



1
00:00:07,749 --> 00:00:04,870
good morning commander bravery this is

2
00:00:15,030 --> 00:00:07,759
uh tarek malik with space.com how do you

3
00:00:19,189 --> 00:00:16,470
good morning commander burbank this is a

4
00:00:21,750 --> 00:00:19,199
tariq malik with space.com tarek good

5
00:00:23,189 --> 00:00:21,760
morning got you loud and clear oh great

6
00:00:24,950 --> 00:00:23,199
well uh thank you so much for having

7
00:00:27,109 --> 00:00:24,960
some uh some time to talk with us today

8
00:00:30,550 --> 00:00:27,119
and welcome uh welcome back to

9
00:00:32,310 --> 00:00:30,560
uh to houston obviously um you know i

10
00:00:33,590 --> 00:00:32,320
guess our first question is how how has

11
00:00:36,790 --> 00:00:33,600
it been uh

12
00:00:39,510 --> 00:00:36,800
uh coming back home after uh landing uh

13
00:00:40,630 --> 00:00:39,520

uh and uh and readapting to

14

00:00:41,910 --> 00:00:40,640

you know all the

15

00:00:44,069 --> 00:00:41,920

the the

16

00:00:45,350 --> 00:00:44,079

the minor details of life on earth with

17

00:00:48,709 --> 00:00:45,360

gravity

18

00:00:50,790 --> 00:00:48,719

challenging thing i think compared to a

19

00:00:52,389 --> 00:00:50,800

shuttle mission though in some ways it

20

00:00:53,990 --> 00:00:52,399

was probably a little bit easier and

21

00:00:55,510 --> 00:00:54,000

it's because i think now for the long

22

00:00:57,510 --> 00:00:55,520

duration missions with the exercise

23

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

equipment you got on board you can act

24

00:01:00,549 --> 00:00:59,120

in the time that we devote to it every

25

00:01:02,389 --> 00:01:00,559

day you can actually

26

00:01:04,229 --> 00:01:02,399

finish out a mission and uh and feel

27

00:01:06,230 --> 00:01:04,239

like you're you're fairly fit it does

28

00:01:08,630 --> 00:01:06,240

take a little bit of time to get your

29

00:01:10,630 --> 00:01:08,640

your gyros working properly again but

30

00:01:12,950 --> 00:01:10,640

after two weeks i feel pretty much back

31

00:01:14,710 --> 00:01:12,960

to normal

32

00:01:16,469 --> 00:01:14,720

that's that's good to hear it uh has

33

00:01:17,830 --> 00:01:16,479

there been any um unexpected side

34

00:01:19,590 --> 00:01:17,840

effects of getting back to earth have

35

00:01:21,670 --> 00:01:19,600

you if you uh i think some volkswagen

36

00:01:22,870 --> 00:01:21,680

told us how you know maybe uh they they

37

00:01:24,630 --> 00:01:22,880

put a glass up in the air i think it's

38

00:01:26,870 --> 00:01:24,640

gonna float and and they forget that

39

00:01:28,710 --> 00:01:26,880

there is gravity anything like that uh

40

00:01:30,630 --> 00:01:28,720

so far none maybe because i'm i'm a

41

00:01:32,149 --> 00:01:30,640

little bit careful about it i uh

42

00:01:34,149 --> 00:01:32,159

actually after the after a shuttle

43

00:01:35,510 --> 00:01:34,159

mission though uh occasionally that

44

00:01:37,109 --> 00:01:35,520

would that would be the case you'd be

45

00:01:39,190 --> 00:01:37,119

shaving in the morning and

46

00:01:40,550 --> 00:01:39,200

put out a shaving a can of shaving cream

47

00:01:42,389 --> 00:01:40,560

in front of you and expect it to float

48

00:01:44,870 --> 00:01:42,399

there and i haven't had anything like

49

00:01:47,749 --> 00:01:44,880

that this time but uh you know i feel

50

00:01:50,069 --> 00:01:47,759

very very normal um

51
00:01:52,310 --> 00:01:50,079
look forward very much to running every

52
00:01:54,069 --> 00:01:52,320
day getting out and uh and actually

53
00:01:55,590 --> 00:01:54,079
running and watching the world go by

54
00:01:58,389 --> 00:01:55,600
instead of running out of treadmills uh

55
00:02:00,149 --> 00:01:58,399
it's really really pleasant very nice

56
00:02:01,510 --> 00:02:00,159
well now that now that you're back what

57
00:02:03,270 --> 00:02:01,520
what uh

58
00:02:05,270 --> 00:02:03,280
what was the the one thing

59
00:02:07,030 --> 00:02:05,280
if there is one thing that that you can

60
00:02:09,749 --> 00:02:07,040
say that you missed that was

61
00:02:12,070 --> 00:02:09,759
that was a maybe like a a small

62
00:02:14,790 --> 00:02:12,080
comfort of life on earth something

63
00:02:17,110 --> 00:02:14,800

that's obviously your family and friends

64

00:02:18,710 --> 00:02:17,120

uh but just one of those those little

65

00:02:19,830 --> 00:02:18,720

things that that you really just when

66

00:02:20,949 --> 00:02:19,840

you got back you're like oh i really

67

00:02:23,670 --> 00:02:20,959

missed this

68

00:02:25,430 --> 00:02:23,680

yeah i think hands down family

69

00:02:27,110 --> 00:02:25,440

the time that you spend away on station

70

00:02:29,030 --> 00:02:27,120

actually the time that you spend away

71

00:02:30,550 --> 00:02:29,040

from family uh during the couple of

72

00:02:32,790 --> 00:02:30,560

years of training leading up to your

73

00:02:34,630 --> 00:02:32,800

launch um that's that's pretty tough

74

00:02:36,630 --> 00:02:34,640

that's one of the toughest aspects i

75

00:02:37,589 --> 00:02:36,640

think of of long-duration spaceflight

76

00:02:39,350 --> 00:02:37,599

right now

77

00:02:41,589 --> 00:02:39,360

but to get back and and be with family

78

00:02:43,750 --> 00:02:41,599

again far and away is the is the thing

79

00:02:45,830 --> 00:02:43,760

that's most precious you missed most

80

00:02:48,710 --> 00:02:45,840

there's there's a lot of things the the

81

00:02:50,869 --> 00:02:48,720

kinds of food that you might eat here

82

00:02:53,509 --> 00:02:50,879

we've got a great selection on board um

83

00:02:56,869 --> 00:02:53,519

but uh but it still isn't quite the same

84

00:02:58,390 --> 00:02:56,879

as having fresh vegetables and uh and so

85

00:03:00,390 --> 00:02:58,400

there's a lot of that that you you

86

00:03:01,750 --> 00:03:00,400

certainly enjoy but there's an awful lot

87

00:03:05,030 --> 00:03:01,760

that we're able to do on on space

88

00:03:07,350 --> 00:03:05,040

station right now it's big and uh and

89

00:03:09,589 --> 00:03:07,360

as well designed for long duration you

90

00:03:11,350 --> 00:03:09,599

know crew uh living

91

00:03:13,509 --> 00:03:11,360

it the space station is actually uh

92

00:03:15,589 --> 00:03:13,519

quite a nice place

93

00:03:17,509 --> 00:03:15,599

what was that that first uh maybe earth

94

00:03:19,509 --> 00:03:17,519

meal that you requested when you when

95

00:03:21,910 --> 00:03:19,519

you got home uh either in kazakhstan or

96

00:03:23,910 --> 00:03:21,920

in houston a meat lover's pizza that was

97

00:03:25,830 --> 00:03:23,920

uh that was number one actually before

98

00:03:28,470 --> 00:03:25,840

that there actually was a uh

99

00:03:30,550 --> 00:03:28,480

a t-bone steak too that we we managed to

100

00:03:32,149 --> 00:03:30,560

uh to track down on our on our flight

101
00:03:34,149 --> 00:03:32,159
back to houston through us through

102
00:03:35,830 --> 00:03:34,159
scotland prestwick

103
00:03:36,789 --> 00:03:35,840
well that sounds that sounds tasty for

104
00:03:39,110 --> 00:03:36,799
sure

105
00:03:40,869 --> 00:03:39,120
um you mentioned the space station and

106
00:03:42,309 --> 00:03:40,879
uh now that you've flown on both uh you

107
00:03:44,630 --> 00:03:42,319
know the short duration and long

108
00:03:48,390 --> 00:03:44,640
duration i'm wondering what was

109
00:03:50,789 --> 00:03:48,400
um your favorite aspect of both uh

110
00:03:53,110 --> 00:03:50,799
flying to the station and and then also

111
00:03:54,229 --> 00:03:53,120
serving as its commander there uh and

112
00:03:55,830 --> 00:03:54,239
now that you've had some time to kind of

113
00:03:57,429 --> 00:03:55,840

reflect on it

114

00:03:58,869 --> 00:03:57,439

i think for everybody that that does a

115

00:04:00,710 --> 00:03:58,879

short duration mission everybody that's

116

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

been to space station maybe had a hand

117

00:04:05,270 --> 00:04:02,720

in uh some of the assembly work on space

118

00:04:06,550 --> 00:04:05,280

station i think for all of us you you

119

00:04:08,710 --> 00:04:06,560

always wonder what it would be like to

120

00:04:11,030 --> 00:04:08,720

spend enough time up there to really

121

00:04:12,710 --> 00:04:11,040

adapt to space to really become you know

122

00:04:14,390 --> 00:04:12,720

a creature of space in a way to become

123

00:04:15,509 --> 00:04:14,400

very good at living up there

124

00:04:17,590 --> 00:04:15,519

and

125

00:04:19,189 --> 00:04:17,600

the views of planet earth are are

126

00:04:21,189 --> 00:04:19,199

unbelievable through the cupola and

127

00:04:23,270 --> 00:04:21,199

those are are are something that'll

128

00:04:25,030 --> 00:04:23,280

that'll always mean a lot to you but i

129

00:04:26,550 --> 00:04:25,040

think just living and working up there

130

00:04:28,710 --> 00:04:26,560

getting very good at it doing the

131

00:04:30,629 --> 00:04:28,720

science you do on space station

132

00:04:32,390 --> 00:04:30,639

making it become a home for you that you

133

00:04:35,830 --> 00:04:32,400

really feel

134

00:04:37,189 --> 00:04:35,840

as much at home in as capable as as you

135

00:04:39,030 --> 00:04:37,199

would in any environment you've ever

136

00:04:41,189 --> 00:04:39,040

been on planet earth to go through that

137

00:04:42,950 --> 00:04:41,199

transition which does take some time

138

00:04:44,950 --> 00:04:42,960

that's probably one of the one of the

139

00:04:47,189 --> 00:04:44,960

really neatest most rewarding aspects

140

00:04:50,469 --> 00:04:47,199

and it requires being up there you know

141

00:04:52,150 --> 00:04:50,479

certainly a lot longer than two weeks

142

00:04:53,430 --> 00:04:52,160

great thanks you know one thing we did

143

00:04:55,909 --> 00:04:53,440

because we we knew that we were going to

144

00:04:58,710 --> 00:04:55,919

be uh speaking with you uh today is we

145

00:05:00,230 --> 00:04:58,720

asked um our space.com readers uh if

146

00:05:02,710 --> 00:05:00,240

there are any questions they would ask

147

00:05:04,629 --> 00:05:02,720

you if they could and they sent us some

148

00:05:07,590 --> 00:05:04,639

some really interesting ones and and if

149

00:05:10,150 --> 00:05:07,600

it's all right i hope to to ask them um

150

00:05:10,870 --> 00:05:10,160

to you at least a few of them absolutely

151
00:05:12,710 --> 00:05:10,880
yeah

152
00:05:15,350 --> 00:05:12,720
well you know to start off john uh thank

153
00:05:17,029 --> 00:05:15,360
you for by the way uh john uh

154
00:05:19,029 --> 00:05:17,039
he he mentioned that he's heard about

155
00:05:20,950 --> 00:05:19,039
the high-speed particles that astronauts

156
00:05:22,790 --> 00:05:20,960
sometimes see those flashes of light i

157
00:05:25,909 --> 00:05:22,800
think i've seen don pettit write about

158
00:05:27,350 --> 00:05:25,919
them as well and he was wondering if you

159
00:05:29,590 --> 00:05:27,360
experienced any of that and if so how

160
00:05:31,270 --> 00:05:29,600
often uh it might happen if it's a

161
00:05:32,230 --> 00:05:31,280
nuisance or anything

162
00:05:33,350 --> 00:05:32,240
um

163
00:05:36,150 --> 00:05:33,360

there's some different words for it's

164

00:05:39,189 --> 00:05:36,160

cherenkov radiation it's uh we call them

165

00:05:41,350 --> 00:05:39,199

phosphines and what it really is is

166

00:05:43,189 --> 00:05:41,360

radiation that's that could be galactic

167

00:05:45,749 --> 00:05:43,199

cosmic rays it could be

168

00:05:47,110 --> 00:05:45,759

particles from the solar wind and these

169

00:05:49,270 --> 00:05:47,120

interact with

170

00:05:51,909 --> 00:05:49,280

uh the basically the fluid inside the

171

00:05:53,909 --> 00:05:51,919

eye and it's the same it's the same kind

172

00:05:56,870 --> 00:05:53,919

of phenomenon that you might see if

173

00:05:58,790 --> 00:05:56,880

you've ever seen the photos or video of

174

00:06:00,790 --> 00:05:58,800

the cooling water in reactors nuclear

175

00:06:03,029 --> 00:06:00,800

reactors for example it's the uh the

176
00:06:05,029 --> 00:06:03,039
bluish glow that you would see there and

177
00:06:07,189 --> 00:06:05,039
essentially these um these radiation

178
00:06:09,270 --> 00:06:07,199
particles will interact with the again

179
00:06:11,270 --> 00:06:09,280
the fluid in the eye and

180
00:06:14,870 --> 00:06:11,280
you don't see it as blue you'll see it

181
00:06:16,629 --> 00:06:14,880
as as glowing flashes it'd be similar to

182
00:06:18,230 --> 00:06:16,639
to me what it what it looks like is if

183
00:06:19,749 --> 00:06:18,240
you're flying in an airplane at high

184
00:06:21,830 --> 00:06:19,759
altitude and you see a thunderstorm in

185
00:06:23,909 --> 00:06:21,840
the distance and if there's a lightning

186
00:06:25,670 --> 00:06:23,919
you know bolt inside the thunderstorm

187
00:06:28,230 --> 00:06:25,680
kind of that sort of

188
00:06:30,230 --> 00:06:28,240

that glowing diffuse

189

00:06:31,830 --> 00:06:30,240

flash that you'll see so it's not

190

00:06:34,070 --> 00:06:31,840

something your eyes can focus on it's

191

00:06:35,510 --> 00:06:34,080

not something that you see in it as a

192

00:06:37,830 --> 00:06:35,520

point source and it's not something you

193

00:06:40,070 --> 00:06:37,840

see certainly as a as a ray but you see

194

00:06:41,510 --> 00:06:40,080

it as kind of a glowing flash you'll

195

00:06:43,749 --> 00:06:41,520

notice it when

196

00:06:45,189 --> 00:06:43,759

uh when the space station uh or the

197

00:06:47,029 --> 00:06:45,199

space shuttle go through what we call

198

00:06:48,790 --> 00:06:47,039

the south atlantic anomaly it's a it's a

199

00:06:50,550 --> 00:06:48,800

slight depression in the magnetosphere

200

00:06:53,350 --> 00:06:50,560

of earth where a lot of these charged

201
00:06:55,029 --> 00:06:53,360
particles actually will uh during their

202
00:06:57,350 --> 00:06:55,039
trajectory for the north and south pole

203
00:06:59,830 --> 00:06:57,360
will actually impinge a little bit onto

204
00:07:01,270 --> 00:06:59,840
the orbit of the space station so if

205
00:07:02,550 --> 00:07:01,280
you're dark adapted if you're getting

206
00:07:04,230 --> 00:07:02,560
ready to go to sleep for example and

207
00:07:05,830 --> 00:07:04,240
your eyes have become you know more

208
00:07:07,270 --> 00:07:05,840
sensitive in your dark environment

209
00:07:09,430 --> 00:07:07,280
you'll notice them more and you'll just

210
00:07:11,110 --> 00:07:09,440
see a few of them and

211
00:07:13,110 --> 00:07:11,120
and it's kind of contingent upon how

212
00:07:16,070 --> 00:07:13,120
energetic the sun may be what the

213
00:07:18,230 --> 00:07:16,080

radiation flux is and um and it's it's

214

00:07:20,629 --> 00:07:18,240

very interesting effect and it's not all

215

00:07:22,150 --> 00:07:20,639

that frequent though yeah

216

00:07:23,589 --> 00:07:22,160

great well thank thanks for that that's

217

00:07:25,510 --> 00:07:23,599

a i think that's the first one i've

218

00:07:27,990 --> 00:07:25,520

heard it described uh

219

00:07:28,830 --> 00:07:28,000

as blue so that's pretty pretty pretty

220

00:07:31,110 --> 00:07:28,840

neat

221

00:07:33,110 --> 00:07:31,120

um uh christopher nguyen he was

222

00:07:35,430 --> 00:07:33,120

wondering what what your ambitions uh or

223

00:07:37,110 --> 00:07:35,440

what what you see as as the the key

224

00:07:38,550 --> 00:07:37,120

ambition that you would like a human

225

00:07:39,830 --> 00:07:38,560

space flight or or space flight in

226

00:07:42,230 --> 00:07:39,840

general to

227

00:07:44,950 --> 00:07:42,240

to see to to reach for or achieve in

228

00:07:46,390 --> 00:07:44,960

like the next 30 years right i i think

229

00:07:48,550 --> 00:07:46,400

it's um i think this is something

230

00:07:50,710 --> 00:07:48,560

extremely valuable to to us as human

231

00:07:52,950 --> 00:07:50,720

beings to us as americans i think space

232

00:07:54,790 --> 00:07:52,960

flight is is really our destination it's

233

00:07:56,790 --> 00:07:54,800

where human beings need to need to go

234

00:07:58,550 --> 00:07:56,800

next and uh and i think when i was

235

00:08:00,550 --> 00:07:58,560

growing up as a kid i thought that by

236

00:08:02,070 --> 00:08:00,560

this time we would have thousands and

237

00:08:03,749 --> 00:08:02,080

thousands of people living in space

238

00:08:05,670 --> 00:08:03,759

living on the moon living on mars et

239

00:08:08,469 --> 00:08:05,680

cetera well it turns out space flight's

240

00:08:10,230 --> 00:08:08,479

a pretty tough thing um so it's not the

241

00:08:11,909 --> 00:08:10,240

kind of thing that maybe things didn't

242

00:08:14,309 --> 00:08:11,919

progress quite as quickly as i'd like

243

00:08:16,550 --> 00:08:14,319

but we're now to a point where

244

00:08:18,469 --> 00:08:16,560

commercial companies now can take over

245

00:08:19,990 --> 00:08:18,479

the piece of getting from from the

246

00:08:22,710 --> 00:08:20,000

surface of planet earth to low earth

247

00:08:25,189 --> 00:08:22,720

orbit and can essentially set the stage

248

00:08:26,790 --> 00:08:25,199

for nasa to take the next big step and i

249

00:08:28,309 --> 00:08:26,800

think we'll do that in an international

250

00:08:30,150 --> 00:08:28,319

way i think

251
00:08:32,310 --> 00:08:30,160
i think in the next coming decades we

252
00:08:34,149 --> 00:08:32,320
will see people living on the moon on

253
00:08:36,469 --> 00:08:34,159
mars and we'll visit asteroids and i

254
00:08:37,829 --> 00:08:36,479
think that is really our destination i

255
00:08:39,350 --> 00:08:37,839
think all the things that you get out of

256
00:08:42,070 --> 00:08:39,360
space flight

257
00:08:42,790 --> 00:08:42,080
the technology that you get from that

258
00:08:47,829 --> 00:08:42,800
but

259
00:08:49,670 --> 00:08:47,839
benefits to humankind are in expanding

260
00:08:51,750 --> 00:08:49,680
our horizons and

261
00:08:52,829 --> 00:08:51,760
and that's what i'd like to see us do in

262
00:08:54,550 --> 00:08:52,839
the coming

263
00:08:56,310 --> 00:08:54,560

decades

264

00:08:58,230 --> 00:08:56,320

right you know we had a related question

265

00:09:00,150 --> 00:08:58,240

from nathan wise and he he wanted to

266

00:09:01,750 --> 00:09:00,160

know specifically about the private the

267

00:09:03,269 --> 00:09:01,760

private the privatization of space we

268

00:09:05,750 --> 00:09:03,279

know that spacex is going to launch

269

00:09:09,110 --> 00:09:05,760

later this uh this month with the the

270

00:09:10,389 --> 00:09:09,120

first dragon uh capsule the the orbital

271

00:09:12,710 --> 00:09:10,399

capsule is going to launch later in the

272

00:09:15,190 --> 00:09:12,720

year um and and we just saw the the new

273

00:09:17,269 --> 00:09:15,200

spacex band capsule as well

274

00:09:19,190 --> 00:09:17,279

um you know i'm just i'm worried as a

275

00:09:21,509 --> 00:09:19,200

nasa astronaut not worried uh uh

276

00:09:24,310 --> 00:09:21,519

interested as a nasa astronaut well your

277

00:09:26,070 --> 00:09:24,320

thoughts are to to to ride on a a a

278

00:09:28,710 --> 00:09:26,080

private capsule

279

00:09:29,590 --> 00:09:28,720

and what it means to have more than one

280

00:09:31,990 --> 00:09:29,600

uh

281

00:09:33,670 --> 00:09:32,000

group with a spacecraft for the united

282

00:09:35,190 --> 00:09:33,680

states

283

00:09:36,310 --> 00:09:35,200

i probably speak for a lot of us that

284

00:09:38,870 --> 00:09:36,320

have been doing this business for a

285

00:09:40,710 --> 00:09:38,880

while and uh and i and i think riding on

286

00:09:41,990 --> 00:09:40,720

any space vehicle would be great you

287

00:09:43,269 --> 00:09:42,000

want to make sure they're safe you want

288

00:09:44,389 --> 00:09:43,279

to make sure that

289

00:09:46,070 --> 00:09:44,399

that the vehicles have all the

290

00:09:47,750 --> 00:09:46,080

redundancy they need to have so that you

291

00:09:49,430 --> 00:09:47,760

can safely get to and from space not

292

00:09:52,310 --> 00:09:49,440

just for ourselves but

293

00:09:53,430 --> 00:09:52,320

what that means for the future of space

294

00:09:56,070 --> 00:09:53,440

travel

295

00:09:58,150 --> 00:09:56,080

i think the more means the more ways

296

00:10:00,470 --> 00:09:58,160

that we have to get to space the better

297

00:10:02,949 --> 00:10:00,480

it's we we don't want to have only a

298

00:10:04,630 --> 00:10:02,959

single way to do it and i think for us

299

00:10:06,069 --> 00:10:04,640

in our in our own personal interests as

300

00:10:08,310 --> 00:10:06,079

americans i think it's good for us to

301
00:10:10,389 --> 00:10:08,320
have american-built vehicles as well but

302
00:10:11,990 --> 00:10:10,399
um but again i believe it's a this is

303
00:10:13,990 --> 00:10:12,000
the kind of thing that we do as a as a

304
00:10:17,110 --> 00:10:14,000
human species so

305
00:10:19,190 --> 00:10:17,120
i am happy to see us have more and more

306
00:10:21,670 --> 00:10:19,200
capability to get to low earth orbit i

307
00:10:24,790 --> 00:10:21,680
think i think it's probably the job of

308
00:10:27,670 --> 00:10:24,800
of countries and job of space agencies

309
00:10:28,870 --> 00:10:27,680
to invest in the the hardest thing and

310
00:10:30,389 --> 00:10:28,880
right now i think the hardest thing is

311
00:10:32,550 --> 00:10:30,399
leaving low earth orbit going into deep

312
00:10:34,230 --> 00:10:32,560
space so the the space launch system

313
00:10:35,990 --> 00:10:34,240

which will give us heavy lift capability

314

00:10:37,750 --> 00:10:36,000

to get lots of hardware up into low

315

00:10:39,590 --> 00:10:37,760

earth orbit that we can then take to the

316

00:10:42,470 --> 00:10:39,600

moon and mars and uh in asteroids i

317

00:10:45,110 --> 00:10:42,480

think that is really the purview of nasa

318

00:10:47,430 --> 00:10:45,120

and having a deep space spacecraft like

319

00:10:49,750 --> 00:10:47,440

orion the multi-purpose crew vehicle is

320

00:10:51,750 --> 00:10:49,760

the thing to do there but we've gotten

321

00:10:54,310 --> 00:10:51,760

to the point in space exploration i

322

00:10:55,829 --> 00:10:54,320

think where commercial companies can can

323

00:10:57,750 --> 00:10:55,839

take over that piece again from low

324

00:11:00,230 --> 00:10:57,760

earth orbit or from the surface of the

325

00:11:02,470 --> 00:11:00,240

earth to low earth orbit and nasa and

326

00:11:04,550 --> 00:11:02,480

other space agencies can contract that

327

00:11:05,990 --> 00:11:04,560

out and it will also give the you know

328

00:11:08,790 --> 00:11:06,000

the those commercial entities the

329

00:11:11,350 --> 00:11:08,800

capability of of selling those services

330

00:11:14,389 --> 00:11:11,360

um to other folks maybe not space and

331

00:11:16,150 --> 00:11:14,399

you know space agencies per se and the

332

00:11:19,110 --> 00:11:16,160

more people we have in space the better

333

00:11:21,350 --> 00:11:19,120

it is i think for all of us

334

00:11:22,470 --> 00:11:21,360

great well commander burma you know

335

00:11:24,790 --> 00:11:22,480

thank you so much i could ask you

336

00:11:27,110 --> 00:11:24,800

questions all day but i know that uh my

337

00:11:29,110 --> 00:11:27,120

time unfortunately is is up

338

00:11:30,949 --> 00:11:29,120

welcome back again all the best and we

339

00:11:32,230 --> 00:11:30,959

look forward to your next spaceflight

340

00:14:22,949 --> 00:11:32,240

derek thanks very much it was good

341

00:14:22,959 --> 00:14:30,389

to

342

00:14:33,350 --> 00:14:31,670

for the surfers and then more of a

343

00:14:35,110 --> 00:14:33,360

choppy effect to the waters as we head

344

00:14:37,030 --> 00:14:35,120

toward the weekend time frame that'll

345

00:14:38,389 --> 00:14:37,040

start like tonight through our friday

346

00:14:40,470 --> 00:14:38,399

saturday and sunday probably blowing

347

00:14:42,550 --> 00:14:40,480

northeast at 15 to 20 knots with seas

348

00:14:44,230 --> 00:14:42,560

coming up good morning dan this is

349

00:14:46,389 --> 00:14:44,240

orlando can you hear me i guess you're

350

00:14:47,829 --> 00:14:46,399

like he's across the coastal areas today

351
00:14:49,110 --> 00:14:47,839
same for the interior thank you so much

352
00:14:52,069 --> 00:14:49,120
for talking with us you're going to be

353
00:14:54,790 --> 00:14:52,079
talking with john coming up john coming

354
00:14:56,710 --> 00:14:54,800
up in just about a minute county six

355
00:14:58,310 --> 00:14:56,720
okay very good thank you got the coast

356
00:14:59,750 --> 00:14:58,320
all the way into the treasure thank you

357
00:15:01,430 --> 00:14:59,760
so very much

358
00:15:03,509 --> 00:15:01,440
flapping in the breeze friday and

359
00:15:05,509 --> 00:15:03,519
saturday and possibly for sunday

360
00:15:07,910 --> 00:15:05,519
overnight lows around 70 and the weekend

361
00:15:09,910 --> 00:15:07,920
temps saturday looking good around 85.

362
00:15:11,269 --> 00:15:09,920
well the roads are still calm out there

363
00:15:12,710 --> 00:15:11,279

for the most part jamie which is

364

00:15:14,470 --> 00:15:12,720

something we like to see we don't

365

00:15:16,949 --> 00:15:14,480

typically get days like today we're

366

00:15:19,350 --> 00:15:16,959

completely accident-free along the i-4

367

00:15:21,509 --> 00:15:19,360

corridor also 408 looking great and as a

368

00:15:23,750 --> 00:15:21,519

result you can see all of your drive

369

00:15:25,509 --> 00:15:23,760

times are still unaffected this morning

370

00:15:27,430 --> 00:15:25,519

let's take you down to a d.o.t camera to

371

00:15:29,749 --> 00:15:27,440

show you a few images of this you can

372

00:15:31,269 --> 00:15:29,759

see i-4 conroy the eastbound side of

373

00:15:32,389 --> 00:15:31,279

course getting just a little bit busier

374

00:15:34,230 --> 00:15:32,399

as they head towards the downtown

375

00:15:36,230 --> 00:15:34,240

skyline which you can see way off there

376

00:15:37,990 --> 00:15:36,240

in the distance but the westbound side

377

00:15:39,509 --> 00:15:38,000

moving just fine at this early hour we

378

00:15:41,670 --> 00:15:39,519

have one other camera to show you in

379

00:15:43,509 --> 00:15:41,680

maitland many of you of course

380

00:15:45,350 --> 00:15:43,519

are headed down from seminole county to

381

00:15:48,389 --> 00:15:45,360

the downtown region you can see cars

382

00:15:49,910 --> 00:15:48,399

here are flying by at 7 15. now let's

383

00:15:50,949 --> 00:15:49,920

send it back to john and amy all right

384

00:15:53,910 --> 00:15:50,959

we're saving you some money with the

385

00:15:56,150 --> 00:15:53,920

stand by dan today at 3 49 a gallon

386

00:15:58,389 --> 00:15:56,160

at the hess station on vineland road and

387

00:16:01,350 --> 00:15:58,399

polynesian isle boulevard in kissimmee

388

00:16:03,910 --> 00:16:01,360

and it's also below 350 349 a gallon at

389

00:16:06,230 --> 00:16:03,920

the shell station on state road 535 and

390

00:16:07,990 --> 00:16:06,240

vestana drive in orlando

391

00:16:09,829 --> 00:16:08,000

new jobs could be headed to the space

392

00:16:11,749 --> 00:16:09,839

coast soon to help fill the void left by

393

00:16:14,629 --> 00:16:11,759

the retired space shuttle program a

394

00:16:16,790 --> 00:16:14,639

company called atk is unveiling a new

395

00:16:19,269 --> 00:16:16,800

rocket and spacecraft system and they

396

00:16:22,230 --> 00:16:19,279

unveiled it yesterday if nasa decides to

397

00:16:24,790 --> 00:16:22,240

use it it could mean 150 to 200 new jobs

398

00:16:27,110 --> 00:16:24,800

along the space coast atk says test

399

00:16:29,030 --> 00:16:27,120

launches should start in 2014. the

400

00:16:32,790 --> 00:16:29,040

system could be ready to send astronauts

401
00:16:34,949 --> 00:16:32,800
to the iss by 2016. and speaking of the

402
00:16:36,790 --> 00:16:34,959
future of space flight our astronauts

403
00:16:38,069 --> 00:16:36,800
are still in a sort of limbo right now

404
00:16:40,470 --> 00:16:38,079
trying to figure out how they're going

405
00:16:42,710 --> 00:16:40,480
to be getting to and from the iss for

406
00:16:44,550 --> 00:16:42,720
future missions and joining us live on

407
00:16:46,629 --> 00:16:44,560
good day is astronaut dan burbank he's

408
00:16:48,150 --> 00:16:46,639
got some local ties i believe dan you

409
00:16:49,749 --> 00:16:48,160
got your master's degree over at embry

410
00:16:51,269 --> 00:16:49,759
riddle right right you spend a lot of

411
00:16:53,189 --> 00:16:51,279
time here in central florida um that's

412
00:16:55,350 --> 00:16:53,199
right actually john i i got the i took

413
00:16:57,509 --> 00:16:55,360

those courses while i was at nasa at

414

00:16:59,749 --> 00:16:57,519

langley um at the uh the embry riddle

415

00:17:01,910 --> 00:16:59,759

campus that was up there but uh but yes

416

00:17:04,230 --> 00:17:01,920

i have been to uh to the to the campus

417

00:17:06,390 --> 00:17:04,240

as well down in florida

418

00:17:08,549 --> 00:17:06,400

all right you spend a lot of time up on

419

00:17:10,870 --> 00:17:08,559

the iss a lot of people wonder what

420

00:17:12,470 --> 00:17:10,880

really happens up there what exactly

421

00:17:14,789 --> 00:17:12,480

were you working on

422

00:17:16,789 --> 00:17:14,799

um an awful lot for one thing we've got

423

00:17:19,110 --> 00:17:16,799

nearly a million pounds worth of space

424

00:17:21,270 --> 00:17:19,120

station up there and it's manned and

425

00:17:23,029 --> 00:17:21,280

operated by six folks uh typically and

426

00:17:24,870 --> 00:17:23,039

although right now we're in a in a short

427

00:17:27,429 --> 00:17:24,880

couple of week period where we have just

428

00:17:29,270 --> 00:17:27,439

three crew members on board and lots of

429

00:17:30,950 --> 00:17:29,280

science is going on board during the six

430

00:17:33,750 --> 00:17:30,960

months we were there there we did about

431

00:17:35,270 --> 00:17:33,760

200 different scientific investigations

432

00:17:37,430 --> 00:17:35,280

a lot of the things you do on space

433

00:17:39,110 --> 00:17:37,440

station is keeping the space station

434

00:17:41,110 --> 00:17:39,120

operating and probably one of the

435

00:17:42,470 --> 00:17:41,120

harshes environments known to uh to

436

00:17:44,150 --> 00:17:42,480

humans but

437

00:17:45,590 --> 00:17:44,160

but a lot of it is the science right now

438

00:17:48,549 --> 00:17:45,600

that is the main thrust that's what

439

00:17:50,390 --> 00:17:48,559

space station was built for

440

00:17:51,510 --> 00:17:50,400

dan i had two separate people ask me

441

00:17:53,029 --> 00:17:51,520

yesterday when they found out i was

442

00:17:54,950 --> 00:17:53,039

going to be talking to you they said

443

00:17:56,549 --> 00:17:54,960

what do they do in their downtime do you

444

00:17:58,230 --> 00:17:56,559

guys work around the clock or when

445

00:18:01,110 --> 00:17:58,240

you're off the clock what exactly can

446

00:18:02,470 --> 00:18:01,120

you do on the iss well our work day

447

00:18:04,789 --> 00:18:02,480

typically goes from about six in the

448

00:18:05,830 --> 00:18:04,799

morning when you get up till about

449

00:18:07,590 --> 00:18:05,840

seven

450

00:18:09,430 --> 00:18:07,600

maybe eight or nine at the latest

451
00:18:10,870 --> 00:18:09,440
typically in the evenings and you have

452
00:18:14,310 --> 00:18:10,880
you have of course the typical breaks

453
00:18:15,270 --> 00:18:14,320
you have for meals and also for exercise

454
00:18:18,230 --> 00:18:15,280
time

455
00:18:21,110 --> 00:18:18,240
includes a day and a half on the

456
00:18:23,190 --> 00:18:21,120
weekends and the after hours time a lot

457
00:18:25,110 --> 00:18:23,200
of it is spent looking out the windows

458
00:18:26,470 --> 00:18:25,120
taking imagery of planet earth taking

459
00:18:29,190 --> 00:18:26,480
imagery of

460
00:18:31,110 --> 00:18:29,200
of different uh celestial objects uh

461
00:18:33,029 --> 00:18:31,120
auroras for example

462
00:18:35,350 --> 00:18:33,039
we have the capability of uh watching

463
00:18:36,710 --> 00:18:35,360

news watching uh movies on occasion if

464

00:18:39,590 --> 00:18:36,720

we have the time

465

00:18:41,510 --> 00:18:39,600

but just living in space i think is uh

466

00:18:43,590 --> 00:18:41,520

is you know living and experiencing what

467

00:18:45,110 --> 00:18:43,600

it's like to be up there and uh spending

468

00:18:47,270 --> 00:18:45,120

time uh you know with the other crew

469

00:18:50,870 --> 00:18:47,280

members uh enjoying meals together and

470

00:18:52,950 --> 00:18:50,880

uh and talking is typically what you do

471

00:18:54,630 --> 00:18:52,960

an office with a heck of a view now you

472

00:18:56,470 --> 00:18:54,640

actually got back from the iss thanks to

473

00:18:57,990 --> 00:18:56,480

a russian soyuz rocket what are your

474

00:18:59,350 --> 00:18:58,000

thoughts on private industries like

475

00:19:01,190 --> 00:18:59,360

we're talking about so much here in

476

00:19:02,870 --> 00:19:01,200

central florida getting into the space

477

00:19:05,430 --> 00:19:02,880

race do you like that or does it concern

478

00:19:07,669 --> 00:19:05,440

you um it it doesn't concern me i think

479

00:19:10,150 --> 00:19:07,679

the more ways we have to get to space

480

00:19:11,430 --> 00:19:10,160

the better off we all are and and i

481

00:19:13,350 --> 00:19:11,440

would like to see us have as many

482

00:19:15,750 --> 00:19:13,360

different american built vehicles as we

483

00:19:18,070 --> 00:19:15,760

possibly can but in general for for

484

00:19:20,549 --> 00:19:18,080

humans to access space we just need to

485

00:19:21,750 --> 00:19:20,559

have many of them and up until now uh

486

00:19:23,909 --> 00:19:21,760

developing and operating those

487

00:19:24,789 --> 00:19:23,919

spacecraft has really been the purview

488

00:19:27,750 --> 00:19:24,799

of

489

00:19:29,909 --> 00:19:27,760

space agencies and using the tax dollars

490

00:19:31,510 --> 00:19:29,919

of of the citizens of those countries

491

00:19:32,870 --> 00:19:31,520

that support it

492

00:19:35,590 --> 00:19:32,880

and typically that's the kind of thing

493

00:19:37,430 --> 00:19:35,600

that nasa has done now truly private

494

00:19:39,110 --> 00:19:37,440

industry has developed those vehicles

495

00:19:41,270 --> 00:19:39,120

for us in the past

496

00:19:43,350 --> 00:19:41,280

but they have developed those with a lot

497

00:19:45,110 --> 00:19:43,360

of involvement directly from the from

498

00:19:46,070 --> 00:19:45,120

the scientists and engineers of nasa for

499

00:19:47,510 --> 00:19:46,080

example

500

00:19:49,190 --> 00:19:47,520

we've gotten to the point i think right

501
00:19:51,110 --> 00:19:49,200
now where the accessing low earth orbit

502
00:19:53,669 --> 00:19:51,120
is something that commercial companies

503
00:19:56,390 --> 00:19:53,679
can do with less direct involvement less

504
00:19:58,390 --> 00:19:56,400
direction by nasa for example and i

505
00:19:59,830 --> 00:19:58,400
think it's nasa's job to take the next

506
00:20:01,909 --> 00:19:59,840
step and that is to go from low earth

507
00:20:05,110 --> 00:20:01,919
orbit to deep space so we want to go to

508
00:20:07,830 --> 00:20:05,120
the moon to mars and to asteroids and i

509
00:20:09,909 --> 00:20:07,840
think developing the sls developing a

510
00:20:11,590 --> 00:20:09,919
deep space spacecraft like orion to get

511
00:20:13,909 --> 00:20:11,600
us there that's what we should be doing

512
00:20:15,510 --> 00:20:13,919
but i'd be happy to fly on some of these

513
00:20:17,669 --> 00:20:15,520

commercial developed vehicles that are

514

00:20:19,029 --> 00:20:17,679

currently in work

515

00:20:20,630 --> 00:20:19,039

that seems to be the way it's going

516

00:20:22,230 --> 00:20:20,640

astronaut dan burbank thanks so much we

517

00:20:30,549 --> 00:20:22,240

hope to talk to you soon okay thank you

518

00:20:30,559 --> 00:20:35,510

we're ready

519

00:20:39,270 --> 00:20:37,190

hey dan good morning it's peter king at

520

00:20:40,549 --> 00:20:39,280

cbs news radio how are you this morning

521

00:20:42,230 --> 00:20:40,559

peter i'm doing great it's great to be

522

00:20:43,830 --> 00:20:42,240

with you again it's good to talk to you

523

00:20:45,590 --> 00:20:43,840

again and uh listening to your answers

524

00:20:47,669 --> 00:20:45,600

earlier with uh terek it sounds like

525

00:20:49,909 --> 00:20:47,679

your adjustment to earth uh has been

526

00:20:52,710 --> 00:20:49,919

pretty quick so i'm wondering just how

527

00:20:54,549 --> 00:20:52,720

quickly can you get back to uh running

528

00:20:56,470 --> 00:20:54,559

and jogging and do those uh doing those

529

00:20:58,950 --> 00:20:56,480

uh strenuous earthly activities that

530

00:21:01,270 --> 00:20:58,960

you've missed yeah well well it was our

531

00:21:05,190 --> 00:21:01,280

plus one you know return plus one day

532

00:21:07,909 --> 00:21:05,200

when uh when i was doing a vo2 or oxygen

533

00:21:09,350 --> 00:21:07,919

maximal uptake experiment so we were

534

00:21:10,950 --> 00:21:09,360

they're putting me to work pretty early

535

00:21:12,630 --> 00:21:10,960

but that was on a bicycle it wasn't any

536

00:21:14,789 --> 00:21:12,640

pounding it wasn't like if you're out

537

00:21:17,669 --> 00:21:14,799

running on trails and so forth so it was

538

00:21:19,909 --> 00:21:17,679

probably i guess uh return plus four or

539

00:21:21,750 --> 00:21:19,919

five days when i when i first got to do

540

00:21:23,750 --> 00:21:21,760

a little bit of jogging but were your

541

00:21:25,669 --> 00:21:23,760

legs wobbly or they feel good that first

542

00:21:27,510 --> 00:21:25,679

time yeah actually not too bad you know

543

00:21:29,510 --> 00:21:27,520

i remember um after shuttle missions

544

00:21:31,669 --> 00:21:29,520

just walking on the beach at cocoa beach

545

00:21:33,190 --> 00:21:31,679

after uh shortly after landing you know

546

00:21:35,270 --> 00:21:33,200

doing that for an hour or so the next

547

00:21:37,750 --> 00:21:35,280

couple of days feeling you know really

548

00:21:39,990 --> 00:21:37,760

really tired very sore legs with a red

549

00:21:41,909 --> 00:21:40,000

which is the advanced resistive exercise

550

00:21:44,470 --> 00:21:41,919

device we got on station you know we can

551
00:21:46,310 --> 00:21:44,480
do squats and deadlifts and heel raises

552
00:21:48,710 --> 00:21:46,320
at really high load and i think for the

553
00:21:50,149 --> 00:21:48,720
most part we're coming back with about

554
00:21:52,310 --> 00:21:50,159
you know in as good shape as you could

555
00:21:53,830 --> 00:21:52,320
be from from a lower body standpoint so

556
00:21:55,270 --> 00:21:53,840
that part's been actually pretty easy

557
00:21:57,510 --> 00:21:55,280
over the last year or so there have been

558
00:21:58,789 --> 00:21:57,520
a number of reports about uh the the eye

559
00:22:01,029 --> 00:21:58,799
side of returning astronauts and

560
00:22:02,630 --> 00:22:01,039
cosmonauts from the space station and

561
00:22:04,789 --> 00:22:02,640
how sometimes there have been visual

562
00:22:07,110 --> 00:22:04,799
changes visual impairments sometimes

563
00:22:09,590 --> 00:22:07,120

visual impairments up in space uh first

564

00:22:11,510 --> 00:22:09,600

of all how's your eyesight at this point

565

00:22:13,029 --> 00:22:11,520

and did you experience any of that while

566

00:22:14,310 --> 00:22:13,039

you're up there

567

00:22:15,909 --> 00:22:14,320

peter i was actually pretty lucky there

568

00:22:18,149 --> 00:22:15,919

was no change at all

569

00:22:20,630 --> 00:22:18,159

from a from an eyesight standpoint and

570

00:22:22,390 --> 00:22:20,640

uh and it's been it's been the minority

571

00:22:24,630 --> 00:22:22,400

of crew members astronauts and

572

00:22:26,149 --> 00:22:24,640

cosmonauts that have had that and i

573

00:22:27,830 --> 00:22:26,159

think the scientists are still trying to

574

00:22:30,149 --> 00:22:27,840

get their arms around exactly what the

575

00:22:32,390 --> 00:22:30,159

phenomena is but but we actually protect

576

00:22:33,909 --> 00:22:32,400

for it and we have uh we've got all of

577

00:22:36,070 --> 00:22:33,919

our standard glasses that we might have

578

00:22:37,510 --> 00:22:36,080

flown beforehand and we've also got some

579

00:22:39,669 --> 00:22:37,520

that'll that'll get us a little bit

580

00:22:41,350 --> 00:22:39,679

higher power if we need it on orbit but

581

00:22:42,789 --> 00:22:41,360

i was lucky i think you know how they

582

00:22:45,110 --> 00:22:42,799

saying there's they say there's no

583

00:22:46,310 --> 00:22:45,120

crying in baseball you know if you wake

584

00:22:47,990 --> 00:22:46,320

up in the morning on earth and you have

585

00:22:49,669 --> 00:22:48,000

a bad head cold like i did the last

586

00:22:52,310 --> 00:22:49,679

couple of mornings you could call in

587

00:22:54,950 --> 00:22:52,320

sick but you know are there sick days in

588

00:22:57,270 --> 00:22:54,960

space or there are no sick days in space

589

00:22:58,789 --> 00:22:57,280

we didn't need any sick days i i suppose

590

00:23:00,149 --> 00:22:58,799

if somebody you know certainly if

591

00:23:01,510 --> 00:23:00,159

somebody was ill if somebody had a

592

00:23:02,870 --> 00:23:01,520

problem you know we could we could

593

00:23:05,029 --> 00:23:02,880

accommodate that

594

00:23:06,710 --> 00:23:05,039

it's interesting because here on planet

595

00:23:07,750 --> 00:23:06,720

earth or traveling the way we typically

596

00:23:09,350 --> 00:23:07,760

do

597

00:23:12,070 --> 00:23:09,360

it's really easy to get a little bit run

598

00:23:14,310 --> 00:23:12,080

down and get a cold nobody had a cold of

599

00:23:15,590 --> 00:23:14,320

any sort there's no flus or cold you

600

00:23:17,110 --> 00:23:15,600

know if somebody were to bring something

601
00:23:19,029 --> 00:23:17,120
up if somebody was sick before they

602
00:23:20,070 --> 00:23:19,039
launched i suppose that could happen but

603
00:23:21,590 --> 00:23:20,080
you're up there you're working pretty

604
00:23:23,830 --> 00:23:21,600
hard working long days maybe getting a

605
00:23:26,470 --> 00:23:23,840
little bit run down but uh but nobody

606
00:23:27,990 --> 00:23:26,480
was nobody had any issues from a from a

607
00:23:29,909 --> 00:23:28,000
medical standpoint which was actually

608
00:23:31,430 --> 00:23:29,919
kind of nice you visited the station

609
00:23:33,190 --> 00:23:31,440
before obviously this is your first

610
00:23:34,830 --> 00:23:33,200
long-duration mission there did it did

611
00:23:37,669 --> 00:23:34,840
it live up to or exceed your

612
00:23:40,950 --> 00:23:37,679
expectations uh it exceeded them uh many

613
00:23:45,029 --> 00:23:40,960

many fold over when i was there last on

614

00:23:46,390 --> 00:23:45,039

12a sts-115 in september 2006

615

00:23:48,149 --> 00:23:46,400

we the space station was probably

616

00:23:50,390 --> 00:23:48,159

two-thirds the size of what it is

617

00:23:52,789 --> 00:23:50,400

currently and we didn't have a cupola so

618

00:23:55,029 --> 00:23:52,799

we didn't have this unbelievable window

619

00:23:57,830 --> 00:23:55,039

on the world that allows you to see a

620

00:23:59,590 --> 00:23:57,840

continent worth beneath you you can see

621

00:24:02,549 --> 00:23:59,600

thousands of miles in all directions and

622

00:24:05,269 --> 00:24:02,559

that place that window is

623

00:24:07,110 --> 00:24:05,279

in and of itself is uh probably uh worth

624

00:24:08,630 --> 00:24:07,120

being up there if you needed any reason

625

00:24:10,549 --> 00:24:08,640

so

626

00:24:11,830 --> 00:24:10,559

we have a new crew or three new crew

627

00:24:14,630 --> 00:24:11,840

members getting ready to launch into

628

00:24:16,630 --> 00:24:14,640

soyuz next monday and i'm wondering i'm

629

00:24:17,350 --> 00:24:16,640

sure you guys crossed paths for a while

630

00:24:20,789 --> 00:24:17,360

uh

631

00:24:23,269 --> 00:24:20,799

them about your experience that's going

632

00:24:25,350 --> 00:24:23,279

to help them out yeah we we get to talk

633

00:24:27,510 --> 00:24:25,360

a lot although not as much as i would

634

00:24:29,669 --> 00:24:27,520

have liked i'd like to give joe gennady

635

00:24:31,909 --> 00:24:29,679

and sergey one more call before before

636

00:24:33,510 --> 00:24:31,919

they leave but but uh they've all been

637

00:24:35,269 --> 00:24:33,520

there before well sergey actually this

638

00:24:36,630 --> 00:24:35,279

will be his first flight but gennady has

639

00:24:38,549 --> 00:24:36,640

certainly spent a lot of time on space

640

00:24:40,789 --> 00:24:38,559

station and joe's been up there on on

641

00:24:42,549 --> 00:24:40,799

space shuttle missions and uh and i

642

00:24:44,470 --> 00:24:42,559

think i think they're going to be

643

00:24:46,390 --> 00:24:44,480

wonderfully pleasantly surprised at what

644

00:24:48,710 --> 00:24:46,400

it's like to be there and i think for

645

00:24:50,070 --> 00:24:48,720

joe being up there for a long duration

646

00:24:51,669 --> 00:24:50,080

he's going to love every minute of it i

647

00:24:53,510 --> 00:24:51,679

think everybody that goes there that's

648

00:24:55,830 --> 00:24:53,520

made that transition from the shuttle

649

00:24:57,350 --> 00:24:55,840

style mission to a long duration mission

650

00:24:59,350 --> 00:24:57,360

is just going to be

651

00:25:00,950 --> 00:24:59,360

wild is going to be going to be very

652

00:25:02,789 --> 00:25:00,960

delighted with what it's like to be up

653

00:25:04,549 --> 00:25:02,799

there that said they're going to be very

654

00:25:06,870 --> 00:25:04,559

very busy early on with the expected

655

00:25:08,950 --> 00:25:06,880

arrival of the spacex dragon capsule if

656

00:25:10,870 --> 00:25:08,960

everything goes as planned you know the

657

00:25:12,630 --> 00:25:10,880

station crew that's up there right now

658

00:25:14,630 --> 00:25:12,640

uh the folks you left behind have had a

659

00:25:16,470 --> 00:25:14,640

lot of time to prepare as did you i

660

00:25:19,590 --> 00:25:16,480

think that was originally supposed to be

661

00:25:21,269 --> 00:25:19,600

during your personal increment but uh

662

00:25:22,789 --> 00:25:21,279

you know there are some long poles to

663

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

clear and if you could talk a little bit

664

00:25:27,430 --> 00:25:25,360

about that uh you know the difficulty or

665

00:25:28,549 --> 00:25:27,440

or the ease of doing this

666

00:25:30,390 --> 00:25:28,559

yeah

667

00:25:32,710 --> 00:25:30,400

i wouldn't have much to say about the

668

00:25:35,110 --> 00:25:32,720

ease of doing it i think we get reminded

669

00:25:37,750 --> 00:25:35,120

many times how difficult uh space flight

670

00:25:40,310 --> 00:25:37,760

is um but uh but i think it's important

671

00:25:42,870 --> 00:25:40,320

for the spacex dragon vehicle the spacex

672

00:25:45,190 --> 00:25:42,880

demo mission this first one to for us to

673

00:25:47,029 --> 00:25:45,200

make sure that the vehicle is in the

674

00:25:49,430 --> 00:25:47,039

best configuration it can be this is a

675

00:25:50,950 --> 00:25:49,440

critical capability the logistics life

676
00:25:52,950 --> 00:25:50,960
stream that

677
00:25:54,470 --> 00:25:52,960
that all these vehicles provide space

678
00:25:56,230 --> 00:25:54,480
station is critical if we want to keep a

679
00:25:58,070 --> 00:25:56,240
crew up there long term and do the

680
00:25:59,510 --> 00:25:58,080
science space station was meant for we

681
00:26:01,830 --> 00:25:59,520
have to make sure we have vehicles like

682
00:26:04,310 --> 00:26:01,840
the spacex dragon like the orbital

683
00:26:06,950 --> 00:26:04,320
sciences cygnus and and the other

684
00:26:08,630 --> 00:26:06,960
vehicles that that supply these critical

685
00:26:11,190 --> 00:26:08,640
supplies to stations so we've got to

686
00:26:13,110 --> 00:26:11,200
make sure it goes well the the track and

687
00:26:14,710 --> 00:26:13,120
capture operation the robotics operation

688
00:26:17,190 --> 00:26:14,720

that the crew is going to do to actually

689

00:26:19,510 --> 00:26:17,200

uh capture dragon and put it on on board

690

00:26:21,350 --> 00:26:19,520

space station attached to uh to node two

691

00:26:22,870 --> 00:26:21,360

is a very very critical thing it's

692

00:26:25,190 --> 00:26:22,880

something we've many crews have trained

693

00:26:26,549 --> 00:26:25,200

for already and these guys will be ready

694

00:26:28,630 --> 00:26:26,559

when it gets there and would be uh neat

695

00:26:30,390 --> 00:26:28,640

to see and you've done that kind of

696

00:26:33,190 --> 00:26:30,400

operation before in moving heavy pieces

697

00:26:35,110 --> 00:26:33,200

of the space station around but uh is

698

00:26:37,750 --> 00:26:35,120

this a lot different than that

699

00:26:38,390 --> 00:26:37,760

well when i've done this before i pulled

700

00:26:55,990 --> 00:26:38,400

a

701
00:26:57,190 --> 00:26:56,000
the hdv

702
00:26:58,549 --> 00:26:57,200
or like

703
00:27:01,430 --> 00:26:58,559
the spacex

704
00:27:02,950 --> 00:27:01,440
dragon or the cygnus uh orbital sciences

705
00:27:04,870 --> 00:27:02,960
cygnus vehicle those come up and they

706
00:27:07,110 --> 00:27:04,880
fly formation with space stations so

707
00:27:09,750 --> 00:27:07,120
space station and this vehicle are very

708
00:27:12,149 --> 00:27:09,760
precisely flying at the orbital speeds

709
00:27:13,830 --> 00:27:12,159
of 17 000 miles an hour and then at a

710
00:27:16,310 --> 00:27:13,840
certain point when the vehicle is at a

711
00:27:18,470 --> 00:27:16,320
safe distance and behaving well

712
00:27:20,630 --> 00:27:18,480
a free drift command is given by the

713
00:27:22,070 --> 00:27:20,640

space station crew to command that

714

00:27:23,669 --> 00:27:22,080

vehicle into free drift and then they

715

00:27:25,350 --> 00:27:23,679

fly the robotic arm

716

00:27:27,750 --> 00:27:25,360

to capture it and that is a very

717

00:27:29,669 --> 00:27:27,760

critical task it's not like picking a

718

00:27:31,909 --> 00:27:29,679

a payload out of the space shuttle's

719

00:27:34,389 --> 00:27:31,919

payload bay where its location its

720

00:27:36,789 --> 00:27:34,399

velocity is fixed relative to the

721

00:27:39,190 --> 00:27:36,799

robotic arm that's capturing it in this

722

00:27:40,950 --> 00:27:39,200

case it is absolutely not fixed so we've

723

00:27:42,870 --> 00:27:40,960

got to make sure that it's it's a very

724

00:27:44,950 --> 00:27:42,880

well controlled very well trained very

725

00:27:47,029 --> 00:27:44,960

well coordinated and choreographed

726

00:27:49,669 --> 00:27:47,039

activity and you guys make it look easy

727

00:27:51,430 --> 00:27:49,679

but it's anything but

728

00:27:53,830 --> 00:27:51,440

the uh

729

00:27:55,430 --> 00:27:53,840

we talked about spacex atk of course has

730

00:27:57,190 --> 00:27:55,440

announced its configuration there are

731

00:27:59,590 --> 00:27:57,200

other companies involved in what

732

00:28:02,310 --> 00:27:59,600

basically is a new space race commercial

733

00:28:04,310 --> 00:28:02,320

race and uh you know i'm wondering uh

734

00:28:05,750 --> 00:28:04,320

about your personal plans because you've

735

00:28:07,830 --> 00:28:05,760

got a couple of shuttle missions and now

736

00:28:09,750 --> 00:28:07,840

a long duration space station mission

737

00:28:11,430 --> 00:28:09,760

under your belt are you anxious to be a

738

00:28:12,630 --> 00:28:11,440

part of this next wave

739

00:28:14,830 --> 00:28:12,640

i think it would be exciting to be a

740

00:28:18,710 --> 00:28:14,840

part of that i think this is a this is a

741

00:28:20,470 --> 00:28:18,720

very critical and very exciting part of

742

00:28:22,789 --> 00:28:20,480

our space program right now the

743

00:28:24,070 --> 00:28:22,799

transition from a government operated

744

00:28:25,830 --> 00:28:24,080

vehicle like the space shuttle to

745

00:28:27,510 --> 00:28:25,840

commercial vehicles

746

00:28:29,350 --> 00:28:27,520

holds a lot of promise and a lot of

747

00:28:30,789 --> 00:28:29,360

excitement for uh for where we go from

748

00:28:32,630 --> 00:28:30,799

here and it would be a neat to have a

749

00:28:34,789 --> 00:28:32,640

part of that right now my focus has been

750

00:28:37,750 --> 00:28:34,799

spending time with family uh getting

751
00:28:39,350 --> 00:28:37,760
myself completely readapted to earth and

752
00:28:40,710 --> 00:28:39,360
if i can be involved in some way with

753
00:28:43,110 --> 00:28:40,720
those kinds of things i think that would

754
00:28:44,549 --> 00:28:43,120
be wonderful do you want to fly again

755
00:28:46,310 --> 00:28:44,559
i i think all of us who do this would

756
00:28:47,430 --> 00:28:46,320
love to fly again but uh but we've got a

757
00:28:49,830 --> 00:28:47,440
lot of other folks that have been

758
00:28:51,750 --> 00:28:49,840
working really hard for a long time uh

759
00:28:52,950 --> 00:28:51,760
that deserve the next shots and they

760
00:28:54,630 --> 00:28:52,960
they tell me that i get one more

761
00:28:55,350 --> 00:28:54,640
question here so you know you've been up

762
00:28:58,149 --> 00:28:55,360
for

763
00:29:00,470 --> 00:28:58,159

about six months or so a mission to mars

764

00:29:02,870 --> 00:29:00,480

or beyond would last a lot longer than

765

00:29:05,029 --> 00:29:02,880

that uh after your experience what do

766

00:29:07,990 --> 00:29:05,039

you see as the biggest challenges uh in

767

00:29:09,830 --> 00:29:08,000

terms of uh you know the human element

768

00:29:12,070 --> 00:29:09,840

well one of the biggest things that that

769

00:29:13,510 --> 00:29:12,080

the nasa science one of the one of the

770

00:29:15,269 --> 00:29:13,520

main questions we're trying to answer

771

00:29:17,510 --> 00:29:15,279

with the nasa sponsored science on space

772

00:29:19,269 --> 00:29:17,520

station is how to keep humans healthy

773

00:29:21,110 --> 00:29:19,279

safe and productive in space long enough

774

00:29:22,470 --> 00:29:21,120

to go to the moon long term long enough

775

00:29:23,350 --> 00:29:22,480

to go to asteroids long enough to go to

776

00:29:25,510 --> 00:29:23,360

mars

777

00:29:26,789 --> 00:29:25,520

and seeing the what it's like to do a

778

00:29:29,350 --> 00:29:26,799

two-week mission and seeing what it's

779

00:29:31,669 --> 00:29:29,360

like to do a six-month mission i

780

00:29:33,669 --> 00:29:31,679

think we're well on track to do that and

781

00:29:36,149 --> 00:29:33,679

uh mars mission i think would probably

782

00:29:38,549 --> 00:29:36,159

be beyond the order of uh two years uh

783

00:29:41,110 --> 00:29:38,559

that's a lot longer than six months but

784

00:29:43,110 --> 00:29:41,120

but six months is much longer than two

785

00:29:44,710 --> 00:29:43,120

weeks so i think we're on track seeing

786

00:29:46,549 --> 00:29:44,720

that you guys had no six days during

787

00:29:48,710 --> 00:29:46,559

your sick days during your increment uh

788

00:29:50,950 --> 00:29:48,720

you're off to a good start there

789

00:29:52,710 --> 00:29:50,960

dan thank you as always great to talk

790

00:33:28,870 --> 00:29:52,720

with you and welcome back peter great to

791

00:33:32,230 --> 00:33:30,710

it i don't believe it's that you're

792

00:33:34,630 --> 00:33:32,240

learned and it's

793

00:33:36,870 --> 00:33:34,640

and it's just it's a right that

794

00:33:38,549 --> 00:33:36,880

if you're gay you have a right to be

795

00:33:40,870 --> 00:33:38,559

you have a partner for life and i think

796

00:33:43,830 --> 00:33:40,880

she'd be able to make it legal

797

00:33:46,310 --> 00:33:43,840

i'm i've always been open for

798

00:33:48,310 --> 00:33:46,320

gay marriage it's it for me it's more

799

00:33:51,590 --> 00:33:48,320

about love and if that works for

800

00:33:53,990 --> 00:33:51,600

somebody then i'm happy for them and

801
00:33:55,750 --> 00:33:54,000
supportive of

802
00:33:57,509 --> 00:33:55,760
future mayor anisse parker has in the

803
00:33:59,110 --> 00:33:57,519
past expressed her doubt that president

804
00:34:00,950 --> 00:33:59,120
barack obama would ever officially

805
00:34:02,789 --> 00:34:00,960
endorse gay marriage well not only did

806
00:34:04,230 --> 00:34:02,799
she tweet her happiness yesterday the

807
00:34:06,310 --> 00:34:04,240
president's decision

808
00:34:07,990 --> 00:34:06,320
he's recently returned from his command

809
00:34:09,909 --> 00:34:08,000
of the international space station

810
00:34:13,190 --> 00:34:09,919
during his third space flight astronaut

811
00:34:15,510 --> 00:34:13,200
dan burbank completed 165 days in space

812
00:34:17,349 --> 00:34:15,520
as a member of the expedition 29 and 30

813
00:34:20,069 --> 00:34:17,359

crews he's performed one spacewalk and

814

00:34:22,389 --> 00:34:20,079

spent 189 days in space astronaut dan

815

00:34:24,389 --> 00:34:22,399

berman joining us live now to talk about

816

00:34:25,909 --> 00:34:24,399

his experiences in space

817

00:34:28,149 --> 00:34:25,919

thank you so much for joining us this

818

00:34:29,669 --> 00:34:28,159

morning dan what was the most exciting

819

00:34:30,710 --> 00:34:29,679

thing about your time at the space

820

00:34:32,470 --> 00:34:30,720

station

821

00:34:33,990 --> 00:34:32,480

i there's a lot of exciting things a lot

822

00:34:35,270 --> 00:34:34,000

of interesting things about being there

823

00:34:36,389 --> 00:34:35,280

i think for me

824

00:34:40,389 --> 00:34:36,399

probably

825

00:34:42,869 --> 00:34:40,399

aspect of it was just to be up there and

826

00:34:44,149 --> 00:34:42,879

to be part of the the science that we do

827

00:34:46,069 --> 00:34:44,159

on space station right now that's what

828

00:34:47,990 --> 00:34:46,079

it was built for and to get a chance to

829

00:34:49,750 --> 00:34:48,000

do what we call some of the utilization

830

00:34:51,430 --> 00:34:49,760

to actually put station to work and be a

831

00:34:53,909 --> 00:34:51,440

part of that was probably one of the

832

00:34:56,629 --> 00:34:53,919

most exciting how do you deal with if it

833

00:34:58,310 --> 00:34:56,639

even comes up boredom and cabin fever do

834

00:35:00,470 --> 00:34:58,320

you ever have to deal with that

835

00:35:03,109 --> 00:35:00,480

um space station is pretty big lon it's

836

00:35:04,790 --> 00:35:03,119

uh it's uh it's plenty big for the six

837

00:35:07,349 --> 00:35:04,800

people that live and work on board space

838

00:35:09,109 --> 00:35:07,359

station most of the time so there was no

839

00:35:10,630 --> 00:35:09,119

problem with cabin fever at all in fact

840

00:35:12,870 --> 00:35:10,640

there'd be times sometimes when you

841

00:35:14,390 --> 00:35:12,880

would uh have a little bit of difficulty

842

00:35:16,870 --> 00:35:14,400

tracking down some one of your crewmates

843

00:35:19,109 --> 00:35:16,880

for example so it's a big expansive

844

00:35:21,349 --> 00:35:19,119

place with an awful lot going on boredom

845

00:35:23,430 --> 00:35:21,359

was never a factor at all i've heard

846

00:35:25,670 --> 00:35:23,440

that over and over again from astronauts

847

00:35:28,310 --> 00:35:25,680

so what did you miss most though about

848

00:35:29,829 --> 00:35:28,320

here on earth back home um hands down

849

00:35:31,589 --> 00:35:29,839

being with family

850

00:35:33,270 --> 00:35:31,599

it's not just the time that you spend on

851
00:35:34,470 --> 00:35:33,280
board space station the six months that

852
00:35:36,230 --> 00:35:34,480
you're there

853
00:35:37,829 --> 00:35:36,240
that that you miss the family you get to

854
00:35:39,910 --> 00:35:37,839
talk to them you get to see them once a

855
00:35:41,109 --> 00:35:39,920
week and talk to them most every day if

856
00:35:41,829 --> 00:35:41,119
you have the time

857
00:35:45,349 --> 00:35:41,839
but

858
00:35:47,190 --> 00:35:45,359
the two and a half years that you spend

859
00:35:49,589 --> 00:35:47,200
much of it on the road traveling working

860
00:35:50,630 --> 00:35:49,599
in in russia and europe and canada and

861
00:35:53,109 --> 00:35:50,640
japan

862
00:35:54,630 --> 00:35:53,119
or other partners for the space station

863
00:35:56,310 --> 00:35:54,640

you do spend an awful lot of time away

864

00:35:58,069 --> 00:35:56,320

from families so one of the one of the

865

00:36:00,069 --> 00:35:58,079

best things about coming back to planet

866

00:36:01,750 --> 00:36:00,079

earth was to be with your family again

867

00:36:03,829 --> 00:36:01,760

sure dan as you know a private company

868

00:36:05,349 --> 00:36:03,839

spacex preparing to do a test cargo

869

00:36:07,190 --> 00:36:05,359

mission to the station and it's even

870

00:36:08,790 --> 00:36:07,200

looking at a possible launch complex

871

00:36:10,550 --> 00:36:08,800

here in texas what do you think about

872

00:36:12,390 --> 00:36:10,560

the private space effort i think it's

873

00:36:14,150 --> 00:36:12,400

great i think the more ways we have to

874

00:36:16,790 --> 00:36:14,160

get to space the better it is for all of

875

00:36:19,030 --> 00:36:16,800

us as americans and as as human beings

876

00:36:21,430 --> 00:36:19,040

and i think it's probably the time is

877

00:36:23,270 --> 00:36:21,440

ripe right now where we can hand off the

878

00:36:24,950 --> 00:36:23,280

the low earth orbit piece that is

879

00:36:26,950 --> 00:36:24,960

getting from the surface of planet earth

880

00:36:28,710 --> 00:36:26,960

to low earth orbit we can hand that off

881

00:36:30,550 --> 00:36:28,720

to private companies and let them take

882

00:36:33,190 --> 00:36:30,560

over that and nasa can contract that

883

00:36:35,109 --> 00:36:33,200

service and then that'll leave open the

884

00:36:37,030 --> 00:36:35,119

ability for nasa to go from low earth

885

00:36:38,870 --> 00:36:37,040

orbit to deep space and that ultimately

886

00:36:41,910 --> 00:36:38,880

i think is our goal as a space

887

00:36:43,589 --> 00:36:41,920

spacefaring people and as americans

888

00:36:45,589 --> 00:36:43,599

well with funding the way it is from

889

00:36:47,270 --> 00:36:45,599

washington and uh in europe and just

890

00:36:48,790 --> 00:36:47,280

about everywhere these days

891

00:36:50,470 --> 00:36:48,800

space doesn't seem to be a priority

892

00:36:52,630 --> 00:36:50,480

anymore do you think that the real

893

00:36:54,230 --> 00:36:52,640

heyday of space is behind us or ahead of

894

00:36:56,390 --> 00:36:54,240

this no i think it's ahead of us you

895

00:36:58,150 --> 00:36:56,400

know we've got some very tough economic

896

00:37:00,470 --> 00:36:58,160

times right now and not just here in the

897

00:37:02,390 --> 00:37:00,480

united states but all over the world but

898

00:37:04,230 --> 00:37:02,400

still the money that we invest in space

899

00:37:06,150 --> 00:37:04,240

is actually a very very small part of

900

00:37:08,230 --> 00:37:06,160

our federal federal budget for example

901
00:37:10,150 --> 00:37:08,240
it's less than one half of of a one

902
00:37:11,829 --> 00:37:10,160
percent so we do not spend a lot of

903
00:37:14,069 --> 00:37:11,839
money and all the money we do spend in

904
00:37:16,230 --> 00:37:14,079
space goes directly into the kinds of

905
00:37:18,870 --> 00:37:16,240
jobs that really fuel our economy they

906
00:37:21,030 --> 00:37:18,880
go into the high-tech jobs and all that

907
00:37:23,109 --> 00:37:21,040
money goes directly into our tax base as

908
00:37:25,510 --> 00:37:23,119
well so it's not money that's uh that's

909
00:37:27,750 --> 00:37:25,520
spent ill it's it's money that's spent

910
00:37:29,750 --> 00:37:27,760
very very well and and i think we get an

911
00:37:31,829 --> 00:37:29,760
awful lot of return from it and i am

912
00:37:33,670 --> 00:37:31,839
very hopeful on where we're going to go

913
00:37:36,150 --> 00:37:33,680

from this point on and i think we are

914

00:37:39,750 --> 00:37:36,160

now just at the verge of being able to

915

00:37:41,030 --> 00:37:39,760

open space up to uh to hundreds and even

916

00:37:42,470 --> 00:37:41,040

thousands of people in the coming

917

00:37:43,349 --> 00:37:42,480

decades that's what really what we need

918

00:37:44,710 --> 00:37:43,359

to do

919

00:37:45,990 --> 00:37:44,720

well dan i know all of us here in the

920

00:37:47,109 --> 00:37:46,000

studio wish we could have been up there

921

00:37:49,589 --> 00:37:47,119

with you

922

00:37:51,270 --> 00:37:49,599

dream to be in space thank you so much

923

00:37:52,710 --> 00:37:51,280

for taking a few moments this morning to

924

00:37:54,069 --> 00:37:52,720

talk to us to

925

00:37:55,750 --> 00:37:54,079

explain what happened to you while you

926

00:37:57,270 --> 00:37:55,760

were in space and we look forward to

927

00:37:59,190 --> 00:37:57,280

talking to you again it was great being

928

00:38:01,349 --> 00:37:59,200

with you today take care astronaut dan

929

00:38:03,109 --> 00:38:01,359

burbank and welcome home glad you're

930

00:38:04,550 --> 00:38:03,119

back let's check in now with our online

931

00:40:01,510 --> 00:38:04,560

editor cecile mitchell to see what's

932

00:40:01,520 --> 00:40:24,790

so

933

00:40:27,589 --> 00:40:25,910

dan this is scott the producer from

934

00:40:29,910 --> 00:40:27,599

harper can you hear us okay sir i've got

935

00:40:31,510 --> 00:40:29,920

you loud and clear

936

00:40:33,510 --> 00:40:31,520

great can you hear um you're talking

937

00:40:35,510 --> 00:40:33,520

with uh with kayla she's one of our

938

00:40:36,829 --> 00:40:35,520

reporters can you hear her okay

939

00:40:38,950 --> 00:40:36,839

i haven't heard her

940

00:40:42,150 --> 00:40:38,960

yet okay

941

00:40:43,990 --> 00:40:42,160

hey daniel yes kayla i've got you now hi

942

00:40:45,109 --> 00:40:44,000

can you hear me yes just fine got you

943

00:40:46,790 --> 00:40:45,119

loud and clear

944

00:40:48,390 --> 00:40:46,800

all right good morning

945

00:41:04,230 --> 00:40:48,400

good morning good to be with you okay

946

00:41:04,240 --> 00:41:12,630

okay

947

00:41:15,430 --> 00:41:13,750

all right daniel we know that you've

948

00:41:17,030 --> 00:41:15,440

spent the past few months in command of

949

00:41:19,030 --> 00:41:17,040

the international space station you've

950

00:41:20,630 --> 00:41:19,040

only been back for a few weeks now what

951
00:41:21,750 --> 00:41:20,640
are some of the first things that you do

952
00:41:23,030 --> 00:41:21,760
when you get back some of the things

953
00:41:25,589 --> 00:41:23,040
that you miss the most when you're gone

954
00:41:27,510 --> 00:41:25,599
for so long i think hands down kayla the

955
00:41:29,670 --> 00:41:27,520
thing you miss the most is being with

956
00:41:31,030 --> 00:41:29,680
family and it's not just the six months

957
00:41:32,950 --> 00:41:31,040
that you've been on board space station

958
00:41:34,550 --> 00:41:32,960
it's the time leading up to the mission

959
00:41:36,870 --> 00:41:34,560
when you spent nearly two and a half

960
00:41:38,230 --> 00:41:36,880
years much of it on the road

961
00:41:40,309 --> 00:41:38,240
learning all you need to learn to

962
00:41:42,309 --> 00:41:40,319
operate an international space station

963
00:41:44,550 --> 00:41:42,319

but that that was hands down the thing i

964

00:41:46,630 --> 00:41:44,560

miss the most

965

00:41:47,910 --> 00:41:46,640

absolutely are there any foods or any tv

966

00:41:49,510 --> 00:41:47,920

shows that the second you get back

967

00:41:52,230 --> 00:41:49,520

you're just like i have to get cut off i

968

00:41:53,829 --> 00:41:52,240

have to go out and get this immediately

969

00:41:56,230 --> 00:41:53,839

we don't have a tv so there wasn't too

970

00:41:57,910 --> 00:41:56,240

many tv shows i missed i guess but

971

00:41:59,430 --> 00:41:57,920

but on the food front there's a lot of

972

00:42:01,349 --> 00:41:59,440

things the space station food's great

973

00:42:03,349 --> 00:42:01,359

first off there were there were some

974

00:42:05,670 --> 00:42:03,359

things i missed and it was nice to get a

975

00:42:07,829 --> 00:42:05,680

uh a steak we had a t-bone steak uh

976

00:42:10,309 --> 00:42:07,839

waiting for me in prestwick scotland on

977

00:42:12,710 --> 00:42:10,319

the flight back towards houston and uh

978

00:42:16,150 --> 00:42:12,720

we also had a meat lover's pizza

979

00:42:17,910 --> 00:42:16,160

and on another stop in bangor maine

980

00:42:18,950 --> 00:42:17,920

that sounds very very understandable now

981

00:42:20,870 --> 00:42:18,960

we know that when you're up there you're

982

00:42:22,069 --> 00:42:20,880

up there for a couple months on end what

983

00:42:24,309 --> 00:42:22,079

are some of the ways that you feel your

984

00:42:25,589 --> 00:42:24,319

time when you're gone so far away for so

985

00:42:27,270 --> 00:42:25,599

long

986

00:42:29,349 --> 00:42:27,280

you don't have to look very hard to find

987

00:42:31,510 --> 00:42:29,359

ways to fill your time space stations

988

00:42:33,270 --> 00:42:31,520

it's a magical place it's a very busy

989

00:42:35,829 --> 00:42:33,280

place we have six people up there space

990

00:42:38,230 --> 00:42:35,839

station is nearly a million pounds worth

991

00:42:39,270 --> 00:42:38,240

of hardware and it's expansive it's huge

992

00:42:40,950 --> 00:42:39,280

we did

993

00:42:42,790 --> 00:42:40,960

on the order of 200 scientific

994

00:42:43,670 --> 00:42:42,800

investigations during our six months up

995

00:42:46,870 --> 00:42:43,680

there

996

00:42:48,630 --> 00:42:46,880

beyond the science that is keeping the

997

00:42:51,990 --> 00:42:48,640

hardware operating and safe and

998

00:42:53,510 --> 00:42:52,000

functional in this the most hazardous

999

00:42:54,470 --> 00:42:53,520

environment that humans have tried to

1000

00:42:57,109 --> 00:42:54,480

live in

1001
00:42:59,190 --> 00:42:57,119
low earth orbit for example so there's

1002
00:43:02,790 --> 00:42:59,200
there's no shortage of things to do

1003
00:43:04,710 --> 00:43:02,800
um if you ever got remotely uh aboard

1004
00:43:06,069 --> 00:43:04,720
and that really didn't happen to us but

1005
00:43:07,589 --> 00:43:06,079
but spending a little bit of time

1006
00:43:09,910 --> 00:43:07,599
looking out the window at this

1007
00:43:13,030 --> 00:43:09,920
unbelievable planet from the perspective

1008
00:43:15,589 --> 00:43:13,040
of 400 kilometers above is is something

1009
00:43:17,030 --> 00:43:15,599
you never got tired of

1010
00:43:18,950 --> 00:43:17,040
yeah i can imagine that's a pretty uh

1011
00:43:20,790 --> 00:43:18,960
unique experience one thing i did notice

1012
00:43:23,030 --> 00:43:20,800
though i saw a picture of you and you

1013
00:43:24,630 --> 00:43:23,040

had a guitar up in space does being in

1014

00:43:26,630 --> 00:43:24,640

the zero gravity effect you're playing

1015

00:43:28,550 --> 00:43:26,640

at all for better for worse

1016

00:43:29,670 --> 00:43:28,560

well i i guess

1017

00:43:31,270 --> 00:43:29,680

there wasn't a lot of time to play

1018

00:43:32,950 --> 00:43:31,280

guitar but when i was able to do that

1019

00:43:34,950 --> 00:43:32,960

the things that are different here on

1020

00:43:36,309 --> 00:43:34,960

planet earth to to hold a guitar

1021

00:43:38,309 --> 00:43:36,319

typically you'd have a strap that went

1022

00:43:39,750 --> 00:43:38,319

over your shoulder to suspend it you

1023

00:43:41,829 --> 00:43:39,760

don't need anything like that in space

1024

00:43:43,510 --> 00:43:41,839

so it can just float in front of you uh

1025

00:43:45,829 --> 00:43:43,520

in fact you don't need to stand anywhere

1026

00:43:47,589 --> 00:43:45,839

you can just float and do slow rolls

1027

00:43:48,870 --> 00:43:47,599

essentially down the modules as you're

1028

00:43:50,390 --> 00:43:48,880

as you're playing

1029

00:43:52,390 --> 00:43:50,400

one of the greatest places to play

1030

00:43:54,870 --> 00:43:52,400

guitar was in the cupola we've got a

1031

00:43:57,190 --> 00:43:54,880

basically a 360 degree window on the

1032

00:43:59,430 --> 00:43:57,200

world you can see a couple of thousand

1033

00:44:00,950 --> 00:43:59,440

thousand miles in all directions see you

1034

00:44:03,190 --> 00:44:00,960

know horizon to horizon a whole

1035

00:44:04,950 --> 00:44:03,200

continent beneath you and it's also a

1036

00:44:08,150 --> 00:44:04,960

pretty has pretty good acoustics there

1037

00:44:10,069 --> 00:44:08,160

so being in the cupola uh maybe after

1038

00:44:11,670 --> 00:44:10,079

you finished your work day

1039

00:44:14,390 --> 00:44:11,680

nine o'clock or so in the evening and

1040

00:44:16,550 --> 00:44:14,400

playing guitar up there was uh was was

1041

00:44:18,390 --> 00:44:16,560

pretty neat

1042

00:44:20,230 --> 00:44:18,400

good to know now you've mentioned having

1043

00:44:21,910 --> 00:44:20,240

your windows out on the world honestly

1044

00:44:23,270 --> 00:44:21,920

do you ever have any moments in all your

1045

00:44:24,630 --> 00:44:23,280

years you've been doing this you've ever

1046

00:44:26,069 --> 00:44:24,640

kind of gone a little bit nervous a

1047

00:44:27,910 --> 00:44:26,079

little bit scared just thought what am i

1048

00:44:29,910 --> 00:44:27,920

doing up here

1049

00:44:33,270 --> 00:44:29,920

i i haven't i i think there are times

1050

00:44:34,950 --> 00:44:33,280

perhaps in a space walk where it comes

1051

00:44:37,349 --> 00:44:34,960

home to you that you're in a very very

1052

00:44:38,950 --> 00:44:37,359

different place on space station it's a

1053

00:44:40,630 --> 00:44:38,960

you know we live and work in essentially

1054

00:44:43,030 --> 00:44:40,640

a shirt sleeve environment now we all

1055

00:44:45,270 --> 00:44:43,040

know that uh just a few millimeters

1056

00:44:47,270 --> 00:44:45,280

worth of uh of space station pressurized

1057

00:44:48,309 --> 00:44:47,280

hull separates us from the vacuum of

1058

00:44:52,550 --> 00:44:48,319

space

1059

00:44:54,950 --> 00:44:52,560

tens of thousands of incredibly smart

1060

00:44:56,870 --> 00:44:54,960

engineers and technicians and scientists

1061

00:44:59,589 --> 00:44:56,880

all over the world and it has an awful

1062

00:45:01,510 --> 00:44:59,599

lot of redundancy and it's very easy to

1063

00:45:04,069 --> 00:45:01,520

start to feel very much like you're at

1064

00:45:06,230 --> 00:45:04,079

home there and we all know that it's

1065

00:45:08,870 --> 00:45:06,240

it's not exactly that and it's a very

1066

00:45:10,150 --> 00:45:08,880

difficult place to operate live and work

1067

00:45:11,910 --> 00:45:10,160

but we have

1068

00:45:15,270 --> 00:45:11,920

hundreds of people that watch over space

1069

00:45:17,349 --> 00:45:15,280

station systems 24 7 365 and control

1070

00:45:18,870 --> 00:45:17,359

centers all over the world and they're

1071

00:45:20,710 --> 00:45:18,880

the ones that really do a lot of the

1072

00:45:22,630 --> 00:45:20,720

flying and a lot of the operating of the

1073

00:45:24,710 --> 00:45:22,640

space station systems and it's kind of

1074

00:45:25,910 --> 00:45:24,720

comforting

1075

00:45:27,349 --> 00:45:25,920

all right well you're a much braver

1076

00:45:28,870 --> 00:45:27,359

person than myself we thank you for your

1077

00:46:08,870 --> 00:45:28,880

time today thank you it's good to be

1078

00:46:12,470 --> 00:46:10,710

good morning dan this is robert perlman

1079

00:46:13,910 --> 00:46:12,480

with collectspace.com welcome back to

1080

00:46:15,750 --> 00:46:13,920

earth hey good morning robert it's good

1081

00:46:17,670 --> 00:46:15,760

to be with you today thank you

1082

00:46:19,430 --> 00:46:17,680

so i i've heard in some of the earlier

1083

00:46:21,589 --> 00:46:19,440

interviews today about you describing

1084

00:46:23,910 --> 00:46:21,599

your adjustment back to earth i was

1085

00:46:26,309 --> 00:46:23,920

wondering having just come back from my

1086

00:46:28,630 --> 00:46:26,319

own month-long trek i realized that i

1087

00:46:30,069 --> 00:46:28,640

had missed some of the news that

1088

00:46:31,750 --> 00:46:30,079

happened around because i wasn't really

1089

00:46:33,030 --> 00:46:31,760

paying attention to it did you

1090

00:46:34,390 --> 00:46:33,040

experience the same thing was there

1091

00:46:36,710 --> 00:46:34,400

something that happened here on earth

1092

00:46:38,069 --> 00:46:36,720

that you went oh that happened um when

1093

00:46:40,309 --> 00:46:38,079

you got back

1094

00:46:42,870 --> 00:46:40,319

um it's kind of hard to i it's kind of

1095

00:46:45,430 --> 00:46:42,880

hard to say to pick exact events and so

1096

00:46:47,270 --> 00:46:45,440

forth we we do get sent up uh from the

1097

00:46:48,950 --> 00:46:47,280

ground from houston and uh and other

1098

00:46:51,430 --> 00:46:48,960

control centers the news so we're able

1099

00:46:53,670 --> 00:46:51,440

to to catch up on the daily news if we

1100

00:46:56,309 --> 00:46:53,680

have time at the end of the day and it's

1101
00:46:58,550 --> 00:46:56,319
print news and actually some of the news

1102
00:46:59,990 --> 00:46:58,560
programs as well you felt like you were

1103
00:47:02,150 --> 00:47:00,000
pretty much in touch and you were able

1104
00:47:04,309 --> 00:47:02,160
to talk to your family so there wasn't

1105
00:47:05,829 --> 00:47:04,319
anything major that that i think took

1106
00:47:08,309 --> 00:47:05,839
place that we didn't generally know

1107
00:47:11,030 --> 00:47:08,319
about within about 12 hours

1108
00:47:12,630 --> 00:47:11,040
okay so going back to the beginning of

1109
00:47:15,829 --> 00:47:12,640
your arrival on station you had an

1110
00:47:18,150 --> 00:47:15,839
expedited handover um because of i

1111
00:47:18,950 --> 00:47:18,160
believe the the progress loss um back

1112
00:47:21,030 --> 00:47:18,960
then

1113
00:47:23,109 --> 00:47:21,040

um and the the ripples through the

1114

00:47:25,510 --> 00:47:23,119

schedule um

1115

00:47:27,430 --> 00:47:25,520

how did that handover go and would you

1116

00:47:29,589 --> 00:47:27,440

recommend that type of expedited

1117

00:47:31,910 --> 00:47:29,599

schedule to a future crew

1118

00:47:34,150 --> 00:47:31,920

yeah it was kind of a whirlwind so when

1119

00:47:35,990 --> 00:47:34,160

we when we docked when anton anatoly and

1120

00:47:38,069 --> 00:47:36,000

i docked a space station

1121

00:47:40,630 --> 00:47:38,079

we had basically four days worth of

1122

00:47:44,150 --> 00:47:40,640

handover you know physical handover uh

1123

00:47:47,109 --> 00:47:44,160

where uh the existing crew mike fossum

1124

00:47:48,790 --> 00:47:47,119

sergey volkov and satoshi furukawa were

1125

00:47:50,950 --> 00:47:48,800

able to show us the ropes and teach us

1126

00:47:52,630 --> 00:47:50,960

how to fly space station

1127

00:47:54,309 --> 00:47:52,640

we typically have anywhere from two

1128

00:47:57,270 --> 00:47:54,319

months to four months on a normal

1129

00:47:59,349 --> 00:47:57,280

handover so we try to overlap the crews

1130

00:48:00,870 --> 00:47:59,359

and give them as much time as possible

1131

00:48:02,549 --> 00:48:00,880

the beauty of the way this thing worked

1132

00:48:04,150 --> 00:48:02,559

out though is that we knew

1133

00:48:04,950 --> 00:48:04,160

well in advance that we would have a

1134

00:48:10,150 --> 00:48:04,960

very

1135

00:48:12,790 --> 00:48:10,160

at all so what we did is mike and

1136

00:48:14,309 --> 00:48:12,800

satoshi and sergey sent us down videos

1137

00:48:16,710 --> 00:48:14,319

of all the various things they would do

1138

00:48:19,190 --> 00:48:16,720

on a daily basis so we had the luxury

1139

00:48:22,069 --> 00:48:19,200

over a couple of months to to watch

1140

00:48:23,750 --> 00:48:22,079

videos multiple times and in a way

1141

00:48:25,109 --> 00:48:23,760

kind of in hindsight looking back on it

1142

00:48:26,549 --> 00:48:25,119

it might have been the best way to do

1143

00:48:28,710 --> 00:48:26,559

the handovers we essentially did a

1144

00:48:30,630 --> 00:48:28,720

virtual handover and it wasn't the kind

1145

00:48:32,309 --> 00:48:30,640

of thing where somebody would micro for

1146

00:48:34,790 --> 00:48:32,319

example would show me how to do do

1147

00:48:36,309 --> 00:48:34,800

something one time over the course of uh

1148

00:48:37,990 --> 00:48:36,319

of a couple of months that we had

1149

00:48:39,990 --> 00:48:38,000

together it was something that i could

1150

00:48:41,670 --> 00:48:40,000

watch as many times as i liked until i

1151
00:48:43,430 --> 00:48:41,680
understood it and then i when i saw him

1152
00:48:45,109 --> 00:48:43,440
face to face you know we could talk

1153
00:48:46,790 --> 00:48:45,119
about the specifics questions i might

1154
00:48:48,630 --> 00:48:46,800
have had so

1155
00:48:50,710 --> 00:48:48,640
the handover worked out actually very

1156
00:48:52,710 --> 00:48:50,720
very well

1157
00:48:54,790 --> 00:48:52,720
your expedition if i'm not mistaken was

1158
00:48:56,870 --> 00:48:54,800
the first to reach an average of 35

1159
00:49:00,069 --> 00:48:56,880
hours of utilization time

1160
00:49:03,109 --> 00:49:00,079
um and i was wondering if you can qual

1161
00:49:05,430 --> 00:49:03,119
quantify or or describe that in some way

1162
00:49:07,510 --> 00:49:05,440
that people here on earth could relate

1163
00:49:09,270 --> 00:49:07,520

how busy were you in terms of doing

1164

00:49:10,790 --> 00:49:09,280

science versus doing assembly and

1165

00:49:12,630 --> 00:49:10,800

maintenance well not assembly but

1166

00:49:14,630 --> 00:49:12,640

maintenance activities on station you

1167

00:49:16,790 --> 00:49:14,640

bet well space station we're operating

1168

00:49:18,630 --> 00:49:16,800

on a frontier so it's a lot like

1169

00:49:20,470 --> 00:49:18,640

operating a science station down in

1170

00:49:22,150 --> 00:49:20,480

antarctica for example

1171

00:49:24,390 --> 00:49:22,160

a lot of the things that you do on a

1172

00:49:26,549 --> 00:49:24,400

daily basis is keeping the systems of

1173

00:49:29,270 --> 00:49:26,559

space station for example operating

1174

00:49:31,190 --> 00:49:29,280

safely and and doing it in such a way

1175

00:49:33,829 --> 00:49:31,200

doing repairs to systems if they need it

1176

00:49:35,430 --> 00:49:33,839

in such a way that they will last a long

1177

00:49:38,230 --> 00:49:35,440

time if we were if we had an issue on

1178

00:49:39,829 --> 00:49:38,240

the space shuttle for example um we the

1179

00:49:41,910 --> 00:49:39,839

crew on board a space shuttle all they

1180

00:49:43,589 --> 00:49:41,920

have to do is essentially safe a system

1181

00:49:45,430 --> 00:49:43,599

and we all know that within two weeks

1182

00:49:47,510 --> 00:49:45,440

that space shuttle is going to be in the

1183

00:49:49,349 --> 00:49:47,520

care of people who have dedicated their

1184

00:49:51,270 --> 00:49:49,359

lives and are and are among the best in

1185

00:49:53,030 --> 00:49:51,280

the world at taking care of that vehicle

1186

00:49:54,870 --> 00:49:53,040

and they'll make it like new before it

1187

00:49:56,390 --> 00:49:54,880

flies again space station it's a

1188

00:49:58,150 --> 00:49:56,400

different animal so a lot of the things

1189

00:50:00,230 --> 00:49:58,160

that you do up there if you have to do

1190

00:50:02,470 --> 00:50:00,240

repair have to be commensurate with how

1191

00:50:05,190 --> 00:50:02,480

people who have spent their entire lives

1192

00:50:06,790 --> 00:50:05,200

working on hardware would do things

1193

00:50:08,390 --> 00:50:06,800

most of our activity on space station

1194

00:50:10,470 --> 00:50:08,400

was the utilization part of it you

1195

00:50:11,910 --> 00:50:10,480

mentioned 35 hours and i and i would

1196

00:50:13,750 --> 00:50:11,920

caution you a little bit because that's

1197

00:50:15,829 --> 00:50:13,760

really not the best way to think of it

1198

00:50:18,549 --> 00:50:15,839

we arbitrarily

1199

00:50:21,109 --> 00:50:18,559

it's an artifact of how we organize

1200

00:50:23,030 --> 00:50:21,119

the space station from from a budgetary

1201
00:50:24,710 --> 00:50:23,040
standpoint here on the ground the the

1202
00:50:26,390 --> 00:50:24,720
thing that space station was was

1203
00:50:28,069 --> 00:50:26,400
designed to do is to do

1204
00:50:29,990 --> 00:50:28,079
answer the kind of scientific questions

1205
00:50:31,990 --> 00:50:30,000
that allow us to leave low earth orbit

1206
00:50:34,470 --> 00:50:32,000
that'll will answer questions that are

1207
00:50:36,549 --> 00:50:34,480
of a basic nature that allow us to

1208
00:50:38,870 --> 00:50:36,559
develop pharmaceuticals that will help

1209
00:50:41,430 --> 00:50:38,880
you know life on earth for example

1210
00:50:43,190 --> 00:50:41,440
there are opera there are scientific

1211
00:50:44,630 --> 00:50:43,200
investigations for example on board

1212
00:50:46,950 --> 00:50:44,640
space station while we were there that

1213
00:50:49,109 --> 00:50:46,960

were on that numbered almost 200 and

1214

00:50:50,470 --> 00:50:49,119

these were experiments that we did and

1215

00:50:53,750 --> 00:50:50,480

there were also experiments that are

1216

00:50:55,430 --> 00:50:53,760

operated by by hundreds and thousands of

1217

00:50:58,390 --> 00:50:55,440

scientists and researchers all around

1218

00:50:59,750 --> 00:50:58,400

the world 24 7. a lot of the science on

1219

00:51:01,829 --> 00:50:59,760

station is done

1220

00:51:03,510 --> 00:51:01,839

essentially remotely and we the crew on

1221

00:51:04,710 --> 00:51:03,520

board station will be the lab

1222

00:51:07,109 --> 00:51:04,720

technicians that take care of the

1223

00:51:08,630 --> 00:51:07,119

hardware that that participate in some

1224

00:51:10,309 --> 00:51:08,640

of the research but much of it is done

1225

00:51:11,750 --> 00:51:10,319

on the ground

1226

00:51:13,270 --> 00:51:11,760

the work that you do on station

1227

00:51:15,750 --> 00:51:13,280

essentially keeping keeping it

1228

00:51:17,829 --> 00:51:15,760

functioning really is is a much greater

1229

00:51:19,430 --> 00:51:17,839

amount than the number you mentioned we

1230

00:51:20,549 --> 00:51:19,440

also do a lot of research on station

1231

00:51:21,990 --> 00:51:20,559

that really

1232

00:51:24,230 --> 00:51:22,000

does not fall in the category of what

1233

00:51:26,950 --> 00:51:24,240

i'd call scientific research but it's

1234

00:51:28,870 --> 00:51:26,960

technological development research so

1235

00:51:30,309 --> 00:51:28,880

the the environmental control system

1236

00:51:32,950 --> 00:51:30,319

that we have on space station that we

1237

00:51:35,030 --> 00:51:32,960

very much depend on now allows us to

1238

00:51:37,190 --> 00:51:35,040

very much close the environmental

1239

00:51:39,030 --> 00:51:37,200

control life support loop we want to

1240

00:51:41,910 --> 00:51:39,040

reclaim as much of the moisture for

1241

00:51:44,069 --> 00:51:41,920

example the water that humans produce

1242

00:51:45,270 --> 00:51:44,079

and in just the course of living and we

1243

00:51:48,230 --> 00:51:45,280

want to feed that back into the

1244

00:51:51,190 --> 00:51:48,240

environmental control loop so we recover

1245

00:51:52,870 --> 00:51:51,200

water from urine we recover water from

1246

00:51:55,910 --> 00:51:52,880

from sweat from

1247

00:51:58,549 --> 00:51:55,920

what we exhale and all that is purified

1248

00:52:00,309 --> 00:51:58,559

ultra purified i can assure you and in a

1249

00:52:02,309 --> 00:52:00,319

very sophisticated system that gives us

1250

00:52:04,870 --> 00:52:02,319

back that water and also gives us the

1251
00:52:06,470 --> 00:52:04,880
ability to generate oxygen so we reclaim

1252
00:52:08,069 --> 00:52:06,480
about two-thirds of the water that

1253
00:52:10,150 --> 00:52:08,079
otherwise would be lost

1254
00:52:12,470 --> 00:52:10,160
that technology actually has a lot of

1255
00:52:14,870 --> 00:52:12,480
relevance here on planet earth and that

1256
00:52:16,630 --> 00:52:14,880
technology has been used in disaster

1257
00:52:19,270 --> 00:52:16,640
zones in third world countries for

1258
00:52:20,950 --> 00:52:19,280
example but it also allows us to be much

1259
00:52:22,950 --> 00:52:20,960
wiser about how we take care of our

1260
00:52:25,270 --> 00:52:22,960
resources on planet earth and there are

1261
00:52:27,430 --> 00:52:25,280
many other examples on space station and

1262
00:52:29,829 --> 00:52:27,440
those go far beyond the 35 hours that

1263
00:52:31,829 --> 00:52:29,839

you've mentioned

1264

00:52:34,150 --> 00:52:31,839

well in terms of returning some of that

1265

00:52:35,829 --> 00:52:34,160

results back to earth spacex is getting

1266

00:52:36,710 --> 00:52:35,839

ready to launch their

1267

00:52:38,549 --> 00:52:36,720

uh

1268

00:52:40,230 --> 00:52:38,559

their first dragon capsule to the

1269

00:52:41,589 --> 00:52:40,240

international space station something

1270

00:52:44,470 --> 00:52:41,599

that would have happened maybe on your

1271

00:52:47,109 --> 00:52:44,480

stay had it played out differently

1272

00:52:48,230 --> 00:52:47,119

but if i understand correctly they're

1273

00:52:50,150 --> 00:52:48,240

they're going to be one of the first

1274

00:52:52,150 --> 00:52:50,160

down mass opportunities or only big down

1275

00:52:54,470 --> 00:52:52,160

mass opportunities after the end of

1276

00:52:56,150 --> 00:52:54,480

shuttle and on their list of stuff

1277

00:52:58,230 --> 00:52:56,160

they're bringing back crew clothing and

1278

00:53:00,630 --> 00:52:58,240

crew choice items and so i'm wondering

1279

00:53:03,109 --> 00:53:00,640

if that includes your items and does

1280

00:53:06,150 --> 00:53:03,119

that add an additional personal stake to

1281

00:53:08,390 --> 00:53:06,160

the success of this mission well

1282

00:53:10,150 --> 00:53:08,400

the the importance of of of uh having

1283

00:53:12,790 --> 00:53:10,160

spacex and

1284

00:53:14,630 --> 00:53:12,800

and their dragon vehicle and the the

1285

00:53:16,390 --> 00:53:14,640

cygnus vehicle that's uh that's going to

1286

00:53:18,150 --> 00:53:16,400

be developed and flown by orbital

1287

00:53:20,710 --> 00:53:18,160

science is absolutely critical to

1288

00:53:22,790 --> 00:53:20,720

station we need to have a logistics

1289

00:53:24,470 --> 00:53:22,800

lifeline that brings up supplies to

1290

00:53:26,630 --> 00:53:24,480

station but we also depend an awful lot

1291

00:53:28,470 --> 00:53:26,640

in having the capability of returning

1292

00:53:30,230 --> 00:53:28,480

samples back to earth for example a lot

1293

00:53:32,630 --> 00:53:30,240

of the biological samples that are the

1294

00:53:34,069 --> 00:53:32,640

result of nasa experiments that answer

1295

00:53:35,670 --> 00:53:34,079

the question of how to keep humans safe

1296

00:53:37,510 --> 00:53:35,680

and productive and healthy and healthy

1297

00:53:39,270 --> 00:53:37,520

in space for a long period of time

1298

00:53:41,030 --> 00:53:39,280

really require getting those samples

1299

00:53:43,910 --> 00:53:41,040

back to planet earth where we can study

1300

00:53:45,670 --> 00:53:43,920

them so the only capability beyond the

1301

00:53:47,829 --> 00:53:45,680

small amount of

1302

00:53:49,430 --> 00:53:47,839

volume that we can return with us on a

1303

00:53:50,950 --> 00:53:49,440

soyuz is

1304

00:53:53,910 --> 00:53:50,960

is now going to be afforded by the

1305

00:53:56,470 --> 00:53:53,920

spacex dragon vehicle and down down the

1306

00:53:58,230 --> 00:53:56,480

road we hope to have more capability but

1307

00:53:59,910 --> 00:53:58,240

but it's actually a critical component

1308

00:54:01,750 --> 00:53:59,920

of getting some down mass of being able

1309

00:54:03,349 --> 00:54:01,760

to return things from space

1310

00:54:05,030 --> 00:54:03,359

we do have a small amount that we're

1311

00:54:07,190 --> 00:54:05,040

able to bring back that are things like

1312

00:54:09,430 --> 00:54:07,200

crew clothing or or journals that we

1313

00:54:12,069 --> 00:54:09,440

might have kept onboard space station or

1314

00:54:14,630 --> 00:54:12,079

a few mementos and things like that

1315

00:54:16,950 --> 00:54:14,640

but the real the real importance of a

1316

00:54:19,270 --> 00:54:16,960

vehicle like like spacex and its down

1317

00:54:21,750 --> 00:54:19,280

mass capability is for the science and

1318

00:54:23,670 --> 00:54:21,760

operations of station so it's it's

1319

00:54:25,349 --> 00:54:23,680

really important for all of us and we

1320

00:54:27,190 --> 00:54:25,359

hope very much that they're they're

1321

00:54:29,109 --> 00:54:27,200

successful in this

1322

00:54:30,710 --> 00:54:29,119

well thank you for your time today and

1323

00:54:59,430 --> 00:54:30,720

welcome back to earth again robert thank