23,030 --> 00:41:20,720

but went into medicine

1027

00:41:25,430 --> 00:41:23,040

and yet still found a path through

1028

00:41:27,190 --> 00:41:25,440

medicine where i could serve human space

1029

00:41:29,829 --> 00:41:27,200

flight as a flight surgeon

1030

00:41:32,309 --> 00:41:29,839

at nasa supporting our crews training

1031

00:41:34,230 --> 00:41:32,319

for international space station missions

1032

00:41:36,950 --> 00:41:34,240

but i still had that dream that that

1033

00:41:38,150 --> 00:41:36,960

perhaps um i would get to do that job

1034

00:41:40,870 --> 00:41:38,160

someday

1035

00:41:43,030 --> 00:41:40,880

it was absolutely amazing to get the

1036

00:41:44,710 --> 00:41:43,040

call that i had been selected into the

1037

00:41:46,069 --> 00:41:44,720

astronaut office

1038

00:41:49,030 --> 00:41:46,079

and it felt

1039

00:41:51,990 --> 00:41:49,040

a little bit like a culmination of

1040

00:41:53,910 --> 00:41:52,000

the hard work that i had invested in

1041

00:41:55,910 --> 00:41:53,920

getting to that point

1042

00:41:56,410 --> 00:41:55,920

what an amazing really dream come true

1043

00:41:57,910 --> 00:41:56,420

for me

1044

00:42:00,870 --> 00:41:57,920

[Music]

1045

00:42:03,190 --> 00:42:00,880

in 2013 i was assigned to my first

1046

00:42:04,470 --> 00:42:03,200

mission and spent 141 days living and

1047

00:42:05,990 --> 00:42:04,480

working on the international space

1048

00:42:07,589 --> 00:42:06,000

station

1049

00:42:10,309 --> 00:42:07,599

that truly was

1050

00:42:12,550 --> 00:42:10,319

the realization of that lifelong dream

1051
00:42:13,750 --> 00:42:12,560
of all those things in that moment and

1052
00:42:17,510 --> 00:42:13,760
in that mission

1053
00:42:22,870 --> 00:42:20,390
it was an absolute honor to get selected

1054
00:42:25,510 --> 00:42:22,880
for the crew four mission and on top of

1055
00:42:27,670 --> 00:42:25,520
that to have the opportunity to command

1056
00:42:28,470 --> 00:42:27,680
getting to fly with this amazing crew

1057
00:42:31,589 --> 00:42:28,480
with

1058
00:42:33,990 --> 00:42:31,599
farmer and samantha and wadi they are

1059
00:42:36,950 --> 00:42:34,000
incredible astronauts and i feel

1060
00:42:39,430 --> 00:42:36,960
very grateful to be on a team with them

1061
00:42:43,829 --> 00:42:39,440
but we're one small part of a larger

1062
00:42:45,910 --> 00:42:43,839
team that spans the nation and the world

1063
00:42:48,309 --> 00:42:45,920

we truly get to leverage the best and

1064

00:42:51,030 --> 00:42:48,319

brightest as we chase somewhat

1065

00:42:53,670 --> 00:42:51,040

impossible goals

1066

00:42:55,190 --> 00:42:53,680

and so as we push forward to the moon as

1067

00:42:56,630 --> 00:42:55,200

we push to mars we are presenting

1068

00:42:58,870 --> 00:42:56,640

ourselves with

1069

00:43:00,069 --> 00:42:58,880

almost insurmountable challenges by

1070

00:43:02,230 --> 00:43:00,079

presenting ourselves with those

1071

00:43:15,670 --> 00:43:02,240

challenges we become better as a

1072

00:43:19,750 --> 00:43:18,150

a great story from chell lindgren on his

1073

00:43:21,670 --> 00:43:19,760

path to becoming an astronaut and this

1074

00:43:23,910 --> 00:43:21,680

is what he's seeing right now megan you

1075

00:43:26,150 --> 00:43:23,920

remember this view this is a live camera

1076

00:43:27,990 --> 00:43:26,160

looking forward from the first tesla in

1077

00:43:30,390 --> 00:43:28,000

the rollout you can see the security car

1078

00:43:32,710 --> 00:43:30,400

ahead of it it's dark but that's nasa

1079

00:43:35,510 --> 00:43:32,720

causeway as they roll towards the pad

1080

00:43:39,510 --> 00:43:37,750

you were rocking out at this time i was

1081

00:43:41,430 --> 00:43:39,520

yes well we were taking turns we each

1082

00:43:43,910 --> 00:43:41,440

got to choose some songs for the

1083

00:43:45,829 --> 00:43:43,920

playlist and i was of the metallica and

1084

00:43:47,030 --> 00:43:45,839

red hot chili peppers variety and

1085

00:43:49,270 --> 00:43:47,040

shane's songs were a little different

1086

00:43:51,030 --> 00:43:49,280

but we did overlap in u2 territory so

1087

00:43:53,829 --> 00:43:51,040

there was some there was some crossover

1088

00:43:55,829 --> 00:43:53,839

finding some common ground there

1089

00:43:59,030 --> 00:43:55,839

riding with joe lindgren is crew dragon

1090

00:44:03,109 --> 00:43:59,040

pilot and nasa astronaut by bob hines

1091

00:44:08,470 --> 00:44:05,589

i truly believe that we all have in us

1092

00:44:10,950 --> 00:44:08,480

an innate desire to go explore and see

1093

00:44:13,349 --> 00:44:10,960

new things and we have this phenomenal

1094

00:44:15,430 --> 00:44:13,359

creation that we've been placed in to

1095

00:44:17,270 --> 00:44:15,440

learn about how it works we have a very

1096

00:44:19,030 --> 00:44:17,280

unique position in our solar system and

1097

00:44:22,390 --> 00:44:19,040

our galaxy to be able to look out there

1098

00:44:24,470 --> 00:44:22,400

and to step out and continue to explore

1099

00:44:26,710 --> 00:44:24,480

my name is bob hines i'm the pilot for

1100

00:44:29,030 --> 00:44:26,720

nasa's spacex crew 4 mission to the

1101
00:44:30,870 --> 00:44:29,040
international space station

1102
00:44:32,710 --> 00:44:30,880
i was born in fayetteville north

1103
00:44:34,710 --> 00:44:32,720
carolina my father was in the army we

1104
00:44:36,230 --> 00:44:34,720
were stationed at fort bragg

1105
00:44:38,309 --> 00:44:36,240
and we moved around a whole bunch the

1106
00:44:40,150 --> 00:44:38,319
longest we ever lived anywhere was about

1107
00:44:42,069 --> 00:44:40,160
two to two and a half years i got really

1108
00:44:44,710 --> 00:44:42,079
comfortable uh showing up in new places

1109
00:44:46,309 --> 00:44:44,720
and being able to make friends

1110
00:44:48,550 --> 00:44:46,319
when i was a kid i

1111
00:44:49,990 --> 00:44:48,560
100 wanted to be a pilot for as long as

1112
00:44:52,309 --> 00:44:50,000
i can remember i was just always

1113
00:44:54,870 --> 00:44:52,319

fascinated not only that something that

1114

00:44:57,430 --> 00:44:54,880

big could fly and do some amazing things

1115

00:44:59,589 --> 00:44:57,440

but also just the opportunity to go and

1116

00:45:01,910 --> 00:44:59,599

see things that not many people have had

1117

00:45:03,349 --> 00:45:01,920

a chance to do being able to fly and see

1118

00:45:05,670 --> 00:45:03,359

the earth from a new perspective has

1119

00:45:07,430 --> 00:45:05,680

really been just a real driver for me

1120

00:45:09,589 --> 00:45:07,440

and getting hired as an astronaut has

1121

00:45:11,430 --> 00:45:09,599

been the ultimate call

1122

00:45:13,510 --> 00:45:11,440

contrary to popular belief being a test

1123

00:45:14,870 --> 00:45:13,520

pilot is not about flying by the seat of

1124

00:45:16,309 --> 00:45:14,880

your pants and going out there and just

1125

00:45:18,309 --> 00:45:16,319

pushing the edge of the envelope all the

1126

00:45:20,790 --> 00:45:18,319

time it is a much more scientific and

1127

00:45:22,630 --> 00:45:20,800

methodical process where we plan out

1128

00:45:24,230 --> 00:45:22,640

every mission and all the tasks on every

1129

00:45:26,230 --> 00:45:24,240

mission and we're constantly mitigating

1130

00:45:28,710 --> 00:45:26,240

the risks that are associated with that

1131

00:45:30,790 --> 00:45:28,720

mission that seems to really dovetail

1132

00:45:33,109 --> 00:45:30,800

very well with space flight because

1133

00:45:35,510 --> 00:45:33,119

that's a lot of what we do

1134

00:45:37,349 --> 00:45:35,520

my experience as a test pilot and as a

1135

00:45:39,349 --> 00:45:37,359

pilot and an instructor i think have all

1136

00:45:41,349 --> 00:45:39,359

kind of led me to this point when i got

1137

00:45:43,829 --> 00:45:41,359

the phone call offering me the position

1138

00:45:45,270 --> 00:45:43,839

of the pilot on the crew 4 mission it

1139

00:45:46,790 --> 00:45:45,280

was absolutely amazing it was actually

1140

00:45:47,829 --> 00:45:46,800

the day after my birthday when i got the

1141

00:45:49,589 --> 00:45:47,839

phone call

1142

00:45:50,950 --> 00:45:49,599

and i just couldn't believe it when i

1143

00:45:52,390 --> 00:45:50,960

told my wife she couldn't believe it

1144

00:45:55,589 --> 00:45:52,400

either

1145

00:45:57,589 --> 00:45:55,599

i've flown over 3 500 hours in more than

1146

00:46:00,230 --> 00:45:57,599

50 different kinds of airplanes and that

1147

00:46:01,829 --> 00:46:00,240

ranges from gliders all the way to

1148

00:46:05,109 --> 00:46:01,839

different kinds of fighter airplanes or

1149

00:46:06,950 --> 00:46:05,119

large transport category airplanes

1150

00:46:08,710 --> 00:46:06,960

i can't wait to pilot this vehicle it is

1151
00:46:10,630 --> 00:46:08,720
an incredible honor and something that i

1152
00:46:12,470 --> 00:46:10,640
never in my wildest dreams thought would

1153
00:46:14,550 --> 00:46:12,480
be a possibility and so to get a chance

1154
00:46:18,470 --> 00:46:14,560
to pilot one of the newest vehicles on

1155
00:46:22,390 --> 00:46:20,710
with chell as our commander and samantha

1156
00:46:23,589 --> 00:46:22,400
and jessica as our mission specialists

1157
00:46:25,910 --> 00:46:23,599
it's just going to continue to be an

1158
00:46:27,430 --> 00:46:25,920
amazing crew and an amazing experience i

1159
00:46:29,109 --> 00:46:27,440
am really looking forward to the

1160
00:46:30,550 --> 00:46:29,119
camaraderie and the time that we'll get

1161
00:46:32,069 --> 00:46:30,560
to spend together as a crew the

1162
00:46:34,150 --> 00:46:32,079
friendships that will develop and so i

1163
00:46:35,589 --> 00:46:34,160

think continuing that process is one of

1164

00:46:36,870 --> 00:46:35,599

the things that i'm looking most forward

1165

00:46:39,270 --> 00:46:36,880

to

1166

00:46:40,790 --> 00:46:39,280

on launch day i am 100 most looking

1167

00:46:42,390 --> 00:46:40,800

forward to the kick in the pants when

1168

00:46:44,230 --> 00:46:42,400

those rocket motors light and we are

1169

00:46:45,910 --> 00:46:44,240

heading off the launch pad it is going

1170

00:46:48,230 --> 00:46:45,920

to be the culmination of a life hood

1171

00:46:50,630 --> 00:46:48,240

dream something that just spend your

1172

00:46:51,910 --> 00:46:50,640

entire life looking for and not ever

1173

00:46:53,910 --> 00:46:51,920

sure that you're actually going to

1174

00:46:55,750 --> 00:46:53,920

achieve it our newest astronaut bob

1175

00:46:57,829 --> 00:46:55,760

hines being an astronaut is an

1176

00:46:59,589 --> 00:46:57,839

incredible responsibility as well as an

1177

00:47:01,190 --> 00:46:59,599

incredible honor every astronaut

1178

00:47:03,109 --> 00:47:01,200

recognizes the honor that comes with

1179

00:47:04,790 --> 00:47:03,119

that but also the responsibility that

1180

00:47:06,950 --> 00:47:04,800

comes with representing not only our

1181

00:47:08,309 --> 00:47:06,960

respective countries but also the world

1182

00:47:09,990 --> 00:47:08,319

and one of the things that we hope to

1183

00:47:12,069 --> 00:47:10,000

show is that regardless of our

1184

00:47:14,390 --> 00:47:12,079

nationalities or our backgrounds when we

1185

00:47:16,390 --> 00:47:14,400

put our mind to a single mission and we

1186

00:47:23,109 --> 00:47:16,400

get along we can accomplish anything

1187

00:47:25,270 --> 00:47:23,119

[Music]

1188

00:47:27,829 --> 00:47:25,280

turn that you see the convoy making

1189

00:47:30,390 --> 00:47:27,839

right there is right in front of the

1190

00:47:31,589 --> 00:47:30,400

historic vehicle assembly building where

1191

00:47:33,990 --> 00:47:31,599

right now

1192

00:47:36,870 --> 00:47:34,000

we've got a mega moon rocket inside the

1193

00:47:39,349 --> 00:47:36,880

sls and orion spacecraft and you'll see

1194

00:47:41,109 --> 00:47:39,359

that there the cars below and uh here

1195

00:47:42,470 --> 00:47:41,119

comes the vap they got to be thinking a

1196

00:47:44,470 --> 00:47:42,480

little bit about that don't you think

1197

00:47:47,190 --> 00:47:44,480

megan that uh you know they're flying

1198

00:47:49,030 --> 00:47:47,200

out of 39a but one day there's going to

1199

00:47:50,950 --> 00:47:49,040

be a big moon rocket going out of 39b

1200

00:47:52,630 --> 00:47:50,960

which is the other way absolutely i know

1201

00:47:54,309 --> 00:47:52,640

they're thinking about it uh even if

1202

00:47:56,150 --> 00:47:54,319

it's just something down in the future

1203

00:47:58,069 --> 00:47:56,160

for them that's uh could be there very

1204

00:48:00,710 --> 00:47:58,079

well be their next ride

1205

00:48:03,510 --> 00:48:00,720

beautiful shot there the vab

1206

00:48:05,030 --> 00:48:03,520

as the crew goes right by us in fact

1207

00:48:07,190 --> 00:48:05,040

here at the

1208

00:48:08,470 --> 00:48:07,200

host desk

1209

00:48:10,309 --> 00:48:08,480

there's our camera on the ground

1210

00:48:24,950 --> 00:48:10,319

catching the shot and you can hear the

1211

00:48:29,030 --> 00:48:26,950

now the crew convoy is approaching pad

1212

00:48:31,990 --> 00:48:29,040

39a and that's an area known as the

1213

00:48:34,390 --> 00:48:32,000

blast danger area or bva

1214

00:48:36,309 --> 00:48:34,400

and before any pad technicians engineers

1215

00:48:38,470 --> 00:48:36,319

or astronauts enter this area around the

1216

00:48:40,630 --> 00:48:38,480

launch pad the spacex and nasa teams

1217

00:48:42,790 --> 00:48:40,640

they conduct an internal go no go pole

1218

00:48:45,030 --> 00:48:42,800

to make sure that that area is safe for

1219

00:48:47,030 --> 00:48:45,040

them to enter and there they go

1220

00:48:52,069 --> 00:48:47,040

so let's hear now from one of our

1221

00:48:57,829 --> 00:48:55,190

exploring is about pushing the bounds of

1222

00:49:00,549 --> 00:48:57,839

what we're capable of as humans

1223

00:49:02,549 --> 00:49:00,559

it gets at who we are intrinsically as

1224

00:49:04,470 --> 00:49:02,559

people and so because of that i think it

1225

00:49:07,270 --> 00:49:04,480

really is something that unites all of

1226

00:49:09,190 --> 00:49:07,280

us together here on earth

1227

00:49:11,589 --> 00:49:09,200

my name is jessica watkins and i'm a

1228

00:49:13,349 --> 00:49:11,599

mission specialist for nasa's spacex

1229

00:49:15,349 --> 00:49:13,359

crew 4 mission to the international

1230

00:49:17,910 --> 00:49:15,359

space station

1231

00:49:20,470 --> 00:49:17,920

at a pretty early age i got kind of set

1232

00:49:22,549 --> 00:49:20,480

on the idea of becoming an astronaut

1233

00:49:25,270 --> 00:49:22,559

that was when i kind of first voiced the

1234

00:49:27,349 --> 00:49:25,280

dream and interest in space and in being

1235

00:49:29,349 --> 00:49:27,359

an astronaut in particular

1236

00:49:31,670 --> 00:49:29,359

my parents always stressed the

1237

00:49:33,109 --> 00:49:31,680

importance of getting a good education

1238

00:49:35,750 --> 00:49:33,119

and finding something that you're

1239

00:49:38,470 --> 00:49:35,760

passionate about and so finding geology

1240

00:49:40,150 --> 00:49:38,480

finding that love of mind that passion

1241

00:49:42,230 --> 00:49:40,160

was really a turning point for me in my

1242

00:49:44,710 --> 00:49:42,240

career

1243

00:49:47,190 --> 00:49:44,720

my graduate work focused mostly on the

1244

00:49:48,710 --> 00:49:47,200

geology of mars it was part of my

1245

00:49:50,950 --> 00:49:48,720

interest in wanting to pursue

1246

00:49:52,150 --> 00:49:50,960

internships at nasa and gave me that

1247

00:49:54,630 --> 00:49:52,160

exposure to those different

1248

00:49:57,270 --> 00:49:54,640

possibilities of what careers are

1249

00:49:59,750 --> 00:49:57,280

possible in this planetary geology field

1250

00:50:01,510 --> 00:49:59,760

deciding to be an astronaut is kind of

1251
00:50:03,510 --> 00:50:01,520
setting out a dream for yourself and

1252
00:50:05,910 --> 00:50:03,520
then kind of stowing it in the back of

1253
00:50:07,750 --> 00:50:05,920
your head at least in my case

1254
00:50:09,750 --> 00:50:07,760
so the day that i received the phone

1255
00:50:11,270 --> 00:50:09,760
call to invite me to come down to

1256
00:50:14,069 --> 00:50:11,280
johnson space center and become an

1257
00:50:15,190 --> 00:50:14,079
astronaut just really was truly a dream

1258
00:50:16,470 --> 00:50:15,200
come true

1259
00:50:18,290 --> 00:50:16,480
ladies and gentlemen the newest

1260
00:50:21,990 --> 00:50:18,300
astronaut jessica watkins

1261
00:50:23,829 --> 00:50:22,000
[Applause]

1262
00:50:28,790 --> 00:50:23,839
and i still am waiting for somebody to

1263
00:50:32,870 --> 00:50:30,630

the opportunity to be the first black

1264

00:50:35,270 --> 00:50:32,880

woman on an international space station

1265

00:50:37,430 --> 00:50:35,280

long duration crew is exciting it

1266

00:50:40,710 --> 00:50:37,440

certainly is important to me and

1267

00:50:42,710 --> 00:50:40,720

impactful to me to be able to be a part

1268

00:50:45,750 --> 00:50:42,720

of the legacy that

1269

00:50:47,910 --> 00:50:45,760

so many before me have paved the way to

1270

00:50:50,710 --> 00:50:47,920

enable me to be here now as much as i

1271

00:50:52,829 --> 00:50:50,720

can be a small part of that legacy i'm

1272

00:50:55,349 --> 00:50:52,839

honored to have the

1273

00:50:58,710 --> 00:50:55,359

opportunity being selected to be a part

1274

00:51:01,589 --> 00:50:58,720

of this crew 4 mission is truly an honor

1275

00:51:05,349 --> 00:51:01,599

i am so excited about the opportunity to

1276

00:51:07,190 --> 00:51:05,359

fly with chell samantha and bob

1277

00:51:09,109 --> 00:51:07,200

all three of them are very different

1278

00:51:11,030 --> 00:51:09,119

they all bring different skill sets

1279

00:51:12,870 --> 00:51:11,040

different experiences

1280

00:51:17,109 --> 00:51:12,880

but i think all four of us together

1281

00:51:20,309 --> 00:51:19,349

i think launch day is going to be the

1282

00:51:22,549 --> 00:51:20,319

day

1283

00:51:24,870 --> 00:51:22,559

that all this starts to really finally

1284

00:51:26,470 --> 00:51:24,880

feel real

1285

00:51:29,270 --> 00:51:26,480

and so i just look forward to that

1286

00:51:30,990 --> 00:51:29,280

moment of exhale and of excitement

1287

00:51:34,829 --> 00:51:31,000

all at the same

1288

00:51:41,190 --> 00:51:38,710

time astronaut jessica watkins there

1289

00:51:43,030 --> 00:51:41,200

as we follow the convoy live

1290

00:51:44,790 --> 00:51:43,040

making their way out to the pad and we

1291

00:51:47,430 --> 00:51:44,800

are expecting a formal announcement that

1292

00:51:49,510 --> 00:51:47,440

the crew is on pad

1293

00:51:52,069 --> 00:51:49,520

right around t minus two hours and 55

1294

00:51:55,430 --> 00:51:52,079

minutes that's the schedule sometimes we

1295

00:51:56,950 --> 00:51:55,440

run a little early a little behind but

1296

00:52:00,870 --> 00:51:56,960

it looks like we're right on time at the

1297

00:52:04,790 --> 00:52:03,589

looking ahead a little bit

1298

00:52:07,349 --> 00:52:04,800

at about

1299

00:52:09,829 --> 00:52:07,359

t minus two hours and 35 minutes the

1300

00:52:11,109 --> 00:52:09,839

astronauts will ingress or

1301

00:52:13,030 --> 00:52:11,119

climb into the dragon with the

1302

00:52:17,349 --> 00:52:13,040

assistance of the suit techs and and

1303

00:52:17,359 --> 00:52:23,109

making the turn there

1304

00:52:26,390 --> 00:52:24,790

direct your attention to some space

1305

00:52:27,349 --> 00:52:26,400

facts in the lower left hand corner

1306

00:52:28,470 --> 00:52:27,359

we'll be

1307

00:52:29,670 --> 00:52:28,480

putting those up throughout the

1308

00:52:32,549 --> 00:52:29,680

broadcast

1309

00:52:37,270 --> 00:52:32,559

some interesting factoids about the crew

1310

00:52:42,549 --> 00:52:40,069

there they are going around the spacex's

1311

00:52:43,349 --> 00:52:42,559

horizontal integration facility megan

1312

00:52:45,430 --> 00:52:43,359

and

1313

00:52:47,030 --> 00:52:45,440

at this point when you're pulling up to

1314

00:52:48,309 --> 00:52:47,040

the rocket probably hard to see because

1315

00:52:49,750 --> 00:52:48,319

it's so tall

1316

00:52:52,069 --> 00:52:49,760

but you know it's there

1317

00:52:54,470 --> 00:52:52,079

and you're inside

1318

00:52:56,470 --> 00:52:54,480

the launch pad area you really are and i

1319

00:52:58,950 --> 00:52:56,480

think actually wadi expressed it really

1320

00:53:01,589 --> 00:52:58,960

well um in that it's an exhale and it's

1321

00:53:03,829 --> 00:53:01,599

a building of excitement all at the same

1322

00:53:05,750 --> 00:53:03,839

time because you realized this is the

1323

00:53:07,750 --> 00:53:05,760

day i've been working for i've reached

1324

00:53:09,750 --> 00:53:07,760

this point um

1325

00:53:12,230 --> 00:53:09,760

and in a sense you you relax because you

1326

00:53:13,589 --> 00:53:12,240

got there you exhale but also wow this

1327

00:53:15,990 --> 00:53:13,599

next thing that you're about to do is

1328

00:53:17,829 --> 00:53:16,000

even more amazing and exciting and so

1329

00:53:19,430 --> 00:53:17,839

the the excitement is building and of

1330

00:53:20,630 --> 00:53:19,440

course the focus and attention that

1331

00:53:23,270 --> 00:53:20,640

they're going to bring to all of the

1332

00:53:24,870 --> 00:53:23,280

tasks ahead of them um and they they're

1333

00:53:26,309 --> 00:53:24,880

realizing that that moment is getting

1334

00:53:28,630 --> 00:53:26,319

closer and closer as they approach the

1335

00:53:30,230 --> 00:53:28,640

rocket the inside shot driving right by

1336

00:53:31,990 --> 00:53:30,240

the rocket that you saw there through

1337

00:53:32,950 --> 00:53:32,000

the front windshield as they make their

1338

00:53:35,910 --> 00:53:32,960

turn

1339

00:53:38,230 --> 00:53:35,920

into the pad area and a beautiful view

1340

00:53:39,670 --> 00:53:38,240

from our helicopter orbiting

1341

00:53:41,750 --> 00:53:39,680

the launch pad

1342

00:53:43,190 --> 00:53:41,760

39a you saw the you see the three

1343

00:53:45,589 --> 00:53:43,200

vehicles down there in the lower left

1344

00:53:51,670 --> 00:53:45,599

hand corner

1345

00:53:57,270 --> 00:53:53,829

there's been a lot of upgrades to this

1346

00:53:59,109 --> 00:53:57,280

launch pad megan you flew it

1347

00:54:01,430 --> 00:53:59,119

and flew out of there under both

1348

00:54:03,670 --> 00:54:01,440

configurations both

1349

00:54:07,270 --> 00:54:03,680

as a space shuttle astronaut

1350

00:54:09,510 --> 00:54:07,280

and as an astronaut on crew dragon

1351
00:54:11,430 --> 00:54:09,520
that's right and we get an opportunity

1352
00:54:12,950 --> 00:54:11,440
to tour the launch pad with a family

1353
00:54:14,790 --> 00:54:12,960
member and the days leading up to the

1354
00:54:17,030 --> 00:54:14,800
launch which is really special but other

1355
00:54:19,750 --> 00:54:17,040
than that we don't spend a whole lot of

1356
00:54:21,910 --> 00:54:19,760
time on the launch pad so getting to see

1357
00:54:22,870 --> 00:54:21,920
it for us is always a very special thing

1358
00:54:25,349 --> 00:54:22,880
as well

1359
00:54:27,589 --> 00:54:25,359
it does look very different now um under

1360
00:54:29,510 --> 00:54:27,599
the under the new owners but you can

1361
00:54:31,349 --> 00:54:29,520
still see the bones of it of the

1362
00:54:33,109 --> 00:54:31,359
historical structure that was there

1363
00:54:35,349 --> 00:54:33,119

supporting all those shuttle launches

1364

00:54:37,190 --> 00:54:35,359

speaking of bones that metal black metal

1365

00:54:39,430 --> 00:54:37,200

to the left we're panning around it but

1366

00:54:41,190 --> 00:54:39,440

that is the old rotating service

1367

00:54:43,270 --> 00:54:41,200

structure that used to have that

1368

00:54:46,150 --> 00:54:43,280

gigantic structure that would you know

1369

00:54:47,430 --> 00:54:46,160

uh contain the cargo bay of the space

1370

00:54:50,390 --> 00:54:47,440

shuttle so you could get in and out of

1371

00:54:52,470 --> 00:54:50,400

it services uh it would rotate out still

1372

00:54:54,789 --> 00:54:52,480

part of it there

1373

00:54:56,789 --> 00:54:54,799

two hours 59 minutes crew have arrived

1374

00:54:58,710 --> 00:54:56,799

at the pad we are on schedule

1375

00:55:00,710 --> 00:54:58,720

there's the announcement of the arrival

1376
00:55:02,549 --> 00:55:00,720
and before the crew makes their way to

1377
00:55:04,390 --> 00:55:02,559
the elevator at the ground level of pad

1378
00:55:06,630 --> 00:55:04,400
39a let's get a look at mission

1379
00:55:10,630 --> 00:55:06,640
specialists and esa astronaut samantha

1380
00:55:15,829 --> 00:55:13,589
i got the call to become an astronaut

1381
00:55:17,430 --> 00:55:15,839
one evening i had this feeling that the

1382
00:55:20,710 --> 00:55:17,440
whole universe just

1383
00:55:22,710 --> 00:55:20,720
stopped turning around and smiled at me

1384
00:55:25,589 --> 00:55:22,720
my name is samantha christopher and i'm

1385
00:55:27,270 --> 00:55:25,599
a mission specialist on the nasa spacex

1386
00:55:29,670 --> 00:55:27,280
crew 4 mission to the international

1387
00:55:32,470 --> 00:55:29,680
space station

1388
00:55:35,349 --> 00:55:32,480

i was born in milan in italy but i grew

1389

00:55:39,109 --> 00:55:35,359

up in a tiny little village in the

1390

00:55:41,990 --> 00:55:39,119

northeastern alps still in italy so a

1391

00:55:44,150 --> 00:55:42,000

very rural place small place

1392

00:55:46,789 --> 00:55:44,160

in the mountains i grew up skiing and

1393

00:55:49,030 --> 00:55:46,799

enjoying the outdoors my parents owned a

1394

00:55:51,030 --> 00:55:49,040

hotel so that's what they did all their

1395

00:55:54,710 --> 00:55:51,040

working life we actually lived in the

1396

00:55:58,549 --> 00:55:56,630

i started dreaming about becoming an

1397

00:56:01,109 --> 00:55:58,559

astronaut pretty early on i was still in

1398

00:56:03,670 --> 00:56:01,119

elementary school i think it was

1399

00:56:05,510 --> 00:56:03,680

a number of impressions that made me

1400

00:56:07,910 --> 00:56:05,520

dream about that the things that i was

1401
00:56:10,309 --> 00:56:07,920
learning in school also books that i

1402
00:56:12,710 --> 00:56:10,319
read it was an avid reader of adventure

1403
00:56:15,670 --> 00:56:12,720
books the fact that i was growing up in

1404
00:56:18,309 --> 00:56:15,680
a place where i had an opportunity to go

1405
00:56:20,870 --> 00:56:18,319
out and play and explore with other kids

1406
00:56:22,870 --> 00:56:20,880
and supervise and get that passion for

1407
00:56:25,030 --> 00:56:22,880
adventure so a number of those things

1408
00:56:27,270 --> 00:56:25,040
and i guess they were enough to

1409
00:56:28,470 --> 00:56:27,280
kindle that sparkle of passion for space

1410
00:56:30,630 --> 00:56:28,480
exploration

1411
00:56:32,630 --> 00:56:30,640
i completed my high school in italy and

1412
00:56:35,109 --> 00:56:32,640
then i enrolled at the technical

1413
00:56:37,030 --> 00:56:35,119

university of munich in their

1414

00:56:39,109 --> 00:56:37,040

engineering degree and i chose the

1415

00:56:41,510 --> 00:56:39,119

aerospace track

1416

00:56:43,910 --> 00:56:41,520

and then something unexpected happened

1417

00:56:48,069 --> 00:56:43,920

the opportunity opened up of actually

1418

00:56:49,750 --> 00:56:48,079

joining the italian air force as a pilot

1419

00:56:52,069 --> 00:56:49,760

that had not been possible for me

1420

00:56:55,030 --> 00:56:52,079

straight out of high school because back

1421

00:56:56,950 --> 00:56:55,040

then the italian military did not admit

1422

00:57:00,470 --> 00:56:56,960

women

1423

00:57:02,470 --> 00:57:00,480

the very broad educational and training

1424

00:57:04,870 --> 00:57:02,480

background that i had when i became an

1425

00:57:07,990 --> 00:57:04,880

astronaut really helped me a lot and the

1426
00:57:10,789 --> 00:57:08,000
astronaut job is really very much about

1427
00:57:13,030 --> 00:57:10,799
this broad spectrum of things that you

1428
00:57:15,750 --> 00:57:13,040
have to master rather than being a

1429
00:57:17,589 --> 00:57:15,760
specialist that has mastered very very

1430
00:57:21,910 --> 00:57:17,599
well for a long time this one thing and

1431
00:57:24,549 --> 00:57:21,920
so i was very grateful in hindsight

1432
00:57:26,549 --> 00:57:24,559
in 2014 i had the opportunity of flying

1433
00:57:28,309 --> 00:57:26,559
to space for the first time and i spent

1434
00:57:29,430 --> 00:57:28,319
200 days on the international space

1435
00:57:33,750 --> 00:57:29,440
station

1436
00:57:35,670 --> 00:57:33,760
hatch hugging our friends were waiting

1437
00:57:37,910 --> 00:57:35,680
for us there getting used to that

1438
00:57:40,069 --> 00:57:37,920

sensation of floating the first look out

1439

00:57:42,150 --> 00:57:40,079

of the cupola that was you know full

1440

00:57:44,230 --> 00:57:42,160

view of the sunrise it was almost

1441

00:57:45,910 --> 00:57:44,240

overwhelming for me and you know of

1442

00:57:47,670 --> 00:57:45,920

course as the time goes by you settle

1443

00:57:49,670 --> 00:57:47,680

into a routine you know you're not

1444

00:57:50,950 --> 00:57:49,680

overwhelmed by emotion every single day

1445

00:57:52,789 --> 00:57:50,960

but it becomes more like a quiet

1446

00:57:55,190 --> 00:57:52,799

affection for the place for the world

1447

00:57:57,750 --> 00:57:55,200

for the people

1448

00:58:00,069 --> 00:57:57,760

getting selected for crew 4 was amazing

1449

00:58:02,470 --> 00:58:00,079

because it's an opportunity to go back

1450

00:58:05,990 --> 00:58:02,480

to the international space station and

1451
00:58:08,470 --> 00:58:06,000
experience a game that transformation

1452
00:58:09,829 --> 00:58:08,480
from being an earthbound creature to

1453
00:58:13,349 --> 00:58:09,839
being this

1454
00:58:16,309 --> 00:58:13,359
space living creature and being part of

1455
00:58:18,069 --> 00:58:16,319
that very very special life up there in

1456
00:58:19,190 --> 00:58:18,079
this outpost of humanity of the air in

1457
00:58:27,109 --> 00:58:19,200
space

1458
00:58:29,190 --> 00:58:27,119
[Music]

1459
00:58:32,630 --> 00:58:29,200
samantha christopher ready the third

1460
00:58:34,390 --> 00:58:32,640
consecutive esa astronaut to ride aboard

1461
00:58:36,789 --> 00:58:34,400
the crew dragon

1462
00:58:38,710 --> 00:58:36,799
it all began

1463
00:58:43,030 --> 00:58:38,720

with crew 2

1464

00:58:46,710 --> 00:58:43,040

and tomas pesquet you remember that well

1465

00:58:48,150 --> 00:58:46,720

there's a look at the launch pad pad 39a

1466

00:58:50,390 --> 00:58:48,160

at the very top

1467

00:58:53,750 --> 00:58:50,400

crew dragon freedom

1468

00:58:55,430 --> 00:58:53,760

a brand new spacecraft from spacex

1469

00:58:59,430 --> 00:58:55,440

riding on top of

1470

00:59:02,789 --> 00:59:01,910

this falcon 9 rocket make an interesting

1471

00:59:05,910 --> 00:59:02,799

note

1472

00:59:07,270 --> 00:59:05,920

it is the when it flies today it'll be

1473

00:59:10,390 --> 00:59:07,280

the fourth time

1474

00:59:11,589 --> 00:59:10,400

that this booster has flown so a reuse

1475

00:59:14,390 --> 00:59:11,599

for the fourth time that's the first

1476

00:59:16,630 --> 00:59:14,400

time for a crude uh

1477

00:59:18,390 --> 00:59:16,640

for a crude capsule to go on top of a

1478

00:59:20,549 --> 00:59:18,400

rocket and get a fourth flight

1479

00:59:21,990 --> 00:59:20,559

of course they have passed four how many

1480

00:59:24,230 --> 00:59:22,000

times ago in fact just last week they

1481

00:59:26,789 --> 00:59:24,240

launched uh a booster for the twelfth

1482

00:59:28,950 --> 00:59:26,799

time right um but uh

1483

00:59:30,710 --> 00:59:28,960

that's really reuse in action with

1484

00:59:32,789 --> 00:59:30,720

astronauts on board right it's an

1485

00:59:34,549 --> 00:59:32,799

amazing capability that actually started

1486

00:59:37,910 --> 00:59:34,559

uh with us we i think were the first

1487

00:59:40,870 --> 00:59:37,920

flight proven booster uh launch uh a

1488

00:59:42,789 --> 00:59:40,880

year ago and so you know true to fashion

1489

00:59:44,710 --> 00:59:42,799

they are making leaps and strides in

1490

00:59:47,109 --> 00:59:44,720

that reusability territory of course

1491

00:59:48,710 --> 00:59:47,119

very careful to make sure that the all

1492

00:59:52,150 --> 00:59:48,720

the parts and pieces pass all of the

1493

00:59:54,470 --> 00:59:52,160

necessary safety checks um and are rated

1494

00:59:56,789 --> 00:59:54,480

to re-fly again um and their fleet

1495

00:59:58,789 --> 00:59:56,799

leaders of course being used on uncrewed

1496

01:00:00,470 --> 00:59:58,799

vehicles so that they can push those

1497

01:00:02,950 --> 01:00:00,480

boundaries and and get more and more

1498

01:00:05,349 --> 01:00:02,960

data but with a with an uncrewed uh

1499

01:00:07,829 --> 01:00:05,359

vehicle absolutely

1500

01:00:10,710 --> 01:00:07,839

and that is exactly what makes this uh

1501

01:00:13,270 --> 01:00:10,720

the cycle of reusability uh work so well

1502

01:00:15,670 --> 01:00:13,280

as uh administration at nasa have talked

1503

01:00:18,069 --> 01:00:15,680

about studying closely very closely this

1504

01:00:19,990 --> 01:00:18,079

booster before it flew

1505

01:00:21,589 --> 01:00:20,000

megan how about we take some more uh

1506

01:00:22,789 --> 01:00:21,599

questions from social sounds great

1507

01:00:24,789 --> 01:00:22,799

you've been taking them throughout the

1508

01:00:27,349 --> 01:00:24,799

night we will continue to do so here at

1509

01:00:29,990 --> 01:00:27,359

t minus two hours and 53 minutes and

1510

01:00:32,309 --> 01:00:30,000

counting and andrew pino wants to know

1511

01:00:34,630 --> 01:00:32,319

megan mcarthur what is your advice to

1512

01:00:36,549 --> 01:00:34,640

students who are interested in becoming

1513

01:00:38,390 --> 01:00:36,559

astronauts in the future and i'm sure

1514

01:00:39,910 --> 01:00:38,400

you get asked this one a lot i do get

1515

01:00:41,589 --> 01:00:39,920

asked this question a lot i remember

1516

01:00:43,349 --> 01:00:41,599

asking the question when i was a student

1517

01:00:44,390 --> 01:00:43,359

wondering well how do i get this job

1518

01:00:46,309 --> 01:00:44,400

right so

1519

01:00:47,430 --> 01:00:46,319

it's important question it does change a

1520

01:00:49,270 --> 01:00:47,440

little bit over the years but the

1521

01:00:51,270 --> 01:00:49,280

fundamentals are going to be the same

1522

01:00:53,670 --> 01:00:51,280

probably for a long time so when you're

1523

01:00:55,430 --> 01:00:53,680

looking to work as a professional

1524

01:00:56,789 --> 01:00:55,440

astronaut work for your government

1525

01:00:59,030 --> 01:00:56,799

there's going to be some kind of a

1526

01:01:00,789 --> 01:00:59,040

selection process involved and that's

1527

01:01:02,470 --> 01:01:00,799

going to involve

1528

01:01:05,190 --> 01:01:02,480

looking at your schooling what kind of

1529

01:01:06,230 --> 01:01:05,200

schooling did you did you partake in and

1530

01:01:09,030 --> 01:01:06,240

for the most part it's going to be

1531

01:01:11,190 --> 01:01:09,040

engineers scientists people with some

1532

01:01:13,430 --> 01:01:11,200

kind of operational background so what i

1533

01:01:15,750 --> 01:01:13,440

mean by that is you are able to work in

1534

01:01:17,270 --> 01:01:15,760

a technical field where where you are

1535

01:01:20,390 --> 01:01:17,280

part of the environment so that

1536

01:01:22,309 --> 01:01:20,400

sometimes pilots it can be um

1537

01:01:24,870 --> 01:01:22,319

folks working on submarines oh this is

1538

01:01:27,270 --> 01:01:24,880

one of my favorite moments when the crew

1539

01:01:29,829 --> 01:01:27,280

gets to first look up at their rocket

1540

01:01:31,750 --> 01:01:29,839

uh ready to go that's chill lingering

1541

01:01:33,670 --> 01:01:31,760

and bob hines giving a look and that's

1542

01:01:36,470 --> 01:01:33,680

bob looks a little giddy yeah

1543

01:01:38,470 --> 01:01:36,480

he's pretty excited look at that rocket

1544

01:01:40,789 --> 01:01:38,480

yep i like that sort of characteristic

1545

01:01:43,349 --> 01:01:40,799

the lean back the look up together it's

1546

01:01:45,109 --> 01:01:43,359

a good uh it's a good look and the wave

1547

01:01:47,829 --> 01:01:45,119

as they get ready to get into the

1548

01:01:49,910 --> 01:01:47,839

elevators to ride up

1549

01:01:51,670 --> 01:01:49,920

to the top where the crew access arm is

1550

01:01:52,870 --> 01:01:51,680

which will take them to the spacecraft

1551

01:01:54,870 --> 01:01:52,880

it is

1552

01:01:57,510 --> 01:01:54,880

the original elevators they've been of

1553

01:01:59,589 --> 01:01:57,520

course renovated but those are the same

1554

01:02:01,029 --> 01:01:59,599

elevators you got in megan as both a

1555

01:02:03,109 --> 01:02:01,039

shuttle astronaut

1556

01:02:04,630 --> 01:02:03,119

and a dragon

1557

01:02:05,750 --> 01:02:04,640

crew member another piece of history

1558

01:02:07,510 --> 01:02:05,760

hopefully at this time of night they

1559

01:02:08,390 --> 01:02:07,520

won't be taking up too many mosquitoes

1560

01:02:09,910 --> 01:02:08,400

with them

1561

01:02:11,270 --> 01:02:09,920

i want to let you finish your thoughts

1562

01:02:13,430 --> 01:02:11,280

that's right i want to let you finish

1563

01:02:15,829 --> 01:02:13,440

your thought about the training of uh

1564

01:02:17,029 --> 01:02:15,839

getting getting ready to to try and put

1565

01:02:19,510 --> 01:02:17,039

yourself in a position to become an

1566

01:02:21,750 --> 01:02:19,520

astronaut absolutely so so working in a

1567

01:02:24,710 --> 01:02:21,760

in a technical field and really working

1568

01:02:26,630 --> 01:02:24,720

with a team astronauts do not work as

1569

01:02:29,109 --> 01:02:26,640

solo agents for the most part it's

1570

01:02:30,789 --> 01:02:29,119

really about your team skills which can

1571

01:02:32,950 --> 01:02:30,799

both be leadership skills and

1572

01:02:35,029 --> 01:02:32,960

followership skills and the ability to

1573

01:02:37,430 --> 01:02:35,039

do both things so my advice you know

1574

01:02:39,029 --> 01:02:37,440

wherever you're at in school is seek out

1575

01:02:40,390 --> 01:02:39,039

those team projects whether they're part

1576

01:02:42,390 --> 01:02:40,400

of your formal education or there's

1577

01:02:43,910 --> 01:02:42,400

something that you want to do on the

1578

01:02:45,910 --> 01:02:43,920

side that you and your friends develop

1579

01:02:47,109 --> 01:02:45,920

together those team experiences where

1580

01:02:48,390 --> 01:02:47,119

you're working together to build

1581

01:02:49,829 --> 01:02:48,400

something and operate something are

1582

01:02:53,430 --> 01:02:49,839

really valuable

1583

01:02:55,270 --> 01:02:53,440

absolutely great advice

1584

01:02:57,510 --> 01:02:55,280

as we see the first two astronauts make

1585

01:03:01,829 --> 01:02:57,520

their way up out of the elevators and

1586

01:03:06,789 --> 01:03:04,789

some fist pumps

1587

01:03:08,069 --> 01:03:06,799

with their crew

1588

01:03:10,870 --> 01:03:08,079

and then they'll make their way over to

1589

01:03:13,270 --> 01:03:10,880

a telephone

1590

01:03:15,430 --> 01:03:13,280

for a last call

1591

01:03:22,630 --> 01:03:15,440

well last call before they leave earth

1592

01:03:25,910 --> 01:03:24,309

so this is about the moment when your

1593

01:03:27,109 --> 01:03:25,920

family members and loved ones realize

1594

01:03:29,109 --> 01:03:27,119

they really hope they've left their

1595

01:03:31,270 --> 01:03:29,119

phone on they haven't put it on mute

1596

01:03:34,230 --> 01:03:31,280

because you you do hopefully get a phone

1597

01:03:35,750 --> 01:03:34,240

call from the launch pad um there's that

1598

01:03:37,670 --> 01:03:35,760

there's that bend back look again there

1599

01:03:39,029 --> 01:03:37,680

should be a name for that move

1600

01:03:40,870 --> 01:03:39,039

there should be we'll see if we can come

1601
01:03:44,549 --> 01:03:40,880
up with one but we should name it yeah

1602
01:03:46,950 --> 01:03:44,559
samantha and jessica there

1603
01:03:48,710 --> 01:03:46,960
how about just lean back look

1604
01:03:50,309 --> 01:03:48,720
let's get you got a

1605
01:03:51,990 --> 01:03:50,319
feather rocket in there somehow yeah

1606
01:03:53,670 --> 01:03:52,000
that's right yeah i'm going to work on

1607
01:03:56,069 --> 01:03:53,680
that megan i'll i'll get with you later

1608
01:03:57,750 --> 01:03:56,079
okay i appreciate that

1609
01:03:59,510 --> 01:03:57,760
so on the right hand side we have

1610
01:04:01,910 --> 01:03:59,520
samantha jessica getting ready to get

1611
01:04:03,990 --> 01:04:01,920
into the elevator on the left hand side

1612
01:04:05,829 --> 01:04:04,000
um bob and shell

1613
01:04:08,150 --> 01:04:05,839

making that phone call there's a phone

1614

01:04:10,470 --> 01:04:08,160

there it has very large

1615

01:04:12,150 --> 01:04:10,480

buttons for dialing the numbers

1616

01:04:13,990 --> 01:04:12,160

um because you've got those big gloves

1617

01:04:15,510 --> 01:04:14,000

on got those big gloves on that's right

1618

01:04:17,109 --> 01:04:15,520

and of course you can't put the phone up

1619

01:04:18,230 --> 01:04:17,119

against your ear

1620

01:04:19,670 --> 01:04:18,240

with that helmet on so you're

1621

01:04:21,670 --> 01:04:19,680

essentially kind of shouting into the

1622

01:04:23,750 --> 01:04:21,680

receiver and doing your best to hear

1623

01:04:26,230 --> 01:04:23,760

what is maybe shouted back but it's just

1624

01:04:28,150 --> 01:04:26,240

that one last chance to send the i love

1625

01:04:30,549 --> 01:04:28,160

yous back and forth over uh over the

1626

01:04:32,069 --> 01:04:30,559

phone wires before you leave the planet

1627

01:04:33,750 --> 01:04:32,079

so do you have to memorize the numbers

1628

01:04:35,349 --> 01:04:33,760

since it's actually typically there's

1629

01:04:36,950 --> 01:04:35,359

someone there that dials for you oh very

1630

01:04:38,630 --> 01:04:36,960

good but you're right nowadays people

1631

01:04:40,309 --> 01:04:38,640

you often don't memorize phone numbers

1632

01:04:42,870 --> 01:04:40,319

right we all get them out of our mobile

1633

01:04:43,750 --> 01:04:42,880

phones that's right

1634

01:04:45,349 --> 01:04:43,760

they've thought of everything though

1635

01:04:47,190 --> 01:04:45,359

someone's got it written down

1636

01:04:49,910 --> 01:04:47,200

you know and we should expect nothing

1637

01:04:53,270 --> 01:04:52,069

you can see the the chevrons on the

1638

01:04:54,870 --> 01:04:53,280

ground

1639

01:04:56,950 --> 01:04:54,880

and the direction that they point those

1640

01:04:58,710 --> 01:04:56,960

have a purpose as well

1641

01:05:00,470 --> 01:04:58,720

that's right the chevrons are directing

1642

01:05:02,309 --> 01:05:00,480

in the event of a contingency where

1643

01:05:03,750 --> 01:05:02,319

there are people on the launch pad the

1644

01:05:06,069 --> 01:05:03,760

chevrons are

1645

01:05:08,309 --> 01:05:06,079

one signal a visual signal that's easy

1646

01:05:11,029 --> 01:05:08,319

to see if there's you know darkness or

1647

01:05:13,029 --> 01:05:11,039

smoke to direct you away from the rocket

1648

01:05:15,430 --> 01:05:13,039

and toward the um

1649

01:05:19,109 --> 01:05:15,440

the baskets that you would ride in to

1650

01:05:20,789 --> 01:05:19,119

get far away from the launch pad

1651
01:05:27,109 --> 01:05:20,799
and now our mission specialists have

1652
01:05:31,029 --> 01:05:28,630
it looks like

1653
01:05:32,789 --> 01:05:31,039
bob hynes is having a

1654
01:05:34,150 --> 01:05:32,799
nice little conversation there this is a

1655
01:05:35,430 --> 01:05:34,160
beautiful beautiful shot from our

1656
01:05:37,589 --> 01:05:35,440
helicopter

1657
01:05:39,349 --> 01:05:37,599
looking at the top of the launch tower

1658
01:05:40,870 --> 01:05:39,359
and the crew access arm to the right

1659
01:05:43,510 --> 01:05:40,880
goes out to the rocket

1660
01:05:45,670 --> 01:05:43,520
you looked at that view it's nighttime

1661
01:05:47,109 --> 01:05:45,680
and we are in a national wildlife refuge

1662
01:05:48,950 --> 01:05:47,119
so i imagine there's not a whole lot to

1663
01:05:50,870 --> 01:05:48,960

see but still

1664

01:05:53,109 --> 01:05:50,880

it is pretty special and you're sort of

1665

01:05:55,990 --> 01:05:53,119

realizing this is as close as i'm going

1666

01:05:57,109 --> 01:05:56,000

to get to nature for a while and so it's

1667

01:05:58,710 --> 01:05:57,119

a special

1668

01:06:00,230 --> 01:05:58,720

feeling you get a little bit of breeze

1669

01:06:01,670 --> 01:06:00,240

on your face

1670

01:06:03,430 --> 01:06:01,680

and that's a special feeling as well

1671

01:06:04,710 --> 01:06:03,440

things that you're going to miss when

1672

01:06:06,390 --> 01:06:04,720

you're closed up inside the

1673

01:06:08,470 --> 01:06:06,400

international space station

1674

01:06:10,549 --> 01:06:08,480

samantha and jessica taking advantage of

1675

01:06:12,630 --> 01:06:10,559

exactly what you just said

1676

01:06:14,870 --> 01:06:12,640

a chance to look out

1677

01:06:16,549 --> 01:06:14,880

at planet earth

1678

01:06:19,510 --> 01:06:16,559

one last time

1679

01:06:21,589 --> 01:06:19,520

before getting inside crew dragon

1680

01:06:23,270 --> 01:06:21,599

and i heard the astronauts from crew 3

1681

01:06:25,430 --> 01:06:23,280

talking the other day

1682

01:06:27,349 --> 01:06:25,440

about what they missed and they were

1683

01:06:28,309 --> 01:06:27,359

such earthly things you know

1684

01:06:31,109 --> 01:06:28,319

um

1685

01:06:32,950 --> 01:06:31,119

thomas marshburn talked about wanting to

1686

01:06:33,829 --> 01:06:32,960

to just have the wind blow in his face

1687

01:06:36,549 --> 01:06:33,839

yes

1688

01:06:38,870 --> 01:06:36,559

they talked about a hot bath

1689

01:06:41,270 --> 01:06:38,880

i went running in the rain and it felt

1690

01:06:43,510 --> 01:06:41,280

wonderful it i just had a smile on my

1691

01:06:45,109 --> 01:06:43,520

face the whole time with you know rain

1692

01:06:47,109 --> 01:06:45,119

running down my face and down my neck

1693

01:06:49,430 --> 01:06:47,119

and into my clothes but it just was it

1694

01:06:51,670 --> 01:06:49,440

felt like yep i am i'm here on earth

1695

01:06:59,029 --> 01:06:51,680

this is good space is awesome to visit

1696

01:07:02,789 --> 01:07:00,470

if you're just joining us you are

1697

01:07:05,109 --> 01:07:02,799

watching live coverage of nasa's spacex

1698

01:07:06,630 --> 01:07:05,119

mission known as crew four

1699

01:07:08,789 --> 01:07:06,640

good evening and welcome to the kennedy

1700

01:07:10,789 --> 01:07:08,799

space center in florida i'm daryl nail

1701

01:07:13,430 --> 01:07:10,799

along with a recent pilot aboard a

1702

01:07:16,390 --> 01:07:13,440

spacex crew dragon the voice of nasa

1703

01:07:18,870 --> 01:07:16,400

astronaut megan mcarthur she is here and

1704

01:07:20,470 --> 01:07:18,880

giving us great insight into the mission

1705

01:07:22,470 --> 01:07:20,480

today

1706

01:07:25,029 --> 01:07:22,480

thanks daryl it's really i just really

1707

01:07:27,430 --> 01:07:25,039

enjoy watching them go through this and

1708

01:07:29,029 --> 01:07:27,440

remembering what it was like for us

1709

01:07:31,029 --> 01:07:29,039

but as well knowing that they're going

1710

01:07:32,870 --> 01:07:31,039

to have their own individual take on it

1711

01:07:34,630 --> 01:07:32,880

their individual experience and just

1712

01:07:36,950 --> 01:07:34,640

seeing already the camaraderie the

1713

01:07:38,390 --> 01:07:36,960

relationships between the crew members

1714

01:07:40,789 --> 01:07:38,400

and knowing that they're going to have

1715

01:07:43,029 --> 01:07:40,799

such a fun and successful time up there

1716

01:07:49,190 --> 01:07:43,039

walking down the crew access scarm comes

1717

01:08:00,230 --> 01:07:51,430

we see them inside and the shot to the

1718

01:08:04,950 --> 01:08:03,190

the closeout team not far behind

1719

01:08:08,549 --> 01:08:04,960

they have some work to do to get them

1720

01:08:16,550 --> 01:08:10,150

and now our emissions specialists have

1721

01:08:20,390 --> 01:08:19,189

we are t minus two hours and 45 minutes

1722

01:08:22,789 --> 01:08:20,400

and counting

1723

01:08:25,910 --> 01:08:22,799

until the liftoff of crew four from the

1724

01:08:30,789 --> 01:08:29,430

this is now a look inside the white room

1725

01:08:33,030 --> 01:08:30,799

shell has arrived

1726
01:08:35,510 --> 01:08:33,040
on countdown one we are at t-minus two

1727
01:08:37,269 --> 01:08:35,520
hours 45 minutes the crew have arrived

1728
01:08:41,269 --> 01:08:37,279
at the white room and are preparing for

1729
01:08:45,910 --> 01:08:43,829
right on schedule

1730
01:08:47,749 --> 01:08:45,920
you see he's got the sharpie in his hand

1731
01:08:49,749 --> 01:08:47,759
and megan he's signing

1732
01:08:51,430 --> 01:08:49,759
that white wall inside the white room he

1733
01:08:53,669 --> 01:08:51,440
is he's signing his name there in

1734
01:08:55,910 --> 01:08:53,679
preparation for launch all of the crews

1735
01:08:57,590 --> 01:08:55,920
that have launched from there previously

1736
01:08:59,269 --> 01:08:57,600
will have already signed

1737
01:09:02,229 --> 01:08:59,279
their name and so each one of the crew

1738
01:09:03,990 --> 01:09:02,239

members will get to do that and as you

1739

01:09:05,749 --> 01:09:04,000

know the the white room is not really a

1740

01:09:07,749 --> 01:09:05,759

room it's just kind of the end of that

1741

01:09:08,630 --> 01:09:07,759

walkway so it is a relatively small

1742

01:09:10,789 --> 01:09:08,640

space

1743

01:09:13,269 --> 01:09:10,799

that's being used to do final suit

1744

01:09:14,709 --> 01:09:13,279

preparations it does have some a small

1745

01:09:16,630 --> 01:09:14,719

amount of emergency equipment in there

1746

01:09:18,229 --> 01:09:16,640

so it is a tight little space

1747

01:09:19,669 --> 01:09:18,239

but it's important to take that time and

1748

01:09:21,910 --> 01:09:19,679

acknowledge those traditions that are

1749

01:09:25,510 --> 01:09:21,920

being built and renewed here

1750

01:09:27,590 --> 01:09:25,520

your name is on that wall on that wall

1751

01:09:30,550 --> 01:09:27,600

hopefully they didn't write over it ooh

1752

01:09:31,990 --> 01:09:30,560

yeah i might have to go back and check

1753

01:09:33,189 --> 01:09:32,000

we'll take a look after the launch just

1754

01:09:36,149 --> 01:09:33,199

make sure everything's right make sure

1755

01:09:40,950 --> 01:09:38,709

in fact that sharpie is uh

1756

01:09:44,950 --> 01:09:40,960

is an item on a checklist of course

1757

01:09:44,960 --> 01:09:53,189

and here come our next two astronauts

1758

01:09:56,870 --> 01:09:54,790

finishing up one last phone call it

1759

01:10:06,550 --> 01:09:56,880

looks like and then they'll probably

1760

01:10:09,750 --> 01:10:08,149

were you able to hear the call that you

1761

01:10:11,510 --> 01:10:09,760

made were you able to hear

1762

01:10:13,590 --> 01:10:11,520

it's it's difficult because again you

1763

01:10:15,590 --> 01:10:13,600

can't get the receiver up inside your

1764

01:10:17,110 --> 01:10:15,600

helmet against your ear and so once your

1765

01:10:18,950 --> 01:10:17,120

family realizes that then they're you

1766

01:10:24,390 --> 01:10:18,960

know essentially shouting it's not time

1767

01:10:28,550 --> 01:10:26,390

it looks like jessica and samantha are

1768

01:10:36,310 --> 01:10:28,560

wrapped up

1769

01:10:42,070 --> 01:10:37,910

i'm kind of getting juked out here no

1770

01:10:46,229 --> 01:10:43,510

and here come

1771

01:10:46,239 --> 01:10:49,590

and samantha

1772

01:10:56,470 --> 01:10:51,270

they'll walk down the crew access arm

1773

01:11:00,470 --> 01:10:58,149

well samantha is saying something not

1774

01:11:01,669 --> 01:11:00,480

sure what she's saying but uh she is

1775

01:11:03,189 --> 01:11:01,679

smiling

1776

01:11:05,430 --> 01:11:03,199

i think they could about smile their way

1777

01:11:15,189 --> 01:11:05,440

into space

1778

01:11:19,270 --> 01:11:17,189

the white room also allows for

1779

01:11:22,550 --> 01:11:19,280

completion of cargo load

1780

01:11:23,830 --> 01:11:22,560

at t minus 24 hours

1781

01:11:25,990 --> 01:11:23,840

so

1782

01:11:28,630 --> 01:11:26,000

it has used to both get the astronauts

1783

01:11:36,390 --> 01:11:28,640

inside the crew capsule and

1784

01:11:40,630 --> 01:11:38,390

this is part of the countdown that we

1785

01:11:42,310 --> 01:11:40,640

call ingress a milestone that we have

1786

01:11:44,310 --> 01:11:42,320

reached at

1787

01:11:46,950 --> 01:11:44,320

inside the two-hour

1788

01:11:49,350 --> 01:11:46,960

and 42-minute mark

1789

01:11:53,669 --> 01:11:49,360

simply means that the astronauts are

1790

01:11:53,679 --> 01:11:57,110

the closeout team

1791

01:12:01,189 --> 01:11:59,030

surrounds them and is

1792

01:12:03,910 --> 01:12:01,199

preparing them to go inside they have

1793

01:12:07,669 --> 01:12:03,920

covers on their boots

1794

01:12:10,310 --> 01:12:07,679

that make sure everything is kept clean

1795

01:12:12,870 --> 01:12:10,320

upon entering

1796

01:12:24,870 --> 01:12:12,880

the capsule samantha flashiness the crew

1797

01:12:30,310 --> 01:12:27,270

that's a great shot looking back

1798

01:12:31,430 --> 01:12:30,320

towards the crew access arm

1799

01:12:33,110 --> 01:12:31,440

as the

1800

01:12:36,070 --> 01:12:33,120

closeout team does their work right

1801
01:12:38,070 --> 01:12:36,080
there between jessica and samantha and

1802
01:12:56,870 --> 01:12:38,080
the signatures with some fresh ink

1803
01:12:56,880 --> 01:13:01,830
those helmets are 3d printed

1804
01:13:01,840 --> 01:13:07,030
and customized

1805
01:13:11,270 --> 01:13:09,270
all right let's check back in with

1806
01:13:13,270 --> 01:13:11,280
our team at spacex headquarters in

1807
01:13:18,550 --> 01:13:13,280
hawthorne california send it over to

1808
01:13:22,390 --> 01:13:20,149
thanks daryl

1809
01:13:24,709 --> 01:13:22,400
it's really exciting to see the crew

1810
01:13:27,590 --> 01:13:24,719
starting to ingress the dragon vehicle

1811
01:13:29,350 --> 01:13:27,600
and get ready for their journey to the

1812
01:13:31,350 --> 01:13:29,360
international space station just a quick

1813
01:13:33,510 --> 01:13:31,360

clarification the journey will be about

1814

01:13:36,390 --> 01:13:33,520

16 hours long

1815

01:13:38,229 --> 01:13:36,400

once they lift off this morning

1816

01:13:40,310 --> 01:13:38,239

yeah that's that's right about the

1817

01:13:42,229 --> 01:13:40,320

middle of what we've seen for most of

1818

01:13:44,790 --> 01:13:42,239

these missions they can be as short as

1819

01:13:46,550 --> 01:13:44,800

eight if we end up getting a

1820

01:13:48,229 --> 01:13:46,560

basically a phasing angle that works

1821

01:13:50,229 --> 01:13:48,239

really really well they can be as long

1822

01:13:52,229 --> 01:13:50,239

as two days so

1823

01:13:54,630 --> 01:13:52,239

about 16 hours will be nice but right

1824

01:13:57,189 --> 01:13:54,640

now they they're ingressing the capsule

1825

01:13:59,350 --> 01:13:57,199

as daryl said we've got jessica watkins

1826

01:14:01,350 --> 01:13:59,360

still out here in the white room white

1827

01:14:02,870 --> 01:14:01,360

room is kind of their last stop on

1828

01:14:04,390 --> 01:14:02,880

planet earth it's

1829

01:14:07,510 --> 01:14:04,400

as we said it's the end of the the

1830

01:14:09,270 --> 01:14:07,520

access arm there's a seal that extends

1831

01:14:10,950 --> 01:14:09,280

from the white room around the capsule

1832

01:14:13,350 --> 01:14:10,960

just to help keep

1833

01:14:15,750 --> 01:14:13,360

the dragon interior as clean of an

1834

01:14:17,750 --> 01:14:15,760

environment as possible keep out all the

1835

01:14:19,030 --> 01:14:17,760

moisture the humidity from that florida

1836

01:14:20,709 --> 01:14:19,040

weather

1837

01:14:22,950 --> 01:14:20,719

and so each of the crew members they're

1838

01:14:24,709 --> 01:14:22,960

doing the signing they're also getting

1839

01:14:26,630 --> 01:14:24,719

what's known as a fod check before an

1840

01:14:28,470 --> 01:14:26,640

object debris check just making sure

1841

01:14:30,470 --> 01:14:28,480

that they're not bringing any dust

1842

01:14:32,070 --> 01:14:30,480

debris particles things like that in

1843

01:14:33,669 --> 01:14:32,080

that could interfere

1844

01:14:35,430 --> 01:14:33,679

with the umbilicals or any of the

1845

01:14:37,110 --> 01:14:35,440

different systems because anything that

1846

01:14:40,229 --> 01:14:37,120

goes in that capsule is going to space

1847

01:14:45,350 --> 01:14:42,630

really exciting to see jessica watkins

1848

01:14:47,110 --> 01:14:45,360

and samantha christopher eddie signing

1849

01:14:49,669 --> 01:14:47,120

their names

1850

01:14:51,430 --> 01:14:49,679

uh and they do have this in the

1851
01:14:54,149 --> 01:14:51,440
procedure

1852
01:14:55,590 --> 01:14:54,159
to have the sharpie ready for them

1853
01:14:57,750 --> 01:14:55,600
so that they can

1854
01:14:59,830 --> 01:14:57,760
do this signing before they ingress the

1855
01:15:01,750 --> 01:14:59,840
dragon vehicle

1856
01:15:03,910 --> 01:15:01,760
looks like now they both have signed

1857
01:15:06,870 --> 01:15:03,920
their signatures and

1858
01:15:08,630 --> 01:15:06,880
next steps is to start ingressing the

1859
01:15:11,669 --> 01:15:08,640
dragon capsule

1860
01:15:13,830 --> 01:15:11,679
we've got jel and bob in already and

1861
01:15:15,910 --> 01:15:13,840
when we get a look in through the hatch

1862
01:15:17,350 --> 01:15:15,920
the seats are numbered one through four

1863
01:15:19,110 --> 01:15:17,360

so when you're looking in from the hatch

1864

01:15:20,470 --> 01:15:19,120

it goes from right to left

1865

01:15:22,229 --> 01:15:20,480

so that seat all the way on the right

1866

01:15:23,990 --> 01:15:22,239

will be seat one

1867

01:15:26,070 --> 01:15:24,000

and that's where samantha chris ferretti

1868

01:15:27,910 --> 01:15:26,080

is bound uh just to the left of that is

1869

01:15:29,590 --> 01:15:27,920

seat number two that's the commander's

1870

01:15:31,910 --> 01:15:29,600

seat and chell lingard already seated

1871

01:15:33,590 --> 01:15:31,920

there next to that the pilot seat seat

1872

01:15:35,430 --> 01:15:33,600

number three where bob hines is going to

1873

01:15:37,189 --> 01:15:35,440

be riding uphill and then jessica

1874

01:15:39,189 --> 01:15:37,199

watkins will be in seat four all the way

1875

01:15:42,229 --> 01:15:39,199

on the left

1876
01:15:44,550 --> 01:15:42,239
and these seats have a connection point

1877
01:15:47,510 --> 01:15:44,560
to the suits they've got an umbilical

1878
01:15:49,910 --> 01:15:47,520
basically a hose almost that plugs into

1879
01:15:52,470 --> 01:15:49,920
the leg of the suits and that provides a

1880
01:15:54,229 --> 01:15:52,480
couple of really critical functions

1881
01:15:56,070 --> 01:15:54,239
for this suit it

1882
01:15:57,510 --> 01:15:56,080
gives them a hard-line connection to

1883
01:15:59,830 --> 01:15:57,520
communications

1884
01:16:02,709 --> 01:15:59,840
through the dragon spacecraft it also

1885
01:16:05,189 --> 01:16:02,719
provides the capability to flow just

1886
01:16:07,750 --> 01:16:05,199
conditioned cabin air to help them stay

1887
01:16:09,110 --> 01:16:07,760
cool so

1888
01:16:12,070 --> 01:16:09,120

performing a similar function of that

1889

01:16:14,149 --> 01:16:12,080

blue box we saw them carrying earlier

1890

01:16:15,990 --> 01:16:14,159

but then one of the really critical ones

1891

01:16:18,470 --> 01:16:16,000

that all the different umbilical points

1892

01:16:21,270 --> 01:16:18,480

can provide is pressurized nitrox and

1893

01:16:23,110 --> 01:16:21,280

that's to uh if these suits need to be

1894

01:16:25,350 --> 01:16:23,120

pressurized for any reason we can flow

1895

01:16:27,030 --> 01:16:25,360

that in if they're in a depressurized

1896

01:16:28,310 --> 01:16:27,040

cabin if there's

1897

01:16:30,470 --> 01:16:28,320

issue with the atmosphere or anything

1898

01:16:32,149 --> 01:16:30,480

like that that suit can provide a

1899

01:16:34,870 --> 01:16:32,159

pressurized safety environment for the

1900

01:16:37,270 --> 01:16:34,880

crew members

1901

01:16:39,350 --> 01:16:37,280

and you can see on your right hand

1902

01:16:41,590 --> 01:16:39,360

screen that all four of the crew members

1903

01:16:43,350 --> 01:16:41,600

are now sitting in their seats

1904

01:16:45,750 --> 01:16:43,360

you can see the suit text there helping

1905

01:16:47,270 --> 01:16:45,760

them get strapped in or harnessed into

1906

01:16:50,310 --> 01:16:47,280

each of their seats and they're

1907

01:16:53,110 --> 01:16:50,320

umbilicals attached to their suits

1908

01:16:54,229 --> 01:16:53,120

and every part of this process is very

1909

01:16:55,830 --> 01:16:54,239

precise

1910

01:16:57,270 --> 01:16:55,840

you did see

1911

01:16:59,830 --> 01:16:57,280

as the crew

1912

01:17:01,990 --> 01:16:59,840

ingress through the hatchway the suit

1913

01:17:03,830 --> 01:17:02,000

techs even put their their hand over

1914

01:17:05,590 --> 01:17:03,840

their helmet that's a part of the

1915

01:17:07,030 --> 01:17:05,600

procedure again to make sure that

1916

01:17:09,270 --> 01:17:07,040

they're you know they don't damage

1917

01:17:11,270 --> 01:17:09,280

anything as they enter the vehicle same

1918

01:17:13,510 --> 01:17:11,280

with as they're

1919

01:17:14,870 --> 01:17:13,520

putting together their

1920

01:17:18,950 --> 01:17:14,880

harnessing

1921

01:17:21,110 --> 01:17:18,960

um again every step of this process is

1922

01:17:23,910 --> 01:17:21,120

very precise and we might be able to see

1923

01:17:25,910 --> 01:17:23,920

it in a minute here but they do have uh

1924

01:17:27,910 --> 01:17:25,920

some tablets and some pads with them

1925

01:17:30,870 --> 01:17:27,920

where the the crew can follow along with

1926

01:17:31,990 --> 01:17:30,880

every procedure every step of the way

1927

01:17:34,310 --> 01:17:32,000

and we were just looking at shell

1928

01:17:37,510 --> 01:17:34,320

lingering he's seen this entire process

1929

01:17:39,430 --> 01:17:37,520

from up close before we saw zina cardman

1930

01:17:41,030 --> 01:17:39,440

she's the ask the astronaut support

1931

01:17:43,430 --> 01:17:41,040

personnel for this one

1932

01:17:45,510 --> 01:17:43,440

chell did it back on crew one

1933

01:17:48,229 --> 01:17:45,520

and got some internet notoriety is he

1934

01:17:50,550 --> 01:17:48,239

was the spacex ninja that had two

1935

01:17:52,149 --> 01:17:50,560

umbrellas as it was a rainy day

1936

01:17:54,550 --> 01:17:52,159

um so

1937

01:17:56,390 --> 01:17:54,560

getting a little fame from that one but

1938

01:17:59,510 --> 01:17:56,400

so he he did that for the crew once this

1939

01:18:00,229 --> 01:17:59,520

is not his first trip down this walkway

1940

01:18:01,750 --> 01:18:00,239

and

1941

01:18:03,510 --> 01:18:01,760

but this time he's

1942

01:18:05,990 --> 01:18:03,520

going to be strapping in and heading

1943

01:18:07,830 --> 01:18:06,000

uphill so they're they're getting

1944

01:18:09,590 --> 01:18:07,840

strapped in they've got a five-point

1945

01:18:11,510 --> 01:18:09,600

harness that's going to be

1946

01:18:12,709 --> 01:18:11,520

secured throughout the entire ascent

1947

01:18:14,470 --> 01:18:12,719

portion they're going to be in their

1948

01:18:16,790 --> 01:18:14,480

suits until they're on orbit they're

1949

01:18:18,870 --> 01:18:16,800

going to wear these suits for all of the

1950

01:18:20,790 --> 01:18:18,880

different what we call dynamic phases of

1951

01:18:23,430 --> 01:18:20,800

flight so that's where the vehicle's

1952

01:18:25,830 --> 01:18:23,440

actively making maneuvers and so that's

1953

01:18:27,669 --> 01:18:25,840

obviously going to be launch and ascent

1954

01:18:30,790 --> 01:18:27,679

they'll put their suits back on when we

1955

01:18:32,630 --> 01:18:30,800

get into the docking with this with the

1956

01:18:34,149 --> 01:18:32,640

international space station

1957

01:18:35,590 --> 01:18:34,159

same in reverse they'll wear them for

1958

01:18:37,189 --> 01:18:35,600

undocking

1959

01:18:38,550 --> 01:18:37,199

and then they'll wear them at the very

1960

01:18:43,910 --> 01:18:38,560

end of the mission when we get to the

1961

01:18:49,750 --> 01:18:46,709

once the suit techs uh finish getting

1962

01:18:52,870 --> 01:18:49,760

the crew all settled in they will do

1963

01:18:54,550 --> 01:18:52,880

some comm checks then rotate their seats

1964

01:18:56,790 --> 01:18:54,560

into launch position

1965

01:18:58,950 --> 01:18:56,800

uh right now the seats are rotated down

1966

01:19:00,630 --> 01:18:58,960

so that they are much more accessible

1967

01:19:02,790 --> 01:19:00,640

but once they rotate upwards they'll be

1968

01:19:05,110 --> 01:19:02,800

able to access those display panels that

1969

01:19:08,390 --> 01:19:05,120

you can kind of see right above uh the

1970

01:19:10,390 --> 01:19:08,400

pilot and commander seat there

1971

01:19:12,870 --> 01:19:10,400

and these uh these dragons these are

1972

01:19:14,229 --> 01:19:12,880

actually custom made for each

1973

01:19:16,149 --> 01:19:14,239

crew member

1974

01:19:17,910 --> 01:19:16,159

they kind of go hand in hand with their

1975

01:19:20,229 --> 01:19:17,920

custom suits

1976

01:19:23,270 --> 01:19:20,239

and the suits are basically an extension

1977

01:19:25,430 --> 01:19:23,280

of the dragon vehicle

1978

01:19:28,709 --> 01:19:25,440

so pretty cool they get their own custom

1979

01:19:33,270 --> 01:19:28,719

made seats a custom made suit which is

1980

01:19:37,590 --> 01:19:35,669

yeah we'll see them get strapped in and

1981

01:19:39,110 --> 01:19:37,600

then there's as jesse said there's a

1982

01:19:40,790 --> 01:19:39,120

couple of events that we're gonna we're

1983

01:19:43,189 --> 01:19:40,800

gonna listen to and we're gonna see take

1984

01:19:45,990 --> 01:19:43,199

place uh those communication checks will

1985

01:19:47,830 --> 01:19:46,000

come up we'll hear uh the core that's

1986

01:19:49,669 --> 01:19:47,840

the essentially the voice of mission

1987

01:19:52,709 --> 01:19:49,679

control hawthorne

1988

01:19:54,229 --> 01:19:52,719

which for today is arthur barrio so

1989

01:19:56,149 --> 01:19:54,239

we'll hear his voice when we get ready

1990

01:19:56,950 --> 01:19:56,159

for the communications checks

1991

01:20:00,950 --> 01:19:56,960

they'll

1992

01:20:03,030 --> 01:20:00,960

comm check from each of the crew members

1993

01:20:06,149 --> 01:20:03,040

so they'll call down you'll hear them

1994

01:20:08,950 --> 01:20:06,159

call down as commander pilot or plt ms-1

1995

01:20:10,310 --> 01:20:08,960

ms2 for the two mission specialists and

1996

01:20:12,390 --> 01:20:10,320

they're going to be talking to the corps

1997

01:20:13,910 --> 01:20:12,400

throughout the entire mission and

1998

01:20:15,669 --> 01:20:13,920

they're also going to do a communication

1999

01:20:18,149 --> 01:20:15,679

check with a couple of other of the key

2000

01:20:20,790 --> 01:20:18,159

team members on one the spacex mission

2001
01:20:23,110 --> 01:20:20,800
director who here in hawthorne has the

2002
01:20:25,510 --> 01:20:23,120
overall authority for the mission

2003
01:20:27,510 --> 01:20:25,520
and also the spacex launch director or

2004
01:20:29,510 --> 01:20:27,520
Id who's overseeing all of the

2005
01:20:34,470 --> 01:20:29,520
pre-launch and launch preparations down

2006
01:20:38,790 --> 01:20:36,149
and then we'll do those communications

2007
01:20:40,390 --> 01:20:38,800
checks over a couple of different paths

2008
01:20:42,149 --> 01:20:40,400
both through ground sites and also

2009
01:20:43,910 --> 01:20:42,159
through what's known as tdrs the

2010
01:20:45,510 --> 01:20:43,920
tracking and data relay satellites

2011
01:20:47,830 --> 01:20:45,520
that's what

2012
01:20:50,149 --> 01:20:47,840
same satellites we use for command

2013
01:20:52,149 --> 01:20:50,159

telemetry data with the space station

2014

01:20:54,550 --> 01:20:52,159

and same satellites that are used to get

2015

01:20:56,550 --> 01:20:54,560

all of that to and from dragon so

2016

01:20:58,629 --> 01:20:56,560

they'll do all of those checks they're

2017

01:21:01,510 --> 01:20:58,639

also going to do another round of suit

2018

01:21:03,990 --> 01:21:01,520

leak checks so we saw them do that in

2019

01:21:05,669 --> 01:21:04,000

the suit up room a little while ago

2020

01:21:07,590 --> 01:21:05,679

now that they're actually on board

2021

01:21:09,270 --> 01:21:07,600

dragon able to integrate into the

2022

01:21:11,030 --> 01:21:09,280

systems use the umbilicals they'll do

2023

01:21:12,470 --> 01:21:11,040

another leak check

2024

01:21:17,189 --> 01:21:12,480

and then the crew will be one step

2025

01:21:22,470 --> 01:21:19,350

and really exciting to see if you're

2026

01:21:25,669 --> 01:21:22,480

just now joining us the crew 4

2027

01:21:26,830 --> 01:21:25,679

astronauts are now in their seats they

2028

01:21:29,910 --> 01:21:26,840

have ingress

2029

01:21:32,550 --> 01:21:29,920

dragon and we do still have the suit

2030

01:21:35,590 --> 01:21:32,560

techs there still assisting with getting

2031

01:21:37,590 --> 01:21:35,600

them settled in and and prepared for

2032

01:21:40,310 --> 01:21:37,600

their mission today

2033

01:21:43,110 --> 01:21:40,320

the suit techs help with

2034

01:21:45,110 --> 01:21:43,120

getting their harnessing strapped uh for

2035

01:21:48,149 --> 01:21:45,120

each of the crew members getting their

2036

01:21:50,629 --> 01:21:48,159

umbilicals attached um and again as dan

2037

01:21:53,430 --> 01:21:50,639

mentioned they will be doing some comm

2038

01:21:54,709 --> 01:21:53,440

checks uh here shortly once they are all

2039

01:21:57,350 --> 01:21:54,719

settled in

2040

01:21:58,950 --> 01:21:57,360

um into their seats

2041

01:22:01,189 --> 01:21:58,960

and once we get to those checks you'll

2042

01:22:03,110 --> 01:22:01,199

see them using their armrests that's

2043

01:22:05,750 --> 01:22:03,120

where they have a couple of different

2044

01:22:07,750 --> 01:22:05,760

buttons uh one is to actually enable

2045

01:22:09,990 --> 01:22:07,760

that communication they can change their

2046

01:22:12,950 --> 01:22:10,000

their vox settings their their audio

2047

01:22:14,790 --> 01:22:12,960

communication settings

2048

01:22:16,790 --> 01:22:14,800

just for volume levels things like that

2049

01:22:18,870 --> 01:22:16,800

inside the helmet

2050

01:22:20,709 --> 01:22:18,880

they're they're in

2051
01:22:22,470 --> 01:22:20,719
a rotated position right now just for

2052
01:22:24,950 --> 01:22:22,480
ingress but after we get through a

2053
01:22:26,950 --> 01:22:24,960
couple of more steps we'll get to seat

2054
01:22:28,629 --> 01:22:26,960
rotation so we'll see their feet swing

2055
01:22:30,229 --> 01:22:28,639
up a little bit they

2056
01:22:32,550 --> 01:22:30,239
rotate the seats by a little less than

2057
01:22:34,390 --> 01:22:32,560
30 degrees to put them in the launch

2058
01:22:37,590 --> 01:22:34,400
position and this is

2059
01:22:39,830 --> 01:22:37,600
to orient them just for

2060
01:22:41,910 --> 01:22:39,840
the best position for managing the g

2061
01:22:44,149 --> 01:22:41,920
loads on the way up hill uh it also

2062
01:22:46,950 --> 01:22:44,159
gives them direct access to those

2063
01:22:51,830 --> 01:22:48,550

yeah dan and there's some pretty cool

2064

01:22:55,270 --> 01:22:51,840

features about the these suits as well

2065

01:22:58,390 --> 01:22:55,280

the helmets you mentioned uh the audio

2066

01:23:00,870 --> 01:22:58,400

attachment on their uh armrest

2067

01:23:03,030 --> 01:23:00,880

the helmets themselves have the audio

2068

01:23:04,790 --> 01:23:03,040

basically designed into them

2069

01:23:06,390 --> 01:23:04,800

and the helmets are 3d printed which is

2070

01:23:09,270 --> 01:23:06,400

pretty cool

2071

01:23:10,550 --> 01:23:09,280

the suits are flame resistant and the

2072

01:23:12,950 --> 01:23:10,560

gloves

2073

01:23:14,870 --> 01:23:12,960

as dan mentioned they will be using

2074

01:23:17,430 --> 01:23:14,880

that display

2075

01:23:19,110 --> 01:23:17,440

those display screens above the pilot

2076

01:23:21,189 --> 01:23:19,120

and commander seat

2077

01:23:23,270 --> 01:23:21,199

those gloves are actually

2078

01:23:24,629 --> 01:23:23,280

designed to be able to use on that touch

2079

01:23:30,310 --> 01:23:24,639

screen

2080

01:23:32,870 --> 01:23:30,320

shell linger and bob hines have

2081

01:23:36,149 --> 01:23:32,880

basically all of their direct insight

2082

01:23:38,070 --> 01:23:36,159

into dragon systems they can dig down

2083

01:23:40,790 --> 01:23:38,080

into all the different subsystems and

2084

01:23:43,750 --> 01:23:40,800

the alerts or alarms will show up there

2085

01:23:45,910 --> 01:23:43,760

and that's also the means of manual

2086

01:23:47,510 --> 01:23:45,920

piloting for dragon there's no control

2087

01:23:48,550 --> 01:23:47,520

sticks there's no flight sticks anything

2088

01:23:50,310 --> 01:23:48,560

like that

2089

01:23:53,910 --> 01:23:50,320

it's all done via touch screen in fact

2090

01:23:55,990 --> 01:23:53,920

spacex had a really cool uh interactive

2091

01:23:59,189 --> 01:23:56,000

where you could do it on the web

2092

01:24:01,830 --> 01:23:59,199

when we did demo 2 about two years ago

2093

01:24:04,229 --> 01:24:01,840

and it's it's very similar they use that

2094

01:24:05,270 --> 01:24:04,239

touch screen to take control and command

2095

01:24:07,430 --> 01:24:05,280

dragon

2096

01:24:09,669 --> 01:24:07,440

if required again the flight designed to

2097

01:24:11,510 --> 01:24:09,679

be autonomous the whole way but those

2098

01:24:13,350 --> 01:24:11,520

touch screens can be used should the

2099

01:24:15,910 --> 01:24:13,360

crew need to step in uh both shell

2100

01:24:19,590 --> 01:24:15,920

ingrain and bob hines both trained both

2101
01:24:21,910 --> 01:24:19,600
capable to jump in and pilot dragon

2102
01:24:23,430 --> 01:24:21,920
and there's also a row of buttons you

2103
01:24:24,390 --> 01:24:23,440
can just see them at the top of your

2104
01:24:28,229 --> 01:24:24,400
screen

2105
01:24:30,550 --> 01:24:28,239
are

2106
01:24:33,910 --> 01:24:30,560
hardline buttons to a couple of just

2107
01:24:36,390 --> 01:24:33,920
really critical items um if you need to

2108
01:24:38,790 --> 01:24:36,400
basically hit them immediately

2109
01:24:41,350 --> 01:24:38,800
things like initiating a de-orbit

2110
01:24:42,470 --> 01:24:41,360
suppressing fire there's

2111
01:24:44,390 --> 01:24:42,480
several buttons for some of the

2112
01:24:47,510 --> 01:24:44,400
different pyrotechnics on the vehicle

2113
01:24:49,669 --> 01:24:47,520

deploying parachutes um and that display

2114

01:24:54,070 --> 01:24:49,679

that's just a cluster that's just

2115

01:24:57,990 --> 01:24:56,070

looking like we're getting close to

2116

01:25:00,390 --> 01:24:58,000

getting the suit x out of there yeah it

2117

01:25:02,950 --> 01:25:00,400

looks like we had some fist bumps and

2118

01:25:03,990 --> 01:25:02,960

these suit techs are now egressing or

2119

01:25:07,110 --> 01:25:04,000

exiting

2120

01:25:08,790 --> 01:25:07,120

the dragon capsule

2121

01:25:10,149 --> 01:25:08,800

all right well with the suetec starting

2122

01:25:12,790 --> 01:25:10,159

to get out of there we should be coming

2123

01:25:15,189 --> 01:25:12,800

up now on those communications checks

2124

01:25:17,669 --> 01:25:15,199

and suit leak checks so we should be

2125

01:25:20,310 --> 01:25:17,679

getting some call outs from the core the

2126
01:25:22,470 --> 01:25:20,320
crew operations and resource engineer

2127
01:25:24,310 --> 01:25:22,480
coming up in just a couple of minutes so

2128
01:25:26,310 --> 01:25:24,320
again we've got a couple of those

2129
01:25:27,750 --> 01:25:26,320
milestones coming up we're going to do

2130
01:25:29,510 --> 01:25:27,760
those communications checks they're

2131
01:25:31,189 --> 01:25:29,520
going to do leak checks

2132
01:25:33,910 --> 01:25:31,199
and then after we get through all of

2133
01:25:36,070 --> 01:25:33,920
those we'll be a little bit closer to

2134
01:25:38,070 --> 01:25:36,080
closing out some of the final pad ops

2135
01:25:40,550 --> 01:25:38,080
that that closeout team will be

2136
01:25:42,390 --> 01:25:40,560
responsible for closing that side hatch

2137
01:25:44,070 --> 01:25:42,400
on the dragon spacecraft which will get

2138
01:25:47,270 --> 01:25:44,080

its own leak check

2139

01:25:49,430 --> 01:25:47,280

and once that side hatch is closed it

2140

01:25:51,189 --> 01:25:49,440

and once we pass the leak check it

2141

01:25:52,950 --> 01:25:51,199

doesn't open again

2142

01:25:56,550 --> 01:25:52,960

until dragon is splashed down at the

2143

01:26:00,470 --> 01:25:58,390

yeah we've got some really cool views of

2144

01:26:03,590 --> 01:26:00,480

the pad on your left hand screen with

2145

01:26:05,750 --> 01:26:03,600

the crew crew four crew inside of the

2146

01:26:09,110 --> 01:26:05,760

dragon capsule there

2147

01:26:12,310 --> 01:26:09,120

and so far we've had a pretty on time uh

2148

01:26:14,229 --> 01:26:12,320

schedule today uh the crew we did watch

2149

01:26:16,149 --> 01:26:14,239

live as the crew were

2150

01:26:18,229 --> 01:26:16,159

they were all in the suit up room uh

2151
01:26:20,390 --> 01:26:18,239
doing their suit leak checks uh we

2152
01:26:23,910 --> 01:26:20,400
followed them as they got into their

2153
01:26:25,910 --> 01:26:23,920
teslas and and rode to the launch pad

2154
01:26:27,189 --> 01:26:25,920
as they uh climbed the fixed service

2155
01:26:28,870 --> 01:26:27,199
structure

2156
01:26:31,350 --> 01:26:28,880
and now the crew is all

2157
01:26:33,990 --> 01:26:31,360
settled into their seats the suit techs

2158
01:26:35,750 --> 01:26:34,000
are out of the dragon vehicle

2159
01:26:38,390 --> 01:26:35,760
and now are prepping for the next steps

2160
01:26:41,350 --> 01:26:38,400
as dan mentioned uh getting ready for

2161
01:26:44,070 --> 01:26:41,360
the hatch closure um as well as the the

2162
01:26:45,830 --> 01:26:44,080
coms uh comms checks that we

2163
01:26:52,709 --> 01:26:45,840

should hear coming in

2164

01:27:02,310 --> 01:26:54,870

spacex copies freedom

2165

01:27:40,629 --> 01:27:04,550

great timing sounds like comp checks are

2166

01:27:44,709 --> 01:27:42,310

and we're just standing by for those

2167

01:27:46,390 --> 01:27:44,719

communications checks to to pick up

2168

01:27:49,030 --> 01:27:46,400

that's the core the crew operations and

2169

01:27:50,790 --> 01:27:49,040

resource engineer arthur barrio

2170

01:27:53,590 --> 01:27:50,800

on the left side of your screen he's

2171

01:27:54,790 --> 01:27:53,600

sitting just behind us and mccx here on

2172

01:27:56,310 --> 01:27:54,800

hawthorne

2173

01:27:59,030 --> 01:27:56,320

again we're going to hear

2174

01:28:00,310 --> 01:27:59,040

him give a call up to the crew he'll get

2175

01:28:07,830 --> 01:28:00,320

comm checks from the commander and the

2176

01:28:21,830 --> 01:28:11,189

freedom cdr loud and clear

2177

01:28:25,590 --> 01:28:23,830

core copy is loud and clear umbilical

2178

01:28:48,310 --> 01:28:25,600

comp check is complete stand by for

2179

01:28:51,270 --> 01:28:49,990

all right so we're through the first the

2180

01:28:53,590 --> 01:28:51,280

umbilical check now they're going to

2181

01:28:54,790 --> 01:28:53,600

check through ground stations spacex

2182

01:28:57,750 --> 01:28:54,800

operates

2183

01:28:58,950 --> 01:28:57,760

a suite of ground stations across the

2184

01:29:01,350 --> 01:28:58,960

planet

2185

01:29:03,110 --> 01:29:01,360

to get

2186

01:29:05,830 --> 01:29:03,120

data telemetry and voice to and from

2187

01:29:07,830 --> 01:29:05,840

dragon is an additional path and a

2188

01:29:10,229 --> 01:29:07,840

along with the the primary one those

2189

01:29:16,070 --> 01:29:10,239

tdrs tracking and data relay satellites

2190

01:29:16,080 --> 01:29:19,270

spacex freedom

2191

01:29:23,270 --> 01:29:21,189

core loud and clear ground station come

2192

01:29:26,390 --> 01:29:23,280

check is complete standby for tdrs

2193

01:29:26,400 --> 01:29:58,790

standby

2194

01:29:58,800 --> 01:30:11,830

freedom spacex contract

2195

01:30:15,510 --> 01:30:13,669

check is complete standby for com checks

2196

01:30:18,550 --> 01:30:15,520

with md and ld in the launch

2197

01:30:18,560 --> 01:30:29,590

dragon

2198

01:30:38,229 --> 01:30:31,910

md loud and clear stand by for comp

2199

01:30:38,239 --> 01:30:43,990

freedom md on dragon to ground contract

2200

01:30:47,510 --> 01:30:46,149

md freedom has the latter player over

2201
01:30:48,709 --> 01:30:47,520
dragging the ground to degrees of bliss

2202
01:30:51,110 --> 01:30:48,719
this morning anna

2203
01:30:54,950 --> 01:30:51,120
good to hear yours as well and be loud

2204
01:31:00,229 --> 01:30:54,960
and clear stand by for contracts with ld

2205
01:31:05,270 --> 01:31:01,910
well the freedom has you loud and clear

2206
01:31:12,070 --> 01:31:07,110
ld loud and clear stand by for comp

2207
01:31:21,590 --> 01:31:13,990
freedom ld on dragon the ground comp

2208
01:31:21,600 --> 01:31:30,149
clear

2209
01:31:33,830 --> 01:31:32,550
spacex with that shell launch

2210
01:31:35,590 --> 01:31:33,840
configuration com checks are now

2211
01:31:37,750 --> 01:31:35,600
complete please report when ready for

2212
01:31:57,350 --> 01:31:37,760
seat rotation for section two of four

2213
01:32:02,790 --> 01:31:59,189

spacex freedom we are ready for seat

2214

01:32:02,800 --> 01:32:11,189

that tell we'll report when initiating

2215

01:32:14,709 --> 01:32:12,950

so we're just hearing that the comms

2216

01:32:16,149 --> 01:32:14,719

checks have been completed successfully

2217

01:32:18,470 --> 01:32:16,159

and we're about to get into seat

2218

01:32:20,470 --> 01:32:18,480

rotation here in a couple of minutes uh

2219

01:32:23,270 --> 01:32:20,480

really no issues in work as the

2220

01:32:25,830 --> 01:32:23,280

countdown continues smoothly we heard

2221

01:32:27,430 --> 01:32:25,840

updates from the team that things are on

2222

01:32:28,470 --> 01:32:27,440

schedule several times which is always a

2223

01:32:30,950 --> 01:32:28,480

good thing

2224

01:32:32,870 --> 01:32:30,960

for liftoff

2225

01:32:34,390 --> 01:32:32,880

the dragon launch ops team has completed

2226

01:32:36,870 --> 01:32:34,400

their major activities to prepare the

2227

01:32:38,629 --> 01:32:36,880

spacecraft for the astronauts

2228

01:32:40,870 --> 01:32:38,639

the falcon 9 team

2229

01:32:42,390 --> 01:32:40,880

is also located in fire initiating a

2230

01:32:44,870 --> 01:32:42,400

rotation

2231

01:32:46,629 --> 01:32:44,880

four in the launch control center at

2232

01:32:48,790 --> 01:32:46,639

kennedy space center

2233

01:32:50,950 --> 01:32:48,800

and you just heard the call out that we

2234

01:32:52,709 --> 01:32:50,960

are beginning seat rotation and if we

2235

01:32:54,310 --> 01:32:52,719

get this if we keep this camera view you

2236

01:32:55,430 --> 01:32:54,320

should see the astronauts start to tilt

2237

01:32:56,149 --> 01:32:55,440

back

2238

01:33:01,270 --> 01:32:56,159

and

2239

01:33:05,910 --> 01:33:03,669

some waves to the suit technicians as

2240

01:33:07,430 --> 01:33:05,920

they continue to rotate up

2241

01:33:08,390 --> 01:33:07,440

now this does a couple of things this

2242

01:33:11,030 --> 01:33:08,400

gets them

2243

01:33:13,030 --> 01:33:11,040

uh first and foremost uh ready uh for

2244

01:33:14,950 --> 01:33:13,040

when we do ignite the merlin engines on

2245

01:33:16,950 --> 01:33:14,960

the first stage for ascent but it also

2246

01:33:20,070 --> 01:33:16,960

gives the pilot and the commander

2247

01:33:21,830 --> 01:33:20,080

access and better visibility to the um

2248

01:33:39,830 --> 01:33:21,840

the lcd screens that you see in front of

2249

01:33:44,070 --> 01:33:41,830

after this after the seat rotations we

2250

01:33:45,910 --> 01:33:44,080

should be going into another round of

2251

01:33:47,510 --> 01:33:45,920

suit leak checks

2252

01:33:49,030 --> 01:33:47,520

and really that is

2253

01:33:57,350 --> 01:33:49,040

one of the last operations before we

2254

01:34:08,229 --> 01:33:59,270

freedom spacex seats are in the launch

2255

01:34:12,550 --> 01:34:10,070

there was a confirmation that we did

2256

01:34:14,550 --> 01:34:12,560

successfully rotate the seats um just a

2257

01:34:15,990 --> 01:34:14,560

quick update on range and weather both

2258

01:34:17,510 --> 01:34:16,000

are really looking good

2259

01:34:19,189 --> 01:34:17,520

we look at whether not only at the

2260

01:34:21,510 --> 01:34:19,199

launch site but around the world we need

2261

01:34:23,350 --> 01:34:21,520

to make sure conditions are acceptable

2262

01:34:25,590 --> 01:34:23,360

if dragon has to splash down in the

2263

01:34:27,270 --> 01:34:25,600

atlantic in case of an escape we're also

2264

01:34:29,030 --> 01:34:27,280

monitoring contingency splashdown

2265

01:34:33,510 --> 01:34:29,040

locations if the crew had to come back

2266

01:34:33,520 --> 01:34:38,390

preparation

2267

01:35:08,629 --> 01:34:40,910

okay we copy rear go and port decimal

2268

01:35:33,270 --> 01:35:15,109

so

2269

01:35:35,510 --> 01:35:33,280

are at t minus two hours and 18 minutes

2270

01:35:37,030 --> 01:35:35,520

until liftoff but as this continues to

2271

01:35:38,390 --> 01:35:37,040

count down we're gonna check in with

2272

01:35:47,430 --> 01:35:38,400

chelsea at

2273

01:35:50,149 --> 01:35:48,709

hey thanks and welcome to the

2274

01:35:51,669 --> 01:35:50,159

international space station's flight

2275

01:35:53,590 --> 01:35:51,679

control room here in mission control

2276

01:35:55,189 --> 01:35:53,600

houston a team of flight controllers

2277

01:35:57,910 --> 01:35:55,199

behind me is actively monitoring the

2278

01:35:59,750 --> 01:35:57,920

space station as we speak

2279

01:36:01,750 --> 01:35:59,760

the crew in orbit has completed a number

2280

01:36:02,550 --> 01:36:01,760

of tasks to prepare the station for crew

2281

01:36:04,229 --> 01:36:02,560

4

2282

01:36:06,790 --> 01:36:04,239

like setting up tools to monitor

2283

01:36:08,950 --> 01:36:06,800

dragon's arrival and preparing the leap

2284

01:36:11,350 --> 01:36:08,960

stations for crew 4 many of their

2285

01:36:14,390 --> 01:36:11,360

clothes and other belongings launched on

2286

01:36:16,470 --> 01:36:14,400

previous cargo resupply launches and are

2287

01:36:18,550 --> 01:36:16,480

at the station now but back here in

2288

01:36:19,910 --> 01:36:18,560

houston flight director anthony varya

2289

01:36:21,990 --> 01:36:19,920

and his team are in constant

2290

01:36:23,750 --> 01:36:22,000

communication with the spacex mission

2291

01:36:25,990 --> 01:36:23,760

director for crew 4's launch to the

2292

01:36:27,830 --> 01:36:26,000

international space station

2293

01:36:29,430 --> 01:36:27,840

once we get to integrated operations the

2294

01:36:32,149 --> 01:36:29,440

nasa flight director will be conducted

2295

01:36:33,669 --> 01:36:32,159

conducting a series of go no-go polls at

2296

01:36:35,750 --> 01:36:33,679

the predetermined checkpoints for

2297

01:36:37,270 --> 01:36:35,760

dragon's approach but for now we'll

2298

01:36:39,030 --> 01:36:37,280

continue following along from right here

2299

01:36:40,550 --> 01:36:39,040

in mission control houston so i'll send

2300

01:36:42,070 --> 01:36:40,560

it back down to the team in kennedy over

2301

01:36:43,990 --> 01:36:42,080

to you daryl all right thank you very

2302

01:36:46,790 --> 01:36:44,000

much chelsea and if you're just joining

2303

01:36:49,109 --> 01:36:46,800

us it is t-minus two hours and seventeen

2304

01:36:50,870 --> 01:36:49,119

minutes and counting until spacex is

2305

01:36:53,910 --> 01:36:50,880

fourth i can now give you a go for

2306

01:36:59,430 --> 01:36:55,990

check beginning as we get the call-out

2307

01:37:01,109 --> 01:36:59,440

audio from here go for section 4.

2308

01:37:03,590 --> 01:37:01,119

those are the astronauts

2309

01:37:05,109 --> 01:37:03,600

the crew 4 astronauts communicating with

2310

01:37:07,189 --> 01:37:05,119

the core there

2311

01:37:09,030 --> 01:37:07,199

we are ready for another beautiful crew

2312

01:37:11,270 --> 01:37:09,040

launch got megan macarthur here the

2313

01:37:12,950 --> 01:37:11,280

pilot from crew 2 and a space shuttle

2314

01:37:14,229 --> 01:37:12,960

astronaut we're so grateful that you're

2315

01:37:15,990 --> 01:37:14,239

here sharing your insight and your

2316

01:37:17,510 --> 01:37:16,000

stories thanks it's really fun to be

2317

01:37:19,830 --> 01:37:17,520

here and watch them go through all of

2318

01:37:21,590 --> 01:37:19,840

these activities step by step and uh

2319

01:37:23,189 --> 01:37:21,600

excited to see uh

2320

01:37:24,790 --> 01:37:23,199

everything that comes up brings back

2321

01:37:26,790 --> 01:37:24,800

memories doesn't it it sure does yeah in

2322

01:37:28,709 --> 01:37:26,800

that seat yeah remember you were playing

2323

01:37:30,550 --> 01:37:28,719

a game we were playing a game yes there

2324

01:37:33,510 --> 01:37:30,560

is a fair amount of time where nothing

2325

01:37:34,790 --> 01:37:33,520

specific is happening and so of course

2326

01:37:37,030 --> 01:37:34,800

you want to you taking your job

2327

01:37:38,629 --> 01:37:37,040

seriously you you do review some things

2328

01:37:40,149 --> 01:37:38,639

uh that might happen and how you would

2329

01:37:42,149 --> 01:37:40,159

respond but you also just have some time

2330

01:37:43,750 --> 01:37:42,159

to kill so we did have some uh games

2331

01:37:45,189 --> 01:37:43,760

that tomorrow pesky was in charge of

2332

01:37:46,390 --> 01:37:45,199

keeping us entertained during that

2333

01:37:48,629 --> 01:37:46,400

downtime

2334

01:37:50,470 --> 01:37:48,639

tamar was great for that he was he was

2335

01:37:51,830 --> 01:37:50,480

like our cruise director right brought a

2336

01:37:54,390 --> 01:37:51,840

lot of levity

2337

01:37:57,590 --> 01:37:54,400

and as you look live inside the freedom

2338

01:37:59,109 --> 01:37:57,600

capsule there uh closest to us is chell

2339

01:38:02,229 --> 01:37:59,119

lingard

2340

01:38:05,189 --> 01:38:02,239

and right next to his right is bob hines

2341

01:38:07,510 --> 01:38:05,199

has his arms up on the display screen

2342

01:38:08,870 --> 01:38:07,520

the seats have been articulated up into

2343

01:38:10,550 --> 01:38:08,880

launch position

2344

01:38:12,310 --> 01:38:10,560

and it looks like they're on their back

2345

01:38:14,629 --> 01:38:12,320

from the orientation of the shot there

2346

01:38:16,070 --> 01:38:14,639

and is it that is that pretty accurate

2347

01:38:18,950 --> 01:38:16,080

that is accurate so when they first

2348

01:38:20,550 --> 01:38:18,960

climb in the seats are um in a lowered

2349

01:38:22,870 --> 01:38:20,560

position that just it's a little bit

2350

01:38:25,189 --> 01:38:22,880

easier to ingress but it is difficult

2351

01:38:26,709 --> 01:38:25,199

from that other position to see and

2352

01:38:28,470 --> 01:38:26,719

interact with the screens and so with

2353

01:38:29,910 --> 01:38:28,480

the seats raised like that they are

2354

01:38:31,189 --> 01:38:29,920

tilted a little bit more onto their

2355

01:38:33,350 --> 01:38:31,199

backs and they're raised so that they're

2356

01:38:35,109 --> 01:38:33,360

just able to look directly across at

2357

01:38:39,270 --> 01:38:35,119

those touch screens to monitor their

2358

01:38:43,750 --> 01:38:41,669

all right as we watch the astronauts go

2359

01:38:47,350 --> 01:38:43,760

through their final checks

2360

01:38:51,750 --> 01:38:49,270

let's take a minute to learn more about

2361

01:38:56,470 --> 01:38:51,760

what crew 4 astronauts will be doing

2362

01:38:56,480 --> 01:39:08,709

[Music]

2363

01:39:15,189 --> 01:39:11,430

crew 4 is the fourth crew rotation

2364

01:39:17,750 --> 01:39:15,199

flight for the spacex dragon vehicle

2365

01:39:19,510 --> 01:39:17,760

crew 4's goals are to

2366

01:39:21,750 --> 01:39:19,520

safely and successfully get to the

2367

01:39:23,830 --> 01:39:21,760

international space station and then to

2368

01:39:25,350 --> 01:39:23,840

spend the a lot of time living and

2369

01:39:27,590 --> 01:39:25,360

working in space

2370

01:39:29,990 --> 01:39:27,600

meeting all of the planned research and

2371

01:39:32,149 --> 01:39:30,000

science and maintenance goals of the

2372

01:39:34,229 --> 01:39:32,159

space station program we are all like

2373

01:39:37,189 --> 01:39:34,239

super excited about the opportunity to

2374

01:39:40,709 --> 01:39:37,199

fly on a crew dragon spacecraft that

2375

01:39:43,750 --> 01:39:40,719

vehicle is a super complex modern

2376

01:39:46,629 --> 01:39:43,760

vehicle that enables us to get to space

2377

01:39:49,590 --> 01:39:46,639

efficiently and safely

2378

01:39:51,990 --> 01:39:49,600

my role as pilot on the dragon vehicle

2379

01:39:54,550 --> 01:39:52,000

is primarily to monitor and maintain the

2380

01:39:55,910 --> 01:39:54,560

systems of the vehicle itself to get a

2381

01:39:58,629 --> 01:39:55,920

chance to pilot one of the newest

2382

01:40:00,149 --> 01:39:58,639

vehicles on or off the planet is a true

2383

01:40:03,270 --> 01:40:00,159

honor

2384

01:40:05,750 --> 01:40:03,280

getting selected for crew 4 was

2385

01:40:07,590 --> 01:40:05,760

was amazing because it's it's an

2386

01:40:09,669 --> 01:40:07,600

opportunity to go back to the

2387

01:40:13,270 --> 01:40:09,679

international space station and

2388

01:40:15,669 --> 01:40:13,280

experience again that transformation

2389

01:40:17,109 --> 01:40:15,679

from being an earth-bound creature to

2390

01:40:19,350 --> 01:40:17,119

being this

2391

01:40:20,950 --> 01:40:19,360

space-living creature

2392

01:40:23,510 --> 01:40:20,960

when you get to space station the yeah

2393

01:40:25,750 --> 01:40:23,520

the first thing that really strikes is

2394

01:40:27,910 --> 01:40:25,760

this feeling of weightlessness i'm so

2395

01:40:29,030 --> 01:40:27,920

excited to revisit the space station it

2396

01:40:31,590 --> 01:40:29,040

was home

2397

01:40:33,910 --> 01:40:31,600

for five months back in 2015.

2398

01:40:35,910 --> 01:40:33,920

you know we arrived on orbit and really

2399

01:40:38,550 --> 01:40:35,920

within a couple of days my brain

2400

01:40:40,550 --> 01:40:38,560

adjusted to the idea of floating not

2401

01:40:43,189 --> 01:40:40,560

that i was good at it but the novelty of

2402

01:40:45,590 --> 01:40:43,199

it i think that the fact that our brains

2403

01:40:47,030 --> 01:40:45,600

can adapt to something that is so novel

2404

01:40:49,030 --> 01:40:47,040

so different something that we're

2405

01:40:50,950 --> 01:40:49,040

completely unaccustomed to for all of

2406

01:40:53,750 --> 01:40:50,960

our lives and that it can just just

2407

01:40:56,149 --> 01:40:53,760

adapt like that is absolutely amazing

2408

01:40:59,590 --> 01:40:56,159

the international space station is a

2409

01:41:01,910 --> 01:40:59,600

national laboratory built to do science

2410

01:41:03,750 --> 01:41:01,920

the connecting element between all the

2411

01:41:05,669 --> 01:41:03,760

experiments that we do up there is the

2412

01:41:07,590 --> 01:41:05,679

space environment and specifically

2413

01:41:09,350 --> 01:41:07,600

weightlessness microgravity as the

2414

01:41:11,590 --> 01:41:09,360

scientists like to say

2415

01:41:13,510 --> 01:41:11,600

when you're dealing with complex systems

2416

01:41:15,750 --> 01:41:13,520

one way to learn how they work is to

2417

01:41:17,750 --> 01:41:15,760

start removing variables we're able to

2418

01:41:19,189 --> 01:41:17,760

do a lot of that down here on earth but

2419

01:41:21,030 --> 01:41:19,199

one of the things that we have a

2420

01:41:23,510 --> 01:41:21,040

challenge doing and we can't do is

2421

01:41:25,030 --> 01:41:23,520

remove the effects of gravity and so by

2422

01:41:26,870 --> 01:41:25,040

taking things to the international space

2423

01:41:29,590 --> 01:41:26,880

station we can remove that and we can

2424

01:41:31,430 --> 01:41:29,600

see how these complex systems work how

2425

01:41:33,350 --> 01:41:31,440

things grow how they develop we do so

2426

01:41:36,229 --> 01:41:33,360

much research up there that not only

2427

01:41:38,629 --> 01:41:36,239

helps technologies and development down

2428

01:41:40,550 --> 01:41:38,639

here on earth but it is also aiding

2429

01:41:41,830 --> 01:41:40,560

nasa's pivot back into deep space

2430

01:41:43,669 --> 01:41:41,840

exploration

2431

01:41:46,070 --> 01:41:43,679

the work that we do every day helps us

2432

01:41:48,310 --> 01:41:46,080

to better understand how the human body

2433

01:41:50,070 --> 01:41:48,320

changes in weightlessness and to

2434

01:41:52,310 --> 01:41:50,080

understand how to do the operations like

2435

01:41:53,830 --> 01:41:52,320

spacewalks and robotic arm activities

2436

01:41:56,550 --> 01:41:53,840

that are necessary

2437

01:41:58,470 --> 01:41:56,560

for us to be successful in lunar orbit

2438

01:42:01,350 --> 01:41:58,480

on the lunar surface and on our way to

2439

01:42:04,229 --> 01:42:01,360

mars we get this awesome opportunity to

2440

01:42:06,870 --> 01:42:04,239

be representatives of of humanity of all

2441

01:42:08,390 --> 01:42:06,880

of you and we don't take that lightly

2442

01:42:10,950 --> 01:42:08,400

we're super honored to have that

2443

01:42:13,980 --> 01:42:10,960

responsibility and are excited about

2444

01:42:22,149 --> 01:42:13,990

sharing the journey with with all of you

2445

01:42:23,990 --> 01:42:22,159

[Music]

2446

01:42:25,430 --> 01:42:24,000

there's so much work that the crew does

2447

01:42:26,950 --> 01:42:25,440

once they get up to the international

2448

01:42:29,270 --> 01:42:26,960

space station but at the moment as

2449

01:42:31,189 --> 01:42:29,280

you're looking live outside the dragon

2450

01:42:33,189 --> 01:42:31,199

capsule they're on the ground

2451

01:42:34,709 --> 01:42:33,199

how long make it does it take for the

2452

01:42:35,910 --> 01:42:34,719

astronauts once you get there they got

2453

01:42:37,830 --> 01:42:35,920

they got a launch they got to fly they

2454

01:42:39,590 --> 01:42:37,840

got a rendezvous and get into the space

2455

01:42:41,030 --> 01:42:39,600

station are you ready to go or does it

2456

01:42:43,030 --> 01:42:41,040

take some time before you can start

2457

01:42:44,950 --> 01:42:43,040

doing all that important research it it

2458

01:42:47,510 --> 01:42:44,960

takes some time for your body to adjust

2459

01:42:49,030 --> 01:42:47,520

but i think it helps that you're working

2460

01:42:51,109 --> 01:42:49,040

during that time while your body is

2461

01:42:52,629 --> 01:42:51,119

adjusting the space station is a super

2462

01:42:54,229 --> 01:42:52,639

unique environment

2463

01:42:56,070 --> 01:42:54,239

with the micro g conditions that we

2464

01:42:58,229 --> 01:42:56,080

can't duplicate here on earth for any

2465

01:42:59,750 --> 01:42:58,239

long duration of time and so not only

2466

01:43:01,030 --> 01:42:59,760

are you excited to get to work and start

2467

01:43:03,189 --> 01:43:01,040

doing these science projects but it

2468

01:43:04,629 --> 01:43:03,199

really i think helps you adapt to the

2469

01:43:07,430 --> 01:43:04,639

environment the sooner you start

2470

01:43:08,870 --> 01:43:07,440

learning to work in it

2471

01:43:11,430 --> 01:43:08,880

and then once you get rolling there's a

2472

01:43:12,550 --> 01:43:11,440

lot of exciting exciting science that is

2473

01:43:14,310 --> 01:43:12,560

happening for this mission we're going

2474

01:43:16,310 --> 01:43:14,320

to talk about that and we're going to

2475

01:43:18,790 --> 01:43:16,320

talk more in depth with megan about some

2476

01:43:21,030 --> 01:43:18,800

of the experiments that she worked on as

2477

01:43:22,390 --> 01:43:21,040

well as some that are in the future and

2478

01:43:24,550 --> 01:43:22,400

that's coming up a little bit later in

2479

01:43:25,750 --> 01:43:24,560

the show but we are currently t minus

2480

01:43:28,229 --> 01:43:25,760

two hours

2481

01:43:29,830 --> 01:43:28,239

ten minutes and counting so let's head

2482

01:43:32,070 --> 01:43:29,840

back out to spacex headquarters in

2483

01:43:37,189 --> 01:43:32,080

california where dan and jesse will be

2484

01:43:41,510 --> 01:43:38,709

great thanks daryl

2485

01:43:43,830 --> 01:43:41,520

now it took years of hard work to get to

2486

01:43:45,270 --> 01:43:43,840

where we are with flying crew the

2487

01:43:47,270 --> 01:43:45,280

development of crew dragon really

2488

01:43:48,870 --> 01:43:47,280

started with cargo dragon and dragon was

2489

01:43:51,109 --> 01:43:48,880

designed from the beginning for flying

2490

01:43:53,109 --> 01:43:51,119

humans to space even the first cargo

2491

01:43:54,470 --> 01:43:53,119

dragon had a window despite not having

2492

01:43:56,390 --> 01:43:54,480

humans on board

2493

01:43:58,310 --> 01:43:56,400

before we could fly humans our teams

2494

01:44:00,310 --> 01:43:58,320

implemented a number of design upgrades

2495

01:44:02,390 --> 01:44:00,320

to make sure that both dragon falcon 9

2496

01:44:04,149 --> 01:44:02,400

were suitable for flying people

2497

01:44:06,310 --> 01:44:04,159

we then put both vehicles through

2498

01:44:09,590 --> 01:44:06,320

thousands of tests prove their safety

2499

01:44:11,750 --> 01:44:09,600

now since demo 2 in may of 2020 spacex

2500

01:44:14,070 --> 01:44:11,760

has been regularly flying crude missions

2501

01:44:17,270 --> 01:44:14,080

for nasa at the cadence of about one

2502

01:44:19,430 --> 01:44:17,280

flight every six months crew four will

2503

01:44:21,830 --> 01:44:19,440

be spacex's fifth crude space flight for

2504

01:44:23,990 --> 01:44:21,840

nasa following the crude test flight

2505

01:44:26,390 --> 01:44:24,000

demo two and three previous operational

2506

01:44:29,109 --> 01:44:26,400

crude missions to the space station

2507

01:44:30,870 --> 01:44:29,119

now will also be spacex's seventh crude

2508

01:44:33,590 --> 01:44:30,880

space flight overall including

2509

01:44:35,350 --> 01:44:33,600

inspiration for the first all-civilian

2510

01:44:36,790 --> 01:44:35,360

mission to space

2511

01:44:38,709 --> 01:44:36,800

now inspiration four was really a

2512

01:44:41,109 --> 01:44:38,719

historic first and what's really

2513

01:44:43,430 --> 01:44:41,119

exciting is it certainly will not be the

2514

01:44:45,430 --> 01:44:43,440

last of its kind now in fact jared

2515

01:44:47,669 --> 01:44:45,440

isaacman commander of the inspiration

2516

01:44:50,070 --> 01:44:47,679

for mission will return to orbit with

2517

01:44:52,470 --> 01:44:50,080

spacex under the polaris program

2518

01:44:54,390 --> 01:44:52,480

which is a series of missions to advance

2519

01:44:56,470 --> 01:44:54,400

deep space exploration while raising

2520

01:44:57,910 --> 01:44:56,480

global awareness for st jude children's

2521

01:44:59,830 --> 01:44:57,920

research hospital

2522

01:45:01,590 --> 01:44:59,840

polaris will consist of up to three

2523

01:45:03,109 --> 01:45:01,600

human space flight missions that will

2524

01:45:06,709 --> 01:45:03,119

culminate in the first flight of

2525

01:45:09,109 --> 01:45:06,719

spacex's starship with humans on board

2526

01:45:11,030 --> 01:45:09,119

now the first mission polaris dawn is

2527

01:45:12,950 --> 01:45:11,040

targeted for no earlier than the fourth

2528

01:45:14,950 --> 01:45:12,960

quarter of this year and in addition to

2529

01:45:17,750 --> 01:45:14,960

mission commander jared isaacman will

2530

01:45:19,189 --> 01:45:17,760

include pilot scott kidd poteet who

2531

01:45:21,510 --> 01:45:19,199

served as the mission director of

2532

01:45:23,910 --> 01:45:21,520

inspiration for mission specialist sarah

2533

01:45:26,149 --> 01:45:23,920

gillis and mission specialist medic and

2534

01:45:28,229 --> 01:45:26,159

medical officer anna menon

2535

01:45:31,350 --> 01:45:28,239

during the polaris dawn mission jared

2536

01:45:32,550 --> 01:45:31,360

will perform the first ever commercial

2537

01:45:34,550 --> 01:45:32,560

spacewalk

2538

01:45:36,950 --> 01:45:34,560

the mission is also flying higher than

2539

01:45:39,270 --> 01:45:36,960

any dragon mission to date and the and

2540

01:45:42,629 --> 01:45:39,280

endeavoring to reach the highest earth

2541

01:45:44,390 --> 01:45:42,639

orbit ever flown and nasa's efforts

2542

01:45:45,910 --> 01:45:44,400

particularly with the commercial crew

2543

01:45:48,229 --> 01:45:45,920

program and the certification of

2544

01:45:50,629 --> 01:45:48,239

spacex's dragon are building a

2545

01:45:52,790 --> 01:45:50,639

foundation for a robust u.s led

2546

01:45:55,030 --> 01:45:52,800

commercial economy in low earth orbit

2547

01:45:56,629 --> 01:45:55,040

commercial transportation it's a big one

2548

01:45:59,109 --> 01:45:56,639

that transportation to space but that's

2549

01:46:01,350 --> 01:45:59,119

just one element of our larger plan for

2550

01:46:03,510 --> 01:46:01,360

commercialization we're enabling the

2551

01:46:05,669 --> 01:46:03,520

development of commercial space stations

2552

01:46:08,149 --> 01:46:05,679

private astronaut missions and then

2553

01:46:10,790 --> 01:46:08,159

demand for in-space manufacturing and

2554

01:46:13,030 --> 01:46:10,800

more we just wrapped up the mission with

2555

01:46:14,470 --> 01:46:13,040

axiom space that was a big part of this

2556

01:46:16,310 --> 01:46:14,480

effort and that was the first

2557

01:46:18,470 --> 01:46:16,320

all-private astronaut mission to the

2558

01:46:21,430 --> 01:46:18,480

international space station they lifted

2559

01:46:23,669 --> 01:46:21,440

off back in april 9th on a spacex falcon

2560

01:46:25,990 --> 01:46:23,679

9 rocket and spent

2561

01:46:28,470 --> 01:46:26,000

almost two weeks ended up just some bad

2562

01:46:31,189 --> 01:46:28,480

weather prevented them from coming home

2563

01:46:33,030 --> 01:46:31,199

but in that dragon endeavor for the ax1

2564

01:46:35,109 --> 01:46:33,040

mission there was the commander and the

2565

01:46:37,430 --> 01:46:35,119

former nasa astronaut michael lopez

2566

01:46:39,990 --> 01:46:37,440

alegria pilot larry connor and then

2567

01:46:42,149 --> 01:46:40,000

mission specialists uh

2568

01:46:44,310 --> 01:46:42,159

and mark pathy and again they spent a

2569

01:46:45,430 --> 01:46:44,320

little they spent more than 10 days in

2570

01:46:47,430 --> 01:46:45,440

orbit

2571

01:46:49,109 --> 01:46:47,440

including an extended stay on board the

2572

01:46:50,470 --> 01:46:49,119

international space station they just

2573

01:46:52,629 --> 01:46:50,480

returned

2574

01:46:54,149 --> 01:46:52,639

just this week but during that mission

2575

01:46:55,350 --> 01:46:54,159

they performed hundreds of hours of

2576

01:46:58,229 --> 01:46:55,360

research

2577

01:46:59,510 --> 01:46:58,239

more than 25 different experiments and

2578

01:47:01,590 --> 01:46:59,520

this is just helping to lay the

2579

01:47:03,750 --> 01:47:01,600

groundwork for a lot of the really

2580

01:47:05,669 --> 01:47:03,760

exciting stuff coming up including the

2581

01:47:07,830 --> 01:47:05,679

axiom station which is going to be a

2582

01:47:09,510 --> 01:47:07,840

commercial space station attached to the

2583

01:47:11,350 --> 01:47:09,520

international space station and is

2584

01:47:13,510 --> 01:47:11,360

currently under construction i mean low

2585

01:47:16,229 --> 01:47:13,520

earth orbit we know it's an incredible

2586

01:47:18,550 --> 01:47:16,239

space for scientific research technology

2587

01:47:19,830 --> 01:47:18,560

development astronaut training as we go

2588

01:47:21,510 --> 01:47:19,840

to the moon we're going to still need a

2589

01:47:23,669 --> 01:47:21,520

place to train our astronauts low earth

2590

01:47:25,189 --> 01:47:23,679

orbits the place to do it and its values

2591

01:47:27,669 --> 01:47:25,199

been proven through thousands of

2592

01:47:29,430 --> 01:47:27,679

experiments decades of international and

2593

01:47:30,709 --> 01:47:29,440

commercial cooperation onboard the

2594

01:47:33,270 --> 01:47:30,719

station so

2595

01:47:35,189 --> 01:47:33,280

just a lot more to come we're just at

2596

01:47:37,590 --> 01:47:35,199

the dawn of this commercialization of

2597

01:47:39,750 --> 01:47:37,600

low earth orbit um so just can't wait to

2598

01:47:41,990 --> 01:47:39,760

see even more but let's get back into

2599

01:47:43,990 --> 01:47:42,000

the ops we saw a good suit leak checks

2600

01:47:45,990 --> 01:47:44,000

we're getting ready for the hatch close

2601
01:47:47,109 --> 01:47:46,000
so let's send it back over to daryl at

2602
01:47:49,669 --> 01:47:47,119
ksc

2603
01:47:51,750 --> 01:47:49,679
along with megan darryl

2604
01:47:54,709 --> 01:47:51,760
all right thank you very much dan as we

2605
01:47:57,510 --> 01:47:54,719
await side hatch closure

2606
01:48:00,070 --> 01:47:57,520
you can see the teams working there

2607
01:48:01,750 --> 01:48:00,080
hatch still open

2608
01:48:03,990 --> 01:48:01,760
but they will be inspecting it very

2609
01:48:06,950 --> 01:48:04,000
closely you see the light in the hand of

2610
01:48:09,109 --> 01:48:06,960
one of the closeout team members

2611
01:48:10,629 --> 01:48:09,119
they'll be closely examining that seal

2612
01:48:12,629 --> 01:48:10,639
around the hatch

2613
01:48:14,709 --> 01:48:12,639

which is important

2614

01:48:16,070 --> 01:48:14,719

this is going to be protecting them from

2615

01:48:19,109 --> 01:48:16,080

the

2616

01:48:29,030 --> 01:48:19,119

dangerous environment of space

2617

01:48:35,189 --> 01:48:32,709

and as we uh wait for them to continue

2618

01:48:37,270 --> 01:48:35,199

their work

2619

01:48:39,270 --> 01:48:37,280

let's reintroduce you now to the crew

2620

01:48:40,470 --> 01:48:39,280

dragon commander his name is joe

2621

01:48:45,590 --> 01:48:40,480

lindgren

2622

01:48:49,510 --> 01:48:47,270

my name is chell lundgren and i'm the

2623

01:48:50,950 --> 01:48:49,520

commander for nasa's spacex crew 4

2624

01:48:51,910 --> 01:48:50,960

mission to the international space

2625

01:48:53,510 --> 01:48:51,920

station

2626

01:48:55,030 --> 01:48:53,520

i've wanted to be an astronaut for as

2627

01:48:57,590 --> 01:48:55,040

long as i can remember

2628

01:49:00,390 --> 01:48:57,600

i think i was inspired by the very first

2629

01:49:02,709 --> 01:49:00,400

space shuttle launch in april of 1981

2630

01:49:04,310 --> 01:49:02,719

and that i think is really when this

2631

01:49:06,229 --> 01:49:04,320

dream was just burned into my

2632

01:49:09,109 --> 01:49:06,239

consciousness

2633

01:49:11,590 --> 01:49:09,119

it was an absolute honor to get selected

2634

01:49:14,229 --> 01:49:11,600

for the crew for mission and on top of

2635

01:49:16,390 --> 01:49:14,239

that to have the opportunity to command

2636

01:49:17,189 --> 01:49:16,400

getting to fly with this amazing crew

2637

01:49:20,310 --> 01:49:17,199

with

2638

01:49:22,709 --> 01:49:20,320

farmer and samantha and wadi they are

2639

01:49:25,669 --> 01:49:22,719

incredible astronauts and i feel

2640

01:49:28,149 --> 01:49:25,679

very grateful to be on a team with them

2641

01:49:32,550 --> 01:49:28,159

but we're one small part of a larger

2642

01:49:34,629 --> 01:49:32,560

team that spans the nation and the world

2643

01:49:37,030 --> 01:49:34,639

we truly get to leverage the best and

2644

01:49:39,750 --> 01:49:37,040

brightest as we chase somewhat

2645

01:49:47,430 --> 01:49:39,760

impossible goals

2646

01:49:47,440 --> 01:49:51,589

there you see the closeout team

2647

01:49:56,550 --> 01:49:53,109

going through their last procedures

2648

01:49:58,550 --> 01:49:56,560

there to shut the side hatch

2649

01:50:01,270 --> 01:49:58,560

seated next to chad lindgren is crew

2650

01:50:04,950 --> 01:50:01,280

dragon pilot and nasa astronaut bob

2651

01:50:10,310 --> 01:50:07,430

i truly believe that we all have in us

2652

01:50:12,390 --> 01:50:10,320

an innate desire to go explore and see

2653

01:50:13,990 --> 01:50:12,400

new things we have a very unique

2654

01:50:15,830 --> 01:50:14,000

position in our solar system and our

2655

01:50:18,310 --> 01:50:15,840

galaxy to be able to look out there and

2656

01:50:20,390 --> 01:50:18,320

to step out and continue to explore

2657

01:50:22,629 --> 01:50:20,400

my name is bob hines i'm the pilot for

2658

01:50:25,109 --> 01:50:22,639

nasa's spacex crew 4 mission to the

2659

01:50:26,709 --> 01:50:25,119

international space station

2660

01:50:29,030 --> 01:50:26,719

when i was a kid i

2661

01:50:30,550 --> 01:50:29,040

100 wanted to be a pilot being able to

2662

01:50:32,550 --> 01:50:30,560

fly and see the earth from a new

2663

01:50:34,550 --> 01:50:32,560

perspective has really been just a real

2664

01:50:36,790 --> 01:50:34,560

driver for me and getting hired as an

2665

01:50:38,550 --> 01:50:36,800

astronaut has been the ultimate call

2666

01:50:41,030 --> 01:50:38,560

when i got the phone call offering me

2667

01:50:42,870 --> 01:50:41,040

the position of the pilot on the crew 4

2668

01:50:44,550 --> 01:50:42,880

mission i just couldn't believe it i

2669

01:50:46,310 --> 01:50:44,560

can't wait to pilot this vehicle it is

2670

01:50:48,229 --> 01:50:46,320

an incredible honor and something that i

2671

01:50:49,910 --> 01:50:48,239

never in my wildest dreams thought would

2672

01:50:52,310 --> 01:50:49,920

be a possibility

2673

01:50:53,830 --> 01:50:52,320

on launch day i am 100 most looking

2674

01:50:55,430 --> 01:50:53,840

forward to the kick in the pants when

2675

01:50:56,560 --> 01:50:55,440

those rocket motors light and we are

2676
01:51:03,750 --> 01:50:56,570
heading off the launch pad

2677
01:51:05,030 --> 01:51:03,760
[Music]

2678
01:51:07,990 --> 01:51:05,040
and he's going to get that kick in the

2679
01:51:10,629 --> 01:51:08,000
pants right megan that's right

2680
01:51:13,430 --> 01:51:10,639
in seat number one today is mission

2681
01:51:15,910 --> 01:51:13,440
specialist and nasa astronaut jessica

2682
01:51:19,750 --> 01:51:15,920
watkins who will be making her first

2683
01:51:24,070 --> 01:51:21,669
my name is jessica watkins and i'm a

2684
01:51:25,830 --> 01:51:24,080
mission specialist for nasa's spacex

2685
01:51:28,790 --> 01:51:25,840
crew 4 mission to the international

2686
01:51:32,870 --> 01:51:30,629
the opportunity to be the first black

2687
01:51:35,350 --> 01:51:32,880
woman on an international space station

2688
01:51:37,589 --> 01:51:35,360

long duration crew is exciting it

2689

01:51:40,310 --> 01:51:37,599

certainly is important to me and

2690

01:51:42,870 --> 01:51:40,320

impactful to me to be able to

2691

01:51:45,910 --> 01:51:42,880

be a part of the legacy that

2692

01:51:48,070 --> 01:51:45,920

so many before me have paved the way to

2693

01:51:50,870 --> 01:51:48,080

enable me to be here now as much as i

2694

01:51:54,070 --> 01:51:50,880

can be a small part of that legacy i'm

2695

01:51:56,310 --> 01:51:54,080

honored to have the opportunity

2696

01:51:59,510 --> 01:51:56,320

being selected to be a part of this crew

2697

01:52:01,430 --> 01:51:59,520

4 mission is truly an honor we get this

2698

01:52:04,790 --> 01:52:01,440

awesome opportunity to be

2699

01:52:06,709 --> 01:52:04,800

representatives of humanity and we don't

2700

01:52:09,030 --> 01:52:06,719

take that lightly we're super honored to

2701
01:52:10,870 --> 01:52:09,040
have that responsibility and are excited

2702
01:52:14,370 --> 01:52:10,880
about sharing the journey with all of

2703
01:52:23,270 --> 01:52:20,870
[Music]

2704
01:52:26,629 --> 01:52:23,280
and last but not least in seat number

2705
01:52:29,270 --> 01:52:26,639
four is cruz uh for mission specialist

2706
01:52:33,510 --> 01:52:29,280
and european space agency astronaut

2707
01:52:38,709 --> 01:52:36,470
i got the call to become an astronaut

2708
01:52:40,310 --> 01:52:38,719
one evening i had this feeling that the

2709
01:52:43,189 --> 01:52:40,320
whole universe just

2710
01:52:45,189 --> 01:52:43,199
stopped turning around and smiled at me

2711
01:52:48,070 --> 01:52:45,199
my name is samantha christopher and i'm

2712
01:52:49,750 --> 01:52:48,080
a mission specialist on the nasa spacex

2713
01:52:51,270 --> 01:52:49,760

crew 4 mission to the international

2714

01:52:53,189 --> 01:52:51,280

space station

2715

01:52:55,109 --> 01:52:53,199

i started dreaming about becoming an

2716

01:52:57,750 --> 01:52:55,119

astronaut pretty early on i was still in

2717

01:53:00,070 --> 01:52:57,760

elementary school and the astronaut job

2718

01:53:02,550 --> 01:53:00,080

is really very much about this broad

2719

01:53:05,109 --> 01:53:02,560

spectrum of things that you have to

2720

01:53:07,669 --> 01:53:05,119

master rather than being a specialist

2721

01:53:10,229 --> 01:53:07,679

that has mastered one thing

2722

01:53:12,229 --> 01:53:10,239

in 2014 i had the opportunity of flying

2723

01:53:13,990 --> 01:53:12,239

to space for the first time and i spent

2724

01:53:16,790 --> 01:53:14,000

200 days on the international space

2725

01:53:19,109 --> 01:53:16,800

station getting selected for crew 4 was

2726
01:53:22,790 --> 01:53:19,119
amazing because it's an opportunity to

2727
01:53:25,589 --> 01:53:22,800
experience a game being part of that

2728
01:53:27,840 --> 01:53:25,599
very very special life up there in this

2729
01:53:33,589 --> 01:53:27,850
outpost of humanity and space

2730
01:53:38,070 --> 01:53:33,599
[Music]

2731
01:53:41,030 --> 01:53:38,080
and those are astronauts from crew 4

2732
01:53:42,870 --> 01:53:41,040
a lot of fours in this mission megan

2733
01:53:44,390 --> 01:53:42,880
it is of course crew 4 the fourth

2734
01:53:46,870 --> 01:53:44,400
operational flight

2735
01:53:49,750 --> 01:53:46,880
it's the fourth flight of a reflown

2736
01:53:53,430 --> 01:53:49,760
booster okay we're taking off in the

2737
01:53:55,830 --> 01:53:53,440
fourth month of 2022.

2738
01:53:57,669 --> 01:53:55,840

lots of force lots of force four very

2739

01:53:59,589 --> 01:53:57,679

special people getting ready to launch

2740

01:54:01,510 --> 01:53:59,599

tonight indeed

2741

01:54:03,109 --> 01:54:01,520

and this is a great crew they you can

2742

01:54:04,870 --> 01:54:03,119

tell that they've bonded over the time

2743

01:54:07,430 --> 01:54:04,880

that they've been together absolutely

2744

01:54:09,669 --> 01:54:07,440

the time that you spend in

2745

01:54:11,430 --> 01:54:09,679

even though it's shortened in some cases

2746

01:54:13,830 --> 01:54:11,440

is really special um you know that

2747

01:54:15,510 --> 01:54:13,840

you're doing something unique um and

2748

01:54:17,030 --> 01:54:15,520

difficult and you know you're gonna

2749

01:54:18,950 --> 01:54:17,040

really be in a lot of situations where

2750

01:54:20,390 --> 01:54:18,960

you rely on one another and so forming

2751
01:54:21,750 --> 01:54:20,400
those friendships and those bonds are

2752
01:54:23,189 --> 01:54:21,760
really gonna serve them well over the

2753
01:54:26,070 --> 01:54:23,199
next six months

2754
01:54:28,310 --> 01:54:26,080
providing us the insights and the

2755
01:54:30,629 --> 01:54:28,320
explanations throughout this launch

2756
01:54:33,030 --> 01:54:30,639
broadcast megan macarthur on hand here

2757
01:54:34,870 --> 01:54:33,040
shuttle astronaut crew 2 pilot

2758
01:54:36,470 --> 01:54:34,880
on the dragon

2759
01:54:37,589 --> 01:54:36,480
we want to remind you you can ask her a

2760
01:54:39,830 --> 01:54:37,599
question right there at the bottom of

2761
01:54:44,229 --> 01:54:39,840
your screen you can see how just put the

2762
01:54:46,870 --> 01:54:44,239
hashtag ask nasa into twitter

2763
01:54:50,070 --> 01:54:46,880

and send us a tweet and once we uh see

2764

01:54:51,669 --> 01:54:50,080

it we'll uh go through them and pass

2765

01:54:53,669 --> 01:54:51,679

them along to her she's been answering

2766

01:54:55,910 --> 01:54:53,679

them all evening and keep those

2767

01:54:58,149 --> 01:54:55,920

questions coming in the meantime let's

2768

01:55:03,510 --> 01:54:58,159

get over to andy at spacex headquarters

2769

01:55:08,070 --> 01:55:06,149

thanks daryl we are just under t minus

2770

01:55:09,990 --> 01:55:08,080

two hours until liftoff and the

2771

01:55:12,390 --> 01:55:10,000

countdown is proceeding nominally at

2772

01:55:14,310 --> 01:55:12,400

this point onboard the brand new dragon

2773

01:55:16,070 --> 01:55:14,320

spacecraft freedom we heard the

2774

01:55:18,550 --> 01:55:16,080

communication checks between the dragon

2775

01:55:20,709 --> 01:55:18,560

team and the crew and those went well

2776

01:55:22,390 --> 01:55:20,719

the astronaut seats were also rotated in

2777

01:55:24,550 --> 01:55:22,400

flight position and right now the

2778

01:55:26,470 --> 01:55:24,560

closeout leads will verify the cabin

2779

01:55:28,310 --> 01:55:26,480

environments and then begin procedures

2780

01:55:29,589 --> 01:55:28,320

to close side hatch of the dragon

2781

01:55:31,669 --> 01:55:29,599

spacecraft

2782

01:55:33,350 --> 01:55:31,679

afterwards the spacex support team will

2783

01:55:35,589 --> 01:55:33,360

perform the final league check on the

2784

01:55:37,830 --> 01:55:35,599

hatch and once that is finished the team

2785

01:55:39,910 --> 01:55:37,840

will begin steps to ready the access arm

2786

01:55:42,390 --> 01:55:39,920

to retract then the closeout team will

2787

01:55:45,270 --> 01:55:42,400

leave the pad at t-minus one hour

2788

01:55:47,189 --> 01:55:45,280

leaving just the astronauts on the pad

2789

01:55:50,310 --> 01:55:47,199

as for the falcon 9 team

2790

01:55:51,990 --> 01:55:50,320

they are on console in firing room 4.

2791

01:55:54,390 --> 01:55:52,000

they are preparing the communication

2792

01:55:56,310 --> 01:55:54,400

checks with the astronauts that is due

2793

01:55:58,390 --> 01:55:56,320

in just a few minutes here

2794

01:56:00,950 --> 01:55:58,400

spacex engineers have pressurized the

2795

01:56:03,589 --> 01:56:00,960

launch vehicle gas storage bottles these

2796

01:56:05,350 --> 01:56:03,599

are composite overwrap pressure vessels

2797

01:56:07,910 --> 01:56:05,360

they contain gases used to fill the

2798

01:56:09,910 --> 01:56:07,920

tanks with hot helium as propellant is

2799

01:56:12,470 --> 01:56:09,920

drained out of the first and second

2800

01:56:14,709 --> 01:56:12,480

stages during ascent once we top them

2801
01:56:17,030 --> 01:56:14,719
off we'll top them off in the last half

2802
01:56:19,510 --> 01:56:17,040
hour or so before liftoff

2803
01:56:21,589 --> 01:56:19,520
we also use pressurized gases to spin

2804
01:56:23,430 --> 01:56:21,599
the merlin engine turbo pumps when we

2805
01:56:25,589 --> 01:56:23,440
start an engine in space

2806
01:56:27,910 --> 01:56:25,599
the second stage mvac engine starts up

2807
01:56:29,910 --> 01:56:27,920
after the first stage separates and the

2808
01:56:31,830 --> 01:56:29,920
first stage engines need to be restarted

2809
01:56:33,830 --> 01:56:31,840
for its landing sequences

2810
01:56:36,070 --> 01:56:33,840
the gases are also used for attitude

2811
01:56:38,149 --> 01:56:36,080
control systems which helps with vehicle

2812
01:56:40,830 --> 01:56:38,159
orientation and for deploying the grid

2813
01:56:43,430 --> 01:56:40,840

fins grid fins and landing

2814

01:56:45,510 --> 01:56:43,440

lights we continue to monitor weather at

2815

01:56:48,709 --> 01:56:45,520

launch sites and around the world at

2816

01:56:51,510 --> 01:56:48,719

contingency abort and landing zones

2817

01:56:54,709 --> 01:56:51,520

but right now everything is green

2818

01:56:57,109 --> 01:56:54,719

so with that we are at t minus one hour

2819

01:56:58,310 --> 01:56:57,119

57 minutes and counting

2820

01:56:59,669 --> 01:56:58,320

everything's looking good here so i'll

2821

01:57:01,350 --> 01:56:59,679

send it back to you

2822

01:57:03,270 --> 01:57:01,360

daryl and megan

2823

01:57:05,030 --> 01:57:03,280

all right andy and thank you back here

2824

01:57:07,430 --> 01:57:05,040

at the kennedy space center the weather

2825

01:57:10,390 --> 01:57:07,440

is fantastic we've got a

2826
01:57:13,270 --> 01:57:10,400
a cool evening and calm conditions which

2827
01:57:15,910 --> 01:57:13,280
is perfect for launch

2828
01:57:19,430 --> 01:57:15,920
as we look at the closeout team

2829
01:57:22,229 --> 01:57:19,440
finishing their job on their pads

2830
01:57:26,149 --> 01:57:22,239
they've got a list of

2831
01:57:28,149 --> 01:57:26,159
milestones and checks to complete

2832
01:57:30,550 --> 01:57:28,159
and as we wait for them to close that

2833
01:57:31,750 --> 01:57:30,560
side hatch with the four crew astronauts

2834
01:57:33,270 --> 01:57:31,760
inside

2835
01:57:35,030 --> 01:57:33,280
let's take a little moment to take some

2836
01:57:36,390 --> 01:57:35,040
more questions from social media there

2837
01:57:38,870 --> 01:57:36,400
you see

2838
01:57:40,709 --> 01:57:38,880

a question up on your screen

2839

01:57:43,030 --> 01:57:40,719

the question is megan how would you

2840

01:57:46,629 --> 01:57:43,040

describe the first moments after

2841

01:57:49,510 --> 01:57:46,639

arriving to the space station

2842

01:57:51,430 --> 01:57:49,520

well it's such a magical moment in fact

2843

01:57:53,350 --> 01:57:51,440

once the hatches are opened and you

2844

01:57:54,790 --> 01:57:53,360

finally get to come through for me

2845

01:57:56,709 --> 01:57:54,800

having

2846

01:57:58,229 --> 01:57:56,719

worked you know around the space station

2847

01:57:59,830 --> 01:57:58,239

program for so many years but never

2848

01:58:01,430 --> 01:57:59,840

actually seen it it was really really

2849

01:58:02,870 --> 01:58:01,440

special to come through and finally see

2850

01:58:05,030 --> 01:58:02,880

the environment plus you have all of

2851
01:58:06,550 --> 01:58:05,040
these smiling faces people that are

2852
01:58:08,229 --> 01:58:06,560
excited to see you the folks that are

2853
01:58:10,149 --> 01:58:08,239
going to be coming home

2854
01:58:14,070 --> 01:58:10,159
it's really pretty overwhelming lots of

2855
01:58:15,910 --> 01:58:14,080
hugs lots of smiles um and it just you

2856
01:58:18,310 --> 01:58:15,920
know that you finally reached this goal

2857
01:58:19,910 --> 01:58:18,320
that you've worked so hard to attain

2858
01:58:22,229 --> 01:58:19,920
and you're seeing astronauts that you

2859
01:58:23,830 --> 01:58:22,239
used to train with that you know well

2860
01:58:25,750 --> 01:58:23,840
it's like coming over their house

2861
01:58:27,350 --> 01:58:25,760
absolutely yeah it's kind of like your

2862
01:58:28,790 --> 01:58:27,360
long-lost friends you know i think i

2863
01:58:30,709 --> 01:58:28,800

teared up a little bit when i saw my

2864

01:58:32,149 --> 01:58:30,719

friend shannon you know big hug and and

2865

01:58:33,910 --> 01:58:32,159

you kind of get you know you pass around

2866

01:58:35,669 --> 01:58:33,920

everybody hugs everybody and you're

2867

01:58:37,270 --> 01:58:35,679

still learning to move in that

2868

01:58:38,790 --> 01:58:37,280

environment too so you notice the people

2869

01:58:39,990 --> 01:58:38,800

who have just arrived because they go to

2870

01:58:41,510 --> 01:58:40,000

hug and then their whole body you know

2871

01:58:42,950 --> 01:58:41,520

sort of swings by

2872

01:58:44,950 --> 01:58:42,960

the person that's more stable and

2873

01:58:47,109 --> 01:58:44,960

stationary so it's it's a pretty fun

2874

01:58:49,669 --> 01:58:47,119

rodeo to uh to watch those first few

2875

01:58:50,870 --> 01:58:49,679

moments slinging people around on the

2876

01:58:52,790 --> 01:58:50,880

international space that's right there's

2877

01:58:54,870 --> 01:58:52,800

a lot of joy

2878

01:58:57,109 --> 01:58:54,880

that's great great question thank you

2879

01:58:59,189 --> 01:58:57,119

very much for that one and go for space

2880

01:59:02,149 --> 01:58:59,199

launch asks

2881

01:59:04,629 --> 01:59:02,159

how long will the crew for and crew 3

2882

01:59:06,149 --> 01:59:04,639

astronauts be on the space station

2883

01:59:07,830 --> 01:59:06,159

together

2884

01:59:09,750 --> 01:59:07,840

well that's a great question so this is

2885

01:59:11,510 --> 01:59:09,760

what we call a direct handover meaning

2886

01:59:13,990 --> 01:59:11,520

that the crew four astronauts will

2887

01:59:16,229 --> 01:59:14,000

arrive um and spend several days with

2888

01:59:17,350 --> 01:59:16,239

the crew three astronauts before we

2889

01:59:18,870 --> 01:59:17,360

check the weather and make sure it's

2890

01:59:20,629 --> 01:59:18,880

okay for the crew three astronauts to

2891

01:59:22,790 --> 01:59:20,639

come home so typically that's designed

2892

01:59:24,709 --> 01:59:22,800

to be about four or five days but it

2893

01:59:26,070 --> 01:59:24,719

will of course depend on the weather

2894

01:59:28,390 --> 01:59:26,080

conditions they're going to be looking

2895

01:59:30,629 --> 01:59:28,400

for good weather to bring home the crew

2896

01:59:32,870 --> 01:59:30,639

3 astronauts safely now you didn't get

2897

01:59:34,870 --> 01:59:32,880

to hand over with crew the crew that

2898

01:59:36,870 --> 01:59:34,880

followed three three no we did not but

2899

01:59:38,870 --> 01:59:36,880

there's a reason you you pass along a

2900

01:59:41,189 --> 01:59:38,880

lot of knowledge and experience

2901
01:59:43,510 --> 01:59:41,199
you know on to them handover is really

2902
01:59:45,430 --> 01:59:43,520
really important between crews you know

2903
01:59:47,189 --> 01:59:45,440
it's there's so much that you can learn

2904
01:59:48,709 --> 01:59:47,199
you know from the books if you will or

2905
01:59:49,910 --> 01:59:48,719
from the simulation but there's so much

2906
01:59:51,990 --> 01:59:49,920
more that you're going to learn in the

2907
01:59:53,990 --> 01:59:52,000
real environment and we have the luxury

2908
01:59:55,830 --> 01:59:54,000
of um mark vande of course was up there

2909
01:59:57,109 --> 01:59:55,840
he did an entire year in space he's a

2910
01:59:59,109 --> 01:59:57,119
superhero

2911
02:00:01,189 --> 01:59:59,119
and so we were able to leave to take

2912
02:00:02,950 --> 02:00:01,199
advantage of the good landing weather

2913
02:00:04,790 --> 02:00:02,960

knowing that he was going to be there to

2914

02:00:07,030 --> 02:00:04,800

show everybody the ropes that was

2915

02:00:09,430 --> 02:00:07,040

arriving on uh crew 3 of course we would

2916

02:00:11,350 --> 02:00:09,440

have loved to be there to enjoy their

2917

02:00:11,970 --> 02:00:11,360

company for a few days but it does get

2918

02:00:14,790 --> 02:00:11,980

pretty crowded

2919

02:00:16,790 --> 02:00:14,800

[Laughter]

2920

02:00:17,589 --> 02:00:16,800

especially at the line to the bathroom

2921

02:00:19,430 --> 02:00:17,599

yes

2922

02:00:21,510 --> 02:00:19,440

that's a long line

2923

02:00:23,830 --> 02:00:21,520

even in space how about we take another

2924

02:00:26,950 --> 02:00:23,840

question that was a great one

2925

02:00:28,870 --> 02:00:26,960

florida hurricane asks

2926

02:00:31,109 --> 02:00:28,880

does the crew participate in any

2927

02:00:32,870 --> 02:00:31,119

pre-launch traditions

2928

02:00:35,510 --> 02:00:32,880

that's a great question so individual

2929

02:00:37,270 --> 02:00:35,520

crews might have their own specific

2930

02:00:40,070 --> 02:00:37,280

pre-launch traditions

2931

02:00:41,510 --> 02:00:40,080

um and so spending time at the beach

2932

02:00:43,109 --> 02:00:41,520

house here at kennedy space center with

2933

02:00:45,189 --> 02:00:43,119

your loved ones is a big part of that

2934

02:00:47,030 --> 02:00:45,199

tradition for my family we were able to

2935

02:00:48,629 --> 02:00:47,040

go boogie boarding we had some nice

2936

02:00:50,790 --> 02:00:48,639

weather spend some time at the beach

2937

02:00:52,790 --> 02:00:50,800

that was a really great tradition other

2938

02:00:54,870 --> 02:00:52,800

traditions that are more common have to

2939

02:00:56,629 --> 02:00:54,880

do with things we touched on earlier

2940

02:00:59,030 --> 02:00:56,639

putting putting your zap or putting your

2941

02:01:00,390 --> 02:00:59,040

crew sticker in certain places signing

2942

02:01:01,910 --> 02:01:00,400

those things and they'll do that on

2943

02:01:03,270 --> 02:01:01,920

board the international space station as

2944

02:01:04,870 --> 02:01:03,280

well whenever there's a new vehicle

2945

02:01:06,470 --> 02:01:04,880

coming or going we like to put our

2946

02:01:08,390 --> 02:01:06,480

stickers on everything and so those are

2947

02:01:10,550 --> 02:01:08,400

some other traditions that are ongoing

2948

02:01:12,629 --> 02:01:10,560

and special for this crew they actually

2949

02:01:14,229 --> 02:01:12,639

got to go out and see the sls rocket

2950

02:01:16,550 --> 02:01:14,239

which was on the pad

2951
02:01:18,550 --> 02:01:16,560
it just recently went back into the vab

2952
02:01:20,470 --> 02:01:18,560
so we haven't seen it tonight but that

2953
02:01:23,030 --> 02:01:20,480
was a special opportunity

2954
02:01:24,870 --> 02:01:23,040
for them uh which you know not a lot of

2955
02:01:26,629 --> 02:01:24,880
crews yes not many crews will get to see

2956
02:01:28,149 --> 02:01:26,639
well eventually we'll get we'll get to

2957
02:01:29,669 --> 02:01:28,159
see more of that but that must have been

2958
02:01:31,830 --> 02:01:29,679
a special moment going to visit the mega

2959
02:01:33,510 --> 02:01:31,840
moon together and thinking hey this

2960
02:01:35,589 --> 02:01:33,520
could be a next ride for some of us so

2961
02:01:38,070 --> 02:01:35,599
that had to be pretty special absolutely

2962
02:01:40,229 --> 02:01:38,080
and they got inside the gate as well so

2963
02:01:41,910 --> 02:01:40,239

a great opportunity for them

2964

02:01:45,030 --> 02:01:41,920

well thank you for those social media

2965

02:01:47,589 --> 02:01:45,040

questions keep them coming

2966

02:01:49,589 --> 02:01:47,599

shuttle gravity asks

2967

02:01:51,830 --> 02:01:49,599

why have many of the spacex crude

2968

02:01:53,669 --> 02:01:51,840

missions launched at night that's funny

2969

02:01:55,589 --> 02:01:53,679

you and i were just just talking about

2970

02:01:57,750 --> 02:01:55,599

that um i'm not sure that we came up

2971

02:01:59,589 --> 02:01:57,760

with the answer uh certainly is the case

2972

02:02:01,669 --> 02:01:59,599

that launched while orbital mechanics

2973

02:02:02,550 --> 02:02:01,679

are complicated that was my answer yeah

2974

02:02:04,229 --> 02:02:02,560

um

2975

02:02:07,430 --> 02:02:04,239

i think you know we definitely came to

2976

02:02:09,109 --> 02:02:07,440

the agreement that it's a beautiful

2977

02:02:11,910 --> 02:02:09,119

adult well it's certainly orbital

2978

02:02:14,709 --> 02:02:11,920

mechanics where the space station is um

2979

02:02:17,350 --> 02:02:14,719

uh is is important and um i think also

2980

02:02:19,510 --> 02:02:17,360

probably weather might be in general the

2981

02:02:21,109 --> 02:02:19,520

winds might be calmer at night um by the

2982

02:02:21,910 --> 02:02:21,119

ocean but that's that's really just a

2983

02:02:23,030 --> 02:02:21,920

guess

2984

02:02:24,149 --> 02:02:23,040

it's not something that i've tracked

2985

02:02:26,229 --> 02:02:24,159

closely i don't know if you guys have

2986

02:02:28,149 --> 02:02:26,239

talked about it internally it is and the

2987

02:02:30,709 --> 02:02:28,159

conditions are better at night but it's

2988

02:02:32,070 --> 02:02:30,719

exactly as you say it does come down to

2989

02:02:33,430 --> 02:02:32,080

where the space station is going to be

2990

02:02:35,990 --> 02:02:33,440

and how they need to catch up with it

2991

02:02:37,830 --> 02:02:36,000

and so when we land at night the launch

2992

02:02:40,310 --> 02:02:37,840

ends up happening at night it's just the

2993

02:02:41,990 --> 02:02:40,320

way it is and that's why we're spending

2994

02:02:44,629 --> 02:02:42,000

our entire overnight

2995

02:02:46,070 --> 02:02:44,639

getting ready for this launch which it's

2996

02:02:48,709 --> 02:02:46,080

interesting that they they noticed that

2997

02:02:50,790 --> 02:02:48,719

because demo two and crew one

2998

02:02:53,030 --> 02:02:50,800

um crew wanted a little fuzzy on but i

2999

02:02:54,550 --> 02:02:53,040

think those were daytime but crew 2 crew

3000

02:02:56,790 --> 02:02:54,560

3 crew 4

3001
02:02:59,510 --> 02:02:56,800
all overnight all overnight that's right

3002
02:03:01,430 --> 02:02:59,520
but you notice that the axiom 1 mission

3003
02:03:04,149 --> 02:03:01,440
which uh you know was just about two

3004
02:03:05,350 --> 02:03:04,159
weeks ago that was during the day

3005
02:03:07,189 --> 02:03:05,360
so

3006
02:03:08,870 --> 02:03:07,199
yeah it really is really what i what i

3007
02:03:09,830 --> 02:03:08,880
remember from shuttle days is that as

3008
02:03:12,149 --> 02:03:09,840
the launch

3009
02:03:14,149 --> 02:03:12,159
gets later the time gets earlier by

3010
02:03:15,510 --> 02:03:14,159
about 23 minutes or something like that

3011
02:03:17,270 --> 02:03:15,520
day by day so you used to be able to do

3012
02:03:18,629 --> 02:03:17,280
that launch math pretty quickly if you

3013
02:03:20,390 --> 02:03:18,639

knew the mission had slipped a week it

3014

02:03:21,750 --> 02:03:20,400

was going to be so much earlier so it

3015

02:03:23,350 --> 02:03:21,760

really does have to do with where is the

3016

02:03:24,950 --> 02:03:23,360

space station relative to the launch

3017

02:03:26,149 --> 02:03:24,960

site and you got to launch right when

3018

02:03:27,589 --> 02:03:26,159

they're directly overhead and that's

3019

02:03:29,510 --> 02:03:27,599

exactly how we do it and it's an

3020

02:03:32,149 --> 02:03:29,520

instantaneous window right when it is

3021

02:03:34,550 --> 02:03:32,159

overhead and um are we going to take

3022

02:03:38,229 --> 02:03:34,560

another question

3023

02:03:41,910 --> 02:03:40,229

we have reached an important milestone

3024

02:03:44,709 --> 02:03:41,920

as you can see on your screen though as

3025

02:03:46,229 --> 02:03:44,719

we are watching outside the spacecraft

3026

02:03:47,430 --> 02:03:46,239

the crew dragon

3027

02:03:49,990 --> 02:03:47,440

freedom

3028

02:03:51,270 --> 02:03:50,000

the uh closeout crew there in the white

3029

02:03:54,069 --> 02:03:51,280

room

3030

02:03:56,390 --> 02:03:54,079

appears to have the hatch shut

3031

02:03:58,069 --> 02:03:56,400

and now they're checking for leaks and

3032

02:03:59,669 --> 02:03:58,079

while they do that

3033

02:04:06,950 --> 02:03:59,679

let's take this uh

3034

02:04:11,910 --> 02:04:09,189

what kind of food will the astronauts

3035

02:04:13,750 --> 02:04:11,920

have on the international space station

3036

02:04:15,669 --> 02:04:13,760

so food is so important as you can

3037

02:04:17,189 --> 02:04:15,679

imagine and freedom spacex with the site

3038

02:04:18,629 --> 02:04:17,199

hatch now closed we're going to be

3039

02:04:21,030 --> 02:04:18,639

commencing health checks for the launch

3040

02:04:22,629 --> 02:04:21,040

escape system expect moments momentary

3041

02:04:24,229 --> 02:04:22,639

flight computer state change

3042

02:04:26,790 --> 02:04:24,239

followed by transition back to pad hedge

3043

02:04:31,990 --> 02:04:29,750

and there's your confirmation

3044

02:04:33,830 --> 02:04:32,000

so yes food is so important um for any

3045

02:04:35,510 --> 02:04:33,840

long duration mission of course but on

3046

02:04:37,109 --> 02:04:35,520

the international space station there

3047

02:04:38,870 --> 02:04:37,119

are some challenges to providing a

3048

02:04:40,229 --> 02:04:38,880

varied menu you've got a lot of

3049

02:04:42,149 --> 02:04:40,239

different people with a lot of different

3050

02:04:44,470 --> 02:04:42,159

tastes and then you have limited ability

3051
02:04:46,629 --> 02:04:44,480
to keep fresh food fresh so our food has

3052
02:04:47,990 --> 02:04:46,639
to mainly be what we call shelf stable

3053
02:04:49,830 --> 02:04:48,000
so it's kind of like canned food

3054
02:04:52,149 --> 02:04:49,840
although our food comes in packets and

3055
02:04:54,709 --> 02:04:52,159
it's also dehydrated food that we have

3056
02:04:56,390 --> 02:04:54,719
to add water to so the food lab at jsc

3057
02:04:58,229 --> 02:04:56,400
works really really hard to provide us

3058
02:04:59,510 --> 02:04:58,239
that varied menu with lots of different

3059
02:05:01,430 --> 02:04:59,520
flavors

3060
02:05:03,109 --> 02:05:01,440
to try to help you know people with lots

3061
02:05:06,069 --> 02:05:03,119
of different palates and so my personal

3062
02:05:07,189 --> 02:05:06,079
favorites i like the mango fruit salad

3063
02:05:09,350 --> 02:05:07,199

and

3064

02:05:10,950 --> 02:05:09,360

chicken pineapple salad for a nice

3065

02:05:12,390 --> 02:05:10,960

little bistro lunch with some tomato

3066

02:05:14,310 --> 02:05:12,400

basil soup on the side those were some

3067

02:05:15,669 --> 02:05:14,320

of my favorites but a nice broad menu

3068

02:05:18,069 --> 02:05:15,679

for lots of different

3069

02:05:20,870 --> 02:05:18,079

taste buds you are making me hungry

3070

02:05:22,709 --> 02:05:20,880

but is now is that the rehydrated meal

3071

02:05:25,189 --> 02:05:22,719

uh so some of it's rehydrated and some

3072

02:05:27,750 --> 02:05:25,199

of it's um packaged irradiated basically

3073

02:05:29,430 --> 02:05:27,760

to become self-stable all right

3074

02:05:31,189 --> 02:05:29,440

well thank you very much megan for

3075

02:05:33,270 --> 02:05:31,199

taking those questions and thank you to

3076

02:05:35,030 --> 02:05:33,280

the audience for sending them in we'll

3077

02:05:37,109 --> 02:05:35,040

keep taking them as long as we're

3078

02:05:39,589 --> 02:05:37,119

counting down here and we've got about

3079

02:05:41,350 --> 02:05:39,599

an hour and 48 minutes uh left in the

3080

02:05:43,589 --> 02:05:41,360

launch and then only an hour until the

3081

02:05:45,270 --> 02:05:43,599

pad team wraps up its final checks and

3082

02:05:47,109 --> 02:05:45,280

clears the white room that's when the

3083

02:05:49,430 --> 02:05:47,119

action will really pick up with the crew

3084

02:05:51,910 --> 02:05:49,440

access arm retracting then we'll have

3085

02:05:53,109 --> 02:05:51,920

the arming of the launch escape system

3086

02:05:56,310 --> 02:05:53,119

and then of course

3087

02:05:58,229 --> 02:05:56,320

propellant loading so we'll keep you uh

3088

02:06:00,229 --> 02:05:58,239

live into the action as you can see on

3089

02:06:01,830 --> 02:06:00,239

the screen there with the crew as

3090

02:06:03,430 --> 02:06:01,840

they're sitting tight for the next hour

3091

02:06:05,830 --> 02:06:03,440

or so and then of course we'll provide

3092

02:06:08,149 --> 02:06:05,840

you with some more context about this

3093

02:06:10,310 --> 02:06:08,159

mission but in the meantime let's head

3094

02:06:11,990 --> 02:06:10,320

over now to houston for a closer look at

3095

02:06:18,870 --> 02:06:12,000

what the crew will be doing when they

3096

02:06:22,390 --> 02:06:21,109

hey thanks daryl when crew 4 arrives at

3097

02:06:24,790 --> 02:06:22,400

the space station tonight they'll

3098

02:06:26,790 --> 02:06:24,800

officially become expedition 67 flight

3099

02:06:28,870 --> 02:06:26,800

engineers once on board they'll do

3100

02:06:30,550 --> 02:06:28,880

something known as a direct handover

3101

02:06:32,470 --> 02:06:30,560

just like what astronaut megan mcarthur

3102

02:06:34,470 --> 02:06:32,480

was talking about basically saying that

3103

02:06:36,870 --> 02:06:34,480

crew 3 and crew 4 will be aboard the

3104

02:06:39,270 --> 02:06:36,880

space station altogether until crew 3

3105

02:06:41,589 --> 02:06:39,280

comes home sometime next week crew 3

3106

02:06:44,069 --> 02:06:41,599

will be able to to give crew 4 an

3107

02:06:45,830 --> 02:06:44,079

orientation show them the ropes which

3108

02:06:47,830 --> 02:06:45,840

might be particularly helpful for first

3109

02:06:49,669 --> 02:06:47,840

time space fliers jessica watkins and

3110

02:06:51,589 --> 02:06:49,679

bob hines

3111

02:06:53,270 --> 02:06:51,599

a direct handover also helps ensure a

3112

02:06:55,030 --> 02:06:53,280

continuous u.s presence on the space

3113

02:06:57,430 --> 02:06:55,040

station a record that we've held for

3114

02:06:59,030 --> 02:06:57,440

almost 22 years

3115

02:07:00,950 --> 02:06:59,040

but the space station is an orbiting

3116

02:07:03,350 --> 02:07:00,960

laboratory and they'll jump right in on

3117

02:07:04,950 --> 02:07:03,360

research investigations so i'll toss it

3118

02:07:06,229 --> 02:07:04,960

over to megan cruz who can tell us a

3119

02:07:08,310 --> 02:07:06,239

little bit more about those exciting

3120

02:07:09,830 --> 02:07:08,320

experiments the crew four will work on

3121

02:07:11,830 --> 02:07:09,840

chelsea thank you so much yeah i want to

3122

02:07:14,310 --> 02:07:11,840

introduce everyone to david parker here

3123

02:07:16,629 --> 02:07:14,320

he's the european space agency's

3124

02:07:18,470 --> 02:07:16,639

director of exploration how are you i'm

3125

02:07:19,669 --> 02:07:18,480

great good morning to you you are very

3126

02:07:21,030 --> 02:07:19,679

excited well i do know why you're

3127

02:07:22,470 --> 02:07:21,040

excited this is your first launch from

3128

02:07:23,990 --> 02:07:22,480

here at canada it is it's incredible

3129

02:07:25,589 --> 02:07:24,000

i've been working in the industry for 30

3130

02:07:27,109 --> 02:07:25,599

years and here i am the first launch at

3131

02:07:29,030 --> 02:07:27,119

kennedy that's so exciting and you're

3132

02:07:30,950 --> 02:07:29,040

going to watch uh samantha christopher

3133

02:07:32,310 --> 02:07:30,960

reddy's second trip to the international

3134

02:07:33,910 --> 02:07:32,320

space station once she launches from

3135

02:07:35,669 --> 02:07:33,920

here once she gets there she'll be

3136

02:07:37,669 --> 02:07:35,679

working on a lot of science experiments

3137

02:07:40,470 --> 02:07:37,679

right yeah that's true uh we should be

3138

02:07:42,550 --> 02:07:40,480

working in our european lab aboard the

3139

02:07:44,149 --> 02:07:42,560

space station that's called columbus and

3140

02:07:45,430 --> 02:07:44,159

she'll be continuing many experiments

3141

02:07:47,430 --> 02:07:45,440

that have been started but some really

3142

02:07:50,950 --> 02:07:47,440

interesting ones for her mission for

3143

02:07:53,030 --> 02:07:50,960

example she's working on dna research

3144

02:07:54,709 --> 02:07:53,040

and related to aging

3145

02:07:56,790 --> 02:07:54,719

and that's related to one of our own

3146

02:07:58,390 --> 02:07:56,800

interests which is osteoporosis the

3147

02:08:00,470 --> 02:07:58,400

effects of aging back here on earth so

3148

02:08:02,390 --> 02:08:00,480

it's linking what we're doing aboard the

3149

02:08:04,310 --> 02:08:02,400

space station to the research that's

3150

02:08:05,669 --> 02:08:04,320

really relevant to us back here on earth

3151
02:08:06,870 --> 02:08:05,679
yeah and that's important because we do

3152
02:08:08,470 --> 02:08:06,880
know that there is bone loss that

3153
02:08:09,830 --> 02:08:08,480
happens while we have astronauts in

3154
02:08:11,910 --> 02:08:09,840
space now you know something that's

3155
02:08:14,390 --> 02:08:11,920
really interesting is that nasa and issa

3156
02:08:16,149 --> 02:08:14,400
aren't just partners when it comes to

3157
02:08:18,310 --> 02:08:16,159
our commercial crew program you guys are

3158
02:08:20,229 --> 02:08:18,320
playing a critical role in our return to

3159
02:08:22,470 --> 02:08:20,239
the moon nasa's artemis program yeah

3160
02:08:24,390 --> 02:08:22,480
that's super exciting to us i had the

3161
02:08:27,510 --> 02:08:24,400
lovely opportunity yesterday to go into

3162
02:08:29,350 --> 02:08:27,520
the vab behind us here and see the sls

3163
02:08:31,750 --> 02:08:29,360

rocket and we're super excited to be

3164

02:08:33,270 --> 02:08:31,760

part of the artemis program

3165

02:08:35,750 --> 02:08:33,280

because right at the top of the rocket

3166

02:08:37,830 --> 02:08:35,760

is our first of our european service

3167

02:08:40,229 --> 02:08:37,840

modules the power and propulsion for the

3168

02:08:41,830 --> 02:08:40,239

astronauts to take them back to the moon

3169

02:08:43,589 --> 02:08:41,840

and so the first one was it was on top

3170

02:08:45,669 --> 02:08:43,599

of that rocket the second one is already

3171

02:08:47,510 --> 02:08:45,679

delivered to the states and we're

3172

02:08:49,589 --> 02:08:47,520

building more maybe up to number seven

3173

02:08:50,709 --> 02:08:49,599

eight and nine yeah and of course the

3174

02:08:52,790 --> 02:08:50,719

question is where the astronauts going

3175

02:08:55,750 --> 02:08:52,800

to fly to well the first place will be

3176
02:08:57,750 --> 02:08:55,760
the lunar gateway our permanent outpost

3177
02:09:00,229 --> 02:08:57,760
around the moon a thousand times further

3178
02:09:03,109 --> 02:09:00,239
out in deep space than the space station

3179
02:09:04,950 --> 02:09:03,119
so esa is building two out of the three

3180
02:09:07,030 --> 02:09:04,960
habitation modules and what's really

3181
02:09:08,790 --> 02:09:07,040
cool is one of them will be have the

3182
02:09:11,270 --> 02:09:08,800
windows that allow the astronauts to

3183
02:09:12,870 --> 02:09:11,280
look down onto the moon exactly the way

3184
02:09:14,310 --> 02:09:12,880
the astronauts on the space station look

3185
02:09:16,069 --> 02:09:14,320
down from the coupler yeah yeah that's

3186
02:09:17,589 --> 02:09:16,079
why international partnerships are so

3187
02:09:19,669 --> 02:09:17,599
important so we're so grateful to have

3188
02:09:22,069 --> 02:09:19,679

you as part of that artemis program and

3189

02:09:24,629 --> 02:09:22,079

then i wanted to know what does isa hope

3190

02:09:26,390 --> 02:09:24,639

to accomplish by returning to the moon

3191

02:09:28,229 --> 02:09:26,400

well there's a lot to do i always say

3192

02:09:30,149 --> 02:09:28,239

that the moon is the eighth continent of

3193

02:09:31,990 --> 02:09:30,159

planet earth and it's undiscovered

3194

02:09:34,470 --> 02:09:32,000

country really in the days of apollo

3195

02:09:37,030 --> 02:09:34,480

which i'm so old i remember we kind of i

3196

02:09:38,870 --> 02:09:37,040

say the moon is a museum of four billion

3197

02:09:40,709 --> 02:09:38,880

years of solar system history and we

3198

02:09:42,870 --> 02:09:40,719

just kind of went to the museum gift

3199

02:09:44,629 --> 02:09:42,880

shop grabbed the souvenirs and came home

3200

02:09:47,189 --> 02:09:44,639

again now we're going to go there really

3201

02:09:50,149 --> 02:09:47,199

explore it do the job properly this time

3202

02:09:51,589 --> 02:09:50,159

and un unravel its secrets what it could

3203

02:09:53,910 --> 02:09:51,599

tell us about the whole history of our

3204

02:09:55,750 --> 02:09:53,920

solar system and with so much that we

3205

02:09:57,910 --> 02:09:55,760

have ahead of us you guys are really

3206

02:10:00,069 --> 02:09:57,920

focused on stem as much as we are here

3207

02:10:02,149 --> 02:10:00,079

in the us oh absolutely and samantha

3208

02:10:03,990 --> 02:10:02,159

will do a lot of outreach projects and

3209

02:10:05,430 --> 02:10:04,000

education projects for example there's

3210

02:10:08,069 --> 02:10:05,440

some really cool examples we have a

3211

02:10:10,470 --> 02:10:08,079

couple of tiny computers aboard our

3212

02:10:12,870 --> 02:10:10,480

columbus laboratory and school students

3213

02:10:14,470 --> 02:10:12,880

will be challenged to produce software

3214

02:10:17,669 --> 02:10:14,480

that they can upload so they're doing

3215

02:10:19,189 --> 02:10:17,679

their own software and research in orbit

3216

02:10:20,709 --> 02:10:19,199

i really can't get over the fact that

3217

02:10:22,950 --> 02:10:20,719

this is your first launch from here at

3218

02:10:24,550 --> 02:10:22,960

kennedy i need to be right next to you

3219

02:10:27,430 --> 02:10:24,560

when you watch this launch because i

3220

02:10:29,109 --> 02:10:27,440

think you're going to go nuts

3221

02:10:30,390 --> 02:10:29,119

as much as an english person ever goes

3222

02:10:31,830 --> 02:10:30,400

nuts

3223

02:10:33,430 --> 02:10:31,840

well perfect david thank you so much for

3224

02:10:34,950 --> 02:10:33,440

being here and yes i do hope you enjoyed

3225

02:10:36,790 --> 02:10:34,960

today's thank you so much

3226

02:10:38,470 --> 02:10:36,800

guys back to you

3227

02:10:40,550 --> 02:10:38,480

all right thank you megan and looking

3228

02:10:43,030 --> 02:10:40,560

forward to his reaction he's going to

3229

02:10:45,109 --> 02:10:43,040

stay composed so he says that's what he

3230

02:10:47,189 --> 02:10:45,119

says so we just heard about uh the

3231

02:10:49,030 --> 02:10:47,199

science from the european perspective

3232

02:10:50,390 --> 02:10:49,040

and now here's a closer look at some of

3233

02:10:52,870 --> 02:10:50,400

the life-changing science that

3234

02:10:57,510 --> 02:10:52,880

astronauts are performing aboard the

3235

02:11:01,830 --> 02:10:59,430

the international space station is a

3236

02:11:03,589 --> 02:11:01,840

state-of-the-art microgravity laboratory

3237

02:11:05,830 --> 02:11:03,599

that is unlocking discoveries not

3238

02:11:07,990 --> 02:11:05,840

possible on earth and helping us push

3239

02:11:10,229 --> 02:11:08,000

farther into deep space

3240

02:11:12,629 --> 02:11:10,239

every single day we are answering big

3241

02:11:14,229 --> 02:11:12,639

questions about earth and about space

3242

02:11:15,990 --> 02:11:14,239

about where we came from and about where

3243

02:11:17,430 --> 02:11:16,000

we're going but the other thing that

3244

02:11:22,629 --> 02:11:17,440

we're doing is we're learning more

3245

02:11:26,870 --> 02:11:24,709

microgravity turns almost everything we

3246

02:11:29,510 --> 02:11:26,880

know upside down

3247

02:11:32,390 --> 02:11:29,520

liquids behave completely differently

3248

02:11:35,270 --> 02:11:32,400

fire burns in new ways

3249

02:11:36,629 --> 02:11:35,280

biological systems reveal surprises

3250

02:11:38,550 --> 02:11:36,639

there's a few things that may have made

3251
02:11:40,229 --> 02:11:38,560
me gasp out loud up on board space

3252
02:11:42,709 --> 02:11:40,239
station watching heart cells actually

3253
02:11:44,629 --> 02:11:42,719
beat has been a pretty big one

3254
02:11:46,229 --> 02:11:44,639
we're studying ways to grow food in

3255
02:11:49,109 --> 02:11:46,239
microgravity

3256
02:11:51,350 --> 02:11:49,119
i gotta tell you these

3257
02:11:54,470 --> 02:11:51,360
these are pretty amazing we're learning

3258
02:11:56,229 --> 02:11:54,480
how human bodies react to life in space

3259
02:11:58,550 --> 02:11:56,239
and how to keep crew members safe and

3260
02:11:59,589 --> 02:11:58,560
strong on long duration exploration

3261
02:12:01,430 --> 02:11:59,599
missions

3262
02:12:04,390 --> 02:12:01,440
deadlifts are awesome on earth they're

3263
02:12:06,310 --> 02:12:04,400

also awesome in zero gravity

3264

02:12:08,390 --> 02:12:06,320

we're testing technologies that will be

3265

02:12:11,589 --> 02:12:08,400

critical to our return to the moon and

3266

02:12:16,149 --> 02:12:13,750

our research has contributed to medical

3267

02:12:18,390 --> 02:12:16,159

and social benefits on our home planet

3268

02:12:20,709 --> 02:12:18,400

allowing us to find new ways to combat

3269

02:12:22,870 --> 02:12:20,719

disease back on earth and develop

3270

02:12:26,870 --> 02:12:22,880

technologies to deliver clean water to

3271

02:12:31,669 --> 02:12:28,950

the spectacular vantage point of more

3272

02:12:33,669 --> 02:12:31,679

than 200 miles above our planet supports

3273

02:12:36,390 --> 02:12:33,679

our monitoring of earth's climate

3274

02:12:38,550 --> 02:12:36,400

natural disasters and plant life our

3275

02:12:40,069 --> 02:12:38,560

planet earth is absolutely stunning to

3276

02:12:41,990 --> 02:12:40,079

me it doesn't matter where we are in the

3277

02:12:43,589 --> 02:12:42,000

world i just see beauty in different

3278

02:12:46,229 --> 02:12:43,599

ways

3279

02:12:48,390 --> 02:12:46,239

the growing new space economy so vital

3280

02:12:52,390 --> 02:12:48,400

to our continued progress in space

3281

02:12:57,189 --> 02:12:55,189

we're inspiring future generations from

3282

02:13:01,350 --> 02:12:57,199

a platform that is one of the largest

3283

02:13:03,830 --> 02:13:01,360

international collaborations of our time

3284

02:13:05,910 --> 02:13:03,840

we're doing science at 17

3285

02:13:12,750 --> 02:13:05,920

500 miles per hour

3286

02:13:12,760 --> 02:13:17,910

[Music]

3287

02:13:23,109 --> 02:13:20,390

some of the great science taking place

3288

02:13:24,870 --> 02:13:23,119

on board the international space station

3289

02:13:25,830 --> 02:13:24,880

got an operational update for you right

3290

02:13:28,870 --> 02:13:25,840

now

3291

02:13:31,189 --> 02:13:28,880

the crew inside uh dragon there crew 4

3292

02:13:33,270 --> 02:13:31,199

received their post ingress brief

3293

02:13:35,109 --> 02:13:33,280

the teams are tracking no issues at this

3294

02:13:36,790 --> 02:13:35,119

moment they also just completed

3295

02:13:39,030 --> 02:13:36,800

communications checks with the key

3296

02:13:41,109 --> 02:13:39,040

members of the falcon 9 launch team

3297

02:13:43,669 --> 02:13:41,119

and now we are standing by for side

3298

02:13:45,910 --> 02:13:43,679

hatch leak check completion as you can

3299

02:13:50,709 --> 02:13:45,920

see there on your screen

3300

02:13:54,709 --> 02:13:52,950

now nasa astronauts on board the space

3301
02:13:56,870 --> 02:13:54,719
station have been busy preparing for the

3302
02:13:59,589 --> 02:13:56,880
arrival of crew four

3303
02:14:01,350 --> 02:13:59,599
i recently spoke to astronaut raj achary

3304
02:14:03,430 --> 02:14:01,360
who is in space right now

3305
02:14:05,669 --> 02:14:03,440
about how they're getting ready and the

3306
02:14:08,390 --> 02:14:05,679
special connection he has with two crew

3307
02:14:10,950 --> 02:14:08,400
4 astronauts

3308
02:14:12,790 --> 02:14:10,960
raja i covered your launch from cape

3309
02:14:14,470 --> 02:14:12,800
canaveral and i i remember what you look

3310
02:14:17,189 --> 02:14:14,480
like then and i see you now and i'm just

3311
02:14:20,310 --> 02:14:17,199
curious did you get a haircut and if so

3312
02:14:22,550 --> 02:14:20,320
how did you cut your hair in space

3313
02:14:23,910 --> 02:14:22,560

yeah so we've done a few haircuts

3314

02:14:25,910 --> 02:14:23,920

we use a

3315

02:14:28,069 --> 02:14:25,920

clippers with a vacuum hose attached to

3316

02:14:30,470 --> 02:14:28,079

it and so i can do about the front half

3317

02:14:32,790 --> 02:14:30,480

of my head uh basically just in the

3318

02:14:34,870 --> 02:14:32,800

mirror and then usually use a crewmate

3319

02:14:36,470 --> 02:14:34,880

to do the back side of my head hey i

3320

02:14:39,430 --> 02:14:36,480

can't help but notice you've got an

3321

02:14:42,390 --> 02:14:39,440

inflatable globe there attached to your

3322

02:14:43,830 --> 02:14:42,400

leg and i'm wondering what that's for

3323

02:14:46,709 --> 02:14:43,840

that is uh in case you have any

3324

02:14:48,629 --> 02:14:46,719

questions uh about the earthis it's uh

3325

02:14:50,790 --> 02:14:48,639

oftentimes people are curious about

3326

02:14:53,189 --> 02:14:50,800

whether we can watch the launch and uh

3327

02:14:54,470 --> 02:14:53,199

or see the orbital insertion

3328

02:14:57,430 --> 02:14:54,480

so obviously they'll be launching out of

3329

02:14:59,430 --> 02:14:57,440

the cape um based on where we're at

3330

02:15:01,030 --> 02:14:59,440

hopefully we'll have a decent view and

3331

02:15:04,149 --> 02:15:01,040

as long as we're on at least the half of

3332

02:15:06,470 --> 02:15:04,159

the earth that uh can view the cape we

3333

02:15:08,709 --> 02:15:06,480

might get a chance to see the the rocket

3334

02:15:10,629 --> 02:15:08,719

uh plume and maybe the insertion into

3335

02:15:12,870 --> 02:15:10,639

orbit but it's always kind of dependent

3336

02:15:14,709 --> 02:15:12,880

on atmospheric conditions and where

3337

02:15:16,790 --> 02:15:14,719

exactly we are in the orbit in relation

3338

02:15:18,550 --> 02:15:16,800

to their launch we're getting ready to

3339

02:15:19,589 --> 02:15:18,560

send crew 4

3340

02:15:21,510 --> 02:15:19,599

to you

3341

02:15:22,870 --> 02:15:21,520

how are you getting ready for their

3342

02:15:24,149 --> 02:15:22,880

arrival

3343

02:15:26,149 --> 02:15:24,159

well it's uh funny you asked because

3344

02:15:28,470 --> 02:15:26,159

actually just yesterday we caught the

3345

02:15:30,229 --> 02:15:28,480

visiting vehicle cygnus uh the ss pure

3346

02:15:32,950 --> 02:15:30,239

sellers embroidered on board the space

3347

02:15:34,709 --> 02:15:32,960

station and on board that uh that space

3348

02:15:37,430 --> 02:15:34,719

vehicle is a whole bunch of supplies for

3349

02:15:39,030 --> 02:15:37,440

crew 4. so yesterday evening and today

3350

02:15:40,390 --> 02:15:39,040

we've actually been unpacking it and

3351

02:15:44,069 --> 02:15:40,400

part of the supplies that it's brought

3352

02:15:45,750 --> 02:15:44,079

up are food clothes and other items for

3353

02:15:47,750 --> 02:15:45,760

crew 4. so we've been starting to

3354

02:15:49,910 --> 02:15:47,760

distribute those around the station

3355

02:15:51,589 --> 02:15:49,920

pre-position them for them and then when

3356

02:15:52,629 --> 02:15:51,599

it gets closer in time to them or

3357

02:15:54,310 --> 02:15:52,639

showing up we'll actually start to

3358

02:15:56,390 --> 02:15:54,320

unpack those bags

3359

02:15:58,149 --> 02:15:56,400

and set up their crew quarters for them

3360

02:16:00,709 --> 02:15:58,159

tell me a little bit about your

3361

02:16:02,790 --> 02:16:00,719

experience what you remember most about

3362

02:16:04,470 --> 02:16:02,800

your launch day

3363

02:16:05,830 --> 02:16:04,480

when you guys uh launched from cape

3364

02:16:08,229 --> 02:16:05,840

canaveral and went up to the space

3365

02:16:09,750 --> 02:16:08,239

station what a little bit uh about six

3366

02:16:11,350 --> 02:16:09,760

months ago

3367

02:16:13,030 --> 02:16:11,360

yeah i think for me the one of the

3368

02:16:15,109 --> 02:16:13,040

things that struck me uh during the

3369

02:16:17,109 --> 02:16:15,119

first stage uh was just sort of the

3370

02:16:20,229 --> 02:16:17,119

really visceral feedback you get in the

3371

02:16:22,390 --> 02:16:20,239

the rocket and how much uh how quick

3372

02:16:24,790 --> 02:16:22,400

your senses are the next thing is that

3373

02:16:27,270 --> 02:16:24,800

you really feel is the jolt between the

3374

02:16:28,790 --> 02:16:27,280

first and second stage so as the first

3375

02:16:31,910 --> 02:16:28,800

stage uh

3376

02:16:33,589 --> 02:16:31,920

goes out you feel uh yourself kind of

3377

02:16:35,429 --> 02:16:33,599

get weightless for a second a few

3378

02:16:36,790 --> 02:16:35,439

seconds of weightlessness

3379

02:16:38,629 --> 02:16:36,800

and then when the second stage lights

3380

02:16:39,990 --> 02:16:38,639

you get thrown backwards in your seat

3381

02:16:42,230 --> 02:16:40,000

again and then you feel that

3382

02:16:45,270 --> 02:16:42,240

acceleration and then the first spot of

3383

02:16:46,950 --> 02:16:45,280

the space station we happen to see it as

3384

02:16:49,030 --> 02:16:46,960

the sun resizing about 40 kilometers

3385

02:16:50,309 --> 02:16:49,040

away and the way the sun was hit it made

3386

02:16:52,309 --> 02:16:50,319

it look like it was made out of gold it

3387

02:16:54,230 --> 02:16:52,319

was pretty cool and so we just sat there

3388

02:16:56,070 --> 02:16:54,240

mesmerizing the window watching our new

3389

02:16:59,429 --> 02:16:56,080

home get closer to us

3390

02:17:01,429 --> 02:16:59,439

wow that sounds incredible and just a

3391

02:17:03,509 --> 02:17:01,439

beautiful sight to behold it must have

3392

02:17:04,549 --> 02:17:03,519

been thanks for sharing that with us

3393

02:17:06,709 --> 02:17:04,559

so

3394

02:17:09,110 --> 02:17:06,719

what experiments that you've been

3395

02:17:11,110 --> 02:17:09,120

working on for the past few months have

3396

02:17:13,589 --> 02:17:11,120

really stood out and and you've enjoyed

3397

02:17:14,950 --> 02:17:13,599

working on um i'd say one of the ones i

3398

02:17:16,870 --> 02:17:14,960

personally enjoy working on is some of

3399

02:17:19,429 --> 02:17:16,880

the combustion experiments and i think

3400

02:17:21,270 --> 02:17:19,439

because uh just the idea of fire and

3401

02:17:23,110 --> 02:17:21,280

space is are generally things you don't

3402

02:17:25,750 --> 02:17:23,120

want to mix and so you have to spend a

3403

02:17:27,830 --> 02:17:25,760

lot of time and energy uh when you

3404

02:17:29,190 --> 02:17:27,840

design these experiments to contain the

3405

02:17:31,190 --> 02:17:29,200

combustion because you don't want

3406

02:17:34,309 --> 02:17:31,200

obviously that to get out into the

3407

02:17:37,110 --> 02:17:34,319

atmosphere here um but the the rewards

3408

02:17:38,629 --> 02:17:37,120

of that research have led to things uh

3409

02:17:40,309 --> 02:17:38,639

discovering cool flames and some

3410

02:17:43,190 --> 02:17:40,319

potential to have much lower carbon

3411

02:17:45,110 --> 02:17:43,200

emission processes on the ground uh for

3412

02:17:47,990 --> 02:17:45,120

combustion you know whether it's for

3413

02:17:50,709 --> 02:17:48,000

cars or factories and so the promise of

3414

02:17:53,030 --> 02:17:50,719

it is pretty amazing raja chari

3415

02:17:54,309 --> 02:17:53,040

expedition 66 nasa astronaut thank you

3416

02:17:55,429 --> 02:17:54,319

so much for joining us we really

3417

02:17:57,509 --> 02:17:55,439

appreciate it

3418

02:17:59,110 --> 02:17:57,519

yeah thank you guys and uh have fun

3419

02:18:01,030 --> 02:17:59,120

watching the crew 4 launch we'll be

3420

02:18:05,750 --> 02:18:01,040

watching from here and can't wait to to

3421

02:18:09,589 --> 02:18:07,349

well thanks to raj achary and the team

3422

02:18:11,910 --> 02:18:09,599

at jsc for making him available t-minus

3423

02:18:14,790 --> 02:18:11,920

one hour and 35 minutes and counting as

3424

02:18:17,669 --> 02:18:14,800

you look out at the falcon 9 rocket with

3425

02:18:20,549 --> 02:18:17,679

the crew dragon freedom at the very top

3426

02:18:22,309 --> 02:18:20,559

ready to launch in a little over an hour

3427

02:18:24,389 --> 02:18:22,319

update on raj atari by the way he has

3428

02:18:25,910 --> 02:18:24,399

grown in a very thick mustache so when

3429

02:18:27,429 --> 02:18:25,920

you see him again

3430

02:18:29,349 --> 02:18:27,439

he has taken the time and apparently

3431

02:18:31,190 --> 02:18:29,359

it's an air force thing i think mustache

3432

02:18:33,349 --> 02:18:31,200

marches what he called it yeah pretty

3433

02:18:34,150 --> 02:18:33,359

sure march is over though yeah that's

3434

02:18:36,230 --> 02:18:34,160

true

3435

02:18:40,070 --> 02:18:36,240

he's gone with that yeah i apparently he

3436

02:18:41,270 --> 02:18:40,080

missed a couple weeks he's on ketchup

3437

02:18:43,589 --> 02:18:41,280

but the other thing is he talked a

3438

02:18:45,910 --> 02:18:43,599

little bit about watching a launch from

3439

02:18:49,190 --> 02:18:45,920

the space station which i just think is

3440

02:18:51,110 --> 02:18:49,200

sounds really cool um i wonder you know

3441

02:18:53,669 --> 02:18:51,120

now we just got an update about the

3442

02:18:56,230 --> 02:18:53,679

space launch system our mega moon rocket

3443

02:18:59,110 --> 02:18:56,240

which now is looking in the august area

3444

02:19:01,589 --> 02:18:59,120

for launch okay which crew 4 would be on

3445

02:19:03,110 --> 02:19:01,599

board for that launch but i understand

3446

02:19:05,030 --> 02:19:03,120

you got to be kind of lucky to see a

3447

02:19:06,950 --> 02:19:05,040

launch from the space station you do

3448

02:19:09,190 --> 02:19:06,960

have to be kind of lucky we have seen

3449

02:19:10,870 --> 02:19:09,200

them and um you just have to be it's

3450

02:19:13,349 --> 02:19:10,880

again you know kind of right place right

3451

02:19:15,270 --> 02:19:13,359

time right the trajectories have to be

3452

02:19:17,509 --> 02:19:15,280

relative to one another correct the

3453

02:19:19,349 --> 02:19:17,519

lighting of course has to be correct and

3454

02:19:20,549 --> 02:19:19,359

then you kind of just have to be looking

3455

02:19:22,469 --> 02:19:20,559

in the right direction right there's a

3456

02:19:25,830 --> 02:19:22,479

little bit of element of luck involved

3457

02:19:27,669 --> 02:19:25,840

in it as well um and then also you can

3458

02:19:29,509 --> 02:19:27,679

see some de-orbit burns or vehicles

3459

02:19:31,910 --> 02:19:29,519

going home again and uh my crewmate

3460

02:19:34,629 --> 02:19:31,920

thomas pesquet did capture crew one's

3461

02:19:36,309 --> 02:19:34,639

deorbit burn really beautifully well um

3462

02:19:38,389 --> 02:19:36,319

in some photographs and one of the very

3463

02:19:39,990 --> 02:19:38,399

first nights that we were up there so

3464

02:19:41,910 --> 02:19:40,000

kudos to him because i had not figured

3465

02:19:43,509 --> 02:19:41,920

out how to even find a camera much less

3466

02:19:44,629 --> 02:19:43,519

take night photography of a moving

3467

02:19:46,389 --> 02:19:44,639

object but

3468

02:19:47,990 --> 02:19:46,399

so you do have some unique viewing

3469

02:19:49,750 --> 02:19:48,000

opportunities they don't always work out

3470

02:19:51,590 --> 02:19:49,760

but the team on the ground will usually

3471

02:19:54,070 --> 02:19:51,600

tell us what they think those will be

3472

02:19:57,349 --> 02:19:54,080

hope it works out for crew 4 crew 3

3473

02:19:59,590 --> 02:19:57,359

meanwhile set to splash down next week

3474

02:20:01,510 --> 02:19:59,600

megan it seems like yesterday that you

3475

02:20:03,830 --> 02:20:01,520

and your fellow crew 2 astronauts

3476

02:20:06,150 --> 02:20:03,840

splashdown and i want to take a look

3477

02:20:08,790 --> 02:20:06,160

back and take you back down memory oh

3478

02:20:10,790 --> 02:20:08,800

yes remember that yes you had you were

3479

02:20:13,990 --> 02:20:10,800

the first astronaut out yes of the

3480

02:20:15,830 --> 02:20:14,000

spacex uh dragon after splashdown and

3481

02:20:17,750 --> 02:20:15,840

there was your look that it was a good

3482

02:20:18,950 --> 02:20:17,760

moment um it's a little bit painful

3483

02:20:20,790 --> 02:20:18,960

getting out you actually have this

3484

02:20:23,030 --> 02:20:20,800

wonderful team who kind of just reaches

3485

02:20:24,389 --> 02:20:23,040

in and hauls you out there's some straps

3486

02:20:25,990 --> 02:20:24,399

connected to your suit that they reach

3487

02:20:27,270 --> 02:20:26,000

in and grab and haul you out and they

3488

02:20:29,030 --> 02:20:27,280

immediately you know put you on a

3489

02:20:30,950 --> 02:20:29,040

stretcher so they don't want you

3490

02:20:32,309 --> 02:20:30,960

standing up or trying to walk around

3491

02:20:33,830 --> 02:20:32,319

everything kind of hurts at that point

3492

02:20:36,070 --> 02:20:33,840

your back hurts and everything else i

3493

02:20:38,309 --> 02:20:36,080

was really grateful that i felt well i

3494

02:20:39,510 --> 02:20:38,319

did not feel any motion sickness or

3495

02:20:41,030 --> 02:20:39,520

anything like that

3496

02:20:42,790 --> 02:20:41,040

i was just really happy to see i think

3497

02:20:44,550 --> 02:20:42,800

i'm seeing shannon walker down the uh

3498

02:20:46,550 --> 02:20:44,560

down the end of the hall there so i'm

3499

02:20:49,110 --> 02:20:46,560

getting a big smile for my friend

3500

02:20:52,550 --> 02:20:49,120

shannon walker one of our uh guest hosts

3501

02:20:54,230 --> 02:20:52,560

for the previous launch crew 3.

3502

02:20:55,910 --> 02:20:54,240

and raj acharya and the rest of the crew

3503

02:20:57,670 --> 02:20:55,920

3 team of course when they return from

3504

02:20:58,630 --> 02:20:57,680

the international space station next

3505

02:21:00,550 --> 02:20:58,640

week

3506

02:21:02,630 --> 02:21:00,560

it'll be a great moment uh just like the

3507

02:21:05,190 --> 02:21:02,640

one we just saw there with uh megan

3508

02:21:07,830 --> 02:21:05,200

macarthur nasa's megan cruz got to speak

3509

02:21:10,070 --> 02:21:07,840

with crew 3's mission manager as she

3510

02:21:11,910 --> 02:21:10,080

balances the two missions and reflects

3511

02:21:15,030 --> 02:21:11,920

on a busy couple of years here on the

3512

02:21:18,790 --> 02:21:16,950

this is jessica parsons with nasa's

3513

02:21:20,230 --> 02:21:18,800

commercial crew program jessica it's so

3514

02:21:22,389 --> 02:21:20,240

great to have you here oh thank you for

3515

02:21:24,870 --> 02:21:22,399

having me so this is where you will be

3516

02:21:26,630 --> 02:21:24,880

on launch day inside one of the launch

3517

02:21:29,670 --> 02:21:26,640

control centers here at cape canaveral

3518

02:21:32,070 --> 02:21:29,680

space for station but your crew 3

3519

02:21:33,349 --> 02:21:32,080

mission manager how are you involved in

3520

02:21:34,710 --> 02:21:33,359

crew 4

3521

02:21:36,230 --> 02:21:34,720

well that's correct i'm the crew 3

3522

02:21:41,110 --> 02:21:36,240

mission manager

3523

02:21:42,630 --> 02:21:41,120

that's assigned to each of the missions

3524

02:21:45,750 --> 02:21:42,640

for crew for our mission manager is

3525

02:21:48,230 --> 02:21:45,760

actually in the lcc room and firearm for

3526

02:21:50,630 --> 02:21:48,240

with the spacex and the spacecraft team

3527

02:21:53,190 --> 02:21:50,640

but we do have many teams that support

3528

02:21:54,950 --> 02:21:53,200

from different locations hangar ie here

3529

02:21:57,190 --> 02:21:54,960

is one location where we have our launch

3530

02:21:58,710 --> 02:21:57,200

vehicle teams and our grand systems team

3531

02:22:00,710 --> 02:21:58,720

that are following the launch

3532

02:22:03,030 --> 02:22:00,720

preparations for the launch vehicle and

3533

02:22:05,429 --> 02:22:03,040

the ground systems so we do have mission

3534

02:22:07,750 --> 02:22:05,439

managers assigned to different locations

3535

02:22:09,349 --> 02:22:07,760

and as a crew 3 mission manager this is

3536

02:22:12,150 --> 02:22:09,359

where i am since i'm not in the prime

3537

02:22:13,990 --> 02:22:12,160

mission manager role we also have

3538

02:22:16,550 --> 02:22:14,000

a group of engineers that support from

3539

02:22:18,710 --> 02:22:16,560

the mission control center at jsc and

3540

02:22:20,870 --> 02:22:18,720

some of the engineering teams there

3541

02:22:22,630 --> 02:22:20,880

with them monitoring all the activities

3542

02:22:24,950 --> 02:22:22,640

from launch all the way to docking

3543

02:22:27,670 --> 02:22:24,960

gotcha so what is your particular role

3544

02:22:30,550 --> 02:22:27,680

on launch day here so lunch day here i

3545

02:22:33,190 --> 02:22:30,560

am listening to the loops uh helping the

3546

02:22:35,590 --> 02:22:33,200

team if there is any anomalies or any

3547

02:22:37,990 --> 02:22:35,600

issues being aware of what those issues

3548

02:22:39,349 --> 02:22:38,000

are and reporting them up to the team

3549

02:22:41,830 --> 02:22:39,359

make sure they have the latest

3550

02:22:43,830 --> 02:22:41,840

information so our nasa operations

3551

02:22:46,309 --> 02:22:43,840

manager who is the voice within the

3552

02:22:48,309 --> 02:22:46,319

spacex countdown can be aware of those

3553

02:22:50,550 --> 02:22:48,319

and report them if there's an issue and

3554

02:22:53,030 --> 02:22:50,560

why is it important for you as the crew

3555

02:22:54,230 --> 02:22:53,040

3 mission manager to be so intertwined

3556

02:22:56,550 --> 02:22:54,240

with crew 4

3557

02:22:59,349 --> 02:22:56,560

well it is important because i need crew

3558

02:23:01,590 --> 02:22:59,359

3 crew 4 to launch successfully for crew

3559

02:23:03,349 --> 02:23:01,600

3 to return home

3560

02:23:06,309 --> 02:23:03,359

as you know we

3561

02:23:09,270 --> 02:23:06,319

once crew 4 gets into iss that will have

3562

02:23:10,630 --> 02:23:09,280

a five day handover period uh with the

3563

02:23:13,190 --> 02:23:10,640

crew three

3564

02:23:15,110 --> 02:23:13,200

and the once that handover is complete

3565

02:23:16,710 --> 02:23:15,120

depending on the weather we'll assess

3566

02:23:18,630 --> 02:23:16,720

readiness for crew through return and

3567

02:23:19,910 --> 02:23:18,640

then we'll be coming home how long have

3568

02:23:20,790 --> 02:23:19,920

you been with the commercial crew

3569

02:23:22,309 --> 02:23:20,800

program

3570

02:23:24,630 --> 02:23:22,319

so i would say i'm fairly new to

3571

02:23:26,630 --> 02:23:24,640

commercial crew i've been with them for

3572

02:23:29,510 --> 02:23:26,640

two years since we became operational

3573

02:23:31,510 --> 02:23:29,520

actually my first day at work was uh

3574

02:23:33,429 --> 02:23:31,520

the week when we launched demo two we're

3575

02:23:35,750 --> 02:23:33,439

launching bob and dog

3576

02:23:37,429 --> 02:23:35,760

so it was uh craziness to me to

3577

02:23:39,670 --> 02:23:37,439

experience that on my first week at the

3578

02:23:41,270 --> 02:23:39,680

job but since then this is the fifth

3579

02:23:44,870 --> 02:23:41,280

mission that we launched in that period

3580

02:23:47,270 --> 02:23:44,880

of two years so it's an incredibly fast

3581

02:23:49,110 --> 02:23:47,280

cadence it seems like we launch a

3582

02:23:51,030 --> 02:23:49,120

mission and then we have the next

3583

02:23:53,110 --> 02:23:51,040

mission coming up getting ready for it

3584

02:23:55,190 --> 02:23:53,120

so it's very exciting at the same time

3585

02:23:57,510 --> 02:23:55,200

very rewarding why do you say that that

3586

02:23:59,349 --> 02:23:57,520

this job is rewarding well i think it's

3587

02:24:01,990 --> 02:23:59,359

extremely rewarding because you know we

3588

02:24:03,910 --> 02:24:02,000

are contributing to our space program we

3589

02:24:05,990 --> 02:24:03,920

are launching again astronauts from

3590

02:24:08,230 --> 02:24:06,000

american soil something that we hadn't

3591

02:24:10,150 --> 02:24:08,240

done since the space shuttle program and

3592

02:24:11,750 --> 02:24:10,160

having the skatins we're doing it every

3593

02:24:14,070 --> 02:24:11,760

six months so

3594

02:24:16,550 --> 02:24:14,080

it just keeps us excited and motivated

3595

02:24:17,990 --> 02:24:16,560

to continue doing it yeah very busy

3596

02:24:19,349 --> 02:24:18,000

exciting times here on the space coast

3597

02:24:21,590 --> 02:24:19,359

jessica thank you so much for being here

3598

02:24:22,630 --> 02:24:21,600

with me today i appreciate it thank you

3599

02:24:24,550 --> 02:24:22,640

back to you

3600

02:24:26,950 --> 02:24:24,560

thank you jessica and megan and she's

3601

02:24:29,030 --> 02:24:26,960

looking forward to a launch of crew 4 so

3602

02:24:31,190 --> 02:24:29,040

she can bring crew 3 home and we are one

3603

02:24:33,110 --> 02:24:31,200

hour and 29 minutes away from that

3604

02:24:34,870 --> 02:24:33,120

happening you see the crew now that's a

3605

02:24:37,110 --> 02:24:34,880

live shot inside the white room looking

3606

02:24:39,670 --> 02:24:37,120

at the dragon capsule and we just got an

3607

02:24:40,550 --> 02:24:39,680

update we have a good side hatch leak

3608

02:24:42,389 --> 02:24:40,560

check

3609

02:24:45,110 --> 02:24:42,399

and so the team there just uh wrapping

3610

02:24:46,950 --> 02:24:45,120

up the work as they continue progressing

3611

02:24:48,870 --> 02:24:46,960

towards liftoff

3612

02:24:50,230 --> 02:24:48,880

time now to check in on how the rest of

3613

02:24:52,230 --> 02:24:50,240

the countdown is progressing so let's

3614

02:24:56,710 --> 02:24:52,240

send it back out to california and

3615

02:25:00,950 --> 02:24:58,790

thanks daryl uh yeah as you just

3616

02:25:02,550 --> 02:25:00,960

mentioned uh under 90 minutes now until

3617

02:25:04,950 --> 02:25:02,560

liftoff and

3618

02:25:07,030 --> 02:25:04,960

we saw that the hatch was closed and we

3619

02:25:08,870 --> 02:25:07,040

heard that the leak check was

3620

02:25:11,110 --> 02:25:08,880

successfully performed

3621

02:25:13,670 --> 02:25:11,120

launch engineers are located in firing

3622

02:25:15,830 --> 02:25:13,680

room 4 in the nasa launch control center

3623

02:25:17,270 --> 02:25:15,840

at kennedy space center they do have a

3624

02:25:20,230 --> 02:25:17,280

view through the large windows that you

3625

02:25:22,550 --> 02:25:20,240

see on screen of pad 39a just about five

3626
02:25:24,710 --> 02:25:22,560
kilometers east of them the falcon 9

3627
02:25:26,389 --> 02:25:24,720
team is loading helium and nitrogen gas

3628
02:25:29,110 --> 02:25:26,399
into storage bottles on the launch

3629
02:25:31,030 --> 02:25:29,120
vehicle rf checkouts are also complete

3630
02:25:33,910 --> 02:25:31,040
and the final review of vehicle testing

3631
02:25:35,670 --> 02:25:33,920
performed earlier today is underway the

3632
02:25:36,870 --> 02:25:35,680
spacex chief engineer will check with

3633
02:25:39,030 --> 02:25:36,880
the team

3634
02:25:40,550 --> 02:25:39,040
at about the t minus 80 minute mark to

3635
02:25:42,630 --> 02:25:40,560
verify that we are still good to

3636
02:25:44,630 --> 02:25:42,640
continue the countdown the next major

3637
02:25:46,790 --> 02:25:44,640
activity is flowing a small amount of

3638
02:25:49,510 --> 02:25:46,800

fuel into the first stage to prime the

3639

02:25:51,750 --> 02:25:49,520

merlin 1d engines for ignition the team

3640

02:25:53,990 --> 02:25:51,760

is also monitoring fuel and liquid

3641

02:25:55,429 --> 02:25:54,000

oxygen loading preparations ensuring the

3642

02:25:57,830 --> 02:25:55,439

propellants in the ground tanks are

3643

02:26:01,910 --> 02:25:57,840

correctly chilled prior to loading them

3644

02:26:04,150 --> 02:26:01,920

onto the falcon at t minus 35 minutes

3645

02:26:06,389 --> 02:26:04,160

weather and range continue to be green

3646

02:26:08,710 --> 02:26:06,399

they have been green all night so things

3647

02:26:10,710 --> 02:26:08,720

again are looking uh great as we've had

3648

02:26:12,389 --> 02:26:10,720

really just a great and smooth uh

3649

02:26:14,469 --> 02:26:12,399

countdown so far

3650

02:26:16,309 --> 02:26:14,479

with that i do want to check in with dan

3651
02:26:17,349 --> 02:26:16,319
and jesse who have a very special update

3652
02:26:19,510 --> 02:26:17,359
for us

3653
02:26:21,429 --> 02:26:19,520
hey thanks andy now before anybody

3654
02:26:22,630 --> 02:26:21,439
climbs on board dragon for a flight into

3655
02:26:24,710 --> 02:26:22,640
space they're going to spend a lot of

3656
02:26:26,389 --> 02:26:24,720
time here at spacex headquarters in

3657
02:26:28,550 --> 02:26:26,399
hawthorne where we've got a number of

3658
02:26:30,230 --> 02:26:28,560
simulators mock-ups and things like that

3659
02:26:32,469 --> 02:26:30,240
for them to familiarize themselves with

3660
02:26:34,230 --> 02:26:32,479
the spacecraft now before we dive into

3661
02:26:35,510 --> 02:26:34,240
this one jesse's going to walk us a

3662
02:26:37,990 --> 02:26:35,520
little bit more through the dragon

3663
02:26:40,870 --> 02:26:38,000

spacecraft yeah just to get an idea of

3664

02:26:43,349 --> 02:26:40,880

the size of dragon the capsule with the

3665

02:26:45,349 --> 02:26:43,359

trunk attached to it is about 8.1 meters

3666

02:26:47,110 --> 02:26:45,359

tall now dan that's about three and a

3667

02:26:49,670 --> 02:26:47,120

half times the height of shaquille

3668

02:26:51,270 --> 02:26:49,680

o'neal it's a lot of shacks

3669

02:26:53,510 --> 02:26:51,280

the diameter of the vehicle is about

3670

02:26:55,830 --> 02:26:53,520

four meters and the payload mass that it

3671

02:26:58,309 --> 02:26:55,840

can carry up to space is about 6 000

3672

02:27:00,230 --> 02:26:58,319

kilograms so dan just in case you wanted

3673

02:27:04,070 --> 02:27:00,240

to bring a large african elephant with

3674

02:27:06,230 --> 02:27:04,080

you to outer space you totally could

3675

02:27:09,030 --> 02:27:06,240

and the the return mass is about half of

3676
02:27:10,870 --> 02:27:09,040
that it's about 3 000 kilograms when

3677
02:27:13,110 --> 02:27:10,880
returning back to earth

3678
02:27:15,030 --> 02:27:13,120
all right and so spacex has a number of

3679
02:27:17,110 --> 02:27:15,040
simulators mock-ups for the different

3680
02:27:19,349 --> 02:27:17,120
aspects of dragon and this one right

3681
02:27:20,870 --> 02:27:19,359
here is a mock-up of the forward hatch

3682
02:27:22,870 --> 02:27:20,880
so this is on the very top part of the

3683
02:27:24,630 --> 02:27:22,880
dragon spacecraft and this is what

3684
02:27:26,389 --> 02:27:24,640
they'll be opening once they dock to

3685
02:27:27,910 --> 02:27:26,399
move into the space station i'll walk

3686
02:27:29,349 --> 02:27:27,920
you through it a little bit so there's a

3687
02:27:31,349 --> 02:27:29,359
crank right here and there's an

3688
02:27:32,870 --> 02:27:31,359

identical one on the other side and

3689

02:27:34,630 --> 02:27:32,880

there's a decal on here that tell you

3690

02:27:36,309 --> 02:27:34,640

which direction and how to open this so

3691

02:27:37,750 --> 02:27:36,319

when you tune into docking tomorrow

3692

02:27:40,469 --> 02:27:37,760

you'll hear the crew get the call to

3693

02:27:42,309 --> 02:27:40,479

open the hatch for the decal so after we

3694

02:27:44,389 --> 02:27:42,319

move the handle out we can just start to

3695

02:27:46,230 --> 02:27:44,399

open it up there's a small indicator in

3696

02:27:48,870 --> 02:27:46,240

the window that'll tell us just how

3697

02:27:50,790 --> 02:27:48,880

close we're getting and after we get it

3698

02:27:52,230 --> 02:27:50,800

all the way down we're gonna hear a

3699

02:27:54,710 --> 02:27:52,240

telltale pop

3700

02:27:57,670 --> 02:27:54,720

and then it's time to open up the hatch

3701

02:28:00,389 --> 02:27:57,680

and so it opens up pretty slowly

3702

02:28:03,110 --> 02:28:00,399

yeah so now it may look like dan is

3703

02:28:05,110 --> 02:28:03,120

really struggling to open the door but

3704

02:28:07,110 --> 02:28:05,120

in fact the hinges are designed with

3705

02:28:09,270 --> 02:28:07,120

dampers so that the door does open

3706

02:28:12,150 --> 02:28:09,280

pretty slowly it's about seven seconds

3707

02:28:14,790 --> 02:28:12,160

to fully open no matter how much you

3708

02:28:17,030 --> 02:28:14,800

push or pull on the hatch door and

3709

02:28:19,190 --> 02:28:17,040

that's a safety precaution the door

3710

02:28:20,550 --> 02:28:19,200

opens up to the interior of the dragon

3711

02:28:22,950 --> 02:28:20,560

vehicle so we want to make sure that the

3712

02:28:25,270 --> 02:28:22,960

door doesn't swing and hit anything

3713

02:28:27,429 --> 02:28:25,280

inside of the vehicle or harm anybody

3714

02:28:29,910 --> 02:28:27,439

that's inside of the vehicle as well and

3715

02:28:33,030 --> 02:28:29,920

same with closing again it may look like

3716

02:28:35,270 --> 02:28:33,040

dan is struggling but this is per design

3717

02:28:37,750 --> 02:28:35,280

about seven seconds to fully close the

3718

02:28:39,510 --> 02:28:37,760

hatch door and so not just practicing

3719

02:28:41,910 --> 02:28:39,520

how to open the hatch and close it they

3720

02:28:44,070 --> 02:28:41,920

can also practice attaching seals and

3721

02:28:45,670 --> 02:28:44,080

covers to the hatchway there's also a

3722

02:28:47,030 --> 02:28:45,680

window here that you can look through

3723

02:28:49,030 --> 02:28:47,040

out of the forward part of dragon and

3724

02:28:50,790 --> 02:28:49,040

there's a pressure equalization valve

3725

02:28:52,230 --> 02:28:50,800

that can be used to manually equalize

3726

02:28:53,429 --> 02:28:52,240

pressure between dragon and the space

3727

02:28:55,750 --> 02:28:53,439

station

3728

02:28:58,550 --> 02:28:55,760

yeah and this is just one of the many

3729

02:29:01,110 --> 02:28:58,560

components that our teams here get to do

3730

02:29:02,550 --> 02:29:01,120

and be able to train the crew on so if

3731

02:29:05,070 --> 02:29:02,560

you're interested in any of the work

3732

02:29:08,550 --> 02:29:05,080

here at spacex please take a look at

3733

02:29:11,110 --> 02:29:08,560

spacex.com jobs and check it out

3734

02:29:12,710 --> 02:29:11,120

now we'll send it back to kennedy uh

3735

02:29:14,469 --> 02:29:12,720

how's it going over there daryl all

3736

02:29:16,469 --> 02:29:14,479

right it's going great uh jessie thank

3737

02:29:18,309 --> 02:29:16,479

you both for that uh little

3738

02:29:20,309 --> 02:29:18,319

show-and-tell there of the hatch megan

3739

02:29:22,070 --> 02:29:20,319

you were familiar with that absolutely

3740

02:29:23,270 --> 02:29:22,080

that was one of the training items that

3741

02:29:24,950 --> 02:29:23,280

we would use when we would go out to

3742

02:29:26,550 --> 02:29:24,960

hawthorne to make sure we understood how

3743

02:29:28,389 --> 02:29:26,560

that mechanism worked weren't you saying

3744

02:29:29,670 --> 02:29:28,399

that you did it faster

3745

02:29:30,870 --> 02:29:29,680

a little bit maybe a little bit faster

3746

02:29:32,389 --> 02:29:30,880

yeah

3747

02:29:34,309 --> 02:29:32,399

all right we're currently t minus one

3748

02:29:36,790 --> 02:29:34,319

hour and 24 minutes and counting until

3749

02:29:38,870 --> 02:29:36,800

crew dragon flies its next four-person

3750

02:29:40,870 --> 02:29:38,880

crew to the international space station

3751

02:29:43,429 --> 02:29:40,880

with the astronauts that you see

3752

02:29:45,750 --> 02:29:43,439

uh they're inside that spacecraft right

3753

02:29:47,990 --> 02:29:45,760

there commander chell lingard pilot bob

3754

02:29:49,670 --> 02:29:48,000

hines and mission specialist jessica

3755

02:29:51,670 --> 02:29:49,680

watkins and samantha christopher

3756

02:29:53,510 --> 02:29:51,680

ferretti

3757

02:29:57,429 --> 02:29:53,520

we are getting ready to do the launch

3758

02:30:01,270 --> 02:29:59,030

we've had the common leak checks those

3759

02:30:03,510 --> 02:30:01,280

were successful we closed the hatch we

3760

02:30:07,110 --> 02:30:03,520

got a secure seal on that got that

3761

02:30:10,710 --> 02:30:08,950

and then we also

3762

02:30:12,630 --> 02:30:10,720

have started begun started to begin

3763

02:30:14,710 --> 02:30:12,640

those launch escape system and

3764

02:30:16,150 --> 02:30:14,720

communication checks

3765

02:30:18,389 --> 02:30:16,160

that's all conducted by the falcon

3766

02:30:19,990 --> 02:30:18,399

launch team

3767

02:30:21,349 --> 02:30:20,000

these checkouts are a standard part of

3768

02:30:22,870 --> 02:30:21,359

the launch countdown and they're

3769

02:30:25,510 --> 02:30:22,880

critical to make sure everything is in

3770

02:30:30,469 --> 02:30:25,520

working order before arming that launch

3771

02:30:33,910 --> 02:30:31,990

the launch escape system of course

3772

02:30:37,349 --> 02:30:33,920

critical

3773

02:30:40,389 --> 02:30:37,359

to the astronauts inside because this

3774

02:30:42,469 --> 02:30:40,399

once the crew leaves is the only way to

3775

02:30:43,349 --> 02:30:42,479

get off the pad if something were to go

3776

02:30:44,790 --> 02:30:43,359

awry

3777

02:30:46,469 --> 02:30:44,800

that's right it's one of the in my

3778

02:30:48,790 --> 02:30:46,479

opinion one of the best features about

3779

02:30:51,910 --> 02:30:48,800

this transportation system is that you

3780

02:30:53,670 --> 02:30:51,920

have a way to get the crew safely away

3781

02:30:55,429 --> 02:30:53,680

from a rocket that might be experiencing

3782

02:30:57,429 --> 02:30:55,439

an off nominal condition and that

3783

02:30:59,270 --> 02:30:57,439

capability exists from you know before

3784

02:31:01,349 --> 02:30:59,280

you start the propellant load you know

3785

02:31:02,950 --> 02:31:01,359

all the way into orbit and so it's it's

3786

02:31:05,190 --> 02:31:02,960

one of the great capabilities that this

3787

02:31:07,030 --> 02:31:05,200

vehicle brings and that launch escape

3788

02:31:09,190 --> 02:31:07,040

system is powered by

3789

02:31:11,830 --> 02:31:09,200

super draco engines that are capable of

3790

02:31:13,510 --> 02:31:11,840

moving dragon a half a mile in only

3791

02:31:15,349 --> 02:31:13,520

seven and a half seconds that's pretty

3792

02:31:18,870 --> 02:31:15,359

remarkable that is booking and i guess

3793

02:31:21,510 --> 02:31:18,880

equivalent to a peak velocity of 436

3794

02:31:23,750 --> 02:31:21,520

miles per hour i can imagine what that

3795

02:31:26,790 --> 02:31:23,760

feels like well fortunately we have not

3796

02:31:29,190 --> 02:31:26,800

had to experience that at this point but

3797

02:31:31,270 --> 02:31:29,200

if it were necessary to get away like i

3798

02:31:33,830 --> 02:31:31,280

said from a rocket that is um having an

3799

02:31:35,670 --> 02:31:33,840

off nominal event um that would sure be

3800

02:31:37,349 --> 02:31:35,680

how fast you'd want to be moving

3801

02:31:40,070 --> 02:31:37,359

exactly

3802

02:31:43,190 --> 02:31:40,080

whether it's on the ground

3803

02:31:45,349 --> 02:31:43,200

or traveling uphill that's right

3804

02:31:47,750 --> 02:31:45,359

you can manually trigger that system as

3805

02:31:49,270 --> 02:31:47,760

well right you can manually trigger that

3806

02:31:51,750 --> 02:31:49,280

system and it can be triggered in

3807

02:31:54,150 --> 02:31:51,760

response to a condition um the ground

3808

02:31:56,870 --> 02:31:54,160

would typically let you know uh if they

3809

02:31:58,710 --> 02:31:56,880

had time but of course things can happen

3810

02:32:04,790 --> 02:31:58,720

very quickly and so it needs to be able

3811

02:32:08,790 --> 02:32:07,030

crew 3 is scheduled to splash down next

3812

02:32:11,990 --> 02:32:08,800

week we talked a little bit about that

3813

02:32:15,190 --> 02:32:12,000

and uh megan will be there i will

3814

02:32:17,510 --> 02:32:15,200

megan mcarthur no but the ship that

3815

02:32:19,110 --> 02:32:17,520

megan was named after yes oh look at

3816

02:32:19,910 --> 02:32:19,120

that actually the ship was named after

3817

02:32:22,950 --> 02:32:19,920

you

3818

02:32:25,190 --> 02:32:22,960

the spacex's seafaring vessel

3819

02:32:27,910 --> 02:32:25,200

that will be used to recover crew 3 and

3820

02:32:30,070 --> 02:32:27,920

the dragon capsule was renamed after our

3821

02:32:32,070 --> 02:32:30,080

own megan macarthur

3822

02:32:35,110 --> 02:32:32,080

who flew aboard dragon of course on crew

3823

02:32:37,429 --> 02:32:35,120

2 and this is the ship beautiful inside

3824

02:32:39,429 --> 02:32:37,439

previously it was named go navigator

3825

02:32:41,910 --> 02:32:39,439

spacex renamed the

3826

02:32:43,910 --> 02:32:41,920

uh ship megan as well they have another

3827

02:32:45,910 --> 02:32:43,920

ship they renamed it shannon in honor of

3828

02:32:47,830 --> 02:32:45,920

shannon walker the first woman to fly on

3829

02:32:50,469 --> 02:32:47,840

crew dragon look megan your name look at

3830

02:32:52,870 --> 02:32:50,479

that on the life on the life preserver

3831

02:32:54,870 --> 02:32:52,880

that's that's fantastic what an honor um

3832

02:32:56,950 --> 02:32:54,880

i have not seen it in person yet of

3833

02:32:58,630 --> 02:32:56,960

course i have heard about it and that i

3834

02:33:00,630 --> 02:32:58,640

feel like that's a real honor it's funny

3835

02:33:02,550 --> 02:33:00,640

to me as an oceanographer that i flew in

3836

02:33:04,790 --> 02:33:02,560

space and that's what uh got a ship

3837

02:33:06,469 --> 02:33:04,800

named after me for doing but it's a

3838

02:33:08,469 --> 02:33:06,479

tremendous honor and i'm really happy to

3839

02:33:10,309 --> 02:33:08,479

be just a little part of that history

3840

02:33:12,070 --> 02:33:10,319

and hey listen the good ship megan

3841

02:33:14,070 --> 02:33:12,080

already picked up a crew

3842

02:33:15,990 --> 02:33:14,080

they uh they took the ship out there and

3843

02:33:17,110 --> 02:33:16,000

uh picked up the axiom one crew which

3844

02:33:18,950 --> 02:33:17,120

landed just off the coast of

3845

02:33:20,550 --> 02:33:18,960

jacksonville so already hard it was

3846

02:33:22,389 --> 02:33:20,560

already an experienced ship that's

3847

02:33:23,830 --> 02:33:22,399

awesome yep well hopefully you get to

3848

02:33:25,670 --> 02:33:23,840

see it and get a selfie with it

3849

02:33:27,830 --> 02:33:25,680

definitely that's on my list

3850

02:33:31,510 --> 02:33:27,840

speaking of history making astronauts we

3851

02:33:33,110 --> 02:33:31,520

now have a special message megan from

3852

02:33:34,950 --> 02:33:33,120

one of the astronauts who flew crew

3853

02:33:37,030 --> 02:33:34,960

dragons first test flight and the

3854

02:33:39,670 --> 02:33:37,040

message is for our guest host megan

3855

02:33:43,030 --> 02:33:39,680

macarthur and for the four astronauts of

3856

02:33:45,429 --> 02:33:43,040

crew four take a listen all right

3857

02:33:47,030 --> 02:33:45,439

howdy megan it's your husband bob

3858

02:33:48,550 --> 02:33:47,040

i didn't want you to miss the melodious

3859

02:33:51,030 --> 02:33:48,560

sound of my voice while you were down in

3860

02:33:52,790 --> 02:33:51,040

florida giving commentary for crew 4.

3861

02:33:54,070 --> 02:33:52,800

i did want to wish you all the best and

3862

02:33:55,830 --> 02:33:54,080

let you know that theo and i are

3863

02:33:57,830 --> 02:33:55,840

thinking of you and really looking

3864

02:34:00,150 --> 02:33:57,840

forward to reliving both the crew 4

3865

02:34:01,990 --> 02:34:00,160

launch and watching the crew 3 splash

3866

02:34:03,270 --> 02:34:02,000

down together as a family when you

3867

02:34:04,550 --> 02:34:03,280

return

3868

02:34:07,030 --> 02:34:04,560

for crew 4

3869

02:34:08,790 --> 02:34:07,040

chell bob jessica and samantha i wish

3870

02:34:10,550 --> 02:34:08,800

you all the best i know that you've

3871

02:34:12,630 --> 02:34:10,560

trained really hard in preparation for

3872

02:34:14,950 --> 02:34:12,640

this mission and i'm expecting great

3873

02:34:17,429 --> 02:34:14,960

things from you all one while you're on

3874

02:34:19,349 --> 02:34:17,439

board i would give you one piece of

3875

02:34:20,790 --> 02:34:19,359

advice and that's to really enjoy that

3876
02:34:22,550 --> 02:34:20,800
final meal and crew quarters that you

3877
02:34:25,270 --> 02:34:22,560
get prior to heading out to the vehicle

3878
02:34:26,870 --> 02:34:25,280
to strap on and launch into space doug

3879
02:34:28,389 --> 02:34:26,880
and i really enjoyed ours and i'm

3880
02:34:30,469 --> 02:34:28,399
looking forward to hearing a little bit

3881
02:34:32,710 --> 02:34:30,479
about what you selected to eat prior to

3882
02:34:34,469 --> 02:34:32,720
strapping on a rocket ship

3883
02:34:36,550 --> 02:34:34,479
you know for me it's hard to believe

3884
02:34:38,150 --> 02:34:36,560
that it's been nearly two years since i

3885
02:34:40,150 --> 02:34:38,160
launched on the demo 2 mission to the

3886
02:34:41,990 --> 02:34:40,160
international space station and had the

3887
02:34:43,990 --> 02:34:42,000
opportunity to stay on board for just a

3888
02:34:45,750 --> 02:34:44,000

few short months

3889

02:34:47,670 --> 02:34:45,760

it almost seems surreal

3890

02:34:49,110 --> 02:34:47,680

but i'm reminded every day by the great

3891

02:34:50,710 --> 02:34:49,120

accomplishments that i see with the

3892

02:34:53,110 --> 02:34:50,720

crews onboard the international space

3893

02:34:55,349 --> 02:34:53,120

station that uh we achieved something

3894

02:34:57,190 --> 02:34:55,359

that it is real and i'm just really

3895

02:34:59,670 --> 02:34:57,200

looking forward to seeing what you guys

3896

02:35:04,309 --> 02:34:59,680

crew 4 accomplish while you're on orbit

3897

02:35:07,190 --> 02:35:06,309

bye megan

3898

02:35:08,950 --> 02:35:07,200

wow

3899

02:35:09,670 --> 02:35:08,960

that's a great message thank you so much

3900

02:35:12,790 --> 02:35:09,680

for

3901
02:35:14,070 --> 02:35:12,800
awesome that's right we were looking

3902
02:35:16,150 --> 02:35:14,080
forward to this moment of course that

3903
02:35:19,270 --> 02:35:16,160
was bob benkin megan's husband and

3904
02:35:21,990 --> 02:35:19,280
history-making astronaut from demo2 uh

3905
02:35:24,630 --> 02:35:22,000
there with a a nice message for you and

3906
02:35:25,670 --> 02:35:24,640
for crew four yes the funniest part was

3907
02:35:27,349 --> 02:35:25,680
when he said i know you missed the

3908
02:35:28,790 --> 02:35:27,359
melodious sound the melodious sound of

3909
02:35:30,870 --> 02:35:28,800
my voice yes

3910
02:35:32,389 --> 02:35:30,880
um people often ask me you know since i

3911
02:35:34,950 --> 02:35:32,399
flew on the same vehicle in the same

3912
02:35:36,309 --> 02:35:34,960
seat after bob in that uh crew dragon

3913
02:35:37,750 --> 02:35:36,319

endeavour you know did he leave

3914

02:35:39,270 --> 02:35:37,760

something for you on the spaceship did

3915

02:35:40,710 --> 02:35:39,280

he leave something for you

3916

02:35:42,550 --> 02:35:40,720

on the space station and what i like to

3917

02:35:44,469 --> 02:35:42,560

tell people is he left me a fully

3918

02:35:45,830 --> 02:35:44,479

functioning safe spacecraft to get me to

3919

02:35:47,510 --> 02:35:45,840

space and home again and there's really

3920

02:35:48,790 --> 02:35:47,520

no finer gift than that when you're in

3921

02:35:52,070 --> 02:35:48,800

the space flight business i would

3922

02:35:56,790 --> 02:35:54,550

let's now join uh megan cruz who is with

3923

02:35:58,389 --> 02:35:56,800

phil mcallister he is the director of

3924

02:36:00,710 --> 02:35:58,399

the commercial space flight division at

3925

02:36:02,070 --> 02:36:00,720

nasa headquarters you all take it away

3926

02:36:04,070 --> 02:36:02,080

that's right phil mcallister thank you

3927

02:36:05,910 --> 02:36:04,080

so much for being here today thank you

3928

02:36:07,670 --> 02:36:05,920

so talk to me about this being the

3929

02:36:09,429 --> 02:36:07,680

fourth crew rotational flight to the

3930

02:36:11,590 --> 02:36:09,439

international space station what kind of

3931

02:36:13,510 --> 02:36:11,600

milestone does this represent

3932

02:36:15,910 --> 02:36:13,520

well it represents that we've been

3933

02:36:18,389 --> 02:36:15,920

working on these vehicles for it was 10

3934

02:36:19,990 --> 02:36:18,399

years in development so now after all

3935

02:36:21,830 --> 02:36:20,000

that development we're actually flying

3936

02:36:24,230 --> 02:36:21,840

and it's very gratifying and to have

3937

02:36:26,070 --> 02:36:24,240

four missions within two years it's

3938

02:36:28,710 --> 02:36:26,080

really kind of amazing and it's really

3939

02:36:30,150 --> 02:36:28,720

picked up the pace and uh it's just what

3940

02:36:32,070 --> 02:36:30,160

we were working for yeah you know

3941

02:36:33,910 --> 02:36:32,080

reliable or regular cadence it's really

3942

02:36:36,630 --> 02:36:33,920

amazing to see that again this program

3943

02:36:38,070 --> 02:36:36,640

has only been around for about 10 years

3944

02:36:40,309 --> 02:36:38,080

so then you know just a few weeks ago we

3945

02:36:41,910 --> 02:36:40,319

also saw axiom 1 launch from the same

3946

02:36:43,429 --> 02:36:41,920

launch pad that crew 4 is about to

3947

02:36:45,190 --> 02:36:43,439

launch from you know the first all

3948

02:36:47,990 --> 02:36:45,200

private crew to the international space

3949

02:36:50,630 --> 02:36:48,000

station is that the future are we going

3950

02:36:52,550 --> 02:36:50,640

to see more private commercial missions

3951

02:36:55,030 --> 02:36:52,560

maybe commercial space stations

3952

02:36:56,469 --> 02:36:55,040

absolutely i mean that is our strategy

3953

02:36:57,990 --> 02:36:56,479

it was our strategy when we started

3954

02:36:59,750 --> 02:36:58,000

commercial crew that we wanted to be one

3955

02:37:01,270 --> 02:36:59,760

of many customers and to see that

3956

02:37:03,349 --> 02:37:01,280

actually come to fruition because there

3957

02:37:04,950 --> 02:37:03,359

was a lot of skepticism about that in

3958

02:37:06,630 --> 02:37:04,960

the very early days we didn't really

3959

02:37:08,710 --> 02:37:06,640

know how it was going to play out and

3960

02:37:10,950 --> 02:37:08,720

now it seems pretty clear the demand for

3961

02:37:13,110 --> 02:37:10,960

human space transportation is very

3962

02:37:16,469 --> 02:37:13,120

strong and a lot of people

3963

02:37:18,389 --> 02:37:16,479

are going to be able to experience this

3964

02:37:20,710 --> 02:37:18,399

more and more which is kind of just what

3965

02:37:22,790 --> 02:37:20,720

we were doing yeah exactly and what is

3966

02:37:24,630 --> 02:37:22,800

the importance of fostering these

3967

02:37:26,309 --> 02:37:24,640

commercial efforts in low earth orbit

3968

02:37:27,670 --> 02:37:26,319

you know nasa has so many other goals

3969

02:37:29,910 --> 02:37:27,680

but why is it important to still

3970

02:37:31,670 --> 02:37:29,920

maintain this particular presence again

3971

02:37:33,349 --> 02:37:31,680

in low earth orbit i think you said it

3972

02:37:35,349 --> 02:37:33,359

is because nasa does have all these

3973

02:37:36,550 --> 02:37:35,359

goals if we maintained

3974

02:37:38,550 --> 02:37:36,560

all the

3975

02:37:41,030 --> 02:37:38,560

the footprint of what we had done in the

3976

02:37:42,950 --> 02:37:41,040

past we won't be able to go as far in

3977

02:37:45,030 --> 02:37:42,960

the future and far out into the solar

3978

02:37:46,870 --> 02:37:45,040

system as we want so i think it's time

3979

02:37:48,790 --> 02:37:46,880

for low earth orbit that has now a

3980

02:37:50,309 --> 02:37:48,800

little bit more routine of a mission

3981

02:37:52,070 --> 02:37:50,319

it's time to turn that over to the

3982

02:37:54,389 --> 02:37:52,080

private sector they've shown the u.s

3983

02:37:55,990 --> 02:37:54,399

aerospace industry has shown both

3984

02:37:58,309 --> 02:37:56,000

technically and financially that they

3985

02:38:00,230 --> 02:37:58,319

are capable with nasa's help of doing

3986

02:38:02,550 --> 02:38:00,240

that mission and so that we can direct

3987

02:38:04,790 --> 02:38:02,560

our miss our resources towards the moon

3988

02:38:07,270 --> 02:38:04,800

and mars can you remember a busier time

3989

02:38:08,630 --> 02:38:07,280

on the space guys i really cannot you

3990

02:38:10,469 --> 02:38:08,640

know it's interesting i was here for the

3991

02:38:11,670 --> 02:38:10,479

last shuttle mission and i remember

3992

02:38:13,349 --> 02:38:11,680

being at the hotel and they were all

3993

02:38:14,309 --> 02:38:13,359

like oh no this is the last shuttle

3994

02:38:17,110 --> 02:38:14,319

mission i don't know if we're going to

3995

02:38:19,030 --> 02:38:17,120

be able to to keep going and now there's

3996

02:38:19,750 --> 02:38:19,040

five more hotels and you still can't get

3997

02:39:00,230 --> 02:38:19,760

a

3998

02:39:02,630 --> 02:39:00,240

now we're doing it lots of juggling but

3999

02:39:04,550 --> 02:39:02,640

very worthwhile very rewarding yes when

4000

02:39:05,750 --> 02:39:04,560

we complain about it we were like what

4001
02:39:07,510 --> 02:39:05,760
are we complaining about this is

4002
02:39:08,950 --> 02:39:07,520
actually our job so it's nice to be

4003
02:39:10,070 --> 02:39:08,960
flying phil thank you so much i really

4004
02:39:11,590 --> 02:39:10,080
appreciate you being here i hope you

4005
02:39:13,030 --> 02:39:11,600
enjoyed today's launch thank you all

4006
02:39:17,590 --> 02:39:13,040
right let's go back to hawthorne for

4007
02:39:24,150 --> 02:39:21,270
thanks megan now we're just at t minus

4008
02:39:26,230 --> 02:39:24,160
one hour and just under 15 minutes away

4009
02:39:28,550 --> 02:39:26,240
from launch and it just gets more and

4010
02:39:30,950 --> 02:39:28,560
more exciting as we approach that t-zero

4011
02:39:32,710 --> 02:39:30,960
now we've been able to watch the crew

4012
02:39:34,710 --> 02:39:32,720
ingress the dragon vehicle they're

4013
02:39:35,990 --> 02:39:34,720

already inside and there you can see on

4014

02:39:37,590 --> 02:39:36,000

your screen

4015

02:39:39,750 --> 02:39:37,600

they were helped out by our closeout

4016

02:39:41,830 --> 02:39:39,760

team uh the closeout team helped to

4017

02:39:44,150 --> 02:39:41,840

attach their umbilicals which provide

4018

02:39:47,110 --> 02:39:44,160

breathing air and calms to dragon uh

4019

02:39:50,070 --> 02:39:47,120

they also performed uh suit leak checks

4020

02:39:52,550 --> 02:39:50,080

uh as well as those uh com checks with

4021

02:39:54,389 --> 02:39:52,560

the core and launch director as well

4022

02:39:56,150 --> 02:39:54,399

yeah and after the suit league checks

4023

02:39:58,150 --> 02:39:56,160

were complete we got the hatch closed

4024

02:40:00,469 --> 02:39:58,160

and the closeout team was able to

4025

02:40:02,070 --> 02:40:00,479

confirm that we got through a good side

4026

02:40:03,910 --> 02:40:02,080

hatch leak check so that was another

4027

02:40:05,990 --> 02:40:03,920

really important milestone there were

4028

02:40:07,670 --> 02:40:06,000

also some communication checks with some

4029

02:40:09,030 --> 02:40:07,680

of the key members in the falcon 9

4030

02:40:11,190 --> 02:40:09,040

launch team

4031

02:40:12,870 --> 02:40:11,200

but coming up the closeout team is going

4032

02:40:14,870 --> 02:40:12,880

to get ready to depart so we're going to

4033

02:40:16,309 --> 02:40:14,880

see them move off of the out of the

4034

02:40:18,070 --> 02:40:16,319

white room off the crew arm and they're

4035

02:40:20,070 --> 02:40:18,080

going to leave the area and after

4036

02:40:22,630 --> 02:40:20,080

they're gone the only people left at

4037

02:40:24,389 --> 02:40:22,640

that pet area are the astronauts uh the

4038

02:40:25,910 --> 02:40:24,399

final weather checks have just kicked

4039

02:40:28,309 --> 02:40:25,920

off releasing a couple of weather

4040

02:40:30,309 --> 02:40:28,319

balloons the good news is all of the

4041

02:40:32,070 --> 02:40:30,319

weather has continued to look great for

4042

02:40:36,230 --> 02:40:32,080

launch closeout team has departed the

4043

02:40:40,550 --> 02:40:38,870

freedom copies thanks

4044

02:40:42,309 --> 02:40:40,560

and they're the court giving that update

4045

02:40:43,510 --> 02:40:42,319

so the the closeout team is the part of

4046

02:40:45,670 --> 02:40:43,520

the crew arm they're going to get in

4047

02:40:47,269 --> 02:40:45,680

cars and drive away then it's just crew

4048

02:40:48,710 --> 02:40:47,279

4 on the pad and that's it and then

4049

02:40:50,469 --> 02:40:48,720

we're going to get closer to launch

4050

02:40:51,910 --> 02:40:50,479

again weather's continued to look

4051
02:40:54,150 --> 02:40:51,920
fantastic

4052
02:40:56,309 --> 02:40:54,160
very low probability of violation at the

4053
02:40:57,990 --> 02:40:56,319
launch site and then our ascent corridor

4054
02:40:59,590 --> 02:40:58,000
weather just all the way up the eastern

4055
02:41:01,830 --> 02:40:59,600
seaboard of the u.s

4056
02:41:04,070 --> 02:41:01,840
has continued to trend all in the right

4057
02:41:07,830 --> 02:41:04,080
direction so we're not looking at any

4058
02:41:13,750 --> 02:41:10,389
and great news on that weather

4059
02:41:15,510 --> 02:41:13,760
we will also do a final go no go pull

4060
02:41:17,830 --> 02:41:15,520
but before we get to that the various

4061
02:41:19,910 --> 02:41:17,840
teams that both nasa and spacex will do

4062
02:41:22,389 --> 02:41:19,920
an internal go pull making sure that

4063
02:41:25,030 --> 02:41:22,399

conditions are right with falcon 9 the

4064

02:41:27,349 --> 02:41:25,040

dragon the crew the range and the space

4065

02:41:28,309 --> 02:41:27,359

station before we before the final go is

4066

02:41:30,870 --> 02:41:28,319

given

4067

02:41:32,710 --> 02:41:30,880

so now let's check back in with houston

4068

02:41:34,309 --> 02:41:32,720

for a status update on the team

4069

02:41:36,230 --> 02:41:34,319

supporting the space station on the

4070

02:41:41,429 --> 02:41:36,240

readiness for launch chelsea how's it

4071

02:41:45,750 --> 02:41:43,349

hey thanks jesse the team here in

4072

02:41:47,830 --> 02:41:45,760

mission control houston has pulled that

4073

02:41:49,429 --> 02:41:47,840

they are go for launch earlier the

4074

02:41:52,070 --> 02:41:49,439

international space station and its

4075

02:41:54,389 --> 02:41:52,080

onboard crew are ready to for the crew

4076

02:41:56,469 --> 02:41:54,399

for astronauts to lift off

4077

02:41:57,990 --> 02:41:56,479

when flight director anthony varya told

4078

02:41:59,349 --> 02:41:58,000

his team he was asking the flight

4079

02:42:01,269 --> 02:41:59,359

controllers who all work on the

4080

02:42:03,349 --> 02:42:01,279

different key systems on board the space

4081

02:42:05,429 --> 02:42:03,359

station that their focus areas were

4082

02:42:07,510 --> 02:42:05,439

online and working properly this

4083

02:42:09,670 --> 02:42:07,520

includes life support systems proper

4084

02:42:11,030 --> 02:42:09,680

communications links computers that

4085

02:42:13,269 --> 02:42:11,040

allow us to command the station's

4086

02:42:15,429 --> 02:42:13,279

onboard subsystems and our ability to

4087

02:42:17,830 --> 02:42:15,439

control and maneuver the space station

4088

02:42:19,510 --> 02:42:17,840

all of those are fully functional

4089

02:42:20,870 --> 02:42:19,520

the crew in orbit is getting out of

4090

02:42:22,550 --> 02:42:20,880

their sleep period now they're just

4091

02:42:23,670 --> 02:42:22,560

starting to wake up

4092

02:42:26,070 --> 02:42:23,680

and

4093

02:42:28,469 --> 02:42:26,080

when the crew 4 launches this crew is

4094

02:42:29,590 --> 02:42:28,479

actually going to be flying over romania

4095

02:42:31,910 --> 02:42:29,600

that's where the space station will be

4096

02:42:33,910 --> 02:42:31,920

at the time of launch so how about that

4097

02:42:35,830 --> 02:42:33,920

um but as they're getting into their

4098

02:42:36,790 --> 02:42:35,840

morning routine now at the time of

4099

02:42:37,830 --> 02:42:36,800

launch

4100

02:42:40,309 --> 02:42:37,840

they're going to make sure that they're

4101
02:42:41,750 --> 02:42:40,319
refreshed and ready to receive the crew

4102
02:42:43,429 --> 02:42:41,760
but here in mission control houston

4103
02:42:45,190 --> 02:42:43,439
we'll continue monitoring the mission as

4104
02:42:47,110 --> 02:42:45,200
we check off milestones for today's

4105
02:42:48,950 --> 02:42:47,120
flight in the meantime i'll send it back

4106
02:42:53,670 --> 02:42:48,960
to hawthorne the international space

4107
02:42:57,110 --> 02:42:55,590
hey thanks chelsea so the crew 3

4108
02:42:58,870 --> 02:42:57,120
astronauts are currently on board the

4109
02:43:01,429 --> 02:42:58,880
space station they've spent nearly six

4110
02:43:04,150 --> 02:43:01,439
months conducting scientific research in

4111
02:43:05,990 --> 02:43:04,160
a myriad of areas like material science

4112
02:43:07,670 --> 02:43:06,000
developing new health technologies

4113
02:43:09,590 --> 02:43:07,680

working on plant science growing some

4114

02:43:12,070 --> 02:43:09,600

pretty exciting plants on board the

4115

02:43:14,309 --> 02:43:12,080

space station microgravity just a lot of

4116

02:43:16,870 --> 02:43:14,319

different sciences we prepare for human

4117

02:43:19,190 --> 02:43:16,880

exploration beyond low earth orbit and

4118

02:43:21,510 --> 02:43:19,200

also to deliver benefits to us back here

4119

02:43:23,110 --> 02:43:21,520

on earth and all of that research just

4120

02:43:25,030 --> 02:43:23,120

lays the groundwork for that future

4121

02:43:26,710 --> 02:43:25,040

exploration that we're aiming towards to

4122

02:43:29,750 --> 02:43:26,720

the moon and mars starting with the

4123

02:43:32,309 --> 02:43:29,760

agency's artemis missions

4124

02:43:34,870 --> 02:43:32,319

yeah chary is the commander of the crew

4125

02:43:37,269 --> 02:43:34,880

3 crew dragon spacecraft and the crew 3

4126
02:43:39,510 --> 02:43:37,279
mission he is responsible for all phases

4127
02:43:42,150 --> 02:43:39,520
of flight from launch to re-entry he's

4128
02:43:44,309 --> 02:43:42,160
currently serving as an expedition 67

4129
02:43:46,550 --> 02:43:44,319
flight engineer aboard the station the

4130
02:43:48,870 --> 02:43:46,560
crew 3 launch was the first space flight

4131
02:43:51,910 --> 02:43:48,880
for chari who was selected as an a nasa

4132
02:43:54,150 --> 02:43:51,920
astronaut candidate in 2017. now he was

4133
02:43:56,309 --> 02:43:54,160
born in milwaukee but considers cedar

4134
02:43:58,550 --> 02:43:56,319
falls iowa his hometown

4135
02:44:00,309 --> 02:43:58,560
and also on board was nasa astronaut tom

4136
02:44:02,150 --> 02:44:00,319
marshburn he's the pilot of the crew

4137
02:44:03,830 --> 02:44:02,160
dragon spacecraft essentially the second

4138
02:44:05,910 --> 02:44:03,840

in command for the mission while they're

4139

02:44:08,469 --> 02:44:05,920

in free flight he's responsible for the

4140

02:44:09,910 --> 02:44:08,479

spacecraft systems and its performance

4141

02:44:13,349 --> 02:44:09,920

right now though on board the station

4142

02:44:15,510 --> 02:44:13,359

he's the commander of expedition 67

4143

02:44:17,269 --> 02:44:15,520

and marshburn a native of statesville

4144

02:44:20,630 --> 02:44:17,279

north carolina became an astronaut back

4145

02:44:22,710 --> 02:44:20,640

in 2004 crew 3 was his third visit to

4146

02:44:26,230 --> 02:44:22,720

the space station and his second long

4147

02:44:28,389 --> 02:44:26,240

duration stay on the laboratory

4148

02:44:30,710 --> 02:44:28,399

baron was selected as an astronaut

4149

02:44:33,429 --> 02:44:30,720

candidate in 2017 and is a mission

4150

02:44:35,110 --> 02:44:33,439

specialist for crew 3. she works closely

4151
02:44:37,510 --> 02:44:35,120
with the commander and pilot to monitor

4152
02:44:39,429 --> 02:44:37,520
a spacecraft during the dynamic launch

4153
02:44:41,349 --> 02:44:39,439
and re-entry phases of flight she's

4154
02:44:43,990 --> 02:44:41,359
currently serving as a flight engineer

4155
02:44:46,389 --> 02:44:44,000
for expedition 67 aboard the station

4156
02:44:48,070 --> 02:44:46,399
baron was born in pocatello idaho but

4157
02:44:51,110 --> 02:44:48,080
considers richland washington her

4158
02:44:53,349 --> 02:44:51,120
hometown and rounding out crew 3 was

4159
02:44:55,990 --> 02:44:53,359
matthias maurer who was also a mission

4160
02:44:57,750 --> 02:44:56,000
specialist for the crew 3 mission and

4161
02:44:59,750 --> 02:44:57,760
again working with commander and pilot

4162
02:45:01,670 --> 02:44:59,760
to monitor the dragon spacecraft during

4163
02:45:04,790 --> 02:45:01,680

all of those different dynamic phases

4164

02:45:06,150 --> 02:45:04,800

launch re-entry docking and undocking

4165

02:45:09,590 --> 02:45:06,160

he's also a flight engineer on

4166

02:45:11,510 --> 02:45:09,600

expedition 67 and like raja char and

4167

02:45:13,910 --> 02:45:11,520

caleb baron this was his first trip to

4168

02:45:16,150 --> 02:45:13,920

space and he was from vendel in the

4169

02:45:18,469 --> 02:45:16,160

german state of starland so that

4170

02:45:20,950 --> 02:45:18,479

four-person crew is currently on board

4171

02:45:23,190 --> 02:45:20,960

they're preparing for crew 4's arrival

4172

02:45:25,190 --> 02:45:23,200

but their return back to earth is just

4173

02:45:27,510 --> 02:45:25,200

days away assuming we get an on-time

4174

02:45:29,110 --> 02:45:27,520

launch today so looking forward to

4175

02:45:31,349 --> 02:45:29,120

seeing all of them on board the space

4176

02:45:33,190 --> 02:45:31,359

station together let's get back to the

4177

02:45:35,269 --> 02:45:33,200

countdown now we'll head over to daryl

4178

02:45:37,269 --> 02:45:35,279

at the kennedy space center daryl all

4179

02:45:39,269 --> 02:45:37,279

right thank you very much dan and jesse

4180

02:45:40,790 --> 02:45:39,279

and if you're just now joining us

4181

02:45:43,670 --> 02:45:40,800

welcome to coverage for the mission

4182

02:45:45,030 --> 02:45:43,680

known as crew 4 nasa and spacex's fourth

4183

02:45:46,870 --> 02:45:45,040

flight of astronauts to the

4184

02:45:49,590 --> 02:45:46,880

international space station we are

4185

02:45:52,389 --> 02:45:49,600

currently at t minus one hour and eight

4186

02:45:55,750 --> 02:45:52,399

minutes until liftoff liftoff time still

4187

02:45:59,269 --> 02:45:55,760

holding megan for five i'm sorry 352

4188

02:46:00,950 --> 02:45:59,279

eastern time 352 and 55 seconds that's

4189

02:46:03,030 --> 02:46:00,960

where the five is coming from and we're

4190

02:46:05,269 --> 02:46:03,040

tracking no issues with falcon 9 or

4191

02:46:07,429 --> 02:46:05,279

dragon the range is green weather is

4192

02:46:10,230 --> 02:46:07,439

cooperating and over the last three

4193

02:46:12,469 --> 02:46:10,240

hours our crew of joe lindgren bob hines

4194

02:46:15,269 --> 02:46:12,479

jessica watkins and samantha christopher

4195

02:46:17,349 --> 02:46:15,279

have donned their spacex space suits in

4196

02:46:18,870 --> 02:46:17,359

the historic crew quarters suit up room

4197

02:46:20,950 --> 02:46:18,880

then they walked out of the crew

4198

02:46:23,429 --> 02:46:20,960

quarters building as every nasa

4199

02:46:25,269 --> 02:46:23,439

astronaut has done since apollo 7.

4200

02:46:27,190 --> 02:46:25,279

then they were transported to the pad

4201

02:46:29,429 --> 02:46:27,200

where they climbed inside the spacex

4202

02:46:31,750 --> 02:46:29,439

crew dragon freedom and now we are

4203

02:46:34,309 --> 02:46:31,760

seeing them live on that rocket that you

4204

02:46:36,550 --> 02:46:34,319

see on your screen right there awaiting

4205

02:46:38,870 --> 02:46:36,560

liftoff

4206

02:46:39,990 --> 02:46:38,880

and so megan as they wait for this what

4207

02:46:41,910 --> 02:46:40,000

is the crew

4208

02:46:44,389 --> 02:46:41,920

doing in these moments right the

4209

02:46:46,230 --> 02:46:44,399

closeout crew is leaving and so it's

4210

02:46:48,309 --> 02:46:46,240

just the astronauts inside the

4211

02:46:49,910 --> 02:46:48,319

spacecraft yes you certainly realize as

4212

02:46:51,670 --> 02:46:49,920

that hatch closes and you get the call

4213

02:46:53,990 --> 02:46:51,680

that uh everyone's left the pad that

4214

02:46:54,950 --> 02:46:54,000

you're you're getting very very close to

4215

02:46:56,150 --> 02:46:54,960

launch

4216

02:46:57,590 --> 02:46:56,160

throughout the time and it is a

4217

02:46:59,030 --> 02:46:57,600

significant amount of time that they're

4218

02:47:00,870 --> 02:46:59,040

in there and waiting in the beginning

4219

02:47:02,950 --> 02:47:00,880

you know you first arrive you want to

4220

02:47:04,950 --> 02:47:02,960

make sure that if you if you had to do

4221

02:47:07,190 --> 02:47:04,960

an emergency egress you know what all of

4222

02:47:08,710 --> 02:47:07,200

the functions are that you need to do

4223

02:47:10,710 --> 02:47:08,720

what are all of the equipment is and so

4224

02:47:12,309 --> 02:47:10,720

you take some time to be serious about

4225

02:47:14,389 --> 02:47:12,319

thinking through all of that you know

4226

02:47:15,510 --> 02:47:14,399

and as we go further and we approach the

4227

02:47:18,230 --> 02:47:15,520

propellant loading they're going to

4228

02:47:19,590 --> 02:47:18,240

again be very much focused on the tasks

4229

02:47:21,830 --> 02:47:19,600

at hand but in between there's quite a

4230

02:47:23,590 --> 02:47:21,840

lot of down time and so they'll be

4231

02:47:25,269 --> 02:47:23,600

entertaining each other telling stories

4232

02:47:26,790 --> 02:47:25,279

maybe they'll be playing some games the

4233

02:47:28,950 --> 02:47:26,800

few glimpses that we've had of them i've

4234

02:47:30,389 --> 02:47:28,960

seen some smiles on faces so i think

4235

02:47:32,790 --> 02:47:30,399

they're in there having fun getting

4236

02:47:34,950 --> 02:47:32,800

ready plenty of smiles from crew 4

4237

02:47:37,190 --> 02:47:34,960

indeed we've seen that and it's been

4238

02:47:39,269 --> 02:47:37,200

good to see over the next hour we will

4239

02:47:40,469 --> 02:47:39,279

conduct a series of polls to get ready

4240

02:47:42,790 --> 02:47:40,479

for launch

4241

02:47:44,630 --> 02:47:42,800

the crew will also arm the launch escape

4242

02:47:46,950 --> 02:47:44,640

system

4243

02:47:49,670 --> 02:47:46,960

and the fueling of the falcon 9 will

4244

02:47:51,349 --> 02:47:49,680

begin and that's a big moment

4245

02:47:54,550 --> 02:47:51,359

let's talk about today's flight launch

4246

02:47:56,710 --> 02:47:54,560

of course is set for 3 52 and 55 seconds

4247

02:47:58,630 --> 02:47:56,720

am eastern daylight time

4248

02:48:01,429 --> 02:47:58,640

this will include a 12-minute flight to

4249

02:48:03,030 --> 02:48:01,439

orbit and then a roughly 16-hour flight

4250

02:48:04,309 --> 02:48:03,040

to dock with the international space

4251
02:48:07,830 --> 02:48:04,319
station

4252
02:48:08,950 --> 02:48:07,840
at 8 15 p.m tonight eastern daylight

4253
02:48:10,710 --> 02:48:08,960
time

4254
02:48:13,269 --> 02:48:10,720
all in one day

4255
02:48:15,429 --> 02:48:13,279
yes it is a long day

4256
02:48:17,190 --> 02:48:15,439
you know when i think about them getting

4257
02:48:18,790 --> 02:48:17,200
ready to fly

4258
02:48:19,990 --> 02:48:18,800
i think about the story that i've heard

4259
02:48:22,710 --> 02:48:20,000
you tell

4260
02:48:24,389 --> 02:48:22,720
about that flight uphill you'd gotten

4261
02:48:26,230 --> 02:48:24,399
you know

4262
02:48:29,190 --> 02:48:26,240
past the tough part right you've lifted

4263
02:48:30,710 --> 02:48:29,200

off crew 2 is in space

4264

02:48:32,870 --> 02:48:30,720

and you felt like everything was okay

4265

02:48:34,710 --> 02:48:32,880

and then there was this

4266

02:48:36,630 --> 02:48:34,720

sudden alarm yes

4267

02:48:38,070 --> 02:48:36,640

you recount that story sure well

4268

02:48:40,070 --> 02:48:38,080

actually it was uh kind of you know

4269

02:48:42,150 --> 02:48:40,080

again a very long day you're exhausted

4270

02:48:43,910 --> 02:48:42,160

for a lot of reasons and it was at that

4271

02:48:46,150 --> 02:48:43,920

time our bedtime and so we've been given

4272

02:48:47,670 --> 02:48:46,160

the go to dress into our pajamas pull

4273

02:48:49,190 --> 02:48:47,680

out our sleeping bags and and basically

4274

02:48:50,870 --> 02:48:49,200

hunker down and try to get as much sleep

4275

02:48:53,750 --> 02:48:50,880

as you can before the rendezvous begins

4276

02:48:56,070 --> 02:48:53,760

the next day and um we got the call from

4277

02:48:57,269 --> 02:48:56,080

sarah our core to say hey we're tracking

4278

02:48:58,469 --> 02:48:57,279

an object

4279

02:48:59,910 --> 02:48:58,479

that's potentially going to get too

4280

02:49:01,670 --> 02:48:59,920

close to you we need you immediately

4281

02:49:04,070 --> 02:49:01,680

back in your suits and put everything

4282

02:49:05,510 --> 02:49:04,080

away you have i think it was 15 or 20

4283

02:49:07,429 --> 02:49:05,520

minutes and so

4284

02:49:08,950 --> 02:49:07,439

that was an immediate scramble to do

4285

02:49:10,950 --> 02:49:08,960

exactly what she had said there was no

4286

02:49:12,389 --> 02:49:10,960

time to really think about it we had to

4287

02:49:13,750 --> 02:49:12,399

just go right into the drill of

4288

02:49:17,110 --> 02:49:13,760

practicing those motions that we had

4289

02:49:19,110 --> 02:49:17,120

done of course um at home and

4290

02:49:21,190 --> 02:49:19,120

our awesome mission specialist aki and

4291

02:49:23,269 --> 02:49:21,200

tama got shane and i into our suits and

4292

02:49:25,269 --> 02:49:23,279

strapped into our seats and then got

4293

02:49:27,510 --> 02:49:25,279

themselves suited and then had to put

4294

02:49:29,910 --> 02:49:27,520

absolutely everything away every t-shirt

4295

02:49:31,510 --> 02:49:29,920

every sleeping bag every sock everything

4296

02:49:33,269 --> 02:49:31,520

and that was a tremendous amount of work

4297

02:49:35,110 --> 02:49:33,279

under time pressure and just as they got

4298

02:49:36,870 --> 02:49:35,120

the last you know zipper zipped and

4299

02:49:39,590 --> 02:49:36,880

buckled buckled we got the call that

4300

02:49:41,670 --> 02:49:39,600

said it was a false alarm and there was

4301

02:49:43,990 --> 02:49:41,680

not actually an object out there on a

4302

02:49:46,309 --> 02:49:44,000

trajectory with us so it did feel a lot

4303

02:49:47,670 --> 02:49:46,319

like the simulator that the sim soup had

4304

02:49:49,110 --> 02:49:47,680

just maybe seen

4305

02:49:50,870 --> 02:49:49,120

uh that we were

4306

02:49:52,230 --> 02:49:50,880

uh done with the task and was ready to

4307

02:49:53,750 --> 02:49:52,240

move on to the next thing but it was a

4308

02:49:55,429 --> 02:49:53,760

good it was a good practice it got our

4309

02:49:56,790 --> 02:49:55,439

hearts racing what an experience

4310

02:49:58,230 --> 02:49:56,800

thinking you might hit something in

4311

02:50:00,389 --> 02:49:58,240

space but actually it was a false alarm

4312

02:50:02,150 --> 02:50:00,399

that was something that was improperly

4313

02:50:04,070 --> 02:50:02,160

uh entered into the system there was

4314

02:50:05,750 --> 02:50:04,080

nothing there that's right but uh you

4315

02:50:07,349 --> 02:50:05,760

trained for that for that right and you

4316

02:50:09,190 --> 02:50:07,359

were ready for it beware thank you for

4317

02:50:11,590 --> 02:50:09,200

sharing for that sure all right let's

4318

02:50:13,429 --> 02:50:11,600

check in now with uh hawthorne and go

4319

02:50:17,910 --> 02:50:13,439

out to california for a status on both

4320

02:50:21,830 --> 02:50:19,830

thanks daryl we've had a smooth

4321

02:50:24,150 --> 02:50:21,840

countdown so far and the spacex team is

4322

02:50:25,110 --> 02:50:24,160

working no issues as the pace begins to

4323

02:50:27,910 --> 02:50:25,120

pick up

4324

02:50:30,230 --> 02:50:27,920

we heard that the crew had left

4325

02:50:33,030 --> 02:50:30,240

the pad and so right now it's just the

4326
02:50:35,110 --> 02:50:33,040
crew inside dragon for falcon 9 our

4327
02:50:37,110 --> 02:50:35,120
two-stage reusable rocket final

4328
02:50:39,750 --> 02:50:37,120
propulsion checkouts of the first and

4329
02:50:41,590 --> 02:50:39,760
second stages and the engine began

4330
02:50:43,990 --> 02:50:41,600
just a few minutes ago in preparation

4331
02:50:46,710 --> 02:50:44,000
for propellant loading now this involves

4332
02:50:49,830 --> 02:50:46,720
testing and cycling valves as well as

4333
02:50:52,469 --> 02:50:49,840
engine pneumatics

4334
02:50:53,830 --> 02:50:52,479
at the t minus 45 minute mark the team

4335
02:50:55,750 --> 02:50:53,840
will report their readiness for

4336
02:50:57,670 --> 02:50:55,760
propellant load with a final electronic

4337
02:51:00,469 --> 02:50:57,680
go no gold pull

4338
02:51:02,389 --> 02:51:00,479

now before we we can begin starting to

4339

02:51:04,790 --> 02:51:02,399

load propellants on falcon 9 we do have

4340

02:51:07,190 --> 02:51:04,800

a few more tasks to perform first we

4341

02:51:08,950 --> 02:51:07,200

need to retract the crew access arm away

4342

02:51:10,870 --> 02:51:08,960

from the dragon capsule

4343

02:51:13,030 --> 02:51:10,880

to its launch position that's going to

4344

02:51:15,670 --> 02:51:13,040

happen between the t minus 44 and the t

4345

02:51:17,910 --> 02:51:15,680

minus 42 minute mark with the arm out of

4346

02:51:19,830 --> 02:51:17,920

the way the launch escape system will be

4347

02:51:21,990 --> 02:51:19,840

armed and once these two events are

4348

02:51:23,910 --> 02:51:22,000

complete dragon will be ready for falcon

4349

02:51:25,990 --> 02:51:23,920

propellant loading

4350

02:51:28,309 --> 02:51:26,000

we'll also verify with the launch

4351
02:51:30,469 --> 02:51:28,319
weather officer that weather meets all

4352
02:51:32,230 --> 02:51:30,479
the constraints these include items such

4353
02:51:34,630 --> 02:51:32,240
as wind speed lightning and

4354
02:51:36,150 --> 02:51:34,640
precipitation we do expect acceptable

4355
02:51:38,150 --> 02:51:36,160
weather conditions for launch at both

4356
02:51:39,590 --> 02:51:38,160
the surface level and upper altitudes

4357
02:51:41,750 --> 02:51:39,600
though

4358
02:51:44,630 --> 02:51:41,760
range is currently clear for launch from

4359
02:51:46,309 --> 02:51:44,640
historic launch pad 39a worldwide

4360
02:51:48,710 --> 02:51:46,319
network of ground stations and the

4361
02:51:50,469 --> 02:51:48,720
tracking and data relay satellites are

4362
02:51:51,670 --> 02:51:50,479
ready to support dragon as it heads into

4363
02:51:53,590 --> 02:51:51,680

orbit

4364

02:51:57,030 --> 02:51:53,600

today we do have an instantaneous launch

4365

02:51:58,950 --> 02:51:57,040

window at 3 52 a.m eastern time once we

4366

02:52:01,990 --> 02:51:58,960

begin loading propellant there is no

4367

02:52:03,269 --> 02:52:02,000

opportunity to change d0 the timing for

4368

02:52:05,190 --> 02:52:03,279

dragon to rendezvous with the

4369

02:52:07,670 --> 02:52:05,200

international space station is very

4370

02:52:10,070 --> 02:52:07,680

precise down to the down to the second

4371

02:52:13,830 --> 02:52:10,080

so we do only get one chance at it today

4372

02:52:16,230 --> 02:52:13,840

the good news is uh we are uh at t minus

4373

02:52:18,150 --> 02:52:16,240

one hour and one minute and counting

4374

02:52:21,429 --> 02:52:18,160

everything is looking green so i'm gonna

4375

02:52:23,510 --> 02:52:21,439

send it back over to jesse

4376
02:52:24,710 --> 02:52:23,520
that's great news andy thanks for the

4377
02:52:27,110 --> 02:52:24,720
update

4378
02:52:29,269 --> 02:52:27,120
today's launch marks the fourth time a

4379
02:52:31,110 --> 02:52:29,279
rotational crew will fly on a commercial

4380
02:52:33,750 --> 02:52:31,120
spacecraft and each of our crew members

4381
02:52:35,269 --> 02:52:33,760
brings a diverse set of experiences to

4382
02:52:37,670 --> 02:52:35,279
today's flight

4383
02:52:40,150 --> 02:52:37,680
chow lindgren is commander of crew

4384
02:52:42,230 --> 02:52:40,160
dragon of the crew dragon spacecraft and

4385
02:52:43,990 --> 02:52:42,240
the crew form mission responsible for

4386
02:52:45,110 --> 02:52:44,000
all phases of flight from launch to

4387
02:52:47,510 --> 02:52:45,120
re-entry

4388
02:52:49,110 --> 02:52:47,520

chels spent most of his childhood abroad

4389

02:52:50,550 --> 02:52:49,120

and returned to the u.s to earn a

4390

02:52:52,630 --> 02:52:50,560

doctorate of medicine from the

4391

02:52:54,710 --> 02:52:52,640

university of colorado

4392

02:52:57,190 --> 02:52:54,720

board certified in emergency medicine

4393

02:53:00,790 --> 02:52:57,200

shell served as the deputy crew surgeon

4394

02:53:03,750 --> 02:53:00,800

for sts-130 and expedition 24.

4395

02:53:07,429 --> 02:53:03,760

he also flew on expedition 44 and 45

4396

02:53:10,070 --> 02:53:07,439

logged 141 days in space participated in

4397

02:53:12,550 --> 02:53:10,080

two spacewalks and more than a hundred

4398

02:53:14,950 --> 02:53:12,560

different science experiments on station

4399

02:53:16,630 --> 02:53:14,960

and bob hines is the pilot of crew

4400

02:53:18,630 --> 02:53:16,640

dragon freedom today and he's going to

4401
02:53:19,990 --> 02:53:18,640
be responsible for spacecraft systems

4402
02:53:21,670 --> 02:53:20,000
and performance and he's second in

4403
02:53:23,190 --> 02:53:21,680
command for the mission he's also going

4404
02:53:25,990 --> 02:53:23,200
to serve as a flight engineer for

4405
02:53:27,910 --> 02:53:26,000
expedition 67 and 68 on board the

4406
02:53:30,070 --> 02:53:27,920
station he's born in fayetteville north

4407
02:53:31,830 --> 02:53:30,080
carolina earned a bachelor of science

4408
02:53:34,469 --> 02:53:31,840
degree in aerospace engineering from

4409
02:53:36,710 --> 02:53:34,479
boston university after he graduated

4410
02:53:38,630 --> 02:53:36,720
from there went to the u.s air force

4411
02:53:40,230 --> 02:53:38,640
test pilot school where he was awarded a

4412
02:53:42,469 --> 02:53:40,240
master of science in flight test

4413
02:53:44,710 --> 02:53:42,479

engineering and then went on to complete

4414

02:53:45,910 --> 02:53:44,720

a master of science degree in aerospace

4415

02:53:47,750 --> 02:53:45,920

engineering from the university of

4416

02:53:50,550 --> 02:53:47,760

alabama a lot of school

4417

02:53:52,309 --> 02:53:50,560

in 2012 he was selected as a research

4418

02:53:54,630 --> 02:53:52,319

pilot at nasa's johnson space center and

4419

02:53:56,790 --> 02:53:54,640

then in 2017 got the call to become an

4420

02:53:58,870 --> 02:53:56,800

astronaut candidate

4421

02:54:01,429 --> 02:53:58,880

jessica watkins is a mission specialist

4422

02:54:03,269 --> 02:54:01,439

for crew 4. this will be jessica's first

4423

02:54:05,750 --> 02:54:03,279

trip to space following her selection as

4424

02:54:07,269 --> 02:54:05,760

an astronaut in 2017.

4425

02:54:08,950 --> 02:54:07,279

as a mission specialist she will work

4426
02:54:10,469 --> 02:54:08,960
closely with the commander and pilot to

4427
02:54:12,550 --> 02:54:10,479
monitor the spacecraft during the

4428
02:54:13,429 --> 02:54:12,560
dynamic launch and re-entry phases of

4429
02:54:15,269 --> 02:54:13,439
flight

4430
02:54:17,269 --> 02:54:15,279
jessica earned a bachelor's degree in

4431
02:54:19,510 --> 02:54:17,279
geological and environmental sciences

4432
02:54:21,590 --> 02:54:19,520
from stanford university and a doctorate

4433
02:54:23,670 --> 02:54:21,600
in geology from the university of

4434
02:54:25,750 --> 02:54:23,680
california los angeles

4435
02:54:28,230 --> 02:54:25,760
at the time of her astronaut selection

4436
02:54:30,309 --> 02:54:28,240
she was a postdoctoral fellow

4437
02:54:32,309 --> 02:54:30,319
in the division of geological and

4438
02:54:34,150 --> 02:54:32,319

planetary sciences at the california

4439

02:54:36,070 --> 02:54:34,160

institute of technology where she

4440

02:54:38,550 --> 02:54:36,080

collaborated as a member of the science

4441

02:54:40,389 --> 02:54:38,560

team for the mars science laboratory

4442

02:54:42,630 --> 02:54:40,399

rover curiosity

4443

02:54:44,870 --> 02:54:42,640

and our fourth crew member samantha

4444

02:54:47,269 --> 02:54:44,880

chris ferretti also a mission specialist

4445

02:54:49,670 --> 02:54:47,279

for crew 4 from the european space

4446

02:54:51,510 --> 02:54:49,680

agency in 2001 she graduated from the

4447

02:54:53,110 --> 02:54:51,520

technical university of munich germany

4448

02:54:54,870 --> 02:54:53,120

with a master's degree in mechanical

4449

02:54:57,030 --> 02:54:54,880

engineering with specializations in

4450

02:54:59,190 --> 02:54:57,040

aerospace propulsion and lightweight

4451
02:55:02,550 --> 02:54:59,200
structures she also attended the euro

4452
02:55:04,710 --> 02:55:02,560
nato joint jet pilot training program at

4453
02:55:06,469 --> 02:55:04,720
shepherd air force base in the u.s where

4454
02:55:09,349 --> 02:55:06,479
she earned her fighter pilot wings in

4455
02:55:11,590 --> 02:55:09,359
2006. she was selected as a nissa

4456
02:55:13,990 --> 02:55:11,600
astronaut in may 2009 and then in

4457
02:55:17,030 --> 02:55:14,000
november 2014 launched from the

4458
02:55:19,670 --> 02:55:17,040
cosmodrome in baikonur kazakhstan before

4459
02:55:24,070 --> 02:55:19,680
returning to earth in june of 2015 after

4460
02:55:26,790 --> 02:55:24,080
spending 200 days in space then in 2019

4461
02:55:29,190 --> 02:55:26,800
when a different mission nasa's 23rd

4462
02:55:31,510 --> 02:55:29,200
extreme environment mission operations

4463
02:55:33,830 --> 02:55:31,520

also known as nemo a 10-day stay in the

4464

02:55:35,670 --> 02:55:33,840

world's only undersea research station

4465

02:55:37,670 --> 02:55:35,680

aquarius

4466

02:55:40,710 --> 02:55:37,680

each of these four crew members will

4467

02:55:42,070 --> 02:55:40,720

join expeditions 67 and 68 once they

4468

02:55:44,950 --> 02:55:42,080

arrive at the international space

4469

02:55:47,750 --> 02:55:44,960

station all right well we are under an

4470

02:55:50,070 --> 02:55:47,760

hour away from launch so we're getting

4471

02:55:52,309 --> 02:55:50,080

into really the exciting part of the

4472

02:55:54,309 --> 02:55:52,319

countdown we heard that the crew

4473

02:55:56,630 --> 02:55:54,319

the closeout crew has left the arm

4474

02:55:58,550 --> 02:55:56,640

they're out of the area uh and we're

4475

02:56:00,389 --> 02:55:58,560

getting closer to propellant loading and

4476
02:56:02,790 --> 02:56:00,399
some of the really exciting moments uh

4477
02:56:04,950 --> 02:56:02,800
spacex's crew 4 mission is the company's

4478
02:56:07,110 --> 02:56:04,960
fifth crude space flight for nasa we had

4479
02:56:09,110 --> 02:56:07,120
the demo two test flight and three

4480
02:56:12,230 --> 02:56:09,120
previous operational crude missions to

4481
02:56:15,429 --> 02:56:12,240
station uh this is also spacex's seventh

4482
02:56:18,070 --> 02:56:15,439
crude space flight overall uh including

4483
02:56:20,469 --> 02:56:18,080
the uh inspiration four mission as well

4484
02:56:21,830 --> 02:56:20,479
as the ax1 mission which just recently

4485
02:56:24,070 --> 02:56:21,840
came home

4486
02:56:25,910 --> 02:56:24,080
today our crew is flying the newest

4487
02:56:27,750 --> 02:56:25,920
dragon in our fleet and we'll be taking

4488
02:56:30,389 --> 02:56:27,760

a ride on board the falcon 9 that

4489

02:56:31,510 --> 02:56:30,399

supported the crs 22 mission in june of

4490

02:56:33,750 --> 02:56:31,520

last year

4491

02:56:35,590 --> 02:56:33,760

that's been a great countdown so far as

4492

02:56:37,910 --> 02:56:35,600

andy has been saying weather has been

4493

02:56:39,990 --> 02:56:37,920

looking really good for t zero and again

4494

02:56:42,950 --> 02:56:40,000

the excitement just continues to pick up

4495

02:56:45,110 --> 02:56:42,960

as we get closer to the t0 mark

4496

02:56:46,790 --> 02:56:45,120

it's gone really smoothly so far today

4497

02:56:49,110 --> 02:56:46,800

if you joined us at the very beginning

4498

02:56:51,510 --> 02:56:49,120

we started with suit up just over three

4499

02:56:53,269 --> 02:56:51,520

hours ago where the spacex team helped

4500

02:56:54,790 --> 02:56:53,279

the crew put on their suits that they're

4501
02:56:57,429 --> 02:56:54,800
going to wear for all the launch

4502
02:56:59,590 --> 02:56:57,439
operations and did the initial checkouts

4503
02:57:03,110 --> 02:56:59,600
suit leak checks before they got to the

4504
02:57:05,110 --> 02:57:03,120
crew walkout and that's where chell bob

4505
02:57:07,590 --> 02:57:05,120
jessica and samantha gave some final

4506
02:57:09,590 --> 02:57:07,600
goodbyes and some waves to folks

4507
02:57:11,590 --> 02:57:09,600
gathered outside the operations and

4508
02:57:14,469 --> 02:57:11,600
checkout building before they climbed

4509
02:57:18,309 --> 02:57:14,479
into the teslas and began that roughly

4510
02:57:20,150 --> 02:57:18,319
20 minute ride out to pad 39a

4511
02:57:22,389 --> 02:57:20,160
and we did watch as the crew boarded

4512
02:57:25,030 --> 02:57:22,399
their teslas and headed down the nasa

4513
02:57:27,510 --> 02:57:25,040

causeway headed towards the launch pad

4514

02:57:29,269 --> 02:57:27,520

once they arrived at the pad the crew

4515

02:57:31,990 --> 02:57:29,279

took a moment to enjoy the view of the

4516

02:57:33,750 --> 02:57:32,000

vehicle they will be taking flight on

4517

02:57:34,870 --> 02:57:33,760

this morning and then headed up to fixed

4518

02:57:36,790 --> 02:57:34,880

services

4519

02:57:46,870 --> 02:57:36,800

we are cycling orbit tank isolation

4520

02:57:50,950 --> 02:57:49,110

just some calms there between the crew

4521

02:57:53,110 --> 02:57:50,960

and the ground

4522

02:57:55,269 --> 02:57:53,120

and again as they headed up the fixed

4523

02:57:56,950 --> 02:57:55,279

service structure they began the process

4524

02:57:58,550 --> 02:57:56,960

known as crew ingress and that's where

4525

02:57:59,830 --> 02:57:58,560

the astronauts entered the dragon

4526

02:58:02,150 --> 02:57:59,840

spacecraft

4527

02:58:04,710 --> 02:58:02,160

spacex team then performed a series of

4528

02:58:06,790 --> 02:58:04,720

checks to ensure the suits seats

4529

02:58:09,030 --> 02:58:06,800

uh and vehicle interactions were all

4530

02:58:11,590 --> 02:58:09,040

functioning properly yeah they they made

4531

02:58:13,670 --> 02:58:11,600

their way two at a time down

4532

02:58:15,990 --> 02:58:13,680

uh down that crew access arm and then

4533

02:58:18,309 --> 02:58:16,000

getting in one at a time into the dragon

4534

02:58:20,870 --> 02:58:18,319

spacecraft we saw shell and bob make the

4535

02:58:22,309 --> 02:58:20,880

walk down first followed soon after

4536

02:58:24,550 --> 02:58:22,319

by samantha

4537

02:58:26,710 --> 02:58:24,560

and jessica

4538

02:58:29,590 --> 02:58:26,720

and they were helped into the vehicle by

4539

02:58:31,590 --> 02:58:29,600

that closeout team which a little while

4540

02:58:33,510 --> 02:58:31,600

ago we did hear that they made their way

4541

02:58:35,190 --> 02:58:33,520

off the crew access arm

4542

02:58:37,510 --> 02:58:35,200

they were able to close the hatch with

4543

02:58:39,590 --> 02:58:37,520

the crew safely inside execute the hot

4544

02:58:41,910 --> 02:58:39,600

side hatch leak check

4545

02:58:43,429 --> 02:58:41,920

and so we're less than an hour to go now

4546

02:58:45,510 --> 02:58:43,439

and so things are going to

4547

02:58:47,349 --> 02:58:45,520

start to really pick up

4548

02:58:49,429 --> 02:58:47,359

as we go through a series of go no go

4549

02:58:51,990 --> 02:58:49,439

pulls to arm the launch escape system

4550

02:58:54,150 --> 02:58:52,000

and then start propellant loading

4551
02:58:57,349 --> 02:58:54,160
the crew pull for readiness was

4552
02:59:00,469 --> 02:58:57,359
completed at the t-minus 60-minute mark

4553
02:59:02,870 --> 02:59:00,479
and the dragon pole for prop loading uh

4554
02:59:03,830 --> 02:59:02,880
is coming up here at about t minus 55

4555
02:59:05,990 --> 02:59:03,840
minutes

4556
02:59:08,150 --> 02:59:06,000
and then after that we'll be at t minus

4557
02:59:10,150 --> 02:59:08,160
45 minutes there will be an internal

4558
02:59:13,349 --> 02:59:10,160
mission control freedom spacex at this

4559
02:59:15,190 --> 02:59:13,359
time you are go for section six

4560
02:59:21,030 --> 02:59:15,200
okay when you're ready please report go

4561
02:59:21,040 --> 02:59:28,550
copy freedom is go for section six

4562
02:59:32,550 --> 02:59:30,309
again just pausing for those comms

4563
02:59:34,630 --> 02:59:32,560

between the core and the crew 4

4564

02:59:37,990 --> 02:59:34,640

astronauts

4565

02:59:39,830 --> 02:59:38,000

at t minus 45 minutes we will have an

4566

02:59:41,429 --> 02:59:39,840

internal mission control hawthorne poll

4567

02:59:42,870 --> 02:59:41,439

and then the launch director's pull for

4568

02:59:45,110 --> 02:59:42,880

propellant loading

4569

02:59:47,349 --> 02:59:45,120

now when we get to about the t-minus 40

4570

02:59:49,110 --> 02:59:47,359

minute mark the crew access arm will

4571

02:59:51,110 --> 02:59:49,120

retract and the crew will get the call

4572

02:59:53,510 --> 02:59:51,120

to closer visors and to arm the launch

4573

02:59:55,510 --> 02:59:53,520

escape system now that's the automated

4574

02:59:57,590 --> 02:59:55,520

safety system in place that can fire the

4575

02:59:59,030 --> 02:59:57,600

eight super draco thrusters on dragon to

4576

03:00:01,110 --> 02:59:59,040

quickly separate the crew from the

4577

03:00:03,269 --> 03:00:01,120

rocket either on the pad or during the

4578

03:00:05,750 --> 03:00:03,279

flight on the right uphill and then once

4579

03:00:07,510 --> 03:00:05,760

we reach 35 minutes before liftoff

4580

03:00:10,230 --> 03:00:07,520

propellant loading for falcon 9 will

4581

03:00:13,349 --> 03:00:10,240

begin loading fuel and oxidizer on both

4582

03:00:15,110 --> 03:00:13,359

the first and second stages on falcon 9.

4583

03:00:17,030 --> 03:00:15,120

so we'll continue to get views of the

4584

03:00:19,990 --> 03:00:17,040

crew they're going to get ready to

4585

03:00:21,910 --> 03:00:20,000

report their readiness for launch

4586

03:00:22,830 --> 03:00:21,920

they're in their suits throughout this

4587

03:00:25,750 --> 03:00:22,840

entire

4588

03:00:27,110 --> 03:00:25,760

phase but for right now we are just

4589

03:00:28,950 --> 03:00:27,120

standing by

4590

03:00:31,269 --> 03:00:28,960

for these final pulls and then we'll get

4591

03:00:33,030 --> 03:00:31,279

into propellant loading so with things

4592

03:00:35,510 --> 03:00:33,040

starting to pick up let's send it back

4593

03:00:37,830 --> 03:00:35,520

now to the teams in florida over to you

4594

03:00:40,230 --> 03:00:37,840

daryl all right thank you dan and since

4595

03:00:42,280 --> 03:00:40,240

we last saw you our team has grown check

4596

03:00:44,309 --> 03:00:42,290

this out

4597

03:00:45,910 --> 03:00:44,319

[Applause]

4598

03:00:48,710 --> 03:00:45,920

so megan macarthur and i want to welcome

4599

03:00:50,550 --> 03:00:48,720

a group of nasa social participants onto

4600

03:00:53,700 --> 03:00:50,560

our launch broadcast they are standing

4601
03:00:56,230 --> 03:00:53,710
behind us and all around us guys welcome

4602
03:00:58,389 --> 03:00:56,240
[Applause]

4603
03:01:00,389 --> 03:00:58,399
so you might ask what are nasa social

4604
03:01:01,510 --> 03:01:00,399
participants this is them and they are

4605
03:01:04,230 --> 03:01:01,520
stoked and here's what they've been

4606
03:01:06,550 --> 03:01:04,240
doing nasa puts out an open invitation

4607
03:01:08,950 --> 03:01:06,560
to social media influencers who engage

4608
03:01:10,630 --> 03:01:08,960
in stamin science communication to come

4609
03:01:12,230 --> 03:01:10,640
out to kennedy and you're looking at the

4610
03:01:14,550 --> 03:01:12,240
pictures of some of the stops they went

4611
03:01:16,389 --> 03:01:14,560
to around kennedy they toured this

4612
03:01:19,590 --> 03:01:16,399
multi-user spaceport in the days leading

4613
03:01:21,269 --> 03:01:19,600

up to launch and it ends with a rocket

4614

03:01:23,510 --> 03:01:21,279

launch

4615

03:01:25,670 --> 03:01:23,520

they get to see it as close as you can

4616

03:01:28,710 --> 03:01:25,680

possibly get the same distance that the

4617

03:01:30,469 --> 03:01:28,720

media and vips get to watch it so i know

4618

03:01:32,950 --> 03:01:30,479

you guys are excited about that nasa

4619

03:01:35,429 --> 03:01:32,960

social participant camille calabeo is

4620

03:01:38,230 --> 03:01:35,439

otherwise known as the galactic gal on

4621

03:01:40,230 --> 03:01:38,240

instagram and so you're here as with all

4622

03:01:42,230 --> 03:01:40,240

of your nasa participants and i want to

4623

03:01:44,870 --> 03:01:42,240

ask first of all how's it going so far

4624

03:01:46,950 --> 03:01:44,880

it has been absolutely amazing um so

4625

03:01:49,750 --> 03:01:46,960

this is actually my first nasa social i

4626
03:01:51,349 --> 03:01:49,760
started my platform during covid so you

4627
03:01:54,389 --> 03:01:51,359
know we haven't had nasa social since

4628
03:01:57,190 --> 03:01:54,399
then um and it has been absolutely

4629
03:01:59,269 --> 03:01:57,200
incredible i know we had a delay um and

4630
03:02:01,349 --> 03:01:59,279
so you know some of us went home some of

4631
03:02:03,750 --> 03:02:01,359
us stayed we got to come back we got to

4632
03:02:06,469 --> 03:02:03,760
see so many things and i have gotten to

4633
03:02:08,630 --> 03:02:06,479
meet so many wonderful people from all

4634
03:02:10,389 --> 03:02:08,640
different walks of life and you know

4635
03:02:12,150 --> 03:02:10,399
some of them are artists some of them

4636
03:02:13,910 --> 03:02:12,160
are foodies some of them are space

4637
03:02:15,670 --> 03:02:13,920
influencers and so it's just been really

4638
03:02:17,750 --> 03:02:15,680

phenomenal to be here and get to

4639

03:02:20,070 --> 03:02:17,760

experiences with everyone absolutely and

4640

03:02:22,469 --> 03:02:20,080

each one of you represent a substantial

4641

03:02:24,150 --> 03:02:22,479

audience that you're communicating with

4642

03:02:26,309 --> 03:02:24,160

and sharing the science which we

4643

03:02:28,309 --> 03:02:26,319

appreciate so much so we're so glad that

4644

03:02:30,309 --> 03:02:28,319

you're here to do that what's been the

4645

03:02:32,630 --> 03:02:30,319

favorite part that you've done so far

4646

03:02:34,550 --> 03:02:32,640

that is a really hard question

4647

03:02:37,269 --> 03:02:34,560

um everything has been absolutely

4648

03:02:39,910 --> 03:02:37,279

amazing of course um but i think the

4649

03:02:41,910 --> 03:02:39,920

best part for me has been or was getting

4650

03:02:44,469 --> 03:02:41,920

to see three different rockets on their

4651
03:02:47,910 --> 03:02:44,479
pads at the same time it really just

4652
03:02:50,630 --> 03:02:47,920
solidifies me what a time to be alive

4653
03:02:52,950 --> 03:02:50,640
right you see spacex with starlink then

4654
03:02:55,349 --> 03:02:52,960
you see spacex with crew dragon and then

4655
03:02:56,469 --> 03:02:55,359
you see sls and orion taking us back to

4656
03:02:58,389 --> 03:02:56,479
the moon and that was just really

4657
03:03:00,710 --> 03:02:58,399
incredible to see that right here with

4658
03:03:02,389 --> 03:03:00,720
my own eyes totally and you guys get you

4659
03:03:04,070 --> 03:03:02,399
know got lucky really because there was

4660
03:03:06,150 --> 03:03:04,080
a launch last week you've seen two

4661
03:03:08,550 --> 03:03:06,160
launches we have national nasa socials

4662
03:03:10,950 --> 03:03:08,560
that don't get to do that so good on you

4663
03:03:13,190 --> 03:03:10,960

for seeing that what is one of the more

4664

03:03:15,349 --> 03:03:13,200

challenging aspects would you say to

4665

03:03:16,230 --> 03:03:15,359

communicating science in this day and

4666

03:03:18,550 --> 03:03:16,240

age

4667

03:03:21,269 --> 03:03:18,560

yeah i think communicating science on

4668

03:03:22,630 --> 03:03:21,279

social media is challenging for a couple

4669

03:03:24,870 --> 03:03:22,640

different reasons but i think one of

4670

03:03:27,349 --> 03:03:24,880

them is that people just don't have

4671

03:03:29,429 --> 03:03:27,359

a long attention spans anymore right you

4672

03:03:31,110 --> 03:03:29,439

get 30 seconds of people's attention a

4673

03:03:32,870 --> 03:03:31,120

lot of times so most of my content is

4674

03:03:34,950 --> 03:03:32,880

actually on tick tock and those types of

4675

03:03:36,150 --> 03:03:34,960

really short videos and you get 30

4676

03:03:39,590 --> 03:03:36,160

seconds and that's really hard to

4677

03:03:41,349 --> 03:03:39,600

communicate effectively educationally

4678

03:03:42,710 --> 03:03:41,359

and engaging right you have to engage

4679

03:03:44,710 --> 03:03:42,720

your audience and keep them engaged for

4680

03:03:46,870 --> 03:03:44,720

those 30 seconds that you get

4681

03:03:48,389 --> 03:03:46,880

and i think for for space specifically

4682

03:03:49,910 --> 03:03:48,399

it's challenging because space can be

4683

03:03:51,429 --> 03:03:49,920

criticized a lot

4684

03:03:53,429 --> 03:03:51,439

especially from the general public that

4685

03:03:54,710 --> 03:03:53,439

might not be otherwise connected to

4686

03:03:57,269 --> 03:03:54,720

space and so i think just really

4687

03:03:59,190 --> 03:03:57,279

communicating why are we doing this and

4688

03:04:00,950 --> 03:03:59,200

why it's really important to humanity

4689

03:04:02,630 --> 03:04:00,960

and life on earth all right well the

4690

03:04:05,030 --> 03:04:02,640

galactic gal i want to give you an

4691

03:04:06,950 --> 03:04:05,040

opportunity to ask a question of a nasa

4692

03:04:07,830 --> 03:04:06,960

astronaut

4693

03:04:09,590 --> 03:04:07,840

on the spot oh you megan

4694

03:04:12,550 --> 03:04:09,600

me on the spot what one question would

4695

03:04:15,269 --> 03:04:12,560

you ask an astronaut okay so this might

4696

03:04:17,030 --> 03:04:15,279

be cliché but i'm sure we have a lot of

4697

03:04:18,790 --> 03:04:17,040

young people watching and i would really

4698

03:04:20,230 --> 03:04:18,800

love to hear from your perspective as a

4699

03:04:21,910 --> 03:04:20,240

female astronaut

4700

03:04:24,630 --> 03:04:21,920

what is something that you would

4701

03:04:26,710 --> 03:04:24,640

recommend to somebody say five years old

4702

03:04:29,190 --> 03:04:26,720

well i think what i recommend to kids of

4703

03:04:31,030 --> 03:04:29,200

any age in any gender is to figure out

4704

03:04:33,269 --> 03:04:31,040

what it is that you love to do be

4705

03:04:35,349 --> 03:04:33,279

curious and try new things right don't

4706

03:04:36,790 --> 03:04:35,359

decide just one thing at five years old

4707

03:04:38,790 --> 03:04:36,800

i'm gonna do this one thing right

4708

03:04:41,349 --> 03:04:38,800

because there's so many other amazing

4709

03:04:43,429 --> 03:04:41,359

experiences to have so be curious ask

4710

03:04:45,510 --> 03:04:43,439

lots of questions find that thing that

4711

03:04:47,510 --> 03:04:45,520

you love to do and then pursue it and

4712

03:04:48,790 --> 03:04:47,520

and get really good at it i love that

4713

03:04:50,870 --> 03:04:48,800

thank you

4714

03:04:52,870 --> 03:04:50,880

all right while we have all of these

4715

03:04:56,710 --> 03:04:52,880

social media influencers

4716

03:05:00,469 --> 03:04:58,150

out there in the audience throughout the

4717

03:05:03,590 --> 03:05:00,479

show we've been taking your questions at

4718

03:05:05,910 --> 03:05:03,600

the hashtag ask nasa uh throughout the

4719

03:05:07,990 --> 03:05:05,920

night we have time for a few more before

4720

03:05:09,190 --> 03:05:08,000

falcon 9 fueling begins and you can see

4721

03:05:11,830 --> 03:05:09,200

it in the bottom right hand corner of

4722

03:05:14,469 --> 03:05:11,840

your screen this one for megan while on

4723

03:05:15,750 --> 03:05:14,479

the space station what was your biggest

4724

03:05:18,070 --> 03:05:15,760

accomplishment

4725

03:05:19,910 --> 03:05:18,080

that's a tough one i think for me

4726
03:05:22,070 --> 03:05:19,920
meeting the challenge of every single

4727
03:05:23,910 --> 03:05:22,080
day meeting the schedule every day and

4728
03:05:25,990 --> 03:05:23,920
whatever that brought was really the

4729
03:05:28,150 --> 03:05:26,000
challenge because every single day was

4730
03:05:30,070 --> 03:05:28,160
different some days were easier than

4731
03:05:31,349 --> 03:05:30,080
others some days were really hard some

4732
03:05:32,550 --> 03:05:31,359
days you really had to lean on your

4733
03:05:34,630 --> 03:05:32,560
crewmates some days you really were

4734
03:05:36,389 --> 03:05:34,640
helping out your crewmates um so it was

4735
03:05:39,269 --> 03:05:36,399
that maintaining that even keel for the

4736
03:05:39,700 --> 03:05:39,279
entire 200 days and i'm calling it 200

4737
03:05:41,349 --> 03:05:39,710
days

4738
03:05:43,269 --> 03:05:41,359

[Laughter]

4739

03:05:45,910 --> 03:05:43,279

i think was it was the biggest challenge

4740

03:05:47,910 --> 03:05:45,920

yeah well that's great and so to imagine

4741

03:05:49,830 --> 03:05:47,920

for me like what was the most funnest

4742

03:05:51,510 --> 03:05:49,840

thing about space floating around

4743

03:05:53,670 --> 03:05:51,520

this woman was floating around in space

4744

03:05:55,670 --> 03:05:53,680

you know it's the camaraderie right it's

4745

03:05:57,349 --> 03:05:55,680

this it's the silly times that you have

4746

03:05:59,990 --> 03:05:57,359

with your crewmates the ideas that you

4747

03:06:02,070 --> 03:06:00,000

come up with one day um aki and i took

4748

03:06:04,389 --> 03:06:02,080

our zero g indicator which was a baby

4749

03:06:05,990 --> 03:06:04,399

penguin and i taped it to a balloon that

4750

03:06:07,670 --> 03:06:06,000

i had blown up and then released and so

4751

03:06:09,269 --> 03:06:07,680

then the balloon of course

4752

03:06:11,349 --> 03:06:09,279

he was slingshotting all over the inside

4753

03:06:12,630 --> 03:06:11,359

of the u.s lab with this tiny penguin

4754

03:06:14,309 --> 03:06:12,640

you know with his flippers up and he's

4755

03:06:15,830 --> 03:06:14,319

zooming around so stuff like that when

4756

03:06:17,190 --> 03:06:15,840

you have some downtime you know it's a

4757

03:06:19,190 --> 03:06:17,200

it's a little bit science experiment

4758

03:06:20,550 --> 03:06:19,200

it's a lot fun and it's really great uh

4759

03:06:22,309 --> 03:06:20,560

team building so it's all of those

4760

03:06:24,469 --> 03:06:22,319

things at once and it's a lot of hard

4761

03:06:25,990 --> 03:06:24,479

work as well very few astronauts are

4762

03:06:27,510 --> 03:06:26,000

doing a tremendous amount of research

4763

03:06:29,429 --> 03:06:27,520

there we're going to talk more about

4764

03:06:32,630 --> 03:06:29,439

that a little bit later in the show dive

4765

03:06:34,790 --> 03:06:32,640

into the iss stuff that's going on right

4766

03:06:36,710 --> 03:06:34,800

now and in the future but for the moment

4767

03:06:38,389 --> 03:06:36,720

we want to thank our entire nasa social

4768

03:06:41,010 --> 03:06:38,399

team for crew 4 being here y'all are

4769

03:06:42,550 --> 03:06:41,020

fantastic

4770

03:06:44,870 --> 03:06:42,560

[Applause]

4771

03:06:49,030 --> 03:06:44,880

let's now check back in with andy at

4772

03:06:54,950 --> 03:06:52,550

thanks daryl it is t minus 47 minutes

4773

03:06:56,790 --> 03:06:54,960

and counting the spacex launch teams are

4774

03:06:59,670 --> 03:06:56,800

finishing final review of data from

4775

03:07:01,349 --> 03:06:59,680

checkouts of falcon 9 over the last hour

4776

03:07:03,190 --> 03:07:01,359

the launch director is about to pull the

4777

03:07:05,349 --> 03:07:03,200

team for readiness both to load

4778

03:07:07,349 --> 03:07:05,359

propellant and to launch

4779

03:07:09,429 --> 03:07:07,359

and the exciting thing is this is the

4780

03:07:11,510 --> 03:07:09,439

last poll before we lift off

4781

03:07:13,670 --> 03:07:11,520

the seven spacex engineers indicate they

4782

03:07:15,910 --> 03:07:13,680

are go by electronically voting on the

4783

03:07:17,590 --> 03:07:15,920

online countdown procedure the launch

4784

03:07:19,590 --> 03:07:17,600

director also checks in with dragon

4785

03:07:22,630 --> 03:07:19,600

mission director and nasa launch manager

4786

03:07:24,309 --> 03:07:22,640

to make sure that they are also ready

4787

03:07:27,190 --> 03:07:24,319

earlier you saw the vehicle assembly

4788

03:07:29,590 --> 03:07:27,200

building called the vab the falcon and

4789

03:07:31,349 --> 03:07:29,600

dragon launch team as well as key nasa

4790

03:07:33,910 --> 03:07:31,359

launch members are in the launch control

4791

03:07:35,830 --> 03:07:33,920

center adjacent to that vab

4792

03:07:37,190 --> 03:07:35,840

they have a view straight towards pad

4793

03:07:39,349 --> 03:07:37,200

39a

4794

03:07:41,190 --> 03:07:39,359

and they're able to see falcon 9 and

4795

03:07:43,269 --> 03:07:41,200

dragon the team is ready for crew

4796

03:07:44,630 --> 03:07:43,279

through the large windows

4797

03:07:46,950 --> 03:07:44,640

and launch

4798

03:07:48,790 --> 03:07:46,960

for non-urgent no-go conditions brief to

4799

03:07:51,030 --> 03:07:48,800

ce or ld and approve aborting the

4800

03:07:52,630 --> 03:07:51,040

countdown for urgent issues affecting

4801
03:07:54,710 --> 03:07:52,640
the safety of the operation operators

4802
03:07:56,070 --> 03:07:54,720
shall call hold hold hold on the

4803
03:07:57,510 --> 03:07:56,080
countdown net

4804
03:07:59,349 --> 03:07:57,520
launch control abort the launch auto

4805
03:08:01,110 --> 03:07:59,359
sequence immediately and proceed into

4806
03:08:03,110 --> 03:08:01,120
the launch board sequence

4807
03:08:04,550 --> 03:08:03,120
at t minus 10 seconds launch control

4808
03:08:05,990 --> 03:08:04,560
will be hands off relying on automated

4809
03:08:07,030 --> 03:08:06,000
abort criteria for the remainder of the

4810
03:08:08,309 --> 03:08:07,040
count

4811
03:08:09,670 --> 03:08:08,319
operators advise the launch director

4812
03:08:11,269 --> 03:08:09,680
whether structural breakup or fire is

4813
03:08:13,670 --> 03:08:11,279

imminent or occurring for dragon manual

4814

03:08:15,590 --> 03:08:13,680

escape flight rules

4815

03:08:17,269 --> 03:08:15,600

the event of firearm key operators noted

4816

03:08:18,950 --> 03:08:17,279

below will remain at their post while

4817

03:08:20,710 --> 03:08:18,960

the alarm is evaluated

4818

03:08:21,910 --> 03:08:20,720

in the event that personal safety has

4819

03:08:23,429 --> 03:08:21,920

threatened to evacuate to the south

4820

03:08:24,870 --> 03:08:23,439

facing emergency exit which leads

4821

03:08:26,150 --> 03:08:24,880

directly outside

4822

03:08:31,269 --> 03:08:26,160

launch control you may proceed with

4823

03:08:36,469 --> 03:08:33,670

awesome so we heard at the very end of

4824

03:08:40,230 --> 03:08:36,479

that there that we are proceeding with

4825

03:08:42,870 --> 03:08:40,240

the crew arm uh movement so that access

4826
03:08:44,790 --> 03:08:42,880
arm that is uh adjacent to the vehicle

4827
03:08:48,389 --> 03:08:44,800
that's going to start to uh move to its

4828
03:08:50,550 --> 03:08:48,399
launch also firearm 4 and mccc

4829
03:09:05,269 --> 03:08:50,560
the control will be in a lockdown state

4830
03:09:09,429 --> 03:09:07,590
it does take a few minutes for the crew

4831
03:09:11,110 --> 03:09:09,439
access arm to fully retract and after

4832
03:09:12,950 --> 03:09:11,120
that we'll be arming the launch escape

4833
03:09:14,870 --> 03:09:12,960
system so on screen you can see the

4834
03:09:17,190 --> 03:09:14,880
dragon capsule with the crew access arm

4835
03:09:19,269 --> 03:09:17,200
still in the service position position

4836
03:09:22,229 --> 03:09:19,279
uh the crew is on board our retraction

4837
03:09:26,469 --> 03:09:24,070
so great we got an amazing shot of the

4838
03:09:36,630 --> 03:09:26,479

cracks arm retracting away

4839

03:09:39,910 --> 03:09:37,910

so again this is going to take a few

4840

03:09:41,590 --> 03:09:39,920

minutes to fully retract and then the

4841

03:09:43,750 --> 03:09:41,600

next major activity is going to be

4842

03:09:47,269 --> 03:09:43,760

arming that launch escape system

4843

03:09:51,269 --> 03:09:49,590

so far weather and range continue to go

4844

03:09:53,510 --> 03:09:51,279

for launch we are monitoring the

4845

03:09:55,990 --> 03:09:53,520

clearance area around the launch pad as

4846

03:10:09,910 --> 03:09:56,000

well as air and sea space around the

4847

03:10:12,790 --> 03:10:11,110

here at kennedy space center the

4848

03:10:15,670 --> 03:10:12,800

conditions are predicted to be

4849

03:10:17,750 --> 03:10:15,680

acceptable for liftoff just about 43

4850

03:10:19,990 --> 03:10:17,760

minutes from now

4851
03:10:22,150 --> 03:10:20,000
so with that again everything is going

4852
03:10:24,870 --> 03:10:22,160
smoothly on today's countdown so i'm

4853
03:10:26,469 --> 03:10:24,880
gonna send it back over to you daryl

4854
03:10:28,630 --> 03:10:26,479
how are things going

4855
03:10:31,110 --> 03:10:28,640
all right thank you very much andy and

4856
03:10:34,710 --> 03:10:31,120
the countdown clock continuing at

4857
03:10:37,030 --> 03:10:34,720
t minus 43 minutes and counting i want

4858
03:10:38,550 --> 03:10:37,040
to recap a few things here for you the

4859
03:10:41,030 --> 03:10:38,560
closeout team

4860
03:10:43,349 --> 03:10:41,040
they have left the white room and exited

4861
03:10:47,590 --> 03:10:43,359
the blast danger area they are no longer

4862
03:10:53,510 --> 03:10:50,070
also spacex teams have pulled go for the

4863
03:10:57,349 --> 03:10:53,520

les arm and prop load that's the launch

4864

03:11:03,349 --> 03:11:00,950

and spacex dragon freedom reports go for

4865

03:11:08,229 --> 03:11:05,429

and so here we are at t minus 42 minutes

4866

03:11:10,469 --> 03:11:08,239

and counting we're standing by

4867

03:11:12,229 --> 03:11:10,479

for the next major milestone we saw the

4868

03:11:13,590 --> 03:11:12,239

crew access arm

4869

03:11:15,510 --> 03:11:13,600

retract

4870

03:11:17,750 --> 03:11:15,520

and that's one of the last major visual

4871

03:11:21,990 --> 03:11:17,760

milestones that we'll see in preparation

4872

03:11:23,830 --> 03:11:22,000

for liftoff and then shortly thereafter

4873

03:11:25,750 --> 03:11:23,840

we'll hear true access arm retraction is

4874

03:11:28,229 --> 03:11:25,760

complete

4875

03:11:33,590 --> 03:11:28,239

and there is the call out that the crew

4876
03:11:41,590 --> 03:11:35,510
and so now we're looking towards

4877
03:11:45,750 --> 03:11:43,910
megan the propellant loading

4878
03:11:47,510 --> 03:11:45,760
into

4879
03:11:49,510 --> 03:11:47,520
the falcon 9 rocket

4880
03:11:51,590 --> 03:11:49,520
this is a big moment

4881
03:11:54,469 --> 03:11:51,600
not a lot of rockets load propellant

4882
03:11:57,110 --> 03:11:54,479
with astronauts inside the crew capsule

4883
03:11:59,110 --> 03:11:57,120
that's right this was a new capability

4884
03:12:01,750 --> 03:11:59,120
that was developed for this vehicle to

4885
03:12:03,269 --> 03:12:01,760
reduce i think overall the timeline and

4886
03:12:05,110 --> 03:12:03,279
it's something that the combined teams

4887
03:12:06,630 --> 03:12:05,120
looked at very closely together from a

4888
03:12:08,070 --> 03:12:06,640

safety perspective

4889

03:12:09,429 --> 03:12:08,080

during the development of this vehicle

4890

03:12:11,990 --> 03:12:09,439

it's one of the reasons why the launch

4891

03:12:14,309 --> 03:12:12,000

escape system is so crucial to have that

4892

03:12:16,229 --> 03:12:14,319

arm this is a very dynamic activity

4893

03:12:17,910 --> 03:12:16,239

that's happening and so we want to be

4894

03:12:20,150 --> 03:12:17,920

able to keep the crew safe in the event

4895

03:12:22,550 --> 03:12:20,160

that something off nominal happens so

4896

03:12:24,309 --> 03:12:22,560

that's um that launch escape system

4897

03:12:26,229 --> 03:12:24,319

being armed is coming up and that's

4898

03:12:28,309 --> 03:12:26,239

definitely something that i remember the

4899

03:12:30,630 --> 03:12:28,319

demo 2 crew telling us to expect you

4900

03:12:32,389 --> 03:12:30,640

know a loud noise associated with that

4901
03:12:34,150 --> 03:12:32,399
pressurization of those lines and so

4902
03:12:35,990 --> 03:12:34,160
that is something that we were ready for

4903
03:12:39,429 --> 03:12:36,000
and expected how about that you could

4904
03:12:41,590 --> 03:12:39,439
hear the pressurizing of those uh draco

4905
03:12:43,510 --> 03:12:41,600
engines yeah it didn't it was not quite

4906
03:12:45,349 --> 03:12:43,520
instantaneous but a short duration very

4907
03:12:46,630 --> 03:12:45,359
loud sound is what i recall a

4908
03:12:56,469 --> 03:12:46,640
pressurizing of

4909
03:13:00,950 --> 03:12:58,630
at this time i give you a go for section

4910
03:13:05,990 --> 03:13:00,960
7 closed visors and armed launch escape

4911
03:13:09,429 --> 03:13:07,990
okay freedom copies our visors are

4912
03:13:13,269 --> 03:13:09,439
closed and we are arming

4913
03:13:19,030 --> 03:13:16,070

so what does he do to arm that

4914

03:13:23,830 --> 03:13:19,040

um it's a as a command that is sent to

4915

03:13:26,070 --> 03:13:23,840

make that uh a valid um exit strategy

4916

03:13:27,750 --> 03:13:26,080

and as the pilot you're there

4917

03:13:29,110 --> 03:13:27,760

next the commander

4918

03:13:30,710 --> 03:13:29,120

keeping your eyes on all the systems

4919

03:13:32,469 --> 03:13:30,720

basically yeah agreeing with him when

4920

03:13:36,070 --> 03:13:32,479

he's sending commands that that's the

4921

03:13:41,190 --> 03:13:38,870

when that propellant is loading

4922

03:13:43,110 --> 03:13:41,200

can you tell can you hear it

4923

03:13:45,030 --> 03:13:43,120

uh i thought a lot about that and kind

4924

03:13:46,710 --> 03:13:45,040

of pulled my crewmates and other people

4925

03:13:49,590 --> 03:13:46,720

i know that have flown bob says that he

4926

03:13:51,429 --> 03:13:49,600

recalls a gurgling sound what i recall

4927

03:13:53,190 --> 03:13:51,439

is more of like a whirring and clicking

4928

03:13:54,870 --> 03:13:53,200

of the valves moving so i think

4929

03:13:56,790 --> 03:13:54,880

everybody's recollection is slightly

4930

03:13:59,030 --> 03:13:56,800

different and i had a similar experience

4931

03:14:02,469 --> 03:13:59,040

on my shuttle flight spacex launch

4932

03:14:07,349 --> 03:14:02,479

escape system is verified armed

4933

03:14:11,190 --> 03:14:09,349

my memory of the sounds that occur on

4934

03:14:12,710 --> 03:14:11,200

the spaceship are not as good as my

4935

03:14:14,070 --> 03:14:12,720

visual memory and so i think everybody

4936

03:14:17,190 --> 03:14:14,080

remembers you know a slightly different

4937

03:14:19,269 --> 03:14:17,200

overlapping set of things

4938

03:14:21,910 --> 03:14:19,279

and so we just heard that call out uh

4939

03:14:23,349 --> 03:14:21,920

megan that the launch escape system is

4940

03:14:25,830 --> 03:14:23,359

armed yes

4941

03:14:27,750 --> 03:14:25,840

and now that paves the way

4942

03:14:29,670 --> 03:14:27,760

for the loading of propellant that's

4943

03:14:31,990 --> 03:14:29,680

right

4944

03:14:34,469 --> 03:14:32,000

the propellant of course super chilled

4945

03:14:36,309 --> 03:14:34,479

liquid oxygen

4946

03:14:40,469 --> 03:14:36,319

and rp1

4947

03:14:40,479 --> 03:14:47,670

for space flight

4948

03:14:47,680 --> 03:14:51,510

a look from high above

4949

03:14:56,150 --> 03:14:54,309

from the launch tower down onto the crew

4950

03:14:58,950 --> 03:14:56,160

dragon spacecraft

4951

03:15:08,309 --> 03:14:58,960

and rocket below that booster

4952

03:15:13,510 --> 03:15:11,510

we got the les call a little early so

4953

03:15:16,309 --> 03:15:13,520

as far as a schedule is concerned we're

4954

03:15:20,870 --> 03:15:18,630

but we're in a good place

4955

03:15:26,870 --> 03:15:20,880

because propellant load starts at t

4956

03:15:30,710 --> 03:15:28,710

and the crew will while they're not

4957

03:15:32,229 --> 03:15:30,720

actively involved in the propellant

4958

03:15:34,469 --> 03:15:32,239

loading activities they're going to be

4959

03:15:36,870 --> 03:15:34,479

pretty closely monitoring you know when

4960

03:15:38,469 --> 03:15:36,880

the different activities start um

4961

03:15:40,870 --> 03:15:38,479

loading the specific tanks with the

4962

03:15:43,269 --> 03:15:40,880

specific propellants so that they can

4963

03:15:45,990 --> 03:15:43,279

have a sense of where the vehicle is

4964

03:15:47,349 --> 03:15:46,000
at every moment

4965

03:15:50,950 --> 03:15:47,359
a live look there

4966

03:15:53,429 --> 03:15:50,960
at the base of pad 39a

4967

03:15:55,269 --> 03:15:53,439
the launch tower

4968

03:15:57,110 --> 03:15:55,279
and the strongback which is part of the

4969

03:15:59,590 --> 03:15:57,120
transporter erector

4970

03:16:01,269 --> 03:15:59,600
it is in the foreground the rockets

4971

03:16:03,990 --> 03:16:01,279
will be venting for propellant load

4972

03:16:07,429 --> 03:16:04,000
approximately one minute

4973

03:16:10,150 --> 03:16:07,439
okay there you heard in 60 seconds

4974

03:16:19,990 --> 03:16:10,160
venting those tanks in in a in advance

4975

03:16:28,070 --> 03:16:22,950
it's 3 15 a.m eastern daylight time here

4976

03:16:28,080 --> 03:16:32,389

the overnight launch

4977

03:16:38,070 --> 03:16:34,469

will light up the night sky

4978

03:16:42,389 --> 03:16:39,750

the spacecraft at the very top it's a

4979

03:16:48,710 --> 03:16:44,790

crew dragon freedom

4980

03:16:48,720 --> 03:16:53,429

although parts of it are being reused

4981

03:17:03,750 --> 03:16:54,229

the

4982

03:17:04,950 --> 03:17:03,760

i reused it on a dragon

4983

03:17:08,309 --> 03:17:04,960

which is

4984

03:17:11,429 --> 03:17:08,319

just another advancement in spacex's

4985

03:17:13,510 --> 03:17:11,439

reuse capability

4986

03:17:15,750 --> 03:17:13,520

they're able to put flight loads on it

4987

03:17:17,590 --> 03:17:15,760

to test it and qualify it

4988

03:17:18,710 --> 03:17:17,600

nasa has approved it

4989

03:17:20,229 --> 03:17:18,720

and it's ready to go which is

4990

03:17:22,070 --> 03:17:20,239

interesting because it's seen the

4991

03:17:25,269 --> 03:17:22,080

saltwater environment right right but

4992

03:17:29,349 --> 03:17:27,510

get that ready for another go yeah it is

4993

03:17:31,349 --> 03:17:29,359

it's remarkable and that qualification

4994

03:17:33,190 --> 03:17:31,359

program that you mentioned very strict

4995

03:17:34,950 --> 03:17:33,200

obviously it has to be very thorough

4996

03:17:36,630 --> 03:17:34,960

with multiple teams of people making

4997

03:17:38,950 --> 03:17:36,640

sure that all of the requirements are

4998

03:17:41,110 --> 03:17:38,960

met um so that there are no safety

4999

03:17:43,110 --> 03:17:41,120

impacts to reusing these pieces of

5000

03:17:45,750 --> 03:17:43,120

hardware but what how transformative

5001
03:17:47,590 --> 03:17:45,760
really to be able to use reuse pieces

5002
03:17:49,030 --> 03:17:47,600
that in the past would not have ever

5003
03:17:50,630 --> 03:17:49,040
been used again

5004
03:17:52,309 --> 03:17:50,640
to really bring down the efficiencies

5005
03:17:54,550 --> 03:17:52,319
and the costs

5006
03:17:56,950 --> 03:17:54,560
and ultimately the reliability as we are

5007
03:18:00,229 --> 03:17:56,960
able to use flight proven hardware over

5008
03:18:01,910 --> 03:18:00,239
and over again absolutely

5009
03:18:16,070 --> 03:18:01,920
and now here we are just a few seconds

5010
03:18:20,870 --> 03:18:18,150
thinking about the crew 2 mission as we

5011
03:18:23,910 --> 03:18:20,880
look forward to crew 4

5012
03:18:27,190 --> 03:18:23,920
when you were up on the space station

5013
03:18:28,870 --> 03:18:27,200

it was quite the time up there right

5014

03:18:30,790 --> 03:18:28,880

i'm thinking about the the visit from

5015

03:18:32,790 --> 03:18:30,800

the russian film crew that did they're

5016

03:18:35,349 --> 03:18:32,800

shooting visitors that's right that's

5017

03:18:37,910 --> 03:18:35,359

right so they came up uh an actor and a

5018

03:18:41,030 --> 03:18:37,920

producer came up on a soyuz

5019

03:18:42,150 --> 03:18:41,040

and spent the 10 day time period filming

5020

03:18:43,590 --> 03:18:42,160

a movie

5021

03:18:44,550 --> 03:18:43,600

almost exclusively on the russian

5022

03:18:45,990 --> 03:18:44,560

segment

5023

03:18:47,349 --> 03:18:46,000

but we were able to interact with them

5024

03:18:49,670 --> 03:18:47,359

in the evenings we would occasionally

5025

03:18:51,190 --> 03:18:49,680

have dinner parties as we do up there

5026

03:18:52,309 --> 03:18:51,200

and so we would get to chat with them a

5027

03:18:53,750 --> 03:18:52,319

little bit and hear about their lives

5028

03:18:55,269 --> 03:18:53,760

and hear about their plans was that

5029

03:18:57,429 --> 03:18:55,279

interesting it was very interesting they

5030

03:19:00,790 --> 03:18:57,439

were lovely people they were a very

5031

03:19:02,070 --> 03:19:00,800

gracious guest load has started

5032

03:19:05,670 --> 03:19:02,080

there you hear the call out the

5033

03:19:13,030 --> 03:19:05,680

propellant load has begun

5034

03:19:17,190 --> 03:19:15,110

as we are sitting at t minus 34 minutes

5035

03:19:19,349 --> 03:19:17,200

and counting but you were saying megan

5036

03:19:21,750 --> 03:19:19,359

yes so it was it's nice to have some new

5037

03:19:23,670 --> 03:19:21,760

faces quite frankly and to hear some new

5038

03:19:25,030 --> 03:19:23,680

stories um and like i said that we

5039

03:19:26,630 --> 03:19:25,040

really did not work with them they

5040

03:19:30,070 --> 03:19:26,640

worked exclusively on the russian

5041

03:19:31,910 --> 03:19:30,080

segment um and so it did not disrupt our

5042

03:19:34,229 --> 03:19:31,920

ongoing science work that of course

5043

03:19:36,469 --> 03:19:34,239

we're doing that's so important for for

5044

03:19:39,110 --> 03:19:36,479

our international partners so um i think

5045

03:19:41,349 --> 03:19:39,120

it would be difficult to to carry out a

5046

03:19:43,269 --> 03:19:41,359

movie production as well as carry out

5047

03:19:45,670 --> 03:19:43,279

the actual work of the space station

5048

03:19:47,269 --> 03:19:45,680

just another example of the uh you know

5049

03:19:49,190 --> 03:19:47,279

continued private use of the

5050

03:19:51,910 --> 03:19:49,200

international space station and i guess

5051

03:19:53,990 --> 03:19:51,920

you didn't photobomb their their shot

5052

03:19:57,030 --> 03:19:54,000

i did not no i stayed safely behind the

5053

03:20:01,030 --> 03:19:57,040

camera or in the other room entirely

5054

03:20:03,910 --> 03:20:01,040

we are now t minus 33 minutes 57 seconds

5055

03:20:06,309 --> 03:20:03,920

and counting away from the second launch

5056

03:20:07,830 --> 03:20:06,319

of a crew dragon with people on board in

5057

03:20:09,429 --> 03:20:07,840

2022

5058

03:20:11,030 --> 03:20:09,439

today will begin the next six month

5059

03:20:12,309 --> 03:20:11,040

rotation mission to the international

5060

03:20:15,110 --> 03:20:12,319

space station

5061

03:20:16,870 --> 03:20:15,120

the launch escape system is armed

5062

03:20:19,670 --> 03:20:16,880

that happened just before we started

5063

03:20:21,830 --> 03:20:19,680

loading the propellant onto falcon 9.

5064

03:20:23,429 --> 03:20:21,840

the dragon capsule though it was loaded

5065

03:20:25,910 --> 03:20:23,439

with its propellants about a week and a

5066

03:20:29,110 --> 03:20:25,920

half ago just a few miles down the road

5067

03:20:31,670 --> 03:20:29,120

at a facility spacex calls dragonland

5068

03:20:34,670 --> 03:20:31,680

in order to fly dragon needs a fuel and

5069

03:20:37,670 --> 03:20:34,680

an oxidizer so for the fuel spacex uses

5070

03:20:41,670 --> 03:20:37,680

monomethylhydrazine or mmh and nitrogen

5071

03:20:42,710 --> 03:20:41,680

tetroxide or nto for its oxidizer and

5072

03:20:44,630 --> 03:20:42,720

together

5073

03:20:48,550 --> 03:20:44,640

those propellants feed the draco engines

5074

03:20:50,870 --> 03:20:48,560

that maneuver dragon on orbit

5075

03:20:52,790 --> 03:20:50,880

as well as the eight super draco engines

5076
03:20:53,830 --> 03:20:52,800
that would power the launch escape

5077
03:20:57,990 --> 03:20:53,840
system

5078
03:21:01,750 --> 03:20:59,990
and now that fueling for falcon 9 is

5079
03:21:04,229 --> 03:21:01,760
started that means the eight super draco

5080
03:21:06,950 --> 03:21:04,239
engines inside crew dragon are ready if

5081
03:21:09,990 --> 03:21:06,960
needed to pull this capsule away from

5082
03:21:11,590 --> 03:21:10,000
the falcon 9 rocket in an instant should

5083
03:21:15,269 --> 03:21:11,600
there be any kind of emergency

5084
03:21:18,070 --> 03:21:15,279
associated with a rocket on the pad

5085
03:21:19,830 --> 03:21:18,080
or if there was a problem with the pad

5086
03:21:22,150 --> 03:21:19,840
the nasa and spacex teams have trained

5087
03:21:25,269 --> 03:21:22,160
extensively for exactly

5088
03:21:28,309 --> 03:21:25,279

that type of contingency

5089

03:21:31,110 --> 03:21:29,510

now let's head over to spacex

5090

03:21:36,070 --> 03:21:31,120

headquarters in hawthorne for an

5091

03:21:39,990 --> 03:21:38,309

thanks daryl uh yeah we are continuing

5092

03:21:42,150 --> 03:21:40,000

to count down those final minutes and

5093

03:21:44,070 --> 03:21:42,160

everything is still looking good for

5094

03:21:47,670 --> 03:21:44,080

falcon 9 and dragon for an on-time

5095

03:21:49,590 --> 03:21:47,680

liftoff just about 32 minutes from now

5096

03:21:51,830 --> 03:21:49,600

at the t-minus 35-minute mark we heard

5097

03:21:53,910 --> 03:21:51,840

that propellant loading began on falcon

5098

03:21:55,830 --> 03:21:53,920

9. this is gonna continue until about

5099

03:21:58,070 --> 03:21:55,840

the t-minus two minute mark

5100

03:21:59,670 --> 03:21:58,080

the first and second stages of falcon 9

5101
03:22:02,469 --> 03:21:59,680
are each loaded with two liquid

5102
03:22:04,309 --> 03:22:02,479
propellants one is fuel loaded into a

5103
03:22:06,710 --> 03:22:04,319
tank at the bottom of the stage and the

5104
03:22:08,469 --> 03:22:06,720
other is an oxidizer loaded into a tank

5105
03:22:10,309 --> 03:22:08,479
at the top of the stage

5106
03:22:12,469 --> 03:22:10,319
the fuel we use to power the merlin

5107
03:22:15,590 --> 03:22:12,479
engines is a refined kerosene referred

5108
03:22:17,750 --> 03:22:15,600
to as rp1 the oxidizer loaded on each

5109
03:22:20,309 --> 03:22:17,760
stage is a densified liquid oxygen we

5110
03:22:22,630 --> 03:22:20,319
also refer to that as locks

5111
03:22:24,389 --> 03:22:22,640
densified means it is kept much colder

5112
03:22:26,870 --> 03:22:24,399
than typical for launch vehicles and

5113
03:22:30,070 --> 03:22:26,880

takes up less volume and this basically

5114

03:22:32,150 --> 03:22:30,080

allows us to store more oxidizer into

5115

03:22:34,469 --> 03:22:32,160

both the stages

5116

03:22:36,389 --> 03:22:34,479

to ignite the fuel and oxidizer in the

5117

03:22:39,110 --> 03:22:36,399

merlin rocket engine we use an ignition

5118

03:22:41,750 --> 03:22:39,120

fluid called t-tab when t-tep comes into

5119

03:22:44,389 --> 03:22:41,760

contact with oxygen it burns giving off

5120

03:22:46,469 --> 03:22:44,399

a green colored flame once we have the

5121

03:22:48,469 --> 03:22:46,479

flame going we'll add the kerosene fuel

5122

03:22:50,309 --> 03:22:48,479

into the merlin chamber and the engine

5123

03:22:52,150 --> 03:22:50,319

wraps up to full power

5124

03:22:54,150 --> 03:22:52,160

now if you pay close attention you might

5125

03:22:55,750 --> 03:22:54,160

see the green flash as the second stage

5126

03:22:57,990 --> 03:22:55,760

engine ignites following stage

5127

03:23:00,630 --> 03:22:58,000

separation about two and a half minutes

5128

03:23:02,790 --> 03:23:00,640

into flight

5129

03:23:05,429 --> 03:23:02,800

topping off helium into pressure vessels

5130

03:23:07,510 --> 03:23:05,439

on both stages is also underway this is

5131

03:23:09,510 --> 03:23:07,520

used to pressurize the tanks in flight

5132

03:23:12,469 --> 03:23:09,520

as propellant is pulled out by the

5133

03:23:14,070 --> 03:23:12,479

merlin merlin turbo pumps

5134

03:23:15,750 --> 03:23:14,080

onboard the spacecraft the astronauts

5135

03:23:16,950 --> 03:23:15,760

are monitoring systems while propellant

5136

03:23:18,790 --> 03:23:16,960

is loaded

5137

03:23:20,710 --> 03:23:18,800

onto the falcon 9.

5138

03:23:22,389 --> 03:23:20,720

again as megan had mentioned the crew

5139

03:23:24,309 --> 03:23:22,399

training in the simulator included

5140

03:23:26,389 --> 03:23:24,319

playbacks of sounds recorded in the

5141

03:23:28,790 --> 03:23:26,399

dragon capsule during us uh during

5142

03:23:30,070 --> 03:23:28,800

recent flights so this should be the

5143

03:23:33,190 --> 03:23:30,080

sounds that the astronauts are hearing

5144

03:23:35,590 --> 03:23:33,200

should be sort of familiar

5145

03:23:38,150 --> 03:23:35,600

range and weather again as they have

5146

03:23:39,750 --> 03:23:38,160

been all night are really tracking green

5147

03:23:41,510 --> 03:23:39,760

we're really continuing to report no

5148

03:23:43,349 --> 03:23:41,520

problems and

5149

03:23:45,349 --> 03:23:43,359

there really is a very low probability

5150

03:23:47,750 --> 03:23:45,359

of violation for weather

5151
03:23:49,830 --> 03:23:47,760
as a reminder today is an instantaneous

5152
03:23:52,389 --> 03:23:49,840
launch window so at this point if we

5153
03:23:54,389 --> 03:23:52,399
hear a hold for any reason we'll have to

5154
03:23:56,150 --> 03:23:54,399
stand down and our target backup launch

5155
03:23:57,830 --> 03:23:56,160
opportunity tomorrow night

5156
03:23:59,429 --> 03:23:57,840
just under 24 hours from tonight's

5157
03:24:01,830 --> 03:23:59,439
planned launch

5158
03:24:03,830 --> 03:24:01,840
for now let's turn over to jessie and

5159
03:24:06,229 --> 03:24:03,840
dan for an overview of events after

5160
03:24:08,710 --> 03:24:06,239
liftoff

5161
03:24:10,710 --> 03:24:08,720
great thanks andy again always great

5162
03:24:12,870 --> 03:24:10,720
news with some good weather

5163
03:24:14,870 --> 03:24:12,880

just under 30 minutes

5164

03:24:17,349 --> 03:24:14,880
to t0 today

5165

03:24:20,070 --> 03:24:17,359
so for crew four the astronauts play to

5166

03:24:22,469 --> 03:24:20,080
station will take about 16 hours

5167

03:24:24,870 --> 03:24:22,479
and as we await that launch time just

5168

03:24:26,710 --> 03:24:24,880
about 29 and a half minutes from now the

5169

03:24:28,950 --> 03:24:26,720
ground operations teams are doing a

5170

03:24:30,790 --> 03:24:28,960
series of system checks ensuring that

5171

03:24:32,870 --> 03:24:30,800
both dragon and falcon 9 are ready for

5172

03:24:34,790 --> 03:24:32,880
launch and you're looking now just over

5173

03:24:37,269 --> 03:24:34,800
the shoulders of our team out of the

5174

03:24:39,190 --> 03:24:37,279
cape there as they prepare for liftoff

5175

03:24:40,389 --> 03:24:39,200
as we wait for the launch clock to hit

5176
03:24:42,150 --> 03:24:40,399
zero though we wanted to give you a

5177
03:24:44,389 --> 03:24:42,160
quick overview of what the ascent

5178
03:24:45,670 --> 03:24:44,399
portion of this mission is going to look

5179
03:24:48,389 --> 03:24:45,680
like

5180
03:24:50,630 --> 03:24:48,399
once we hit t0 and a successful launch

5181
03:24:53,349 --> 03:24:50,640
occurs we will watch falcon 9 and dragon

5182
03:24:54,790 --> 03:24:53,359
lift off from historic launch pad 39a

5183
03:24:56,550 --> 03:24:54,800
and make their ascent

5184
03:24:58,469 --> 03:24:56,560
one of the first things that happens

5185
03:25:01,269 --> 03:24:58,479
about 50 seconds into the flight those

5186
03:25:03,429 --> 03:25:01,279
nine merlin engines will throttle down

5187
03:25:06,070 --> 03:25:03,439
as the rocket passes through the period

5188
03:25:08,309 --> 03:25:06,080

of maximum dynamic pressure that's max q

5189

03:25:09,910 --> 03:25:08,319

it's really the maximum amount of stress

5190

03:25:12,389 --> 03:25:09,920

that the vehicle is going to hit on its

5191

03:25:14,070 --> 03:25:12,399

way uphill also worth noting when we hit

5192

03:25:15,670 --> 03:25:14,080

max q the vehicle will be going

5193

03:25:17,429 --> 03:25:15,680

supersonic

5194

03:25:19,349 --> 03:25:17,439

once we are through that period of

5195

03:25:21,670 --> 03:25:19,359

maximum dynamic pressure we can throttle

5196

03:25:23,510 --> 03:25:21,680

down our nine merlin engines again and

5197

03:25:25,510 --> 03:25:23,520

from there at about two and a half

5198

03:25:27,110 --> 03:25:25,520

minutes into flight we have a series of

5199

03:25:29,510 --> 03:25:27,120

three events that will happen in rapid

5200

03:25:31,670 --> 03:25:29,520

succession yeah all just right on top of

5201
03:25:33,510 --> 03:25:31,680
each other the first one's miko or main

5202
03:25:35,910 --> 03:25:33,520
engine cutoff that's where all nine of

5203
03:25:38,150 --> 03:25:35,920
those merlin 1d engines shut off in

5204
03:25:39,750 --> 03:25:38,160
preparation for stage separation which

5205
03:25:42,469 --> 03:25:39,760
is the second event this is where the

5206
03:25:44,469 --> 03:25:42,479
first stage detaches from the second the

5207
03:25:46,790 --> 03:25:44,479
first stage starts to make its way back

5208
03:25:49,429 --> 03:25:46,800
to earth for a landing as the second

5209
03:25:51,510 --> 03:25:49,439
stage ignites its engine and continues

5210
03:25:54,070 --> 03:25:51,520
its journey with that third event that

5211
03:25:56,150 --> 03:25:54,080
engine ignition it's called ses1 or

5212
03:25:58,469 --> 03:25:56,160
second stage engine start number one

5213
03:26:00,469 --> 03:25:58,479

that's where we'll see the mvac engine

5214

03:26:02,389 --> 03:26:00,479

light up and propel the second stage

5215

03:26:03,590 --> 03:26:02,399

along with the crew four astronauts into

5216

03:26:05,510 --> 03:26:03,600

orbit

5217

03:26:07,910 --> 03:26:05,520

and as stage two heads towards its

5218

03:26:09,590 --> 03:26:07,920

targeted drop off orbit stage one will

5219

03:26:11,910 --> 03:26:09,600

execute two burns in order to make its

5220

03:26:13,910 --> 03:26:11,920

way back down to earth the first is the

5221

03:26:16,070 --> 03:26:13,920

entry burn that's where three of the

5222

03:26:18,710 --> 03:26:16,080

nine m1d engines will reignite and then

5223

03:26:20,389 --> 03:26:18,720

shut down again now that helps to slow

5224

03:26:21,750 --> 03:26:20,399

the stage down in preparation for

5225

03:26:23,110 --> 03:26:21,760

re-entry back into the earth's

5226
03:26:24,710 --> 03:26:23,120
atmosphere

5227
03:26:26,309 --> 03:26:24,720
and while the first stage is heading

5228
03:26:28,150 --> 03:26:26,319
back towards earth again that second

5229
03:26:30,309 --> 03:26:28,160
stage it just continues to carry them

5230
03:26:32,469 --> 03:26:30,319
into orbit until it cuts off it's one

5231
03:26:35,190 --> 03:26:32,479
merlin engine that was ignited after

5232
03:26:36,469 --> 03:26:35,200
stage separation and once that happens

5233
03:26:37,910 --> 03:26:36,479
we wait for the call out the

5234
03:26:39,830 --> 03:26:37,920
confirmation what's called a good

5235
03:26:41,510 --> 03:26:39,840
orbital insertion just essentially

5236
03:26:42,950 --> 03:26:41,520
they're where we expect them to be in

5237
03:26:45,269 --> 03:26:42,960
outer space

5238
03:26:48,229 --> 03:26:45,279

about 90 seconds after dragon gets into

5239

03:26:49,670 --> 03:26:48,239

orbit falcon 9 will land back on earth

5240

03:26:51,590 --> 03:26:49,680

now the landing burn is just a single

5241

03:26:53,670 --> 03:26:51,600

engine burn that's powerful enough to

5242

03:26:55,990 --> 03:26:53,680

bring the vehicle speed down rapidly in

5243

03:26:58,150 --> 03:26:56,000

order to touch down and land on our

5244

03:26:59,349 --> 03:26:58,160

drone ship about nine and a half minutes

5245

03:27:01,910 --> 03:26:59,359

into the mission

5246

03:27:04,150 --> 03:27:01,920

and while falcon 9's first aegis landing

5247

03:27:05,990 --> 03:27:04,160

dragon is just getting ready to separate

5248

03:27:06,950 --> 03:27:06,000

from the second stage of the falcon 9

5249

03:27:09,510 --> 03:27:06,960

rocket

5250

03:27:11,190 --> 03:27:09,520

it takes about three minutes after we

5251
03:27:12,710 --> 03:27:11,200
get on orbit

5252
03:27:14,630 --> 03:27:12,720
and we just wait for the vehicle to

5253
03:27:16,630 --> 03:27:14,640
cancel out any rates essentially make

5254
03:27:18,710 --> 03:27:16,640
sure everything's nice and stable before

5255
03:27:20,309 --> 03:27:18,720
the two spacecraft separate

5256
03:27:21,990 --> 03:27:20,319
we should get a great view from the

5257
03:27:23,349 --> 03:27:22,000
second stage of dragon's trunk as it

5258
03:27:25,510 --> 03:27:23,359
flies free

5259
03:27:27,750 --> 03:27:25,520
once dragon is a short distance away it

5260
03:27:29,190 --> 03:27:27,760
starts going into a number of checkouts

5261
03:27:30,710 --> 03:27:29,200
immediately

5262
03:27:33,190 --> 03:27:30,720
looking at some of those draco

5263
03:27:35,429 --> 03:27:33,200

maneuvering thrusters

5264

03:27:37,110 --> 03:27:35,439

there's 12 around the service section of

5265

03:27:39,190 --> 03:27:37,120

dragon those are the first ones that get

5266

03:27:41,429 --> 03:27:39,200

checked out and they'll also increase

5267

03:27:42,710 --> 03:27:41,439

that separation distance from falcon 9

5268

03:27:45,110 --> 03:27:42,720

second stage

5269

03:27:47,910 --> 03:27:45,120

these are not the super dracos those are

5270

03:27:49,750 --> 03:27:47,920

disabled as soon as we hit this point on

5271

03:27:51,910 --> 03:27:49,760

orbit they're only using an abort

5272

03:27:53,590 --> 03:27:51,920

scenario once we're in outer space those

5273

03:27:55,269 --> 03:27:53,600

are disabled for the remainder of the

5274

03:27:57,750 --> 03:27:55,279

mission

5275

03:28:00,070 --> 03:27:57,760

40 seconds after separation dragon's

5276

03:28:02,070 --> 03:28:00,080

nose cone deploy sequence will begin it

5277

03:28:04,150 --> 03:28:02,080

will take a roughly four minutes for the

5278

03:28:06,309 --> 03:28:04,160

nose cone hooks to unlatch and open and

5279

03:28:09,269 --> 03:28:06,319

that exposes its guidance navigation

5280

03:28:11,590 --> 03:28:09,279

controls or gnc that will help dragon

5281

03:28:13,429 --> 03:28:11,600

autonomously fly to the space station

5282

03:28:15,510 --> 03:28:13,439

and once that nose cone's deployed the

5283

03:28:17,830 --> 03:28:15,520

remaining four draco thrusters on the

5284

03:28:19,910 --> 03:28:17,840

forward bulkhead get checked out and

5285

03:28:21,910 --> 03:28:19,920

from there it's about 16 hours for

5286

03:28:23,990 --> 03:28:21,920

dragon to go through the rendezvous

5287

03:28:26,309 --> 03:28:24,000

approach phases undergoing the number of

5288

03:28:28,150 --> 03:28:26,319

what's called phasing burns as it makes

5289

03:28:30,229 --> 03:28:28,160

its way to the station just essentially

5290

03:28:33,269 --> 03:28:30,239

raising its orbit and chasing down the

5291

03:28:35,110 --> 03:28:33,279

orbiting traffic to cryohelium loading

5292

03:28:37,670 --> 03:28:35,120

and so all of that's going to be coming

5293

03:28:44,469 --> 03:28:37,680

up soon let's check back in with chelsea

5294

03:28:49,190 --> 03:28:46,550

hey thanks dan flight controllers here

5295

03:28:51,429 --> 03:28:49,200

in mission control are laser focused on

5296

03:28:53,030 --> 03:28:51,439

the onboard systems of the space station

5297

03:28:55,110 --> 03:28:53,040

making sure it's ready to receive the

5298

03:28:56,630 --> 03:28:55,120

dragon vehicle later tonight

5299

03:28:58,550 --> 03:28:56,640

they'll also be making sure that all

5300

03:29:00,150 --> 03:28:58,560

communication links between the station

5301

03:29:01,990 --> 03:29:00,160

dragon and the ground are working

5302

03:29:04,469 --> 03:29:02,000

properly the consensus is that

5303

03:29:05,990 --> 03:29:04,479

everything is proceeding nominally

5304

03:29:08,070 --> 03:29:06,000

teams here in mission control houston

5305

03:29:09,990 --> 03:29:08,080

the team in hawthorne and the astronauts

5306

03:29:11,830 --> 03:29:10,000

aboard the space station will monitor

5307

03:29:13,429 --> 03:29:11,840

the autonomous docking of the dragon

5308

03:29:15,110 --> 03:29:13,439

spacecraft tonight

5309

03:29:16,870 --> 03:29:15,120

they'll perform a series of leak checks

5310

03:29:18,790 --> 03:29:16,880

then work to open the hatches both on

5311

03:29:21,190 --> 03:29:18,800

the dragon side and inside the station's

5312

03:29:23,190 --> 03:29:21,200

pressurized mating adapter we expect

5313

03:29:25,510 --> 03:29:23,200

hatchet opening to take place about an

5314

03:29:27,030 --> 03:29:25,520

hour and a half after docking

5315

03:29:29,269 --> 03:29:27,040

once on board the astronauts will be

5316

03:29:31,110 --> 03:29:29,279

greeted by space station commander tom

5317

03:29:32,950 --> 03:29:31,120

marshburn and the whole space station

5318

03:29:34,550 --> 03:29:32,960

crew will join in for welcoming remarks

5319

03:29:36,229 --> 03:29:34,560

to the new crew members

5320

03:29:37,990 --> 03:29:36,239

from there on out they will no longer be

5321

03:29:39,990 --> 03:29:38,000

referred to as crew 4 as we're calling

5322

03:29:42,309 --> 03:29:40,000

them today but rather flight engineers

5323

03:29:43,990 --> 03:29:42,319

of the international space station here

5324

03:29:46,229 --> 03:29:44,000

in mission control flight director

5325

03:29:48,550 --> 03:29:46,239

anthony varya is on console overseeing

5326
03:29:50,550 --> 03:29:48,560
the team for launch and audi boulos will

5327
03:29:52,389 --> 03:29:50,560
be on console for docking

5328
03:29:54,870 --> 03:29:52,399
but we'll be on air continuously through

5329
03:29:57,349 --> 03:29:54,880
crew 4's arrival but launch coverage of

5330
03:29:58,469 --> 03:29:57,359
docking is expected around 8 15 pm

5331
03:30:00,469 --> 03:29:58,479
eastern

5332
03:30:02,790 --> 03:30:00,479
that's it for mission control i'll toss

5333
03:30:04,870 --> 03:30:02,800
it back to the team in florida daryl i'm

5334
03:30:07,349 --> 03:30:04,880
excited for launch how's it looking all

5335
03:30:09,510 --> 03:30:07,359
right thank you chelsea and so are we

5336
03:30:12,150 --> 03:30:09,520
we're looking great weather-wise here

5337
03:30:14,630 --> 03:30:12,160
range is green weather is green and

5338
03:30:17,429 --> 03:30:14,640

well we're green green and ready to go

5339

03:30:19,590 --> 03:30:17,439

for this launch we are just t minus 23

5340

03:30:22,150 --> 03:30:19,600

minutes and counting from the launch of

5341

03:30:23,830 --> 03:30:22,160

crew 4 the fourth astronaut rotation

5342

03:30:27,030 --> 03:30:23,840

mission to the international space

5343

03:30:28,950 --> 03:30:27,040

station under nasa's commercial crew

5344

03:30:31,190 --> 03:30:28,960

program and it's going to be a good one

5345

03:30:33,670 --> 03:30:31,200

folks the four astronauts are strapped

5346

03:30:36,070 --> 03:30:33,680

in commander chell lindgren pilot bob

5347

03:30:38,229 --> 03:30:36,080

hines and mission specialist jessica

5348

03:30:39,830 --> 03:30:38,239

watkins and samantha christopher they

5349

03:30:42,630 --> 03:30:39,840

are strapped into their seats inside

5350

03:30:44,630 --> 03:30:42,640

crew dragon freedom we can see a live

5351

03:30:46,710 --> 03:30:44,640

shot of their rocket as we look uh to

5352

03:30:50,229 --> 03:30:46,720

the screen right now that is the falcon

5353

03:30:52,630 --> 03:30:50,239

9 the rocket fueling operation is well

5354

03:30:54,790 --> 03:30:52,640

underway the launch escape system is

5355

03:30:56,469 --> 03:30:54,800

armed and that means crew dragon is

5356

03:30:59,110 --> 03:30:56,479

prepared to launch itself away from the

5357

03:31:02,469 --> 03:30:59,120

falcon 9 rocket in case of an emergency

5358

03:31:04,389 --> 03:31:02,479

on the pad or even after liftoff

5359

03:31:05,750 --> 03:31:04,399

so far operations look and sound as

5360

03:31:07,750 --> 03:31:05,760

expected

5361

03:31:11,030 --> 03:31:07,760

we are counting down to that liftoff at

5362

03:31:15,910 --> 03:31:11,040

3 52 and 55 seconds

5363

03:31:15,920 --> 03:31:18,710

and so far

5364

03:31:21,830 --> 03:31:20,630

everything has looked

5365

03:31:24,550 --> 03:31:21,840

right on

5366

03:31:26,630 --> 03:31:24,560

it has it's wonderful to see just 22

5367

03:31:29,030 --> 03:31:26,640

minutes and 32 seconds remaining on the

5368

03:31:30,389 --> 03:31:29,040

clock i'm starting to get really excited

5369

03:31:32,710 --> 03:31:30,399

when you were sitting inside that

5370

03:31:34,790 --> 03:31:32,720

spacecraft how did you feel well at that

5371

03:31:35,990 --> 03:31:34,800

point you are really focused you are um

5372

03:31:37,750 --> 03:31:36,000

you've sort of stopped with the chit

5373

03:31:40,469 --> 03:31:37,760

chat and the storytelling and you are

5374

03:31:42,790 --> 03:31:40,479

very much watching the progress of the

5375

03:31:44,790 --> 03:31:42,800

propellant loading knowing that the the

5376

03:31:47,030 --> 03:31:44,800

time is counting down and you're just

5377

03:31:48,389 --> 03:31:47,040

really starting to get you know get your

5378

03:31:50,309 --> 03:31:48,399

head in the game and be ready for what's

5379

03:31:51,990 --> 03:31:50,319

happening next that's a very serious

5380

03:31:54,309 --> 03:31:52,000

part of the

5381

03:31:55,670 --> 03:31:54,319

countdown is that propellant flowing in

5382

03:31:57,750 --> 03:31:55,680

you can see those systems as you're

5383

03:31:58,469 --> 03:31:57,760

looking on your screen and monitoring

5384

03:32:00,630 --> 03:31:58,479

them

5385

03:32:02,150 --> 03:32:00,640

the mission is the continuation of

5386

03:32:04,070 --> 03:32:02,160

rotational crew flights to the

5387

03:32:05,910 --> 03:32:04,080

international space station from u.s

5388

03:32:08,229 --> 03:32:05,920

soil on private rockets and spacecraft

5389

03:32:11,110 --> 03:32:08,239

and this would not be possible without

5390

03:32:13,590 --> 03:32:11,120

the success of nasa spacex demo two the

5391

03:32:14,710 --> 03:32:13,600

test flight uh two years ago if you can

5392

03:32:17,510 --> 03:32:14,720

believe it

5393

03:32:19,830 --> 03:32:17,520

the safe delivery and return of crews

5394

03:32:23,110 --> 03:32:19,840

one and two and of course

5395

03:32:25,269 --> 03:32:23,120

crew two back on earth six months ago

5396

03:32:27,429 --> 03:32:25,279

and that's why we have with us the pilot

5397

03:32:29,190 --> 03:32:27,439

from crew 2 megan mcarthur appreciate

5398

03:32:30,870 --> 03:32:29,200

you being here absolutely it's hard to

5399

03:32:33,190 --> 03:32:30,880

believe it i've been home for six months

5400

03:32:34,950 --> 03:32:33,200

already and launched almost a year ago

5401

03:32:37,030 --> 03:32:34,960

but

5402

03:32:38,630 --> 03:32:37,040

the time travels yeah it keeps moving

5403

03:32:40,309 --> 03:32:38,640

it was six months that you were up in

5404

03:32:44,389 --> 03:32:40,319

space

5405

03:32:45,590 --> 03:32:44,399

like now have you the symptoms of having

5406

03:32:48,870 --> 03:32:45,600

been up in space for that long

5407

03:32:51,269 --> 03:32:48,880

completely passed um i would say they 90

5408

03:32:53,030 --> 03:32:51,279

back to earth normal um and you know

5409

03:32:54,710 --> 03:32:53,040

there's some lingering things like back

5410

03:32:56,389 --> 03:32:54,720

pain and you know some joint pain and

5411

03:32:57,990 --> 03:32:56,399

things like that that will pop up that

5412

03:33:01,190 --> 03:32:58,000

uh you know i go well am i just older

5413

03:33:03,349 --> 03:33:01,200

now or is earth just harder um so but

5414

03:33:07,830 --> 03:33:03,359

for the most part back to normal

5415

03:33:11,269 --> 03:33:09,429

well you've done a wonderful job for us

5416

03:33:13,269 --> 03:33:11,279

tonight and we appreciate it as we

5417

03:33:15,590 --> 03:33:13,279

continue to count down we're

5418

03:33:19,269 --> 03:33:15,600

looking for

5419

03:33:22,309 --> 03:33:19,279

the next call out which should be stage

5420

03:33:23,990 --> 03:33:22,319

2 rp1 load complete

5421

03:33:25,190 --> 03:33:24,000

it'll be followed by strong back chill

5422

03:33:28,229 --> 03:33:25,200

has begun

5423

03:33:41,510 --> 03:33:28,239

and then we'll start loading stage 2

5424

03:33:41,520 --> 03:33:51,269

stage two rp1 load is complete

5425

03:33:56,309 --> 03:33:53,670

you can see the condensation coming off

5426
03:33:58,630 --> 03:33:56,319
the rocket that super chilled locks

5427
03:34:00,870 --> 03:33:58,640
chilling down everything including

5428
03:34:03,030 --> 03:34:00,880
the skin of the rocket

5429
03:34:05,750 --> 03:34:03,040
so that it condenses the

5430
03:34:07,190 --> 03:34:05,760
humid floor to air and you see there the

5431
03:34:13,750 --> 03:34:07,200
clouds are coming off but at the very

5432
03:34:23,510 --> 03:34:16,229
t-minus 19 minutes

5433
03:34:26,790 --> 03:34:25,110
it's an impressive side i forget that i

5434
03:34:28,469 --> 03:34:26,800
can also look over my shoulder and see

5435
03:34:30,710 --> 03:34:28,479
it's uh

5436
03:34:33,110 --> 03:34:30,720
in real life in fact you just did that

5437
03:34:34,950 --> 03:34:33,120
we can't see you on camera but megan

5438
03:34:37,030 --> 03:34:34,960

turned and

5439

03:34:38,870 --> 03:34:37,040

wanted to see that it was the same thing

5440

03:34:39,670 --> 03:34:38,880

she's looking at on screen and indeed it

5441

03:34:42,150 --> 03:34:39,680

is

5442

03:34:43,750 --> 03:34:42,160

we are bringing you live pictures of the

5443

03:34:46,070 --> 03:34:43,760

launch of crew 4

5444

03:34:48,950 --> 03:34:46,080

from the kennedy space center in florida

5445

03:34:54,950 --> 03:34:48,960

liftoff time 3 52 a.m eastern daylight

5446

03:34:58,229 --> 03:34:56,710

if you're just joining us we want to

5447

03:35:01,030 --> 03:34:58,239

tell you a little bit about the crew on

5448

03:35:03,269 --> 03:35:01,040

board dr lindgren is the commander he

5449

03:35:05,349 --> 03:35:03,279

was born in taipei taiwan but spent most

5450

03:35:07,510 --> 03:35:05,359

of his childhood overseas in england he

5451

03:35:09,030 --> 03:35:07,520

is married with three children

5452

03:35:11,030 --> 03:35:09,040

he was an instructor and jump master

5453

03:35:13,349 --> 03:35:11,040

with the u.s air force academy and he

5454

03:35:15,030 --> 03:35:13,359

also has a doctorate in medicine

5455

03:35:17,190 --> 03:35:15,040

he served as a nasa flight surgeon and

5456

03:35:19,510 --> 03:35:17,200

then as an astronaut aboard soyuz where

5457

03:35:21,750 --> 03:35:19,520

he spent 141 days in space during

5458

03:35:23,269 --> 03:35:21,760

expedition 44 and 45

5459

03:35:26,150 --> 03:35:23,279

and as i mentioned today he is the

5460

03:35:29,190 --> 03:35:26,160

commander of crew dragon sitting next to

5461

03:35:31,670 --> 03:35:29,200

him is his pilot bob hines who was born

5462

03:35:32,710 --> 03:35:31,680

in fayetteville north carolina there he

5463

03:35:34,630 --> 03:35:32,720

is

5464

03:35:36,389 --> 03:35:34,640

he's married with three daughters he has

5465

03:35:38,389 --> 03:35:36,399

a master of science degree in aerospace

5466

03:35:41,190 --> 03:35:38,399

engineering and served 21 years in the

5467

03:35:43,830 --> 03:35:41,200

u.s air force as a test pilot and as a

5468

03:35:46,389 --> 03:35:43,840

fighter pilot in the f-15e he came to

5469

03:35:48,229 --> 03:35:46,399

nasa as a research pilot but today he's

5470

03:35:50,550 --> 03:35:48,239

the crew 4 pilot

5471

03:35:52,229 --> 03:35:50,560

for crew dragon freedom

5472

03:35:53,910 --> 03:35:52,239

a fine commander and pilot you

5473

03:35:56,150 --> 03:35:53,920

understand the role of pilot very well

5474

03:35:58,630 --> 03:35:56,160

you served it in crew 2. that's right um

5475

03:36:00,309 --> 03:35:58,640

the pilot's role is largely to help the

5476

03:36:02,150 --> 03:36:00,319

commander keep track of what's going on

5477

03:36:03,269 --> 03:36:02,160

with the systems any off nominal

5478

03:36:04,870 --> 03:36:03,279

conditions

5479

03:36:06,389 --> 03:36:04,880

while the pilot is monitoring where the

5480

03:36:09,190 --> 03:36:06,399

vehicle is and where it's going so you

5481

03:36:11,510 --> 03:36:09,200

work very closely together

5482

03:36:13,670 --> 03:36:11,520

jessica watkins is one of our two

5483

03:36:15,510 --> 03:36:13,680

mission specialists and she considers

5484

03:36:17,590 --> 03:36:15,520

lafayette colorado her hometown her

5485

03:36:20,950 --> 03:36:17,600

college rugby team won the national

5486

03:36:22,630 --> 03:36:20,960

championship in 2008. she's a geologist

5487

03:36:24,950 --> 03:36:22,640

who completed several internships with

5488

03:36:27,269 --> 03:36:24,960

nasa including one testing system

5489

03:36:30,469 --> 03:36:27,279

designs for the mars perseverance rover

5490

03:36:32,870 --> 03:36:30,479

she became an astronaut in 2017 one of

5491

03:36:35,429 --> 03:36:32,880

the many turtles uh that are going

5492

03:36:37,910 --> 03:36:35,439

around here at the nasa astronaut uh

5493

03:36:40,469 --> 03:36:37,920

crew team uh she's going up into space

5494

03:36:42,150 --> 03:36:40,479

for the very first time as a mission

5495

03:36:45,670 --> 03:36:42,160

specialist

5496

03:36:47,349 --> 03:36:45,680

samantha christa ferretti she was born

5497

03:36:49,030 --> 03:36:47,359

in milan italy

5498

03:36:51,910 --> 03:36:49,040

she has two children she's a fighter

5499

03:36:53,670 --> 03:36:51,920

pilot and in 2013 christopher ready

5500

03:36:56,710 --> 03:36:53,680

launched into a space

5501
03:36:58,150 --> 03:36:56,720
uh into space aboard a soyuz for a long

5502
03:37:00,070 --> 03:36:58,160
duration space flight to the

5503
03:37:01,910 --> 03:37:00,080
international space station

5504
03:37:04,389 --> 03:37:01,920
several years later she was awarded the

5505
03:37:06,950 --> 03:37:04,399
knight grand cross of the order of merit

5506
03:37:09,670 --> 03:37:06,960
from the president of italy

5507
03:37:13,670 --> 03:37:09,680
and today she returns to space with crew

5508
03:37:15,429 --> 03:37:13,680
for two fine mission specialists

5509
03:37:18,790 --> 03:37:15,439
now each of these four crew members will

5510
03:37:20,630 --> 03:37:18,800
be a part of expedition 67 once they

5511
03:37:25,190 --> 03:37:20,640
arrive at the international space

5512
03:37:28,790 --> 03:37:27,110
if you are here locally

5513
03:37:32,150 --> 03:37:28,800

and watching this broadcast and want to

5514

03:37:36,790 --> 03:37:33,910

just heard the call out for stage two

5515

03:37:40,469 --> 03:37:38,389

as i was mentioning if you're listening

5516

03:37:43,190 --> 03:37:40,479

to uh the radio

5517

03:37:44,790 --> 03:37:43,200

you can find the launch coverage

5518

03:37:46,630 --> 03:37:44,800

on the frequencies you see at the bottom

5519

03:37:48,790 --> 03:37:46,640

of your screen vh radio frequency

5520

03:37:52,870 --> 03:37:48,800

146.940

5521

03:37:56,389 --> 03:37:52,880

on the megahertz scale and uh uhf radio

5522

03:38:01,750 --> 03:37:58,469

in the fm mode

5523

03:38:06,469 --> 03:38:03,830

all of that can be seen or i'm sorry

5524

03:38:07,830 --> 03:38:06,479

heard rather here on the space coast

5525

03:38:09,269 --> 03:38:07,840

megan let's talk a little bit about your

5526

03:38:12,229 --> 03:38:09,279

science your team

5527

03:38:13,910 --> 03:38:12,239

spent 199 days in space a record you

5528

03:38:15,750 --> 03:38:13,920

call it 200.

5529

03:38:17,510 --> 03:38:15,760

a spacex record for an entire crew of

5530

03:38:19,590 --> 03:38:17,520

astronauts with all that time spent on

5531

03:38:21,429 --> 03:38:19,600

board space station can you explain how

5532

03:38:23,349 --> 03:38:21,439

space station acts as that orbiting

5533

03:38:25,590 --> 03:38:23,359

laboratory where crew 4 is heading right

5534

03:38:27,269 --> 03:38:25,600

now absolutely so space station

5535

03:38:29,990 --> 03:38:27,279

obviously a very unique environment

5536

03:38:32,550 --> 03:38:30,000

right it's long-term access to micro-g

5537

03:38:34,950 --> 03:38:32,560

environment that scientists can't have

5538

03:38:36,950 --> 03:38:34,960

can't replicate or simulate accurately

5539

03:38:38,469 --> 03:38:36,960

here on earth so it's the ability to run

5540

03:38:40,550 --> 03:38:38,479

these experiments that teach us

5541

03:38:42,550 --> 03:38:40,560

fundamental things about the about the

5542

03:38:44,469 --> 03:38:42,560

physics of fluid mechanics about

5543

03:38:45,990 --> 03:38:44,479

combustion things that we can't again

5544

03:38:48,229 --> 03:38:46,000

replicate on earth that can lead to

5545

03:38:50,070 --> 03:38:48,239

discoveries um that can benefit us in

5546

03:38:51,590 --> 03:38:50,080

space but can also benefit us back on

5547

03:38:53,590 --> 03:38:51,600

earth like

5548

03:38:55,269 --> 03:38:53,600

understanding diseases well enough to

5549

03:38:57,349 --> 03:38:55,279

create new treatments for them or

5550

03:38:58,950 --> 03:38:57,359

understanding combustion in a new way to

5551

03:39:00,630 --> 03:38:58,960

allow us to build cleaner burning

5552

03:39:02,070 --> 03:39:00,640

engines you mentioned some of the

5553

03:39:02,870 --> 03:39:02,080

science that you've worked on what was

5554

03:39:04,389 --> 03:39:02,880

your

5555

03:39:06,630 --> 03:39:04,399

the most impressive and stands out to

5556

03:39:08,469 --> 03:39:06,640

you in your mind well it's hard to

5557

03:39:10,070 --> 03:39:08,479

choose a favorite but of course one that

5558

03:39:12,070 --> 03:39:10,080

is always popular is one you get to eat

5559

03:39:14,870 --> 03:39:12,080

so we got to participate in the plant

5560

03:39:17,269 --> 03:39:14,880

habitat 4 experiment where we grew chili

5561

03:39:19,670 --> 03:39:17,279

peppers that hailed from hatch new

5562

03:39:21,910 --> 03:39:19,680

mexico and so we got to monitor them

5563

03:39:23,670 --> 03:39:21,920

over a period of many months it was a

5564

03:39:25,750 --> 03:39:23,680

fruiting plant that took a long time to

5565

03:39:27,830 --> 03:39:25,760

germinate and to fruit and for long

5566

03:39:30,150 --> 03:39:27,840

duration missions will provide an

5567

03:39:32,229 --> 03:39:30,160

important vitamin c and other

5568

03:39:34,469 --> 03:39:32,239

minerals for for crews on long duration

5569

03:39:36,229 --> 03:39:34,479

missions and they were also just really

5570

03:39:38,710 --> 03:39:36,239

tasty so that was a lot of fun that's a

5571

03:39:40,309 --> 03:39:38,720

bonus and you know growing plants in

5572

03:39:42,150 --> 03:39:40,319

space is part of deeper space

5573

03:39:43,910 --> 03:39:42,160

exploration especially growing them in

5574

03:39:45,429 --> 03:39:43,920

mass amounts right so that you can feed

5575

03:39:47,030 --> 03:39:45,439

a crew absolutely right it'll be an

5576

03:39:47,990 --> 03:39:47,040

important part part of those future

5577

03:39:50,229 --> 03:39:48,000

missions

5578

03:39:51,910 --> 03:39:50,239

crew 4 will fly aboard a brand new

5579

03:39:54,229 --> 03:39:51,920

dragon capsule by the way that the

5580

03:39:56,790 --> 03:39:54,239

astronauts named freedom

5581

03:39:58,309 --> 03:39:56,800

but the booster has flown three previous

5582

03:40:01,110 --> 03:39:58,319

times and there you can see it there

5583

03:40:03,189 --> 03:40:01,120

with a the city covered nasa meatball

5584

03:40:05,429 --> 03:40:03,199

right above them that's crew 4 below

5585

03:40:07,269 --> 03:40:05,439

standing next to their booster

5586

03:40:10,150 --> 03:40:07,279

this flight will be the fourth for that

5587

03:40:11,110 --> 03:40:10,160

booster which is a first for nasa and

5588

03:40:12,870 --> 03:40:11,120

esa

5589

03:40:14,870 --> 03:40:12,880

astronauts

5590

03:40:18,229 --> 03:40:14,880

now at the time that that booster lights

5591

03:40:21,750 --> 03:40:18,239

and takes that crew into space the

5592

03:40:24,790 --> 03:40:21,760

international space station will be 260

5593

03:40:26,870 --> 03:40:24,800

miles over western romania we talked a

5594

03:40:29,750 --> 03:40:26,880

little bit earlier about chasing down

5595

03:40:32,469 --> 03:40:29,760

station well when this thing lights

5596

03:40:34,309 --> 03:40:32,479

crew 4 will then spend the next 16 hours

5597

03:40:35,429 --> 03:40:34,319

chasing down the international space

5598

03:40:38,790 --> 03:40:35,439

station

5599

03:40:42,070 --> 03:40:38,800

for a rendezvous at 8 15

5600

03:40:46,790 --> 03:40:43,990

and there's a special guest there that

5601
03:40:50,150 --> 03:40:46,800
is an apollo astronaut

5602
03:40:52,550 --> 03:40:50,160
harrison schmidt he is a moonwalker

5603
03:40:54,309 --> 03:40:52,560
you may recall

5604
03:40:56,070 --> 03:40:54,319
one of the 12 men who walked on the moon

5605
03:40:59,110 --> 03:40:56,080
he launched on the night of december 7th

5606
03:41:01,590 --> 03:40:59,120
1972 from the same launch pad we're

5607
03:41:03,830 --> 03:41:01,600
using tonight pad 39a and then three

5608
03:41:06,389 --> 03:41:03,840
days later schmidt and commander gene

5609
03:41:08,950 --> 03:41:06,399
cernan landed on the moon what an honor

5610
03:41:11,269 --> 03:41:08,960
to have him watching tonight

5611
03:41:13,110 --> 03:41:11,279
he a geologist watching another

5612
03:41:15,349 --> 03:41:13,120
geologist

5613
03:41:18,550 --> 03:41:15,359

jessica watkins going up to space today

5614

03:41:23,349 --> 03:41:21,990

and harrison schmidt one of the four

5615

03:41:25,670 --> 03:41:23,359

surviving

5616

03:41:28,229 --> 03:41:25,680

uh astronauts who walked on the moon

5617

03:41:30,469 --> 03:41:28,239

buzz aldrin david scott charlie duke and

5618

03:41:32,950 --> 03:41:30,479

harrison schmidt and they are

5619

03:41:34,950 --> 03:41:32,960

a national treasure

5620

03:41:36,870 --> 03:41:34,960

megan we are t minus 12 minutes and

5621

03:41:37,750 --> 03:41:36,880

counting some final thoughts as we get

5622

03:41:39,750 --> 03:41:37,760

ready

5623

03:41:41,830 --> 03:41:39,760

to light this candle for by the way

5624

03:41:44,150 --> 03:41:41,840

samantha christopher eddie's birthday

5625

03:41:45,750 --> 03:41:44,160

was yesterday yes what a what a big

5626

03:41:47,750 --> 03:41:45,760

birthday candle that's right it's a

5627

03:41:48,790 --> 03:41:47,760

pretty pretty good birthday celebration

5628

03:41:51,590 --> 03:41:48,800

i think

5629

03:41:54,150 --> 03:41:51,600

she's gonna enjoy that um but what will

5630

03:41:56,150 --> 03:41:54,160

they experience the moment of liftoff

5631

03:41:57,990 --> 03:41:56,160

the moment of liftoff is really it's

5632

03:41:59,670 --> 03:41:58,000

hard to describe i've heard it described

5633

03:42:01,349 --> 03:41:59,680

as lots of different things a kick in

5634

03:42:03,110 --> 03:42:01,359

the pants uh someone hits your chair

5635

03:42:05,269 --> 03:42:03,120

with a baseball bat it's almost

5636

03:42:07,429 --> 03:42:05,279

indescribable because you start moving

5637

03:42:09,590 --> 03:42:07,439

so fast and you're accelerating

5638

03:42:11,670 --> 03:42:09,600

so fast the whole time that it is it's

5639

03:42:14,150 --> 03:42:11,680

just a sensory overload you're really

5640

03:42:15,670 --> 03:42:14,160

really moving fast and uh on our crew

5641

03:42:17,750 --> 03:42:15,680

people enjoyed that very much there was

5642

03:42:19,910 --> 03:42:17,760

a lot of hooting and laughing basically

5643

03:42:22,150 --> 03:42:19,920

in response to that and as the as the

5644

03:42:24,389 --> 03:42:22,160

rocket changes its speed accelerates

5645

03:42:26,229 --> 03:42:24,399

down and then back up again you feel all

5646

03:42:27,990 --> 03:42:26,239

of that and it really is it's tremendous

5647

03:42:29,750 --> 03:42:28,000

ride astronauts from crew 4 getting

5648

03:42:31,670 --> 03:42:29,760

ready to experience that we're about to

5649

03:42:33,990 --> 03:42:31,680

watch this launch so with t-minus 11

5650

03:42:39,349 --> 03:42:34,000

minutes and 25 seconds let's toss it to

5651
03:42:42,870 --> 03:42:41,189
daryl megan thank you so much it's

5652
03:42:44,950 --> 03:42:42,880
getting more and more exciting here as

5653
03:42:47,030 --> 03:42:44,960
we are just about 11 minutes until

5654
03:42:50,150 --> 03:42:47,040
liftoff uh things are still looking

5655
03:42:51,830 --> 03:42:50,160
great for both falcon 9 and dragon

5656
03:42:54,630 --> 03:42:51,840
falcon 9 began loading propellant at the

5657
03:42:56,229 --> 03:42:54,640
t-minus 35-minute mark we should finish

5658
03:42:57,670 --> 03:42:56,239
around the t-minus

5659
03:42:59,990 --> 03:42:57,680
2-minute mark

5660
03:43:01,590 --> 03:43:00,000
right now densified liquid oxygen is

5661
03:43:03,349 --> 03:43:01,600
loading and continuing on the first

5662
03:43:04,950 --> 03:43:03,359
stage and

5663
03:43:06,950 --> 03:43:04,960

again this is going to wrap up around

5664

03:43:09,189 --> 03:43:06,960

the t-minus two minute mark

5665

03:43:11,429 --> 03:43:09,199

the dragon mission director and team are

5666

03:43:13,670 --> 03:43:11,439

reporting no issues communication

5667

03:43:15,910 --> 03:43:13,680

checkouts are complete the crew access

5668

03:43:18,630 --> 03:43:15,920

arm is retracted the launch escape

5669

03:43:20,550 --> 03:43:18,640

system is armed and the crew is strapped

5670

03:43:22,710 --> 03:43:20,560

in and ready to go

5671

03:43:25,110 --> 03:43:22,720

final instructions to the crew come in

5672

03:43:27,030 --> 03:43:25,120

at the t-minus 10-minute mark the crew

5673

03:43:29,110 --> 03:43:27,040

displays will be configured for launch

5674

03:43:30,870 --> 03:43:29,120

the setup gives the crew insight into

5675

03:43:32,710 --> 03:43:30,880

how the launch is proceeding and

5676

03:43:35,110 --> 03:43:32,720

provides constant update on vehicle

5677

03:43:36,710 --> 03:43:35,120

health at t-minus five minutes we'll be

5678

03:43:39,030 --> 03:43:36,720

in terminal count and the dragon will

5679

03:43:41,189 --> 03:43:39,040

transition to internal power and we'll

5680

03:43:43,349 --> 03:43:41,199

hear we'll hear continued call-outs on

5681

03:43:45,750 --> 03:43:43,359

the countdown nets as we get closer and

5682

03:43:46,950 --> 03:43:45,760

closer to liftoff range and weather are

5683

03:43:49,590 --> 03:43:46,960

both green

5684

03:43:51,110 --> 03:43:49,600

right now i am joined by dan uh dan uh

5685

03:43:53,750 --> 03:43:51,120

when we after ascent we're gonna hear

5686

03:43:55,910 --> 03:43:53,760

some call outs for um different types of

5687

03:43:57,830 --> 03:43:55,920

abort modes right yeah that's right on

5688

03:43:59,830 --> 03:43:57,840

the way up hill you'll you'll clear

5689

03:44:04,630 --> 03:43:59,840

spacex please confirm crew displays are

5690

03:44:08,870 --> 03:44:06,630

freedom confirms displays are configured

5691

03:44:10,950 --> 03:44:08,880

for launch

5692

03:44:12,870 --> 03:44:10,960

spacex copy screw four and on behalf of

5693

03:44:14,469 --> 03:44:12,880

the entire spacex team we're honored to

5694

03:44:16,469 --> 03:44:14,479

have you aboard dragon capsule freedom

5695

03:44:17,670 --> 03:44:16,479

today it's been a privilege working

5696

03:44:19,590 --> 03:44:17,680

together prepare for this launch the

5697

03:44:22,389 --> 03:44:19,600

international space station we wish you

5698

03:44:28,710 --> 03:44:22,399

a great mission good luck godspeed time

5699

03:44:33,269 --> 03:44:30,309

copy spacex we'd like to take this

5700

03:44:36,150 --> 03:44:33,279

opportunity to extend our thanks to

5701
03:44:37,670 --> 03:44:36,160
our nasa spacex international partner

5702
03:44:38,630 --> 03:44:37,680
teams and most of all our families for

5703
03:44:40,150 --> 03:44:38,640
getting us

5704
03:44:41,590 --> 03:44:40,160
to the threshold of this amazing

5705
03:44:43,189 --> 03:44:41,600
opportunity to launch to the

5706
03:44:44,469 --> 03:44:43,199
international space station of kennedy

5707
03:44:46,630 --> 03:44:44,479
space center

5708
03:44:49,189 --> 03:44:46,640
a heartfelt thank you to every one of

5709
03:44:55,590 --> 03:44:49,199
you that made this possible now let's

5710
03:45:00,150 --> 03:44:58,550
okay so crew displays are configured the

5711
03:45:01,750 --> 03:45:00,160
crew just reported they're good to go

5712
03:45:03,110 --> 03:45:01,760
they're ready to launch saw a couple of

5713
03:45:05,189 --> 03:45:03,120

fist bumps there

5714

03:45:07,030 --> 03:45:05,199

uh but yeah as as you mentioned we'll

5715

03:45:09,110 --> 03:45:07,040

hear a couple of different call outs on

5716

03:45:11,750 --> 03:45:09,120

the way up hill a combination letter and

5717

03:45:13,110 --> 03:45:11,760

a number you'll hear 1a right at liftoff

5718

03:45:15,110 --> 03:45:13,120

and these just correspond to the

5719

03:45:18,070 --> 03:45:15,120

different abort modes there's two for

5720

03:45:20,950 --> 03:45:18,080

the first stage and then a through e for

5721

03:45:23,189 --> 03:45:20,960

the second stage and these are telling

5722

03:45:25,510 --> 03:45:23,199

the crew essentially which direction

5723

03:45:27,349 --> 03:45:25,520

dragon's going to be pointing what it

5724

03:45:29,349 --> 03:45:27,359

when it performs a burn of those super

5725

03:45:31,349 --> 03:45:29,359

draco engines also gives you an idea of

5726
03:45:34,790 --> 03:45:31,359
where they're likely to come down if we

5727
03:45:36,469 --> 03:45:34,800
have an abort on the way up hill but

5728
03:45:39,189 --> 03:45:36,479
you'll hear those throughout the the

5729
03:45:41,590 --> 03:45:39,199
flight uphill you'll you'll also hear a

5730
03:45:43,590 --> 03:45:41,600
number of call outs from some of the key

5731
03:45:45,990 --> 03:45:43,600
positions on the falcon 9 team the

5732
03:45:47,750 --> 03:45:46,000
guidance navigation and control officer

5733
03:45:50,229 --> 03:45:47,760
and also the prop lead and we're going

5734
03:45:52,229 --> 03:45:50,239
to be looking to hear trajectory nominal

5735
03:45:54,950 --> 03:45:52,239
propulsion nominal

5736
03:45:57,590 --> 03:45:54,960
just as we make that flight uphill it's

5737
03:45:59,670 --> 03:45:57,600
gonna be about a nine minute trip

5738
03:46:01,429 --> 03:45:59,680

from ground to orbit

5739

03:46:04,710 --> 03:46:01,439

and right now we're just eight minutes

5740

03:46:06,950 --> 03:46:04,720

away and we've got a couple more events

5741

03:46:08,469 --> 03:46:06,960

coming up starting at right around seven

5742

03:46:11,510 --> 03:46:08,479

minutes right andy

5743

03:46:13,189 --> 03:46:11,520

yeah in about 50 seconds at t-minus

5744

03:46:15,750 --> 03:46:13,199

seven minutes we're going to begin

5745

03:46:17,830 --> 03:46:15,760

engine chill on the first stage engine

5746

03:46:19,990 --> 03:46:17,840

uh this is where we inject a small

5747

03:46:22,070 --> 03:46:20,000

amount of super chilled liquid oxygen

5748

03:46:24,150 --> 03:46:22,080

into the merlin engine turbo pumps

5749

03:46:26,229 --> 03:46:24,160

before letting the full flow of locks

5750

03:46:28,710 --> 03:46:26,239

during ignition so we do this in order

5751

03:46:31,510 --> 03:46:28,720

to make sure that we don't uh

5752

03:46:33,990 --> 03:46:31,520

shock the the engines uh because liquid

5753

03:46:35,510 --> 03:46:34,000

auction is so cold um we actually do the

5754

03:46:38,070 --> 03:46:35,520

same exact things

5755

03:46:39,510 --> 03:46:38,080

for the second stage engine that happens

5756

03:46:41,670 --> 03:46:39,520

during ascent but we should hear the

5757

03:46:43,750 --> 03:46:41,680

call out after liftoff for that as well

5758

03:46:45,269 --> 03:46:43,760

and again that is coming up in about 15

5759

03:47:00,950 --> 03:46:45,279

seconds we should hear the callouts over

5760

03:47:07,030 --> 03:47:04,550

stage one engine chill has started

5761

03:47:08,870 --> 03:47:07,040

and that was the call out so again a

5762

03:47:10,950 --> 03:47:08,880

small amount of super chilled liquid

5763

03:47:12,870 --> 03:47:10,960

auction being flowed into the merlin

5764

03:47:15,189 --> 03:47:12,880

engine turbo pumps those nine merlin

5765

03:47:16,630 --> 03:47:15,199

engines on the bottom of the first stage

5766

03:47:19,269 --> 03:47:16,640

all right now we've got a couple more

5767

03:47:21,269 --> 03:47:19,279

events coming up right at about t minus

5768

03:47:23,349 --> 03:47:21,279

six minutes so in 40 seconds from now

5769

03:47:25,990 --> 03:47:23,359

our next prop load milestone will be

5770

03:47:29,030 --> 03:47:26,000

complete we'll have all of the rp1 the

5771

03:47:31,670 --> 03:47:29,040

fuel for stage one fully on board it's

5772

03:47:33,429 --> 03:47:31,680

at about 99 right now so we should hear

5773

03:47:35,189 --> 03:47:33,439

that any moment

5774

03:47:36,150 --> 03:47:35,199

after that we'll hear a number of call

5775

03:47:39,349 --> 03:47:36,160

outs

5776
03:47:41,269 --> 03:47:39,359
uh related to the dragon flight computer

5777
03:47:43,110 --> 03:47:41,279
they'll get ready to configure for

5778
03:47:47,349 --> 03:47:43,120
terminal count and then move on to

5779
03:47:52,389 --> 03:47:49,429
every year the rp1 load is complete so

5780
03:47:55,830 --> 03:47:52,399
we got that a little early so all of the

5781
03:47:57,830 --> 03:47:55,840
rp1 the refined kerosene is on board the

5782
03:47:59,910 --> 03:47:57,840
falcon 9 both the

5783
03:48:02,309 --> 03:47:59,920
first stage just completing we already

5784
03:48:04,150 --> 03:48:02,319
heard that the second stage completed a

5785
03:48:05,510 --> 03:48:04,160
short time ago

5786
03:48:07,990 --> 03:48:05,520
coming up we're going to hear the call

5787
03:48:10,150 --> 03:48:08,000
out for dragon to transition

5788
03:48:12,469 --> 03:48:10,160

to configure for terminal count and then

5789

03:48:14,950 --> 03:48:12,479

transition over to internal power and

5790

03:48:17,030 --> 03:48:14,960

then we'll hear the propellant tanks on

5791

03:48:18,870 --> 03:48:17,040

falcon 9 getting ready to pressurize

5792

03:48:21,110 --> 03:48:18,880

adding some additional rigidity and

5793

03:48:23,670 --> 03:48:21,120

structural support as we get ready for

5794

03:48:26,150 --> 03:48:23,680

the strong back to retract it'll move

5795

03:48:29,189 --> 03:48:26,160

just a couple of degrees at first and

5796

03:48:31,510 --> 03:48:29,199

then we'll see it swing open completely

5797

03:48:32,950 --> 03:48:31,520

uh at the moment of liftoff and that

5798

03:48:35,590 --> 03:48:32,960

strong back

5799

03:48:37,590 --> 03:48:35,600

uh providing access to falcon 9 it's

5800

03:48:39,110 --> 03:48:37,600

also providing all of the fueling lines

5801
03:48:41,110 --> 03:48:39,120
and biblicals

5802
03:48:43,670 --> 03:48:41,120
for both prop load and all the different

5803
03:48:45,189 --> 03:48:43,680
gases being loaded on board

5804
03:48:46,550 --> 03:48:45,199
the vehicle so

5805
03:48:47,990 --> 03:48:46,560
those are coming up we're going to

5806
03:48:49,830 --> 03:48:48,000
continue to

5807
03:48:52,309 --> 03:48:49,840
check through a couple more fueling

5808
03:48:54,389 --> 03:48:52,319
milestones as well the final one we're

5809
03:48:56,870 --> 03:48:54,399
going to hear is that just two minutes

5810
03:48:58,790 --> 03:48:56,880
before flight when we get the liquid

5811
03:49:00,630 --> 03:48:58,800
oxygen finished on board that second

5812
03:49:02,389 --> 03:49:00,640
stage

5813
03:49:04,550 --> 03:49:02,399

dragon is in configure for terminal

5814

03:49:06,309 --> 03:49:04,560

count

5815

03:49:13,670 --> 03:49:06,319

falcon 9 tanks are pressurizing for

5816

03:49:18,790 --> 03:49:16,469

falcon 9 is beginning to pressurize for

5817

03:49:20,309 --> 03:49:18,800

the strong back retract so if you look

5818

03:49:22,070 --> 03:49:20,319

closely on the left hand side of your

5819

03:49:24,790 --> 03:49:22,080

screen or excuse me the left hand side

5820

03:49:26,710 --> 03:49:24,800

of the vehicle there is a large truss

5821

03:49:28,710 --> 03:49:26,720

structure that is the strong back we

5822

03:49:33,910 --> 03:49:28,720

have some clamp arms uh just at the

5823

03:49:37,990 --> 03:49:36,469

well right now the uh those clamp arms

5824

03:49:41,429 --> 03:49:38,000

are beginning to open up you can see

5825

03:49:43,750 --> 03:49:41,439

them right behind all of the the

5826
03:49:45,750 --> 03:49:43,760
white clouds around the vehicle once

5827
03:49:47,670 --> 03:49:45,760
that is fully open then the strong back

5828
03:49:49,910 --> 03:49:47,680
structure will retract away to its

5829
03:49:52,309 --> 03:49:49,920
pre-launch position about two degrees

5830
03:49:54,790 --> 03:49:52,319
away from the vehicle and as we get

5831
03:49:57,750 --> 03:49:54,800
closer to d0 it will continue to recline

5832
03:49:58,870 --> 03:49:57,760
back to make room for falcon 9 and

5833
03:50:02,070 --> 03:49:58,880
dragon

5834
03:50:03,670 --> 03:50:02,080
to lift off and clear the launch pad

5835
03:50:05,590 --> 03:50:03,680
so here's a great shot of those clamp

5836
03:50:07,910 --> 03:50:05,600
arms at the bottom of the screen opening

5837
03:50:10,309 --> 03:50:07,920
wide open

5838
03:50:12,389 --> 03:50:10,319

and we should see that structure

5839

03:50:19,990 --> 03:50:12,399

to the right of falcon 9 and dragon

5840

03:50:24,870 --> 03:50:22,950

this whole sequence takes um about a

5841

03:50:27,030 --> 03:50:24,880

minute a little over a minute to fully

5842

03:50:31,910 --> 03:50:27,040

complete we expect this to complete

5843

03:50:36,070 --> 03:50:32,830

15

5844

03:50:38,229 --> 03:50:36,080

seconds so you can see on screen that

5845

03:50:46,630 --> 03:50:38,239

strongback is beginning to recline away

5846

03:50:50,630 --> 03:50:48,469

all right now coming up next is going to

5847

03:50:52,790 --> 03:50:50,640

be the finish of

5848

03:50:53,670 --> 03:50:52,800

loading that liquid oxygen down to stage

5849

03:50:55,590 --> 03:50:53,680

one

5850

03:50:57,910 --> 03:50:55,600

we finish up on the liquid oxygen stage

5851
03:50:59,990 --> 03:50:57,920
one lux load is complete

5852
03:51:04,070 --> 03:51:00,000
there we go all of the oxidizer loaded

5853
03:51:08,870 --> 03:51:06,309
yep and uh in about a minute here we

5854
03:51:11,189 --> 03:51:08,880
should hear the last call out related to

5855
03:51:13,750 --> 03:51:11,199
propellant that's going to be stage two

5856
03:51:16,309 --> 03:51:13,760
lox load complete and again that is the

5857
03:51:21,510 --> 03:51:16,319
last of propellant loading is in

5858
03:51:25,110 --> 03:51:23,429
and as we wait for that call outs all of

5859
03:51:27,590 --> 03:51:25,120
the white clouds that you're seeing on

5860
03:51:29,110 --> 03:51:27,600
screen that is normal and expected for

5861
03:51:31,189 --> 03:51:29,120
us at this stage in the countdown we'll

5862
03:51:33,189 --> 03:51:31,199
continue to see them build up as we get

5863
03:51:35,110 --> 03:51:33,199

closer and closer to d0 we want to make

5864

03:51:38,550 --> 03:51:35,120

sure that we are keeping the tanks as

5865

03:51:42,070 --> 03:51:38,560

full as possible um and the warm uh

5866

03:51:43,670 --> 03:51:42,080

ambient air of florida is um you know

5867

03:51:51,030 --> 03:51:43,680

helping to create those clouds around

5868

03:51:55,189 --> 03:51:52,870

all right we're coming up on two minutes

5869

03:52:08,790 --> 03:51:55,199

until liftoff standing by for stage two

5870

03:52:08,800 --> 03:52:15,030

stage two locks load is complete

5871

03:52:19,750 --> 03:52:18,229

dragon is an auto idol

5872

03:52:21,750 --> 03:52:19,760

all right dragon's flight computer and

5873

03:52:24,389 --> 03:52:21,760

auto idle next it'll flip over to

5874

03:52:28,630 --> 03:52:26,710

gas closeout has started so we're now

5875

03:52:30,389 --> 03:52:28,640

isolating all the feed lines for the

5876

03:52:32,309 --> 03:52:30,399

different gas systems

5877

03:52:34,640 --> 03:52:32,319

uh from the falcon 9 rocket they're

5878

03:52:35,990 --> 03:52:34,650

gonna then get vented

5879

03:52:39,590 --> 03:52:36,000

[Applause]

5880

03:52:41,110 --> 03:52:39,600

start they're gonna get vented overboard

5881

03:52:43,510 --> 03:52:41,120

through the through umbilicals and

5882

03:52:45,110 --> 03:52:43,520

through the strong backing itself

5883

03:52:47,590 --> 03:52:45,120

coming up at t minus one minute we're

5884

03:52:49,269 --> 03:52:47,600

gonna hear dragon is in countdown it's a

5885

03:52:50,870 --> 03:52:49,279

flight computer will switch to countdown

5886

03:52:55,189 --> 03:52:50,880

mode we'll also hear that the flight

5887

03:52:58,389 --> 03:52:55,199

termination system on falcon 9 is armed

5888

03:52:59,990 --> 03:52:58,399

falcon 9 will move into startup and take

5889

03:53:02,469 --> 03:53:00,000

over control

5890

03:53:05,030 --> 03:53:02,479

fts is armed falcon 9 is in startup and

5891

03:53:08,710 --> 03:53:05,040

is now controlling

5892

03:53:11,189 --> 03:53:08,720

dragon is in countdown

5893

03:53:13,349 --> 03:53:11,199

dragon's flight computer in countdown

5894

03:53:20,070 --> 03:53:13,359

the fts that flight termination system

5895

03:53:20,080 --> 03:53:25,510

freedom is go for lunch

5896

03:53:25,520 --> 03:53:30,469

spacex reports go crew reports

5897

03:53:38,469 --> 03:53:33,349

you heard it there 30 seconds away from

5898

03:53:38,479 --> 03:53:42,950

t minus 20.

5899

03:53:48,630 --> 03:53:44,960

d minus 15 seconds

5900

03:53:50,550 --> 03:53:49,510

10

5901
03:53:51,429 --> 03:53:50,560
nine

5902
03:53:52,389 --> 03:53:51,439
eight

5903
03:53:53,349 --> 03:53:52,399
seven

5904
03:53:54,309 --> 03:53:53,359
six

5905
03:53:55,269 --> 03:53:54,319
five

5906
03:53:56,309 --> 03:53:55,279
four

5907
03:53:57,269 --> 03:53:56,319
three

5908
03:53:58,070 --> 03:53:57,279
two

5909
03:54:00,770 --> 03:53:58,080
one

5910
03:54:16,790 --> 03:54:00,780
zero ignition

5911
03:54:22,229 --> 03:54:18,870
vehicle already pitching down range all

5912
03:54:32,710 --> 03:54:24,070
getting good performance on stage one

5913
03:54:38,710 --> 03:54:36,150

we are t plus 35 seconds into the fourth

5914

03:54:41,269 --> 03:54:38,720

rotational crew mission on board dragon

5915

03:54:44,389 --> 03:54:41,279

and the falcon 9

5916

03:54:45,910 --> 03:54:44,399

the nine merlin 1d engines uh on the

5917

03:54:47,830 --> 03:54:45,920

first stage or beginning to throttle

5918

03:54:50,630 --> 03:54:47,840

down your throttle down

5919

03:54:52,389 --> 03:54:50,640

in preparation for max q this is where

5920

03:54:54,950 --> 03:54:52,399

the vehicle will experience the highest

5921

03:54:56,630 --> 03:54:54,960

amount of aerodynamic pressures so we'll

5922

03:54:58,690 --> 03:54:56,640

throttle down the engines in preparation

5923

03:55:00,870 --> 03:54:58,700

for that event

5924

03:55:03,910 --> 03:55:00,880

[Music]

5925

03:55:05,590 --> 03:55:03,920

vehicle is supersonic

5926
03:55:10,710 --> 03:55:05,600
all right so we've passed the speed of

5927
03:55:16,229 --> 03:55:13,030
back at you and there's our call out for

5928
03:55:21,110 --> 03:55:18,389
so right after max q we will begin to

5929
03:55:22,950 --> 03:55:21,120
throttle those engines up again

5930
03:55:25,030 --> 03:55:22,960
copy one problem

5931
03:55:27,349 --> 03:55:25,040
and one bravo so we're in the second and

5932
03:55:29,110 --> 03:55:27,359
final abort mode for the first stage

5933
03:55:30,550 --> 03:55:29,120
continuing to get good performance

5934
03:55:32,550 --> 03:55:30,560
though the crew already pulling in

5935
03:55:34,229 --> 03:55:32,560
excess of two g's

5936
03:55:37,830 --> 03:55:34,239
and coming up next is going to be a

5937
03:55:39,670 --> 03:55:37,840
couple of events in rapid succession

5938
03:55:41,910 --> 03:55:39,680

yep in about 10 seconds here we're going

5939

03:55:44,150 --> 03:55:41,920

to be performing engine chill on the

5940

03:55:45,349 --> 03:55:44,160

second stage mvac engine

5941

03:55:47,349 --> 03:55:45,359

um

5942

03:55:49,110 --> 03:55:47,359

and then in about a minute we're going

5943

03:55:51,189 --> 03:55:49,120

to start off with miko also known as

5944

03:55:53,670 --> 03:55:51,199

main engine cutoff this is where those

5945

03:55:54,790 --> 03:55:53,680

nine engines that you're seeing

5946

03:55:56,309 --> 03:55:54,800

ignite on

5947

03:55:58,790 --> 03:55:56,319

being lit up on screen those are going

5948

03:56:01,670 --> 03:55:58,800

to cut off in preparation

5949

03:56:03,670 --> 03:56:01,680

for stage separation where the first and

5950

03:56:04,550 --> 03:56:03,680

second stages will separate from one

5951
03:56:06,150 --> 03:56:04,560
another

5952
03:56:07,990 --> 03:56:06,160
and then the

5953
03:56:10,630 --> 03:56:08,000
single merlin vacuum engine on the

5954
03:56:14,309 --> 03:56:10,640
second stage will ignite and continue to

5955
03:56:18,389 --> 03:56:14,319
carry our crew 4 astronauts to orbit

5956
03:56:23,670 --> 03:56:18,399
we've heard that mvac chill has started

5957
03:56:29,910 --> 03:56:25,510
the problem merlin engines starting to

5958
03:56:29,920 --> 03:56:39,110
and standing by for mikko

5959
03:56:39,120 --> 03:56:41,990
and mikko

5960
03:56:45,670 --> 03:56:44,309
stage separation confirmed

5961
03:56:46,550 --> 03:56:45,680
all right

5962
03:56:53,590 --> 03:56:46,560
so

5963
03:56:58,229 --> 03:56:56,389

you see that second stage engine light

5964

03:57:00,229 --> 03:56:58,239

we're in two alpha the second or fourth

5965

03:57:01,830 --> 03:57:00,239

mode the second stage is lit

5966

03:57:03,750 --> 03:57:01,840

continuing to carry the crew 4

5967

03:57:05,910 --> 03:57:03,760

astronauts on to orbit

5968

03:57:07,670 --> 03:57:05,920

uh and this is a fantastic view on the

5969

03:57:09,030 --> 03:57:07,680

left hand side this is the first stage

5970

03:57:10,630 --> 03:57:09,040

now separated

5971

03:57:12,710 --> 03:57:10,640

from the second stage but it's still

5972

03:57:14,389 --> 03:57:12,720

being illuminated by that single merlin

5973

03:57:16,469 --> 03:57:14,399

vacuum engine on the second stage on the

5974

03:57:18,070 --> 03:57:16,479

right-hand side of your screen uh so

5975

03:57:20,950 --> 03:57:18,080

right now the first stage is making its

5976
03:57:23,349 --> 03:57:20,960
way back to earth to attempt its fourth

5977
03:57:24,550 --> 03:57:23,359
landing on our drone ship a shortfall of

5978
03:57:26,710 --> 03:57:24,560
gravitas

5979
03:57:28,070 --> 03:57:26,720
the crew is on the opposite opposite

5980
03:57:29,750 --> 03:57:28,080
side of the engine that you see on the

5981
03:57:31,510 --> 03:57:29,760
right hand side of the screen they are

5982
03:57:33,349 --> 03:57:31,520
continuing with their journey to outer

5983
03:57:36,150 --> 03:57:33,359
space

5984
03:57:39,510 --> 03:57:36,160
seeing good performance on that lone

5985
03:57:42,229 --> 03:57:39,520
merlin vacuum engine on the second stage

5986
03:57:43,830 --> 03:57:42,239
the cruise g load dips right when we hit

5987
03:57:46,469 --> 03:57:43,840
that separation event and it's going to

5988
03:57:48,630 --> 03:57:46,479

continue to build up now

5989

03:57:49,670 --> 03:57:48,640

shared acquisition of signal bermuda

5990

03:57:55,349 --> 03:57:49,680

that means

5991

03:57:59,189 --> 03:57:57,750

freedom copies nominal trajectory

5992

03:58:01,030 --> 03:57:59,199

that was our guidance navigation and

5993

03:58:02,870 --> 03:58:01,040

control officer nominal trajectory

5994

03:58:05,189 --> 03:58:02,880

dragons pointed in the right direction

5995

03:58:06,790 --> 03:58:05,199

continuing its flight to orbit we heard

5996

03:58:09,510 --> 03:58:06,800

bermuda called out that's one of the

5997

03:58:11,510 --> 03:58:09,520

ground stations now receiving telemetry

5998

03:58:16,389 --> 03:58:11,520

from the dragon as it continues its path

5999

03:58:20,550 --> 03:58:18,550

so we will have the dueling boxes here

6000

03:58:22,710 --> 03:58:20,560

for a while as the first stage makes its

6001
03:58:26,309 --> 03:58:22,720
way down that second stage going to

6002
03:58:29,110 --> 03:58:26,319
continue firing until about a little

6003
03:58:33,510 --> 03:58:29,120
over eight minutes into the flight

6004
03:58:38,389 --> 03:58:35,910
the first stage has um a couple of

6005
03:58:41,110 --> 03:58:38,399
events itself in order to to land on a

6006
03:58:43,429 --> 03:58:41,120
drone ship so at t plus seven minutes

6007
03:58:45,349 --> 03:58:43,439
and 25 seconds it's going to

6008
03:58:48,229 --> 03:58:45,359
start its entry burn it's going to be

6009
03:58:49,429 --> 03:58:48,239
one of two burns uh this is where three

6010
03:58:51,429 --> 03:58:49,439
of the nine

6011
03:58:53,910 --> 03:58:51,439
engines basic nominal trajectory on the

6012
03:58:55,830 --> 03:58:53,920
first stage will re-light uh and burn

6013
03:58:57,429 --> 03:58:55,840

for about 30 seconds in order to slow

6014

03:58:59,349 --> 03:58:57,439

the vehicle down

6015

03:59:01,030 --> 03:58:59,359

before hitting the denser parts of the

6016

03:59:04,710 --> 03:59:01,040

earth's atmosphere

6017

03:59:07,830 --> 03:59:06,229

all right now

6018

03:59:09,750 --> 03:59:07,840

on the new hampshire ground station

6019

03:59:11,830 --> 03:59:09,760

another call out there from our guidance

6020

03:59:13,110 --> 03:59:11,840

navigation and control officer nominal

6021

03:59:16,229 --> 03:59:13,120

trajectory

6022

03:59:18,389 --> 03:59:16,239

second stage continues to power

6023

03:59:22,469 --> 03:59:18,399

call out just then propulsion is nominal

6024

03:59:25,750 --> 03:59:24,070

crew pulling a little more than one and

6025

03:59:27,670 --> 03:59:25,760

a quarter gs right now again that's

6026
03:59:29,910 --> 03:59:27,680
going to continue to ramp up peaking

6027
03:59:31,750 --> 03:59:29,920
just before we get to that second stage

6028
03:59:33,910 --> 03:59:31,760
cut off

6029
03:59:37,269 --> 03:59:33,920
yep this this this single engine here

6030
03:59:39,510 --> 03:59:37,279
dan can produce over 220 000 pounds of

6031
03:59:43,910 --> 03:59:39,520
thrust in the vacuum of space so

6032
03:59:49,510 --> 03:59:45,670
we're already about 200 kilometers in

6033
03:59:49,520 --> 03:59:56,070
dragon spacex nominal trajectory

6034
03:59:56,080 --> 03:59:59,910
freedom copies nominal trajectory

6035
04:00:03,189 --> 04:00:01,590
great call out that

6036
04:00:05,750 --> 04:00:03,199
we are headed in the direction that we

6037
04:00:10,389 --> 04:00:05,760
need to and we we just heard from

6038
04:00:16,389 --> 04:00:11,990

and we should get one more of those

6039

04:00:17,910 --> 04:00:16,399

trajectory check-ins in about 30 seconds

6040

04:00:19,830 --> 04:00:17,920

from now

6041

04:00:22,389 --> 04:00:19,840

and then we'll start to

6042

04:00:24,150 --> 04:00:22,399

hit our events in rapid succession as

6043

04:00:25,830 --> 04:00:24,160

the first stage continues to make its

6044

04:00:27,750 --> 04:00:25,840

way back home

6045

04:00:29,590 --> 04:00:27,760

the second stage will

6046

04:00:42,630 --> 04:00:29,600

start to wrap up its job of delivering

6047

04:00:46,309 --> 04:00:44,550

yeah we don't see it on screen right now

6048

04:00:49,189 --> 04:00:46,319

but the first stage is making its way

6049

04:00:51,910 --> 04:00:49,199

back to our drone ship uh in about

6050

04:00:53,990 --> 04:00:51,920

dragon spacex nominal trajectory in

6051
04:00:59,670 --> 04:00:54,000
about 30 seconds here it's going to

6052
04:01:04,150 --> 04:01:02,150
and there was the other call that uh you

6053
04:01:06,150 --> 04:01:04,160
were mentioning dan about trajectory

6054
04:01:27,670 --> 04:01:06,160
things again continuing to look very

6055
04:01:32,389 --> 04:01:29,429
stage two flight termination system so

6056
04:01:36,229 --> 04:01:32,399
for those just joining us we are

6057
04:01:38,710 --> 04:01:36,239
just under eight minutes into flight

6058
04:01:40,309 --> 04:01:38,720
we have four astronauts as part of the

6059
04:01:43,110 --> 04:01:40,319
crew 4

6060
04:01:44,710 --> 04:01:43,120
operational mission

6061
04:01:47,030 --> 04:01:44,720
you can see on the left-hand side this

6062
04:01:49,510 --> 04:01:47,040
is our first stage with three of nine

6063
04:01:50,950 --> 04:01:49,520

merlin engines reignited and slowing

6064

04:01:53,269 --> 04:01:50,960

down the first stage before we hit the

6065

04:01:56,070 --> 04:01:53,279

denser parts of the earth's atmosphere

6066

04:01:57,990 --> 04:01:56,080

so this first stage has one more burning

6067

04:01:59,349 --> 04:01:58,000

shutdown

6068

04:02:01,110 --> 04:01:59,359

that's going to happen

6069

04:02:02,469 --> 04:02:01,120

just before the t plus nine minute mark

6070

04:02:04,630 --> 04:02:02,479

and then we'll attempt to landing for

6071

04:02:11,910 --> 04:02:04,640

the fourth time on our drone ship that's

6072

04:02:17,429 --> 04:02:13,269

so is that

6073

04:02:20,229 --> 04:02:17,439

entry burn completes terminal guidance

6074

04:02:22,150 --> 04:02:20,239

we're in the final stages of the second

6075

04:02:23,670 --> 04:02:22,160

stages flight into orbit we're about to

6076
04:02:25,750 --> 04:02:23,680
pass through several of the different

6077
04:02:27,990 --> 04:02:25,760
abort phases which essentially

6078
04:02:30,150 --> 04:02:28,000
correspond to areas along the very

6079
04:02:32,229 --> 04:02:30,160
northeastern seaboard of the u.s and

6080
04:02:34,950 --> 04:02:32,239
then across the atlantic and off the

6081
04:02:37,189 --> 04:02:34,960
coast of scotland but continuing to get

6082
04:02:38,710 --> 04:02:37,199
call outs that stage two propulsion is

6083
04:02:41,189 --> 04:02:38,720
nominal

6084
04:02:43,990 --> 04:02:41,199
copy shannon and the callout of shannon

6085
04:02:50,309 --> 04:02:44,000
ireland that's stage one transonic

6086
04:02:54,469 --> 04:02:52,790
and after this uh second stage engine

6087
04:02:56,389 --> 04:02:54,479
shuts off its engine we are going to be

6088
04:02:59,189 --> 04:02:56,399

listening for the confirmation of a good

6089

04:03:01,590 --> 04:02:59,199

orbit which tells us that

6090

04:03:04,790 --> 04:03:01,600

the crew of them and dragon are where

6091

04:03:09,510 --> 04:03:04,800

they need to be in landing

6092

04:03:13,510 --> 04:03:11,110

and that was the call that we wanted on

6093

04:03:15,910 --> 04:03:13,520

the second stage here's a fantastic view

6094

04:03:18,070 --> 04:03:15,920

we're glad to be in orbit

6095

04:03:22,550 --> 04:03:18,080

of the first spacex launch escape system

6096

04:03:26,710 --> 04:03:25,189

fantastic

6097

04:03:28,389 --> 04:03:26,720

landing legs have been deployed

6098

04:03:34,309 --> 04:03:28,399

returning back to earth for a fourth

6099

04:03:45,370 --> 04:03:36,630

just like that a fourth landing is part

6100

04:03:52,229 --> 04:03:49,750

[Applause]

6101
04:03:53,269 --> 04:03:52,239
but prior to this acquisition signal new

6102
04:03:55,830 --> 04:03:53,279
finland

6103
04:03:57,750 --> 04:03:55,840
we saw the crew we heard that the crew

6104
04:03:58,870 --> 04:03:57,760
has been successfully inserted into a

6105
04:04:00,389 --> 04:03:58,880
good orbit

6106
04:04:02,229 --> 04:04:00,399
and this is them

6107
04:04:05,110 --> 04:04:02,239
uh in zero g

6108
04:04:07,110 --> 04:04:05,120
two of them for the first time

6109
04:04:09,750 --> 04:04:07,120
and getting a look it looks like we

6110
04:04:11,510 --> 04:04:09,760
might have a couple of zero g indicators

6111
04:04:14,150 --> 04:04:11,520
i see a turtle

6112
04:04:16,550 --> 04:04:14,160
in bob heinz's hands that is the

6113
04:04:19,349 --> 04:04:16,560

nickname for the astronaut class from

6114

04:04:21,910 --> 04:04:19,359

2017 of which he and jessica watkins

6115

04:04:23,910 --> 04:04:21,920

were apart i believe we've got a monkey

6116

04:04:26,469 --> 04:04:23,920

floating over by

6117

04:04:29,990 --> 04:04:26,479

samantha chris ferretti but

6118

04:04:32,150 --> 04:04:30,000

there's a first view of crew 4 on orbit

6119

04:04:34,550 --> 04:04:32,160

experiencing microgravity they're still

6120

04:04:36,630 --> 04:04:34,560

attached to that second stage which at

6121

04:04:38,469 --> 04:04:36,640

this point is going to continue to coast

6122

04:04:40,630 --> 04:04:38,479

for a couple of minutes

6123

04:04:42,630 --> 04:04:40,640

it's got small reaction control

6124

04:04:44,710 --> 04:04:42,640

thrusters on the upper part of the

6125

04:04:46,870 --> 04:04:44,720

second stage that can be used to cancel

6126
04:04:49,269 --> 04:04:46,880
out rates essentially making sure that

6127
04:04:51,750 --> 04:04:49,279
they're on a stable coast before we get

6128
04:04:54,469 --> 04:04:51,760
to that separation event after which

6129
04:04:57,590 --> 04:04:54,479
we'll see dragon freedom flying free for

6130
04:05:01,750 --> 04:04:59,990
we've got yeah a couple of stowaways the

6131
04:05:03,349 --> 04:05:01,760
turtle class really does seem to be

6132
04:05:05,349 --> 04:05:03,359
taken over now

6133
04:05:08,389 --> 04:05:05,359
with a turtle zero g

6134
04:05:13,670 --> 04:05:10,469
all right we should be just about a

6135
04:05:17,030 --> 04:05:13,680
minute away from that separation after

6136
04:05:19,910 --> 04:05:17,040
which a number of activation

6137
04:05:22,070 --> 04:05:19,920
checkouts occur automatically first

6138
04:05:24,229 --> 04:05:22,080

checking out 12 of those draco

6139

04:05:26,469 --> 04:05:24,239

maneuvering thrusters

6140

04:05:28,389 --> 04:05:26,479

all around the server section of the

6141

04:05:31,189 --> 04:05:28,399

dragon capsule

6142

04:05:33,590 --> 04:05:31,199

we'll also start to

6143

04:05:34,389 --> 04:05:33,600

get ready for the nose cone opening

6144

04:05:36,469 --> 04:05:34,399

which

6145

04:05:38,630 --> 04:05:36,479

it stays closed for the the flight

6146

04:05:40,070 --> 04:05:38,640

uphill to help protect

6147

04:05:42,710 --> 04:05:40,080

all of those guidance navigation and

6148

04:05:44,790 --> 04:05:42,720

control sensors it's also covering four

6149

04:05:46,790 --> 04:05:44,800

of the draco thrusters that we're going

6150

04:05:49,110 --> 04:05:46,800

to be using for

6151
04:05:49,990 --> 04:05:49,120
providing the majority of the thrust the

6152
04:05:51,910 --> 04:05:50,000
push

6153
04:06:00,150 --> 04:05:51,920
for these different phasing burns as

6154
04:06:00,160 --> 04:06:07,349
all right standing by for separation

6155
04:06:10,950 --> 04:06:09,269
so typically we'll get a shot from the

6156
04:06:12,870 --> 04:06:10,960
second stage looking at the

6157
04:06:19,830 --> 04:06:12,880
unpressurized surface section of the

6158
04:06:19,840 --> 04:06:34,389
what a magnificent view

6159
04:06:38,870 --> 04:06:36,550
looking like a good separation good

6160
04:06:41,110 --> 04:06:38,880
rates

6161
04:06:42,550 --> 04:06:41,120
dragon freedom flying free for the very

6162
04:06:44,950 --> 04:06:42,560
first time

6163
04:06:48,630 --> 04:06:44,960

so again now those

6164

04:06:50,950 --> 04:06:48,640

those draco checkouts are starting

6165

04:06:52,630 --> 04:06:50,960

and pretty shortly we'll get to the

6166

04:06:55,510 --> 04:06:52,640

nosecone deploy

6167

04:06:58,950 --> 04:06:55,520

and that's that's when they'll

6168

04:07:03,510 --> 04:07:00,950

that are holding the nose cone in place

6169

04:07:20,870 --> 04:07:03,520

and it sounds like that has begun and

6170

04:07:25,670 --> 04:07:23,429

high

6171

04:07:27,830 --> 04:07:25,680

so though the crew as we see them here

6172

04:07:29,910 --> 04:07:27,840

inside dragon uh they have separated

6173

04:07:32,070 --> 04:07:29,920

from the second stage but they still

6174

04:07:33,590 --> 04:07:32,080

have about a 16-hour journey before

6175

04:07:36,149 --> 04:07:33,600

making it to the international space

6176
04:07:39,670 --> 04:07:36,159
station and docking tomorrow or today

6177
04:07:47,429 --> 04:07:42,070
but it is so great to see them

6178
04:07:51,910 --> 04:07:49,429
and we did a confirmation that that

6179
04:07:54,149 --> 04:07:51,920
nosecone deploy sequence has started so

6180
04:07:56,710 --> 04:07:54,159
again those six hooks that hold the nose

6181
04:07:59,189 --> 04:07:56,720
cone in place during uh the launch and

6182
04:08:01,269 --> 04:07:59,199
ascent portions have to retract and then

6183
04:08:04,469 --> 04:08:01,279
the nose cone will be able to start to

6184
04:08:07,030 --> 04:08:04,479
swing open and deploy and that will

6185
04:08:09,189 --> 04:08:07,040
uncover a number of critical

6186
04:08:11,269 --> 04:08:09,199
systems for dragon's flight up to the

6187
04:08:13,910 --> 04:08:11,279
space station not the least of which

6188
04:08:15,750 --> 04:08:13,920

freedom I'd hope you enjoyed your ride

6189

04:08:18,469 --> 04:08:15,760

it's been an honor flying with you chill

6190

04:08:20,309 --> 04:08:18,479

farmer samantha jessica have a safe

6191

04:08:22,309 --> 04:08:20,319

journey in the space station say hi to

6192

04:08:23,910 --> 04:08:22,319

crew 3 for us and we'll look forward to

6193

04:08:25,990 --> 04:08:23,920

seeing you when you get home

6194

04:08:29,189 --> 04:08:26,000

indeed the dream is alive have some

6195

04:08:37,349 --> 04:08:31,269

dragon ceo privilege having you fly with

6196

04:08:41,830 --> 04:08:39,910

hey and uh from freedom we want to thank

6197

04:08:43,510 --> 04:08:41,840

uh big thank you to spacex the

6198

04:08:47,030 --> 04:08:43,520

commercial crew program and specifically

6199

04:08:49,189 --> 04:08:47,040

the falcon 9 team for a great ride it is

6200

04:08:51,189 --> 04:08:49,199

a privilege to get to fly this new

6201
04:08:52,710 --> 04:08:51,199
vehicle the crew dragon freedom to orbit

6202
04:08:54,309 --> 04:08:52,720
huge thanks to the teams that assembled

6203
04:08:55,670 --> 04:08:54,319
and prepared her for flight we're

6204
04:09:01,670 --> 04:08:55,680
feeling great and looking forward to the

6205
04:09:09,510 --> 04:09:04,070
all right so some congratulatory words

6206
04:09:14,469 --> 04:09:11,429
and the chief engineer

6207
04:09:17,189 --> 04:09:14,479
up to the crew on board freedom

6208
04:09:19,670 --> 04:09:17,199
channel radioing down their thanks

6209
04:09:21,429 --> 04:09:19,680
for the smooth ride to orbit

6210
04:09:23,590 --> 04:09:21,439
so

6211
04:09:25,429 --> 04:09:23,600
as andy said we've got about 16 hours

6212
04:09:27,110 --> 04:09:25,439
freedom spacex

6213
04:09:28,710 --> 04:09:27,120

can confirm nominal dehumidifier

6214

04:09:35,030 --> 04:09:28,720

activation and service section draco

6215

04:09:41,670 --> 04:09:37,349

okay freedom copies uh equals activation

6216

04:09:45,269 --> 04:09:43,269

and that call from the core here in

6217

04:09:48,149 --> 04:09:45,279

hawthorne

6218

04:09:51,910 --> 04:09:50,149

indicating that we had good checkouts of

6219

04:09:54,229 --> 04:09:51,920

those 12 draco thrusters around the

6220

04:09:56,070 --> 04:09:54,239

service section there's four to go after

6221

04:09:57,670 --> 04:09:56,080

we get the nose cone open and the

6222

04:09:59,349 --> 04:09:57,680

eclipse the environmental control and

6223

04:10:01,429 --> 04:09:59,359

life support system activated and

6224

04:10:03,750 --> 04:10:01,439

running inside dragon crew will be able

6225

04:10:06,149 --> 04:10:03,760

to get their visors open and pretty soon

6226

04:10:08,469 --> 04:10:06,159

get out of their suits

6227

04:10:11,429 --> 04:10:08,479

and settle in for a 16 hour ride to the

6228

04:10:14,149 --> 04:10:11,439

space station so with crew 4 now

6229

04:10:16,229 --> 04:10:14,159

successfully on orbit

6230

04:10:18,469 --> 04:10:16,239

let's head over to our counterparts at

6231

04:10:21,349 --> 04:10:18,479

the kennedy space center it looked great

6232

04:10:23,429 --> 04:10:21,359

on tv i'm sure it was even better in

6233

04:10:25,670 --> 04:10:23,439

person daryl megan

6234

04:10:27,830 --> 04:10:25,680

how are things over there on the ground

6235

04:10:30,070 --> 04:10:27,840

well thank you very much dan and uh

6236

04:10:31,910 --> 04:10:30,080

you're absolutely right it was

6237

04:10:34,309 --> 04:10:31,920

phenomenal here at the kennedy space

6238

04:10:37,830 --> 04:10:34,319

center watching the launch of uh crew

6239

04:10:40,070 --> 04:10:37,840

four wow megan mcarthur nasa astronaut

6240

04:10:41,590 --> 04:10:40,080

pilot for crew 2 and she's been on the

6241

04:10:43,990 --> 04:10:41,600

space shuttle you got to watch that

6242

04:10:46,550 --> 04:10:44,000

launch and i saw you taking it in it was

6243

04:10:49,189 --> 04:10:46,560

spectacular it really was wonderful to

6244

04:10:50,790 --> 04:10:49,199

see a launch up close again a night

6245

04:10:53,670 --> 04:10:50,800

launch which has been a while since i've

6246

04:10:55,269 --> 04:10:53,680

seen one in person just spectacular

6247

04:10:56,630 --> 04:10:55,279

it really it never never gets old i

6248

04:10:59,189 --> 04:10:56,640

think if it gets old you're probably in

6249

04:11:01,910 --> 04:10:59,199

the wrong business absolutely it was so

6250

04:11:03,830 --> 04:11:01,920

loud so powerful um the roar of the

6251
04:11:05,910 --> 04:11:03,840
engines when it lifted off it seemed

6252
04:11:07,510 --> 04:11:05,920
louder than than usual but that just

6253
04:11:09,269 --> 04:11:07,520
might be because of the atmospherics and

6254
04:11:11,030 --> 04:11:09,279
then that light off the water what a

6255
04:11:14,229 --> 04:11:11,040
beautiful sight not only were we

6256
04:11:16,950 --> 04:11:14,239
watching but also crew on station tuned

6257
04:11:19,189 --> 04:11:16,960
in to the nasa tv broadcast watching

6258
04:11:21,670 --> 04:11:19,199
them lift off as they wait for them to

6259
04:11:23,269 --> 04:11:21,680
arrive tonight at 8 15. that's right i

6260
04:11:24,550 --> 04:11:23,279
know they're excited for lots of reasons

6261
04:11:26,229 --> 04:11:24,560
one they're going to get to see their

6262
04:11:27,830 --> 04:11:26,239
friends and they're going to get to come

6263
04:11:29,750 --> 04:11:27,840

home themselves so they're looking

6264

04:11:31,670 --> 04:11:29,760

forward to it all right well megan thank

6265

04:11:33,269 --> 04:11:31,680

you for your thoughts on that and we

6266

04:11:34,950 --> 04:11:33,279

also have a very special guest who

6267

04:11:36,710 --> 04:11:34,960

watched the launch with us here at the

6268

04:11:38,630 --> 04:11:36,720

kennedy space center let's get over to

6269

04:11:41,030 --> 04:11:38,640

megan cruz who is with one of the

6270

04:11:43,830 --> 04:11:41,040

astronauts who walked on the moon almost

6271

04:11:45,990 --> 04:11:43,840

50 years ago megan yeah i am really

6272

04:11:48,149 --> 04:11:46,000

honored to be standing next to apollo

6273

04:11:49,670 --> 04:11:48,159

astronaut harrison schmidt i really

6274

04:11:51,510 --> 04:11:49,680

cannot believe i'm standing next to you

6275

04:11:54,149 --> 04:11:51,520

it really is an honor oh it's my

6276

04:11:55,349 --> 04:11:54,159

pleasure i'm happy i'm here oh well

6277

04:11:56,469 --> 04:11:55,359

we're so thrilled to have you here and

6278

04:11:57,830 --> 04:11:56,479

actually we're going to pull up some old

6279

04:11:59,429 --> 04:11:57,840

photos of you why don't we take a trip

6280

04:12:01,670 --> 04:11:59,439

down memory lane

6281

04:12:05,590 --> 04:12:01,680

so for those who don't know harrison was

6282

04:12:09,429 --> 04:12:05,600

the last person to step on the moon with

6283

04:12:11,269 --> 04:12:09,439

apollo 17 in 1972. what picture are we

6284

04:12:12,229 --> 04:12:11,279

looking at right here well this is the

6285

04:12:15,269 --> 04:12:12,239

crew

6286

04:12:17,110 --> 04:12:15,279

ron evans gene cernan myself

6287

04:12:19,110 --> 04:12:17,120

this is sort of the publicity shot with

6288

04:12:21,429 --> 04:12:19,120

the lunar rover we were the

6289

04:12:23,110 --> 04:12:21,439

third mission to have a lunar rover

6290

04:12:25,189 --> 04:12:23,120

that we drove around on the surface of

6291

04:12:27,910 --> 04:12:25,199

the moon we actually landed in a valley

6292

04:12:29,990 --> 04:12:27,920

deeper than the grand canyon yeah and

6293

04:12:32,149 --> 04:12:30,000

and the rover enabled us to visit both

6294

04:12:34,950 --> 04:12:32,159

sides of the valley and really just had

6295

04:12:36,950 --> 04:12:34,960

a not only a great time but a tremendous

6296

04:12:38,550 --> 04:12:36,960

scientific return how does it feel to

6297

04:12:40,309 --> 04:12:38,560

look back on these pictures there's you

6298

04:12:42,389 --> 04:12:40,319

on the moon there to look back on these

6299

04:12:44,469 --> 04:12:42,399

pictures and to be standing here 50

6300

04:12:46,070 --> 04:12:44,479

years later and you just watched crew 4

6301
04:12:48,550 --> 04:12:46,080
launch well of course i'm happy to be

6302
04:12:49,510 --> 04:12:48,560
standing here

6303
04:12:51,110 --> 04:12:49,520
and the

6304
04:12:51,830 --> 04:12:51,120
the launch

6305
04:12:54,550 --> 04:12:51,840
of

6306
04:12:56,070 --> 04:12:54,560
the falcon 9 and the dragon

6307
04:12:57,670 --> 04:12:56,080
to the international space station was

6308
04:12:59,189 --> 04:12:57,680
spectacular

6309
04:13:01,030 --> 04:12:59,199
it uh

6310
04:13:03,269 --> 04:13:01,040
you know those of us that wrote a saturn

6311
04:13:05,910 --> 04:13:03,279
five into into space you know are a

6312
04:13:08,550 --> 04:13:05,920
little bit jaded about about the smaller

6313
04:13:10,389 --> 04:13:08,560

rockets but uh still uh it really was

6314

04:13:12,710 --> 04:13:10,399

something and and on board was a

6315

04:13:14,229 --> 04:13:12,720

geologist yes jessica watkins yes you

6316

04:13:16,070 --> 04:13:14,239

got your special invite today from

6317

04:13:18,309 --> 04:13:16,080

jessica what do you think about that

6318

04:13:20,070 --> 04:13:18,319

that's great jessica and i've worked a

6319

04:13:22,229 --> 04:13:20,080

little bit in houston with the lunar

6320

04:13:24,070 --> 04:13:22,239

samples and the like

6321

04:13:27,189 --> 04:13:24,080

during the apollo

6322

04:13:30,229 --> 04:13:27,199

11 celebration a 50th anniversary

6323

04:13:32,469 --> 04:13:30,239

celebration and she was very kind enough

6324

04:13:34,950 --> 04:13:32,479

to invite me and my wife here my wife

6325

04:13:37,510 --> 04:13:34,960

theresa fitzgibbon and they uh

6326
04:13:38,830 --> 04:13:37,520
we sort of consider ourselves the the

6327
04:13:40,389 --> 04:13:38,840
jessica

6328
04:13:42,070 --> 04:13:40,399
team that's so sweet

6329
04:13:44,070 --> 04:13:42,080
just what do you think about the fact

6330
04:13:45,910 --> 04:13:44,080
that there is a geologist on board the

6331
04:13:48,950 --> 04:13:45,920
importance of having a geologist for

6332
04:13:50,630 --> 04:13:48,960
this mission well for for me i did not

6333
04:13:52,309 --> 04:13:50,640
have a chance to gain the kind of

6334
04:13:53,349 --> 04:13:52,319
operational experience that jessica is

6335
04:13:54,790 --> 04:13:53,359
getting

6336
04:13:57,189 --> 04:13:54,800
to uh

6337
04:14:00,149 --> 04:13:57,199
i gained my operational experience from

6338
04:14:02,149 --> 04:14:00,159

learning to fly t38s and helicopters and

6339

04:14:03,429 --> 04:14:02,159

then a lot of simulator time she's

6340

04:14:05,910 --> 04:14:03,439

gaining it in

6341

04:14:08,149 --> 04:14:05,920

in space and that's very important

6342

04:14:10,309 --> 04:14:08,159

and you know i hope it'll stand up in

6343

04:14:12,790 --> 04:14:10,319

good stead for being part of one of the

6344

04:14:14,469 --> 04:14:12,800

artemis crews that goes to the moon yeah

6345

04:14:16,870 --> 04:14:14,479

absolutely artemis let's talk about that

6346

04:14:19,110 --> 04:14:16,880

that's going to return us to the moon

6347

04:14:20,469 --> 04:14:19,120

isn't that crazy it's crazy

6348

04:14:22,389 --> 04:14:20,479

it's been a long time there have been

6349

04:14:25,910 --> 04:14:22,399

several attempts

6350

04:14:28,070 --> 04:14:25,920

to get us back there uh the the

6351
04:14:29,990 --> 04:14:28,080
two bush presidents both tried to get

6352
04:14:32,469 --> 04:14:30,000
something going and it didn't uh

6353
04:14:34,950 --> 04:14:32,479
materialize but maybe artemis is the the

6354
04:14:36,389 --> 04:14:34,960
third time's a charm yeah and uh we're

6355
04:14:37,429 --> 04:14:36,399
looking forward to it

6356
04:14:38,790 --> 04:14:37,439
do you think we're ready to go back to

6357
04:14:40,229 --> 04:14:38,800
the moon we need to go back oh i think

6358
04:14:42,070 --> 04:14:40,239
we've been ready for a long time the

6359
04:14:44,550 --> 04:14:42,080
technology is there the big difference

6360
04:14:45,510 --> 04:14:44,560
is nasa had to develop the technology

6361
04:14:47,030 --> 04:14:45,520
for

6362
04:14:49,429 --> 04:14:47,040
uh apollo

6363
04:14:50,790 --> 04:14:49,439

advanced old technologies as well as new

6364

04:14:52,309 --> 04:14:50,800

technologies

6365

04:14:54,309 --> 04:14:52,319

the thing that's changed is the

6366

04:14:57,189 --> 04:14:54,319

commercial sector

6367

04:14:58,469 --> 04:14:57,199

has moved taken the nasa technologies to

6368

04:15:01,590 --> 04:14:58,479

move forward

6369

04:15:04,630 --> 04:15:01,600

and now nasa has to integrate that into

6370

04:15:06,950 --> 04:15:04,640

a new lunar program such as artemis

6371

04:15:09,030 --> 04:15:06,960

and you saw that tonight with the falcon

6372

04:15:10,790 --> 04:15:09,040

9 launch that was developed by the

6373

04:15:12,870 --> 04:15:10,800

spacex corporation

6374

04:15:15,910 --> 04:15:12,880

and it's been a turned out to be an

6375

04:15:17,990 --> 04:15:15,920

extraordinary reliable vehicle for

6376

04:15:19,670 --> 04:15:18,000

launches in general and in particular

6377

04:15:21,189 --> 04:15:19,680

now the fourth launch to the

6378

04:15:22,710 --> 04:15:21,199

international space station yeah well

6379

04:15:24,229 --> 04:15:22,720

like you said i'm glad that you're here

6380

04:15:25,830 --> 04:15:24,239

and i'm glad that you will that you

6381

04:15:27,510 --> 04:15:25,840

witness crew 4 and then also that you'll

6382

04:15:28,950 --> 04:15:27,520

see artemis launch soon so thank you so

6383

04:15:31,269 --> 04:15:28,960

much for being here well thank you for

6384

04:15:33,110 --> 04:15:31,279

inviting me it's great and my best to

6385

04:15:35,349 --> 04:15:33,120

everyone in nasa and keep doing great

6386

04:15:37,110 --> 04:15:35,359

work perfect thank you so much back to

6387

04:15:38,950 --> 04:15:37,120

you guys all right thank you megan and

6388

04:15:39,830 --> 04:15:38,960

thank you to moonwalker harrison schmidt

6389

04:15:41,910 --> 04:15:39,840

boy

6390

04:15:43,429 --> 04:15:41,920

for astronaut jessica watkins to have a

6391

04:15:44,790 --> 04:15:43,439

moonwalker on your team is a pretty nice

6392

04:15:46,790 --> 04:15:44,800

thing that's pretty great yeah that's

6393

04:15:48,950 --> 04:15:46,800

fantastic well we're joined now by

6394

04:15:51,670 --> 04:15:48,960

joseph oshbacher director general of the

6395

04:15:53,830 --> 04:15:51,680

european space agency who just watched

6396

04:15:55,750 --> 04:15:53,840

his first crew launch uh just a few

6397

04:15:57,429 --> 04:15:55,760

moments ago joseph thanks for being here

6398

04:15:59,670 --> 04:15:57,439

and what'd you think

6399

04:16:01,750 --> 04:15:59,680

oh thank you daryl it's just a

6400

04:16:03,910 --> 04:16:01,760

fascinating moment this is my

6401
04:16:05,910 --> 04:16:03,920
first crew launch i've been director

6402
04:16:08,309 --> 04:16:05,920
general only since one year so this is

6403
04:16:10,870 --> 04:16:08,319
really a good experience i have to say

6404
04:16:12,950 --> 04:16:10,880
this is uh phenomenal but let me also

6405
04:16:15,990 --> 04:16:12,960
say a lot of thank you to

6406
04:16:18,389 --> 04:16:16,000
to nasa nasa is an enormously good

6407
04:16:20,469 --> 04:16:18,399
partner to us the european space agency

6408
04:16:21,990 --> 04:16:20,479
it's really a pleasure working with nasa

6409
04:16:23,990 --> 04:16:22,000
we have very good relationships a very

6410
04:16:27,189 --> 04:16:24,000
strong partnership but also thank you to

6411
04:16:29,670 --> 04:16:27,199
spacex for delivering our astronaut

6412
04:16:31,670 --> 04:16:29,680
samantha crystal variety up into the

6413
04:16:33,990 --> 04:16:31,680

space station and this is a is a very

6414

04:16:36,229 --> 04:16:34,000

important moment but for us also at the

6415

04:16:38,710 --> 04:16:36,239

european space agency we are

6416

04:16:40,710 --> 04:16:38,720

building up a strong human exploration

6417

04:16:43,670 --> 04:16:40,720

program and samantha is the third

6418

04:16:45,670 --> 04:16:43,680

astronaut now in a row uh following uh

6419

04:16:47,670 --> 04:16:45,680

tomma pesquet matthias mara who is in

6420

04:16:50,149 --> 04:16:47,680

space right now and now joined by

6421

04:16:51,750 --> 04:16:50,159

samantha so a year and a half of

6422

04:16:53,349 --> 04:16:51,760

presence of

6423

04:16:55,189 --> 04:16:53,359

astronauts in the space station is the

6424

04:16:57,189 --> 04:16:55,199

longest time ever and therefore for us

6425

04:16:59,269 --> 04:16:57,199

this is really a very important moment

6426

04:17:01,670 --> 04:16:59,279

and i'm very excited personally but uh

6427

04:17:03,269 --> 04:17:01,680

thrilled to see what's coming samantha

6428

04:17:05,510 --> 04:17:03,279

will have a lot of work to do a lot of

6429

04:17:06,950 --> 04:17:05,520

experiments uh she is also a very good

6430

04:17:10,070 --> 04:17:06,960

role model for

6431

04:17:12,229 --> 04:17:10,080

us in europe but worldwide lady and this

6432

04:17:14,469 --> 04:17:12,239

is also on top of all the other

6433

04:17:17,189 --> 04:17:14,479

qualities she has so really excited and

6434

04:17:19,910 --> 04:17:17,199

uh once more thank you nasa thank you

6435

04:17:21,429 --> 04:17:19,920

spacex for doing this fantastic job with

6436

04:17:23,670 --> 04:17:21,439

us together and we appreciate all the

6437

04:17:25,429 --> 04:17:23,680

work that isa does as well for

6438

04:17:27,750 --> 04:17:25,439

the nasa team and for commercial crew

6439

04:17:29,750 --> 04:17:27,760

and you can see uh samantha she's on the

6440

04:17:32,149 --> 04:17:29,760

far right hand side actually you can see

6441

04:17:34,070 --> 04:17:32,159

her boot there as she goes up into space

6442

04:17:37,110 --> 04:17:34,080

and a quick operational update we have

6443

04:17:39,670 --> 04:17:37,120

deployed the nose cone from the front of

6444

04:17:41,269 --> 04:17:39,680

dragon that's an important milestone in

6445

04:17:43,269 --> 04:17:41,279

order for dragon to dock to the

6446

04:17:45,189 --> 04:17:43,279

international space station so

6447

04:17:47,189 --> 04:17:45,199

we passed that milestone and the crew

6448

04:17:48,790 --> 04:17:47,199

continues as you can see there

6449

04:17:50,229 --> 04:17:48,800

on their flight through space you

6450

04:17:51,750 --> 04:17:50,239

mentioned you mentioned samantha

6451

04:17:52,950 --> 04:17:51,760

christopher ferretti

6452

04:17:54,790 --> 04:17:52,960

she was speaking the other day in a

6453

04:17:58,550 --> 04:17:54,800

press conference not sure if she's going

6454

04:18:00,710 --> 04:17:58,560

to get to do an eva it's possible but

6455

04:18:02,630 --> 04:18:00,720

one of the exciting technologies that

6456

04:18:03,590 --> 04:18:02,640

you have up there right now

6457

04:18:07,110 --> 04:18:03,600

is

6458

04:18:08,950 --> 04:18:07,120

the european uh arm that's on board uh

6459

04:18:10,389 --> 04:18:08,960

this will be over on the russian segment

6460

04:18:12,950 --> 04:18:10,399

but i'm fascinated by this arm which

6461

04:18:14,950 --> 04:18:12,960

like has hands on two ends and like

6462

04:18:17,269 --> 04:18:14,960

crawls around on on the station it's

6463

04:18:19,429 --> 04:18:17,279

pretty neat it's pretty neat and in fact

6464

04:18:21,349 --> 04:18:19,439

we launched it last year and it's really

6465

04:18:23,030 --> 04:18:21,359

neat it's uh it has

6466

04:18:25,189 --> 04:18:23,040

you know you can really move it any any

6467

04:18:27,830 --> 04:18:25,199

way you want and this is it has to be

6468

04:18:30,870 --> 04:18:27,840

commissioned this era it's called

6469

04:18:33,590 --> 04:18:30,880

and it is on the program of samantha's

6470

04:18:35,269 --> 04:18:33,600

tasks among many uh to commission to

6471

04:18:36,870 --> 04:18:35,279

support the commissioning of this era

6472

04:18:39,429 --> 04:18:36,880

and this is something that is quite a

6473

04:18:42,070 --> 04:18:39,439

unique piece of hardware uh talking of

6474

04:18:44,630 --> 04:18:42,080

samantha uh probably uh not everyone

6475

04:18:46,550 --> 04:18:44,640

knows but yesterday was her birthday

6476

04:18:49,269 --> 04:18:46,560

and today she flies up on space so it's

6477

04:18:50,870 --> 04:18:49,279

a nice birthday gift to her to get into

6478

04:18:52,950 --> 04:18:50,880

a rocket and up to the space station

6479

04:18:53,910 --> 04:18:52,960

though happy birthday samantha so thank

6480

04:18:55,750 --> 04:18:53,920

you

6481

04:18:59,349 --> 04:18:55,760

that's right we lit a big birthday

6482

04:19:01,189 --> 04:18:59,359

candle for samantha um what is uh

6483

04:19:02,469 --> 04:19:01,199

happening next for issa you know you

6484

04:19:05,030 --> 04:19:02,479

mentioned today

6485

04:19:06,550 --> 04:19:05,040

uh that budgets are on the top of

6486

04:19:09,189 --> 04:19:06,560

everybody's mind you've got the member

6487

04:19:10,469 --> 04:19:09,199

states uh that are going to be seeking

6488

04:19:13,349 --> 04:19:10,479

to fund you're going to be looking for

6489

04:19:16,149 --> 04:19:13,359

funding from them um what's next for you

6490

04:19:17,910 --> 04:19:16,159

the next big thing for esa i mean i'm

6491

04:19:19,910 --> 04:19:17,920

being here now at

6492

04:19:22,070 --> 04:19:19,920

cape at kennedy space center this is

6493

04:19:24,630 --> 04:19:22,080

actually not my day job my day job is

6494

04:19:25,510 --> 04:19:24,640

talking to politicians to my member

6495

04:19:27,910 --> 04:19:25,520

states

6496

04:19:29,830 --> 04:19:27,920

and really put the program together for

6497

04:19:31,349 --> 04:19:29,840

the next three years

6498

04:19:32,550 --> 04:19:31,359

and we're having a very ambitious

6499

04:19:35,269 --> 04:19:32,560

program we are putting together

6500

04:19:37,830 --> 04:19:35,279

certainly exploration is a priority uh

6501
04:19:39,110 --> 04:19:37,840
we yesterday had a very nice very

6502
04:19:41,030 --> 04:19:39,120
constructive meeting with the

6503
04:19:43,110 --> 04:19:41,040
administrator of nasa bill nelson and

6504
04:19:45,030 --> 04:19:43,120
his team we have many projects in the

6505
04:19:47,429 --> 04:19:45,040
pipeline where we are working together

6506
04:19:49,429 --> 04:19:47,439
already and we want to intensify and

6507
04:19:50,870 --> 04:19:49,439
come with more activities let me of

6508
04:19:51,830 --> 04:19:50,880
course i mentioned the space station

6509
04:19:54,950 --> 04:19:51,840
where we

6510
04:19:57,189 --> 04:19:54,960
continue the operational uh supply of

6511
04:19:59,670 --> 04:19:57,199
of our activities the

6512
04:20:01,830 --> 04:19:59,680
our hardware partners which are then in

6513
04:20:04,309 --> 04:20:01,840

exchange giving us flights of astronauts

6514

04:20:06,389 --> 04:20:04,319

so this is uh nominally proceeding

6515

04:20:08,229 --> 04:20:06,399

despite all the discussions you assumed

6516

04:20:10,630 --> 04:20:08,239

here in the in the news

6517

04:20:12,630 --> 04:20:10,640

then of course on mars temple return we

6518

04:20:15,189 --> 04:20:12,640

are preparing together with nasa our

6519

04:20:17,590 --> 04:20:15,199

contribution to mass temple return we

6520

04:20:19,349 --> 04:20:17,600

also planning missions to the moon we

6521

04:20:21,750 --> 04:20:19,359

have a large

6522

04:20:23,349 --> 04:20:21,760

lander which we are preparing in europe

6523

04:20:25,830 --> 04:20:23,359

which would be again about a

6524

04:20:27,910 --> 04:20:25,840

contribution to nasa again in exchange

6525

04:20:29,990 --> 04:20:27,920

for massive flights this will be a huge

6526

04:20:32,630 --> 04:20:30,000

one it will be a truck actually going up

6527

04:20:35,110 --> 04:20:32,640

to the moon uh capable of launching or

6528

04:20:37,030 --> 04:20:35,120

transporting about 1.5 tons

6529

04:20:39,590 --> 04:20:37,040

of mars to the moon which of course is

6530

04:20:41,110 --> 04:20:39,600

necessary to build up

6531

04:20:43,830 --> 04:20:41,120

and the various infrastructure which

6532

04:20:46,309 --> 04:20:43,840

will be required and we have many other

6533

04:20:48,309 --> 04:20:46,319

activities where we work very very

6534

04:20:50,149 --> 04:20:48,319

nicely very closely with nasa i should

6535

04:20:52,229 --> 04:20:50,159

mention also exomars

6536

04:20:54,710 --> 04:20:52,239

exomars was a mission

6537

04:20:56,710 --> 04:20:54,720

we did prepare together with russia

6538

04:20:58,870 --> 04:20:56,720

until very recently and through the

6539

04:21:00,229 --> 04:20:58,880

innovation we cannot continue there

6540

04:21:02,710 --> 04:21:00,239

obviously

6541

04:21:05,110 --> 04:21:02,720

the the rover called rosa and franklin

6542

04:21:07,750 --> 04:21:05,120

robert is ready for launch we would have

6543

04:21:10,070 --> 04:21:07,760

shipped it to baikonur but of course now

6544

04:21:12,149 --> 04:21:10,080

i had to stop to suspend this

6545

04:21:15,030 --> 04:21:12,159

cooperation and now i have to find new

6546

04:21:18,550 --> 04:21:15,040

ways of bringing this uh really

6547

04:21:20,790 --> 04:21:18,560

incredibly uh fascinating rover onto the

6548

04:21:22,469 --> 04:21:20,800

mouse surface so i'm working now

6549

04:21:24,630 --> 04:21:22,479

with my member states obviously but

6550

04:21:27,030 --> 04:21:24,640

we're doing industrial studies and again

6551
04:21:29,910 --> 04:21:27,040
nasa has reached out to us supporting us

6552
04:21:32,790 --> 04:21:29,920
with expertise and on how we could uh

6553
04:21:34,710 --> 04:21:32,800
bring this rover now uh to the mars

6554
04:21:36,070 --> 04:21:34,720
surface and replacing obviously those

6555
04:21:38,229 --> 04:21:36,080
components that

6556
04:21:40,870 --> 04:21:38,239
have been russian with european ones or

6557
04:21:42,630 --> 04:21:40,880
possibly with some help of of of the u.s

6558
04:21:45,349 --> 04:21:42,640
so we have yet to see that and decisions

6559
04:21:47,590 --> 04:21:45,359
are being prepared right now uh we have

6560
04:21:49,429 --> 04:21:47,600
decisions on that in the july time frame

6561
04:21:51,429 --> 04:21:49,439
but our big moment of visa is in

6562
04:21:53,990 --> 04:21:51,439
november when we come with a big package

6563
04:21:55,830 --> 04:21:54,000

of next uh space programs to our member

6564

04:21:57,030 --> 04:21:55,840

states to fund our activities for the

6565

04:21:58,870 --> 04:21:57,040

next three years

6566

04:22:00,229 --> 04:21:58,880

well good luck with that good luck with

6567

04:22:03,590 --> 04:22:00,239

uh you know continuing to work to

6568

04:22:05,750 --> 04:22:03,600

exomars that was a bit of a blow um but

6569

04:22:07,990 --> 04:22:05,760

your moon stuff you know we've got uh

6570

04:22:10,790 --> 04:22:08,000

part of your uh you know part of your

6571

04:22:12,229 --> 04:22:10,800

hardware over there in the vav right now

6572

04:22:14,070 --> 04:22:12,239

and so have you had a chance to go over

6573

04:22:16,389 --> 04:22:14,080

there and see in the sls rocket i have

6574

04:22:18,950 --> 04:22:16,399

seen of course the sls rocket i've seen

6575

04:22:20,870 --> 04:22:18,960

it last time in the vab i've seen it uh

6576

04:22:22,149 --> 04:22:20,880

just a day before yesterday out in the

6577

04:22:24,630 --> 04:22:22,159

open air

6578

04:22:27,590 --> 04:22:24,640

and i have to say this is uh this is so

6579

04:22:29,189 --> 04:22:27,600

impressive uh i'm very proud to be part

6580

04:22:31,510 --> 04:22:29,199

of the sls

6581

04:22:34,309 --> 04:22:31,520

you see a little isa logo under the nasa

6582

04:22:36,950 --> 04:22:34,319

logo because we provide the esm european

6583

04:22:38,389 --> 04:22:36,960

service module a very uh element on the

6584

04:22:40,550 --> 04:22:38,399

critical path and

6585

04:22:42,149 --> 04:22:40,560

again once more thank you nasa for this

6586

04:22:44,070 --> 04:22:42,159

strong partnership which we enjoy

6587

04:22:46,309 --> 04:22:44,080

working with you all right

6588

04:22:47,750 --> 04:22:46,319

joseph osbacher director general visa

6589

04:22:49,349 --> 04:22:47,760

thank you so much for making time and

6590

04:22:50,630 --> 04:22:49,359

joining us and good luck to you thank

6591

04:22:51,990 --> 04:22:50,640

you very much

6592

04:22:53,590 --> 04:22:52,000

all right well mentioning the

6593

04:22:54,950 --> 04:22:53,600

international space station nasa

6594

04:22:57,110 --> 04:22:54,960

recently announced the international

6595

04:23:02,570 --> 04:22:57,120

space station would be extended another

6596

04:23:08,950 --> 04:23:05,990

[Music]

6597

04:23:11,510 --> 04:23:08,960

the international space station

6598

04:23:13,990 --> 04:23:11,520

an unparalleled laboratory for

6599

04:23:16,790 --> 04:23:14,000

cutting-edge research unachievable in

6600

04:23:19,750 --> 04:23:16,800

earth's gravity for the benefit of all

6601
04:23:25,269 --> 04:23:22,070
an observatory for earth's evolving

6602
04:23:25,279 --> 04:23:30,149
a beacon of international collaboration

6603
04:23:30,159 --> 04:23:36,389
and our home until 2030.

6604
04:23:41,269 --> 04:23:38,630
as the station enters its third decade

6605
04:23:43,030 --> 04:23:41,279
it is busier than ever

6606
04:23:45,269 --> 04:23:43,040
developing technology for human

6607
04:23:47,110 --> 04:23:45,279
exploration missions to the moon and

6608
04:23:50,389 --> 04:23:47,120
mars

6609
04:23:52,870 --> 04:23:50,399
finding new ways to combat disease

6610
04:23:55,510 --> 04:23:52,880
and acting as a test bed for in-space

6611
04:23:58,270 --> 04:23:55,520
manufacturing of advanced materials and

6612
04:24:05,830 --> 04:23:58,280
new medical products

6613
04:24:10,710 --> 04:24:08,309

humanity's future is an ever expanding

6614

04:24:12,309 --> 04:24:10,720

team of nations

6615

04:24:15,269 --> 04:24:12,319

and companies

6616

04:24:19,030 --> 04:24:15,279

enabling exploration together

6617

04:24:23,910 --> 04:24:20,870

the international space station is a

6618

04:24:25,189 --> 04:24:23,920

critical step on a great journey ahead

6619

04:24:34,309 --> 04:24:25,199

to the moon

6620

04:24:37,830 --> 04:24:36,229

today's launch is the fourth operational

6621

04:24:40,550 --> 04:24:37,840

mission for nasa's commercial crew

6622

04:24:43,510 --> 04:24:40,560

program it has seen many successes in

6623

04:24:46,070 --> 04:24:43,520

just a few short years nasa's megan cruz

6624

04:24:48,870 --> 04:24:46,080

is back now with some leadership from

6625

04:24:50,710 --> 04:24:48,880

our nasa program megan

6626
04:24:52,870 --> 04:24:50,720
yeah i'm here with dana hutcherson she's

6627
04:24:54,389 --> 04:24:52,880
the deputy manager of nasa's commercial

6628
04:24:56,309 --> 04:24:54,399
crew program it is really great to have

6629
04:24:57,990 --> 04:24:56,319
you here thanks for having me so what

6630
04:24:59,910 --> 04:24:58,000
did you think of today's launch it's so

6631
04:25:02,070 --> 04:24:59,920
exciting you know it's the launches

6632
04:25:04,070 --> 04:25:02,080
never get old i'm always excited to get

6633
04:25:06,469 --> 04:25:04,080
to see a launch and to be up here on the

6634
04:25:08,550 --> 04:25:06,479
balcony and hear new people watch the

6635
04:25:10,469 --> 04:25:08,560
launch it's always just a breath of

6636
04:25:12,550 --> 04:25:10,479
fresh air to hear that yeah you know our

6637
04:25:15,510 --> 04:25:12,560
mission is not done though so we're

6638
04:25:17,349 --> 04:25:15,520

always watching and i don't breathe a um

6639

04:25:19,429 --> 04:25:17,359

i don't breathe a sigh of relief until

6640

04:25:20,950 --> 04:25:19,439

we actually land the crew so what i

6641

04:25:22,710 --> 04:25:20,960

thought was really cool though is right

6642

04:25:24,550 --> 04:25:22,720

after a liftoff pretty shortly after a

6643

04:25:25,830 --> 04:25:24,560

liftoff we heard the commander chell

6644

04:25:28,229 --> 04:25:25,840

give you guys a shout out the commercial

6645

04:25:29,429 --> 04:25:28,239

crew program a shout out yeah exactly i

6646

04:25:31,510 --> 04:25:29,439

think that was really awesome we have a

6647

04:25:32,950 --> 04:25:31,520

lot of great people that work with in

6648

04:25:36,070 --> 04:25:32,960

our program a lot of people that spend

6649

04:25:37,830 --> 04:25:36,080

tireless days working on working with

6650

04:25:39,830 --> 04:25:37,840

them both spacex and nasa and all of our

6651
04:25:41,750 --> 04:25:39,840
teams that work together so really

6652
04:25:43,429 --> 04:25:41,760
appreciate that shout out from chill

6653
04:25:46,229 --> 04:25:43,439
well is this program would you say

6654
04:25:48,870 --> 04:25:46,239
accomplishing what it set out to do when

6655
04:25:51,110 --> 04:25:48,880
it was created 11 years ago yeah i do

6656
04:25:53,670 --> 04:25:51,120
believe it has i mean it was cost

6657
04:25:55,110 --> 04:25:53,680
effective safe reliable transportation

6658
04:25:56,870 --> 04:25:55,120
to low earth orbit and to the

6659
04:25:59,030 --> 04:25:56,880
international space station so yes i

6660
04:26:01,269 --> 04:25:59,040
believe we have definitely achieved that

6661
04:26:03,269 --> 04:26:01,279
goal and also working with these

6662
04:26:05,349 --> 04:26:03,279
commercial companies building

6663
04:26:07,510 --> 04:26:05,359

multiple commercial systems space flight

6664

04:26:08,469 --> 04:26:07,520

systems delivering our astronauts to

6665

04:26:10,550 --> 04:26:08,479

space

6666

04:26:12,790 --> 04:26:10,560

it's um it's also opened up the doors

6667

04:26:14,870 --> 04:26:12,800

for the private industry as well and so

6668

04:26:17,750 --> 04:26:14,880

enabling that space transportation for

6669

04:26:19,670 --> 04:26:17,760

the public so it's just we actually had

6670

04:26:21,429 --> 04:26:19,680

two private missions in the last year

6671

04:26:24,070 --> 04:26:21,439

right that spacex

6672

04:26:26,630 --> 04:26:24,080

has accomplished so i think our goals um

6673

04:26:28,469 --> 04:26:26,640

in the commercial crew program we've um

6674

04:26:29,670 --> 04:26:28,479

gone above and beyond on meeting those

6675

04:26:32,229 --> 04:26:29,680

goals yeah you've really been the

6676
04:26:34,229 --> 04:26:32,239
springboard into what we can expect to

6677
04:26:35,750 --> 04:26:34,239
be our our near future it sounds like

6678
04:26:37,590 --> 04:26:35,760
with all these commercial um programs

6679
04:26:39,590 --> 04:26:37,600
like you said exactly it's a new era

6680
04:26:41,510 --> 04:26:39,600
with nasa and the commercial and human

6681
04:26:42,870 --> 04:26:41,520
space flight for sure dana thank you so

6682
04:26:44,550 --> 04:26:42,880
much i appreciate you being here all

6683
04:26:45,590 --> 04:26:44,560
right thank you daryl and megan back to

6684
04:26:49,750 --> 04:26:45,600
you

6685
04:26:51,510 --> 04:26:49,760
channel bob jessica and samantha are now

6686
04:26:54,630 --> 04:26:51,520
on course to arrive at the international

6687
04:26:57,510 --> 04:26:54,640
space station around 8 15 p.m eastern

6688
04:27:00,070 --> 04:26:57,520

daylight time tonight and nasa tv will

6689

04:27:02,950 --> 04:27:00,080

stay on the air for continuous live

6690

04:27:04,790 --> 04:27:02,960

coverage along crew 4's entire ride to

6691

04:27:07,030 --> 04:27:04,800

station meanwhile spacex's youtube

6692

04:27:10,389 --> 04:27:07,040

channel will join live coverage starting

6693

04:27:11,910 --> 04:27:10,399

roughly two hours prior to docking

6694

04:27:13,910 --> 04:27:11,920

and though our coverage here at kennedy

6695

04:27:15,590 --> 04:27:13,920

space center is concluding we will turn

6696

04:27:17,830 --> 04:27:15,600

it over to the team in houston to take

6697

04:27:19,990 --> 04:27:17,840

us through the next phases of crew 4's

6698

04:27:22,870 --> 04:27:20,000

mission all the way to arrival at the

6699

04:27:23,990 --> 04:27:22,880

international space station megan

6700

04:27:25,110 --> 04:27:24,000

when they arrive at the international

6701
04:27:27,110 --> 04:27:25,120
space station you were talking about a

6702
04:27:28,710 --> 04:27:27,120
moment ago it's a it's a big moment you

6703
04:27:29,990 --> 04:27:28,720
arrived you finally got there it is such

6704
04:27:32,550 --> 04:27:30,000
a big moment it is sort of the

6705
04:27:33,990 --> 04:27:32,560
culmination of so much training not just

6706
04:27:35,269 --> 04:27:34,000
your mission specific training but

6707
04:27:36,630 --> 04:27:35,279
something that you have been you know

6708
04:27:39,269 --> 04:27:36,640
working towards pretty much your whole

6709
04:27:40,630 --> 04:27:39,279
career and so it's a fantastic moment to

6710
04:27:42,630 --> 04:27:40,640
come through the hatch to see your

6711
04:27:43,510 --> 04:27:42,640
friends there waiting for you smiling at

6712
04:27:45,189 --> 04:27:43,520
you

6713
04:27:47,429 --> 04:27:45,199

there's a lot of emotions just a lot of

6714

04:27:49,349 --> 04:27:47,439

joy and you know you're about to get

6715

04:27:51,269 --> 04:27:49,359

started on a pretty great adventure bob

6716

04:27:53,990 --> 04:27:51,279

hines and jessica watkins flying for the

6717

04:27:55,910 --> 04:27:54,000

first time i wonder what that was like

6718

04:27:57,590 --> 04:27:55,920

for them well i'm sure they're still

6719

04:27:58,950 --> 04:27:57,600

talking about it and still processing it

6720

04:28:01,030 --> 04:27:58,960

right i mean it's a lot of things that

6721

04:28:02,389 --> 04:28:01,040

happen happen so quickly that it's it's

6722

04:28:03,830 --> 04:28:02,399

hard to take it all in and they'll be

6723

04:28:04,870 --> 04:28:03,840

talking about it for days to come i

6724

04:28:06,229 --> 04:28:04,880

think but we're going to see great

6725

04:28:07,670 --> 04:28:06,239

things from them from all four of them

6726
04:28:09,750 --> 04:28:07,680
once they reach the international space

6727
04:28:11,110 --> 04:28:09,760
station i think big smiles all around

6728
04:28:12,630 --> 04:28:11,120
but lots of great work as well

6729
04:28:14,550 --> 04:28:12,640
absolutely we look forward to seeing the

6730
04:28:16,550 --> 04:28:14,560
work that they will do for those of you

6731
04:28:18,630 --> 04:28:16,560
watching online on youtube make sure you

6732
04:28:21,030 --> 04:28:18,640
take sure take a look at the description

6733
04:28:23,750 --> 04:28:21,040
below the video we'll have a new link

6734
04:28:25,670 --> 04:28:23,760
for the crew 4 coast phase and that live

6735
04:28:27,670 --> 04:28:25,680
coverage will continue at that new

6736
04:28:29,510 --> 04:28:27,680
location shortly if you're watching on

6737
04:28:32,229 --> 04:28:29,520
nasa tv while you won't notice a thing

6738
04:28:34,630 --> 04:28:32,239

and coverage will continue also a

6739

04:28:37,670 --> 04:28:34,640

post-launch news conference is scheduled

6740

04:28:40,229 --> 04:28:37,680

for 5 30 a.m eastern daylight time on

6741

04:28:43,830 --> 04:28:40,239

nasa tv and you can find mission updates

6742

04:28:46,710 --> 04:28:43,840

at any time on twitter at nasa at spacex

6743

04:28:48,389 --> 04:28:46,720

and on the web at nasa.gov including

6744

04:28:49,349 --> 04:28:48,399

including the timing on any potential

6745

04:28:51,830 --> 04:28:49,359

live

6746

04:28:53,110 --> 04:28:51,840

tours of dragon freedom during the trip

6747

04:28:55,189 --> 04:28:53,120

to the station

6748

04:28:57,030 --> 04:28:55,199

now before we sign off i want to thank

6749

04:28:58,790 --> 04:28:57,040

megan macarthur for being on the launch

6750

04:29:03,110 --> 04:28:58,800

broadcast and sharing your incredible

6751
04:29:06,229 --> 04:29:03,120
insight and experiences on an overnight

6752
04:29:08,550 --> 04:29:06,239
it started yesterday and ran into today

6753
04:29:10,630 --> 04:29:08,560
i really appreciate it absolutely it was

6754
04:29:12,469 --> 04:29:10,640
totally worth it oh fantastic it was

6755
04:29:14,309 --> 04:29:12,479
great great to hear you say that

6756
04:29:16,950 --> 04:29:14,319
and so now we will leave you with a

6757
04:29:19,110 --> 04:29:16,960
little bit of a replay and thanks to all

6758
04:29:21,590 --> 04:29:19,120
of our guests who came here the nasa

6759
04:29:23,670 --> 04:29:21,600
social participants who joined us and

6760
04:29:25,349 --> 04:29:23,680
are now going to share the story of

6761
04:29:27,670 --> 04:29:25,359
their adventures here with their

6762
04:29:30,149 --> 04:29:27,680
audiences and of course we thank all of

6763
04:29:32,469 --> 04:29:30,159

you who are watching right now

6764

04:29:35,830 --> 04:29:32,479

here are now some highlights from the

6765

04:29:37,830 --> 04:29:35,840

journey to orbit off the earth for the

6766

04:29:40,229 --> 04:29:37,840

earth take care everyone and keep

6767

04:29:41,110 --> 04:29:40,239

looking up

6768

04:29:43,990 --> 04:29:41,120

this

6769

04:29:46,229 --> 04:29:44,000

is the suit-up room inside the

6770

04:29:48,149 --> 04:29:46,239

operations and checkout building at the

6771

04:29:51,870 --> 04:29:48,159

kennedy space center

6772

04:29:59,590 --> 04:29:51,880

and here comes crew 4 down the hallway

6773

04:30:01,349 --> 04:29:59,600

[Music]

6774

04:30:04,469 --> 04:30:01,359

there they are they are

6775

04:30:05,950 --> 04:30:04,479

jessica watkins bob hines jell lindgren

6776
04:30:09,349 --> 04:30:05,960
and samantha christopher

6777
04:30:10,850 --> 04:30:09,359
[Music]

6778
04:30:13,510 --> 04:30:10,860
samantha and jessica there

6779
04:30:18,790 --> 04:30:13,520
[Music]

6780
04:30:18,800 --> 04:30:26,469
and here come jessica and samantha

6781
04:30:30,870 --> 04:30:28,389
the closeout crew there

6782
04:30:46,950 --> 04:30:30,880
appears to have the hatch shut

6783
04:30:51,990 --> 04:30:49,030
vehicle already pitching down range all