



1
00:00:07,190 --> 00:00:04,470
good afternoon i'm valerie Neal a space

2
00:00:09,589 --> 00:00:07,200
history curator and we are broadcasting

3
00:00:12,070 --> 00:00:09,599
from the moving beyond earth gallery at

4
00:00:13,270 --> 00:00:12,080
the smithsonian's national air and space

5
00:00:15,669 --> 00:00:13,280
museum

6
00:00:25,750 --> 00:00:15,679
please join me in welcoming today

7
00:00:29,269 --> 00:00:27,429
well we are thrilled to have you here

8
00:00:31,589 --> 00:00:29,279
today and we look forward to having a

9
00:00:33,430 --> 00:00:31,599
conversation with you over the course of

10
00:00:35,510 --> 00:00:33,440
the next hour

11
00:00:37,270 --> 00:00:35,520
it's a special privilege always to have

12
00:00:38,310 --> 00:00:37,280
astronauts come visit us here in the

13
00:00:40,950 --> 00:00:38,320

museum

14

00:00:44,310 --> 00:00:40,960

and today we have two astronauts who

15

00:00:46,869 --> 00:00:44,320

have flown two shuttle missions each and

16

00:00:49,270 --> 00:00:46,879

have each spent almost six months on the

17

00:00:50,790 --> 00:00:49,280

international space station so i think

18

00:00:52,630 --> 00:00:50,800

we're going to be in for a wonderful

19

00:00:55,189 --> 00:00:52,640

program hearing both about shuttle

20

00:00:56,389 --> 00:00:55,199

flights and life aboard the space

21

00:00:59,430 --> 00:00:56,399

station

22

00:01:01,830 --> 00:00:59,440

astronaut katie coleman is a local woman

23

00:01:04,310 --> 00:01:01,840

she went to high school here in fairfax

24

00:01:05,509 --> 00:01:04,320

virginia so we consider her kind of one

25

00:01:09,590 --> 00:01:05,519

of our own

26
00:01:11,190 --> 00:01:09,600
she flew twice on columbia in 1995 and

27
00:01:13,670 --> 00:01:11,200
1999

28
00:01:15,990 --> 00:01:13,680
and if i'm not mistaken your 20th

29
00:01:17,950 --> 00:01:16,000
anniversary as an astronaut is coming up

30
00:01:21,830 --> 00:01:17,960
next month

31
00:01:24,630 --> 00:01:21,840
1992 it's true all right so 20 years in

32
00:01:27,590 --> 00:01:24,640
the astronaut core already

33
00:01:30,870 --> 00:01:27,600
katie is a scientist she's a research

34
00:01:33,350 --> 00:01:30,880
chemist with a degree from mit

35
00:01:35,270 --> 00:01:33,360
uh a school that not many of us could

36
00:01:38,149 --> 00:01:35,280
get into probably

37
00:01:40,069 --> 00:01:38,159
and she has served on two science

38
00:01:41,990 --> 00:01:40,079

missions on the shuttle and she was both

39

00:01:45,429 --> 00:01:42,000

chief scientist on the international

40

00:01:48,310 --> 00:01:45,439

space station and also chief robotics

41

00:01:51,030 --> 00:01:48,320

officer now how cool is that to be in

42

00:01:53,429 --> 00:01:51,040

charge of robots

43

00:01:55,670 --> 00:01:53,439

mike fossum joined the astronaut corps

44

00:01:57,429 --> 00:01:55,680

just a few years later

45

00:02:00,550 --> 00:01:57,439

came in from the

46

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

air force and through nasa came into a

47

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

different route actually i should say

48

00:02:05,510 --> 00:02:04,560

astronaut coleman was also in the air

49

00:02:06,630 --> 00:02:05,520

force

50

00:02:09,990 --> 00:02:06,640

and

51
00:02:14,150 --> 00:02:10,000
he has served as a flight

52
00:02:16,309 --> 00:02:14,160
test pilot for f-16s cf-16

53
00:02:18,790 --> 00:02:16,319
as a flight test engineer my test

54
00:02:20,470 --> 00:02:18,800
engineer so he came through the

55
00:02:23,030 --> 00:02:20,480
traditional route

56
00:02:25,990 --> 00:02:23,040
for the astronaut corps of being a test

57
00:02:28,550 --> 00:02:26,000
pilot and flight engineer

58
00:02:31,270 --> 00:02:28,560
he also has been engaged in science on

59
00:02:34,869 --> 00:02:31,280
the space station and his two missions

60
00:02:36,710 --> 00:02:34,879
were aboard discovery in 2006

61
00:02:39,750 --> 00:02:36,720
2009

62
00:02:42,630 --> 00:02:39,760
we will be receiving discovery into this

63
00:02:45,430 --> 00:02:42,640

museum in april so we're really thrilled

64

00:02:46,550 --> 00:02:45,440

to have an expert on discovery with us

65

00:02:48,309 --> 00:02:46,560

today

66

00:02:51,030 --> 00:02:48,319

i am going to turn the program over to

67

00:02:52,949 --> 00:02:51,040

you to talk and show your video and then

68

00:02:54,949 --> 00:02:52,959

we'll move into q and a after that you

69

00:02:57,190 --> 00:02:54,959

bet uh this is exciting valerie to be

70

00:02:58,949 --> 00:02:57,200

here the air space museum is my favorite

71

00:03:00,790 --> 00:02:58,959

museum in the world i just love this

72

00:03:02,470 --> 00:03:00,800

place i i can't count the number of

73

00:03:04,470 --> 00:03:02,480

times i've been here brought my family

74

00:03:07,430 --> 00:03:04,480

here to to wander through the exhibits

75

00:03:10,149 --> 00:03:07,440

in the halls and see uh you know as a

76
00:03:12,390 --> 00:03:10,159
you know younger a child an adult to see

77
00:03:14,070 --> 00:03:12,400
you know the history in here and in more

78
00:03:16,149 --> 00:03:14,080
recent years i see

79
00:03:18,070 --> 00:03:16,159
you know airplanes that i've touched

80
00:03:19,589 --> 00:03:18,080
back when they were at edwards or or

81
00:03:20,949 --> 00:03:19,599
doing their flight test or setting their

82
00:03:22,630 --> 00:03:20,959
records and

83
00:03:24,949 --> 00:03:22,640
so it's it's really exciting for me

84
00:03:27,030 --> 00:03:24,959
because history really is alive

85
00:03:29,190 --> 00:03:27,040
uh it's we're making more history all

86
00:03:31,350 --> 00:03:29,200
the time and this is a place for some of

87
00:03:33,110 --> 00:03:31,360
the just for me the most fascinating but

88
00:03:35,030 --> 00:03:33,120

you know i love this uh the

89

00:03:36,470 --> 00:03:35,040

airplanes and rockets like

90

00:03:37,750 --> 00:03:36,480

like every kid or everything like

91

00:03:39,589 --> 00:03:37,760

homework

92

00:03:41,750 --> 00:03:39,599

right oh yeah so it does feel like home

93

00:03:43,509 --> 00:03:41,760

because i i i have you know they're like

94

00:03:46,149 --> 00:03:43,519

old friends and i think it's an

95

00:03:48,149 --> 00:03:46,159

important you know part of our you know

96

00:03:49,670 --> 00:03:48,159

nation's history our world's history to

97

00:03:51,670 --> 00:03:49,680

to see these things to see them in

98

00:03:53,589 --> 00:03:51,680

context to see them with your own eyes

99

00:03:54,949 --> 00:03:53,599

instead of just reading about them and

100

00:03:56,869 --> 00:03:54,959

really that's one of the things that

101
00:03:59,190 --> 00:03:56,879
drew me to want to come to the astronaut

102
00:04:00,710 --> 00:03:59,200
business was to experience it myself to

103
00:04:02,869 --> 00:04:00,720
see it with my own eyes to see out of

104
00:04:05,110 --> 00:04:02,879
the windows at the earth below not just

105
00:04:08,070 --> 00:04:05,120
looking at pictures and video

106
00:04:10,630 --> 00:04:08,080
and so you know that's that's you know

107
00:04:12,070 --> 00:04:10,640
exciting for me glad to be here well and

108
00:04:13,270 --> 00:04:12,080
for for me

109
00:04:15,350 --> 00:04:13,280
something that's a little bit different

110
00:04:17,110 --> 00:04:15,360
about the museum now than when i was

111
00:04:19,670 --> 00:04:17,120
growing up is that

112
00:04:21,830 --> 00:04:19,680
now you can come to the museum and you

113
00:04:23,590 --> 00:04:21,840

can see women living and working in

114

00:04:24,950 --> 00:04:23,600

space whereas that actually was not

115

00:04:26,070 --> 00:04:24,960

something when i was a little kid i

116

00:04:27,510 --> 00:04:26,080

could see

117

00:04:28,950 --> 00:04:27,520

and so that's a big difference and

118

00:04:30,629 --> 00:04:28,960

that's what makes this uh such a

119

00:04:32,710 --> 00:04:30,639

wonderful place i mean we're really glad

120

00:04:34,469 --> 00:04:32,720

that all of you are here today um and at

121

00:04:36,469 --> 00:04:34,479

the same time it's hard for us you know

122

00:04:38,390 --> 00:04:36,479

to touch everyone in the whole world and

123

00:04:40,830 --> 00:04:38,400

and so it's nice when there's a place

124

00:04:44,070 --> 00:04:40,840

like the air and space museum that

125

00:04:45,909 --> 00:04:44,080

brings what is amazing work alive to

126
00:04:47,990 --> 00:04:45,919
people today what mike and i are going

127
00:04:50,230 --> 00:04:48,000
to talk to to you about is basically a

128
00:04:52,710 --> 00:04:50,240
year on the international space station

129
00:04:54,950 --> 00:04:52,720
i launched in december just a couple

130
00:04:56,469 --> 00:04:54,960
days after my 50th birthday as a great

131
00:04:58,469 --> 00:04:56,479
birthday present

132
00:05:00,950 --> 00:04:58,479
big candle my husband said he was really

133
00:05:02,230 --> 00:05:00,960
pleased to arrange for me to

134
00:05:04,629 --> 00:05:02,240
have a little rocket ride for my

135
00:05:07,830 --> 00:05:04,639
birthday and so i launched in december i

136
00:05:09,590 --> 00:05:07,840
came home at the end of may and um mike

137
00:05:11,510 --> 00:05:09,600
was my backup and then he launched in

138
00:05:13,430 --> 00:05:11,520

the middle of june and came home just

139

00:05:15,670 --> 00:05:13,440

after thanksgiving so we represent

140

00:05:17,510 --> 00:05:15,680

literally a year on the iss

141

00:05:20,469 --> 00:05:17,520

and you're going to see a couple

142

00:05:22,070 --> 00:05:20,479

different patches and a couple different

143

00:05:24,950 --> 00:05:22,080

vehicles and i just want to kind of help

144

00:05:26,950 --> 00:05:24,960

you navigate before we start so

145

00:05:28,390 --> 00:05:26,960

we go on the space station we have six

146

00:05:30,310 --> 00:05:28,400

people that live there

147

00:05:32,390 --> 00:05:30,320

and we go up in groups of three

148

00:05:34,790 --> 00:05:32,400

so when i got there in my group of three

149

00:05:37,110 --> 00:05:34,800

with an italian guy and a russian guy in

150

00:05:38,790 --> 00:05:37,120

our little soyuz when we arrived there

151
00:05:41,430 --> 00:05:38,800
were already three people there we knew

152
00:05:43,749 --> 00:05:41,440
that it was not a surprise and and so um

153
00:05:46,070 --> 00:05:43,759
scott kelly and sasha kaleri alex

154
00:05:49,110 --> 00:05:46,080
kiripoch were up there and that's why i

155
00:05:51,270 --> 00:05:49,120
have this patch which is expedition 26.

156
00:05:53,670 --> 00:05:51,280
and so together we formed a crew of six

157
00:05:54,950 --> 00:05:53,680
which was expedition 26 but then a

158
00:05:56,629 --> 00:05:54,960
couple months into the mission it's

159
00:05:58,950 --> 00:05:56,639
their turn to go home

160
00:06:01,430 --> 00:05:58,960
and we're on the station and then ron

161
00:06:04,710 --> 00:06:01,440
and his two russian compatriots come up

162
00:06:06,790 --> 00:06:04,720
and we formed expedition 27

163
00:06:09,189 --> 00:06:06,800

okay and then while ron is

164

00:06:11,510 --> 00:06:09,199

while ron is up there mike comes up you

165

00:06:13,510 --> 00:06:11,520

you leave i leave yes they gave me a

166

00:06:15,029 --> 00:06:13,520

place she wasn't ready to come to my

167

00:06:16,790 --> 00:06:15,039

room you took my room on the space

168

00:06:19,029 --> 00:06:16,800

station i did

169

00:06:21,909 --> 00:06:19,039

and then i came up and we began

170

00:06:23,670 --> 00:06:21,919

expedition 28 which

171

00:06:26,230 --> 00:06:23,680

symbolized by this patch here for the

172

00:06:29,029 --> 00:06:26,240

the crew of six at that time

173

00:06:32,790 --> 00:06:30,950

september when ron came home we began

174

00:06:34,390 --> 00:06:32,800

expedition 29

175

00:06:36,950 --> 00:06:34,400

and i wear that patch right here and i

176

00:06:39,110 --> 00:06:36,960

was the commander of expedition 29 as we

177

00:06:41,749 --> 00:06:39,120

uh kind of finished out the year so it's

178

00:06:43,590 --> 00:06:41,759

a you know right even now as we speak

179

00:06:45,110 --> 00:06:43,600

and they're probably still awake um

180

00:06:46,870 --> 00:06:45,120

there's six people living on the space

181

00:06:48,870 --> 00:06:46,880

station doing that same kind of three

182

00:06:49,830 --> 00:06:48,880

and three and and three and three the

183

00:06:52,070 --> 00:06:49,840

other thing you're going to see in the

184

00:06:53,830 --> 00:06:52,080

video is is actually a lot of vehicles

185

00:06:58,070 --> 00:06:53,840

going back and forth mike and i each

186

00:06:59,670 --> 00:06:58,080

launched on the soyuz from kazakhstan

187

00:07:00,870 --> 00:06:59,680

excuse me in baikonur in the middle of

188

00:07:03,909 --> 00:07:00,880

kazakhstan

189

00:07:05,670 --> 00:07:03,919

and and then we landed there as well but

190

00:07:07,029 --> 00:07:05,680

while we were up there while i was up

191

00:07:09,589 --> 00:07:07,039

there i think we had three russian

192

00:07:11,749 --> 00:07:09,599

supply ships a japanese supply ship and

193

00:07:13,670 --> 00:07:11,759

a european supply ship and two space

194

00:07:15,270 --> 00:07:13,680

shuttles and then while mike was up

195

00:07:16,870 --> 00:07:15,280

there they had one more space shuttle

196

00:07:18,309 --> 00:07:16,880

another space shuttle

197

00:07:20,150 --> 00:07:18,319

right so you're going to see things

198

00:07:21,909 --> 00:07:20,160

coming and going and people coming and

199

00:07:24,550 --> 00:07:21,919

going and uh we just want to give you a

200

00:07:27,909 --> 00:07:24,560

little game plan before we start on the

201
00:07:30,550 --> 00:07:27,919
ride a year in about 14 minutes yes a

202
00:07:32,629 --> 00:07:30,560
year on the iss in 14 minutes so here we

203
00:07:34,150 --> 00:07:32,639
go okay let's roll it and we'll just

204
00:07:35,589 --> 00:07:34,160
where are we going to see this where is

205
00:07:38,550 --> 00:07:35,599
everybody uh it's going to be on that

206
00:07:40,309 --> 00:07:38,560
screen okay yes okay so yeah you may

207
00:07:41,749 --> 00:07:40,319
want to turn around here

208
00:07:43,189 --> 00:07:41,759
but don't despair because it takes a

209
00:07:46,869 --> 00:07:43,199
while to show the patches so you'll see

210
00:07:49,350 --> 00:07:48,070
and there's just a little music don't

211
00:07:51,189 --> 00:07:49,360
worry we're you're not going to hear

212
00:07:54,469 --> 00:07:51,199
stuff the whole time so it's mostly

213
00:07:56,710 --> 00:07:54,479

you're stuck with us talking yeah

214

00:07:58,710 --> 00:07:56,720

so the place that we stay before launch

215

00:08:01,189 --> 00:07:58,720

we have a tradition we sign our door we

216

00:08:03,189 --> 00:08:01,199

get blessed by the russian priest and we

217

00:08:05,029 --> 00:08:03,199

walk out and i'm actually begging these

218

00:08:07,189 --> 00:08:05,039

guys to take short steps and slow ones

219

00:08:09,110 --> 00:08:07,199

but they forget and we report to the

220

00:08:10,629 --> 00:08:09,120

russian commission

221

00:08:12,469 --> 00:08:10,639

and we they

222

00:08:14,150 --> 00:08:12,479

load us up on the rocket

223

00:08:15,189 --> 00:08:14,160

and moments later

224

00:08:17,029 --> 00:08:15,199

we are

225

00:08:19,510 --> 00:08:17,039

leaving the planet

226

00:08:21,430 --> 00:08:19,520

big deal for people to leave the planet

227

00:08:23,510 --> 00:08:21,440

mike what was launch like for you i was

228

00:08:25,990 --> 00:08:23,520

standing about a mile away and watching

229

00:08:27,830 --> 00:08:26,000

the the katie's rocket just shred the

230

00:08:29,990 --> 00:08:27,840

night sky it was

231

00:08:32,469 --> 00:08:30,000

really close really amazing eight and a

232

00:08:34,630 --> 00:08:32,479

half minutes to get to space two days to

233

00:08:36,230 --> 00:08:34,640

rendezvous with the iss and then we are

234

00:08:38,949 --> 00:08:36,240

living in space and it's not about

235

00:08:41,589 --> 00:08:38,959

floating around it's about flying

236

00:08:43,430 --> 00:08:41,599

so it's just amazing to be in such a big

237

00:08:45,350 --> 00:08:43,440

giant place where there's there's

238

00:08:47,110 --> 00:08:45,360

experiments there's all sorts of

239

00:08:48,949 --> 00:08:47,120

equipment it's a it's a bigger place

240

00:08:51,430 --> 00:08:48,959

it's like eight train cars all put

241

00:08:52,949 --> 00:08:51,440

together and so it's a lot of room

242

00:08:54,790 --> 00:08:52,959

especially when these supply ships come

243

00:08:57,269 --> 00:08:54,800

up you just saw the japanese supply ship

244

00:08:58,949 --> 00:08:57,279

and then just now the european automated

245

00:09:01,190 --> 00:08:58,959

transfer vehicle and now the space

246

00:09:03,110 --> 00:09:01,200

shuttle with our last module for the

247

00:09:05,509 --> 00:09:03,120

space station so they're going to put

248

00:09:07,430 --> 00:09:05,519

that module on board before they come up

249

00:09:08,870 --> 00:09:07,440

they do sort of a pirouette under us and

250

00:09:10,550 --> 00:09:08,880

they take pictures of us and we take

251

00:09:12,150 --> 00:09:10,560

pictures of them it's kind of neat to

252

00:09:13,829 --> 00:09:12,160

see each other and at the same time it's

253

00:09:15,590 --> 00:09:13,839

to understand you know the health of

254

00:09:17,590 --> 00:09:15,600

each other's vehicles and there's the

255

00:09:19,829 --> 00:09:17,600

shuttle crew they're installing all the

256

00:09:21,430 --> 00:09:19,839

cables and all the power so that our new

257

00:09:22,710 --> 00:09:21,440

module is all plugged into the space

258

00:09:24,710 --> 00:09:22,720

station we actually pick it up out of

259

00:09:26,630 --> 00:09:24,720

the payload bay with the robotic arm and

260

00:09:28,550 --> 00:09:26,640

then stick it on the space station hook

261

00:09:30,150 --> 00:09:28,560

it up and then the shuttle crew helped

262

00:09:32,310 --> 00:09:30,160

us install that

263

00:09:34,550 --> 00:09:32,320

and then their work done they they um

264

00:09:36,550 --> 00:09:34,560

these folks went back into their shuttle

265

00:09:37,910 --> 00:09:36,560

and undocked and closed the hatch and

266

00:09:39,190 --> 00:09:37,920

we're left doing a lot of the

267

00:09:41,750 --> 00:09:39,200

experiments that they brought up one of

268

00:09:43,190 --> 00:09:41,760

those is robonaut and you'll see that

269

00:09:45,030 --> 00:09:43,200

mike got to spend some pretty neat time

270

00:09:47,269 --> 00:09:45,040

with robonaut while he was up there but

271

00:09:49,750 --> 00:09:47,279

now scott and his crew left and look at

272

00:09:51,990 --> 00:09:49,760

this this is not animation that is a

273

00:09:52,949 --> 00:09:52,000

real photograph a movie of the space

274

00:09:54,870 --> 00:09:52,959

station

275

00:09:56,630 --> 00:09:54,880

and that was me playing the flute a

276

00:09:59,430 --> 00:09:56,640

little bit up there and now greeting our

277

00:10:01,430 --> 00:09:59,440

new crew so we're expedition 27

278

00:10:03,269 --> 00:10:01,440

ron and sasha and andre are coming on

279

00:10:05,990 --> 00:10:03,279

board we're so excited to share this

280

00:10:07,030 --> 00:10:06,000

amazing place with them

281

00:10:09,030 --> 00:10:07,040

we were actually up there during the

282

00:10:10,949 --> 00:10:09,040

japanese tsunami you actually see

283

00:10:12,230 --> 00:10:10,959

evidence of that from space and so we

284

00:10:15,190 --> 00:10:12,240

made those

285

00:10:17,430 --> 00:10:15,200

those origami white cranes for them and

286

00:10:20,310 --> 00:10:17,440

this is the six of us on the 50th

287

00:10:23,110 --> 00:10:20,320

anniversary of human space flight 50

288

00:10:24,710 --> 00:10:23,120

years after april 12 19

289

00:10:26,550 --> 00:10:24,720

2011

290

00:10:28,230 --> 00:10:26,560

people first left the planet yuri

291

00:10:30,389 --> 00:10:28,240

gagarin was the first human to leave the

292

00:10:32,069 --> 00:10:30,399

planet and there we are thinking it's

293

00:10:34,069 --> 00:10:32,079

normal i'm a family that thinks it's

294

00:10:35,990 --> 00:10:34,079

normal to live on a space station we

295

00:10:38,150 --> 00:10:36,000

actually launched from the same launch

296

00:10:40,230 --> 00:10:38,160

pad that yuri gagarin launched from 50

297

00:10:42,310 --> 00:10:40,240

years ago and it's making possible

298

00:10:44,550 --> 00:10:42,320

things like this the ams alpha magnetic

299

00:10:46,389 --> 00:10:44,560

spectrometer looks at dark energy dark

300

00:10:48,230 --> 00:10:46,399

matter and we had two italians on our

301
00:10:50,470 --> 00:10:48,240
flight when the shuttle came up one with

302
00:10:53,269 --> 00:10:50,480
me and one on the shuttle and so because

303
00:10:54,790 --> 00:10:53,279
of the two italians we were able to have

304
00:10:57,269 --> 00:10:54,800
a conference with the pope that was

305
00:10:58,630 --> 00:10:57,279
really a great privilege for all of us

306
00:11:00,630 --> 00:10:58,640
these are just some views of this

307
00:11:02,150 --> 00:11:00,640
amazing space station so we live on the

308
00:11:03,670 --> 00:11:02,160
inside there this is outside where the

309
00:11:05,590 --> 00:11:03,680
space walks are

310
00:11:09,509 --> 00:11:05,600
but pretty soon it's our time dima and

311
00:11:11,269 --> 00:11:09,519
paolo and i to climb in our soyuz undock

312
00:11:13,110 --> 00:11:11,279
and you'll see a soyuz out here out

313
00:11:16,230 --> 00:11:13,120

right out here on the the the mirror

314

00:11:17,670 --> 00:11:16,240

model that you all have out there right

315

00:11:20,310 --> 00:11:17,680

out there

316

00:11:22,310 --> 00:11:20,320

and so you can see that same thing

317

00:11:23,750 --> 00:11:22,320

and these pictures are really unusual

318

00:11:25,829 --> 00:11:23,760

and it's the first time we've undocked

319

00:11:27,430 --> 00:11:25,839

when a shuttle was present so paulo dima

320

00:11:28,870 --> 00:11:27,440

and i left in the middle of the night

321

00:11:31,509 --> 00:11:28,880

and took these pictures of the space

322

00:11:33,269 --> 00:11:31,519

station with the space shuttle attached

323

00:11:34,550 --> 00:11:33,279

and the only pictures you'll ever see of

324

00:11:36,470 --> 00:11:34,560

the shuttle attached to the station are

325

00:11:38,310 --> 00:11:36,480

the ones that paulo took when we were

326
00:11:41,430 --> 00:11:38,320
undocking and then landing just a few

327
00:11:43,990 --> 00:11:41,440
hours later in in kazakhstan

328
00:11:45,590 --> 00:11:44,000
and that's us coming in for our soft

329
00:11:49,430 --> 00:11:45,600
landing

330
00:11:51,509 --> 00:11:49,440
solid and you know the spacecraft is

331
00:11:53,190 --> 00:11:51,519
built for it our seats are built for it

332
00:11:54,230 --> 00:11:53,200
and it was really nice to be home

333
00:11:57,910 --> 00:11:54,240
although i would have stayed a little

334
00:12:02,790 --> 00:11:59,990
so now this is so we left ron on the

335
00:12:04,310 --> 00:12:02,800
station ron and his two compatriots and

336
00:12:06,389 --> 00:12:04,320
the shuttle's crew was still there and

337
00:12:07,990 --> 00:12:06,399
they just undocked there's the station

338
00:12:10,550 --> 00:12:08,000

and their view of the space station as

339

00:12:12,310 --> 00:12:10,560

they leave and then mike cruz mike

340

00:12:14,230 --> 00:12:12,320

fossu's crew is about to come aboard

341

00:12:15,590 --> 00:12:14,240

while katie was was going through the

342

00:12:17,110 --> 00:12:15,600

descent

343

00:12:19,590 --> 00:12:17,120

and and coming back to earth we were

344

00:12:21,110 --> 00:12:19,600

going through our final preparations

345

00:12:23,829 --> 00:12:21,120

uh and heading to the baikonur

346

00:12:25,590 --> 00:12:23,839

cosmodrome in kazakhstan to for our own

347

00:12:27,590 --> 00:12:25,600

launch and then our docking which you

348

00:12:29,750 --> 00:12:27,600

see here it's about a 50 hours from the

349

00:12:32,310 --> 00:12:29,760

time you launch until the time you get

350

00:12:34,069 --> 00:12:32,320

docked and hatches open it was great to

351
00:12:36,389 --> 00:12:34,079
come aboard and see the guys ron and i

352
00:12:38,870 --> 00:12:36,399
had a long long-standing

353
00:12:40,550 --> 00:12:38,880
joke about him having the uh coffee on

354
00:12:42,870 --> 00:12:40,560
for me and then he gave i traveled a

355
00:12:44,629 --> 00:12:42,880
million miles and he gave me a bag of

356
00:12:46,629 --> 00:12:44,639
instant coffee

357
00:12:48,150 --> 00:12:46,639
nobody actually goes for the food so

358
00:12:49,990 --> 00:12:48,160
yeah

359
00:12:51,590 --> 00:12:50,000
and immediately it was time to uh to

360
00:12:53,750 --> 00:12:51,600
jump in and get to work

361
00:12:56,470 --> 00:12:53,760
working on different systems on the

362
00:12:58,629 --> 00:12:56,480
station we are we're responsible for the

363
00:13:00,710 --> 00:12:58,639

maintaining the systems upgrading things

364

00:13:03,509 --> 00:13:00,720

fixing them and preparing for space

365

00:13:06,710 --> 00:13:03,519

shuttle atlantis to come up on sts-135

366

00:13:08,310 --> 00:13:06,720

the final space shuttle mission

367

00:13:10,790 --> 00:13:08,320

it was pretty amazing to see it come up

368

00:13:12,949 --> 00:13:10,800

below us we were also ready

369

00:13:14,710 --> 00:13:12,959

with uh high-powered cameras to take

370

00:13:17,269 --> 00:13:14,720

photographs of its heat shield to make

371

00:13:19,509 --> 00:13:17,279

sure it was all okay and it was so we

372

00:13:21,509 --> 00:13:19,519

greeted them on board a couple days

373

00:13:24,310 --> 00:13:21,519

later ron guerin and i are heading out

374

00:13:26,629 --> 00:13:24,320

the door to do the last space walk of

375

00:13:28,629 --> 00:13:26,639

the space shuttle era as we moved a

376

00:13:30,790 --> 00:13:28,639

broken pump module from the outside of

377

00:13:33,030 --> 00:13:30,800

the station to the cargo bay of the

378

00:13:36,310 --> 00:13:33,040

shuttle to bring it home

379

00:13:38,069 --> 00:13:36,320

and then we installed a a module there

380

00:13:40,949 --> 00:13:38,079

it's a

381

00:13:42,870 --> 00:13:40,959

a robotic refueling mission uh

382

00:13:44,550 --> 00:13:42,880

experiment from the space that the space

383

00:13:47,110 --> 00:13:44,560

shuttle brought up and is now installed

384

00:13:49,189 --> 00:13:47,120

on the outside of the station itself

385

00:13:52,470 --> 00:13:49,199

that was uh seven spacewalks total for

386

00:13:54,949 --> 00:13:52,480

me it's a very exhilarating

387

00:13:57,030 --> 00:13:54,959

uh and a little bit scary

388

00:13:59,030 --> 00:13:57,040

and then they ron and mike have the most

389

00:14:00,870 --> 00:13:59,040

spacewalk time together of any two

390

00:14:01,990 --> 00:14:00,880

people i'm understanding there they are

391

00:14:03,509 --> 00:14:02,000

with the folks on the shuttle crew to

392

00:14:05,110 --> 00:14:03,519

help them get out the door and the

393

00:14:07,110 --> 00:14:05,120

shuttle crew before they undock bear in

394

00:14:09,030 --> 00:14:07,120

mind this is the last flight uh this is

395

00:14:11,750 --> 00:14:09,040

the flight of atlantis and so it's the

396

00:14:13,670 --> 00:14:11,760

last space shuttle that ron is ringing

397

00:14:14,870 --> 00:14:13,680

them is saying space shuttle atlantis

398

00:14:16,949 --> 00:14:14,880

departing

399

00:14:19,189 --> 00:14:16,959

i i broke a little rule here and opened

400

00:14:21,269 --> 00:14:19,199

a cover on a window to get this picture

401
00:14:23,110 --> 00:14:21,279
of the space shuttle as it backed away i

402
00:14:25,269 --> 00:14:23,120
like to think the robot arm is saluting

403
00:14:27,910 --> 00:14:25,279
the station the shuttle's work finally

404
00:14:30,150 --> 00:14:27,920
done the major thing of its of its era

405
00:14:31,750 --> 00:14:30,160
was building the space station and we

406
00:14:33,590 --> 00:14:31,760
would not have the space station we have

407
00:14:36,310 --> 00:14:33,600
today without the incredible capability

408
00:14:37,990 --> 00:14:36,320
of the space shuttle program

409
00:14:39,509 --> 00:14:38,000
we say that you can't see any borders

410
00:14:41,829 --> 00:14:39,519
from space but this bright colored

411
00:14:42,710 --> 00:14:41,839
ribbon on this shot here is actually the

412
00:14:43,430 --> 00:14:42,720
indo

413
00:14:46,790 --> 00:14:43,440

the

414

00:14:48,550 --> 00:14:46,800

india-pakistan border and it is a lit

415

00:14:51,430 --> 00:14:48,560

border where there is a fence between

416

00:14:53,030 --> 00:14:51,440

those two countries in those areas and

417

00:14:55,110 --> 00:14:53,040

you know in some ways it's sad that we

418

00:14:57,350 --> 00:14:55,120

can see borders from space the world has

419

00:14:59,110 --> 00:14:57,360

changed a lot and in our view from you

420

00:15:01,269 --> 00:14:59,120

know living up on the space station it

421

00:15:03,269 --> 00:15:01,279

looks like one planet that all of us

422

00:15:05,430 --> 00:15:03,279

could live peacefully on and at the same

423

00:15:07,829 --> 00:15:05,440

time it's really i think amazing to have

424

00:15:10,230 --> 00:15:07,839

a platform that we can look down and

425

00:15:11,829 --> 00:15:10,240

understand with compassion that you know

426

00:15:14,230 --> 00:15:11,839

that life is hard in lots of different

427

00:15:16,150 --> 00:15:14,240

places and as a people of the earth we

428

00:15:18,949 --> 00:15:16,160

have some very serious problems to solve

429

00:15:22,870 --> 00:15:21,030

our job was not looking out the window

430

00:15:25,350 --> 00:15:22,880

and taking pictures but we sure enjoyed

431

00:15:27,110 --> 00:15:25,360

doing that when we had the opportunity

432

00:15:29,670 --> 00:15:27,120

you can see the familiar land forms of

433

00:15:31,670 --> 00:15:29,680

course cape cod they're reaching out see

434

00:15:33,829 --> 00:15:31,680

weather hurricane irene we saw three

435

00:15:36,150 --> 00:15:33,839

major hurricanes while we were up there

436

00:15:37,749 --> 00:15:36,160

and and actually saw the water running

437

00:15:39,350 --> 00:15:37,759

off from the east coast after the big

438

00:15:40,870 --> 00:15:39,360

one came up this way

439

00:15:42,870 --> 00:15:40,880

all the way up

440

00:15:45,030 --> 00:15:42,880

seeing the Nile river in the Nile delta

441

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

with your own eyes lit up at night was

442

00:15:49,430 --> 00:15:47,360

was phenomenal

443

00:15:52,150 --> 00:15:49,440

after about three and a half months up

444

00:15:54,710 --> 00:15:52,160

there with Ronnie, Andre, and Sasha it was

445

00:15:57,350 --> 00:15:54,720

time for them to head home

446

00:15:58,629 --> 00:15:57,360

and it was it was a great time we sure

447

00:16:02,550 --> 00:15:58,639

enjoyed so of course Ryan and I had

448

00:16:04,230 --> 00:16:02,560

flown together on STS 124 back in 2008

449

00:16:06,710 --> 00:16:04,240

so we have lived and trained and flown

450

00:16:08,629 --> 00:16:06,720

together for five years it was uh kind

451
00:16:10,310 --> 00:16:08,639
of strange watching them as they as they

452
00:16:11,990 --> 00:16:10,320
backed away

453
00:16:13,749 --> 00:16:12,000
i love this video of going around the

454
00:16:16,069 --> 00:16:13,759
earth now we don't actually go this fast

455
00:16:17,670 --> 00:16:16,079
this is kind of time lapse photography

456
00:16:19,910 --> 00:16:17,680
but it was something that was pioneered

457
00:16:21,670 --> 00:16:19,920
by mike and ron where they actually

458
00:16:24,230 --> 00:16:21,680
figured out how to take pictures with

459
00:16:25,590 --> 00:16:24,240
our cameras you know one after the other

460
00:16:27,990 --> 00:16:25,600
to be able to put a video like this

461
00:16:29,749 --> 00:16:28,000
together and look at this this is aurora

462
00:16:32,230 --> 00:16:29,759
borealis astralis

463
00:16:33,990 --> 00:16:32,240

astralis the southern lights and

464

00:16:36,389 --> 00:16:34,000

we see these kind of things and and

465

00:16:38,310 --> 00:16:36,399

they're so exciting to see and you see

466

00:16:40,710 --> 00:16:38,320

and you're always frustrated by the

467

00:16:42,230 --> 00:16:40,720

limitations of cameras and for me one of

468

00:16:44,389 --> 00:16:42,240

the most exciting parts of the mission

469

00:16:46,550 --> 00:16:44,399

was when we figured out how to capture

470

00:16:48,069 --> 00:16:46,560

these views so we could bring them here

471

00:16:49,590 --> 00:16:48,079

and share them with you today

472

00:16:51,030 --> 00:16:49,600

look at that moonrise watch the

473

00:16:52,870 --> 00:16:51,040

reflection

474

00:16:54,470 --> 00:16:52,880

isn't that beautiful oh

475

00:16:56,790 --> 00:16:54,480

it was just stunning and you can see

476
00:16:58,710 --> 00:16:56,800
these on the internet uh there's a peter

477
00:17:00,870 --> 00:16:58,720
gabriel video that right now uses the

478
00:17:03,189 --> 00:17:00,880
these sequences there's uh cairo again

479
00:17:05,029 --> 00:17:03,199
in the Nile in a different point of view

480
00:17:06,470 --> 00:17:05,039
during the daytime

481
00:17:08,390 --> 00:17:06,480
again it's faster than what we're used

482
00:17:10,150 --> 00:17:08,400
to seeing when we look out our windows

483
00:17:11,909 --> 00:17:10,160
but it shows you a little bit about what

484
00:17:16,230 --> 00:17:11,919
it feels like to be

485
00:17:20,069 --> 00:17:18,390
you know it looks bad but we're we're in

486
00:17:23,590 --> 00:17:20,079
seats that are actually molded to our

487
00:17:25,669 --> 00:17:23,600
backsides exactly and so um we actually

488
00:17:28,150 --> 00:17:25,679

that spreads out the force and it we

489

00:17:30,549 --> 00:17:28,160

land just fine because there was a a

490

00:17:31,669 --> 00:17:30,559

problem in the russian soyuz launch

491

00:17:33,990 --> 00:17:31,679

rocket

492

00:17:35,430 --> 00:17:34,000

on a cargo ship we were we just had

493

00:17:38,870 --> 00:17:35,440

three people up there well not counting

494

00:17:39,990 --> 00:17:38,880

robonaut he's still one on the left

495

00:17:41,590 --> 00:17:40,000

isn't he great

496

00:17:43,750 --> 00:17:41,600

so we just had a crew of three for a

497

00:17:45,590 --> 00:17:43,760

couple of months sergei volkov here and

498

00:17:47,830 --> 00:17:45,600

my japanese crewmate or our japanese

499

00:17:49,830 --> 00:17:47,840

crewmate satoshi furukawa that's how you

500

00:17:51,990 --> 00:17:49,840

take your weight in space

501
00:17:55,110 --> 00:17:52,000
here's how you run a harness and bungee

502
00:17:56,630 --> 00:17:55,120
cords to hold you to the treadmill

503
00:17:58,710 --> 00:17:56,640
taking a shower doesn't make much sense

504
00:18:00,470 --> 00:17:58,720
because the water can't find the drain

505
00:18:01,669 --> 00:18:00,480
so we use a little soapy water on a

506
00:18:03,110 --> 00:18:01,679
washcloth

507
00:18:05,190 --> 00:18:03,120
and you can wash your face without

508
00:18:06,710 --> 00:18:05,200
getting your shirt wet

509
00:18:08,150 --> 00:18:06,720
going to bed at night means climbing

510
00:18:10,630 --> 00:18:08,160
into your sleeping bag which is just

511
00:18:12,630 --> 00:18:10,640
tacked to the wall

512
00:18:15,430 --> 00:18:12,640
it doesn't need to be laying down does

513
00:18:18,870 --> 00:18:15,440

it it's all the same

514

00:18:20,549 --> 00:18:18,880

so working on systems uh on the station

515

00:18:22,310 --> 00:18:20,559

working on experiments i mean there are

516

00:18:24,230 --> 00:18:22,320

just some fascinating things that we get

517

00:18:26,710 --> 00:18:24,240

to do and i will say even eating is an

518

00:18:29,110 --> 00:18:26,720

experiment uh except eating onions like

519

00:18:30,870 --> 00:18:29,120

they just were i'm glad i was gone

520

00:18:32,630 --> 00:18:30,880

that's that's our window to the world we

521

00:18:34,230 --> 00:18:32,640

call it the cupola it's a little bubble

522

00:18:35,590 --> 00:18:34,240

of cluster of windows on the bottom of

523

00:18:37,590 --> 00:18:35,600

the station

524

00:18:39,350 --> 00:18:37,600

this video here shows what happens when

525

00:18:41,909 --> 00:18:39,360

we're burning the engine on the station

526
00:18:44,390 --> 00:18:41,919
to reboot it we're going at a constant

527
00:18:46,549 --> 00:18:44,400
speed when we let go the space station

528
00:18:47,830 --> 00:18:46,559
is accelerating away from us

529
00:18:50,390 --> 00:18:47,840
it's really cool

530
00:18:53,029 --> 00:18:50,400
here's satoshi he has a love for

531
00:18:55,270 --> 00:18:53,039
baseball and he's showing us his uh

532
00:18:56,870 --> 00:18:55,280
one-man baseball skills he can pitch the

533
00:18:58,470 --> 00:18:56,880
ball

534
00:19:00,950 --> 00:18:58,480
then he's got to fly faster than the

535
00:19:02,230 --> 00:19:00,960
ball to get to the to get to the plate

536
00:19:05,270 --> 00:19:02,240
we don't have enough for a whole team

537
00:19:11,270 --> 00:19:06,710
spat her up

538
00:19:14,310 --> 00:19:11,280

he swings he hits it's a pop fly

539

00:19:18,070 --> 00:19:14,320

can he field his own ball let's see it

540

00:19:22,310 --> 00:19:20,230

like katie likes to point out the after

541

00:19:24,710 --> 00:19:22,320

she left we didn't do anything but just

542

00:19:27,430 --> 00:19:24,720

mess around and play games it's not true

543

00:19:28,950 --> 00:19:27,440

they got amazing experiments done but uh

544

00:19:30,310 --> 00:19:28,960

you know

545

00:19:32,070 --> 00:19:30,320

you can't work every single minute of

546

00:19:34,310 --> 00:19:32,080

the day and it's a fascinating place to

547

00:19:37,669 --> 00:19:34,320

live and work finally in mid-november

548

00:19:39,669 --> 00:19:37,679

dan burbank anton and anatoly came up we

549

00:19:42,390 --> 00:19:39,679

just had a few days with them on the

550

00:19:45,350 --> 00:19:42,400

station to hand over uh everything we

551
00:19:47,590 --> 00:19:45,360
knew uh or do the best we could and then

552
00:19:50,789 --> 00:19:47,600
it's it's time to a hand over a change

553
00:19:52,630 --> 00:19:50,799
of command so dan burbank

554
00:19:54,789 --> 00:19:52,640
is uh now the commander of the space

555
00:19:56,630 --> 00:19:54,799
station expedition 30.

556
00:19:59,909 --> 00:19:56,640
it was time for us to uh pack up our

557
00:20:02,390 --> 00:19:59,919
very few belongings you could take just

558
00:20:05,270 --> 00:20:02,400
about a pound and a half or so of of

559
00:20:07,430 --> 00:20:05,280
personal stuff that you can take home

560
00:20:10,390 --> 00:20:07,440
and we

561
00:20:13,029 --> 00:20:10,400
unlock the soyuz and start backing away

562
00:20:15,270 --> 00:20:13,039
from the station it was neat to kind of

563
00:20:17,190 --> 00:20:15,280

catch a glimpse as we backed away that's

564

00:20:19,110 --> 00:20:17,200

us riding a home in a meteor we're

565

00:20:21,110 --> 00:20:19,120

really the small dot in the middle of

566

00:20:23,590 --> 00:20:21,120

the screen is our capsule the other two

567

00:20:26,149 --> 00:20:23,600

pieces are expendable pieces of the

568

00:20:28,710 --> 00:20:26,159

soyuz that are burning up

569

00:20:30,710 --> 00:20:28,720

we landed just before dawn our capsules

570

00:20:32,470 --> 00:20:30,720

in the middle of the picture there and

571

00:20:35,110 --> 00:20:32,480

they get us out and our first conclusion

572

00:20:36,549 --> 00:20:35,120

was gravity really stinks

573

00:20:38,710 --> 00:20:36,559

absolutely

574

00:20:40,310 --> 00:20:38,720

the the ship that's it that is the whole

575

00:20:42,149 --> 00:20:40,320

thing right there that we come home in

576

00:20:42,870 --> 00:20:42,159

and it's all charred we were watching

577

00:20:43,990 --> 00:20:42,880

the

578

00:20:47,190 --> 00:20:44,000

incredible

579

00:20:48,789 --> 00:20:47,200

plasma fall around it a little while

580

00:20:51,270 --> 00:20:48,799

later we have the traditional funny hat

581

00:20:52,870 --> 00:20:51,280

ceremony

582

00:20:54,390 --> 00:20:52,880

it's a press conference that we do after

583

00:20:56,149 --> 00:20:54,400

launch because we land in kazakhstan

584

00:20:58,149 --> 00:20:56,159

they have their own traditions and so

585

00:21:08,230 --> 00:20:58,159

that's it that's what we're here

586

00:21:13,830 --> 00:21:11,830

let me ask our audience who wants to go

587

00:21:15,510 --> 00:21:13,840

anybody out there wanting to go to the

588

00:21:17,350 --> 00:21:15,520

space station we have somebody that's

589

00:21:19,909 --> 00:21:17,360

already dressed yeah there we go okay

590

00:21:22,470 --> 00:21:19,919

good you are dressed it's true we have a

591

00:21:24,149 --> 00:21:22,480

young astronaut in the audience uh well

592

00:21:26,549 --> 00:21:24,159

we are going to start taking some

593

00:21:28,549 --> 00:21:26,559

questions in just a moment um

594

00:21:30,710 --> 00:21:28,559

i am going to

595

00:21:32,549 --> 00:21:30,720

take the prerogative of being on stage

596

00:21:35,350 --> 00:21:32,559

to ask the first question

597

00:21:38,789 --> 00:21:35,360

if you don't mind and i apologize to you

598

00:21:42,390 --> 00:21:38,799

i left out your most signal title which

599

00:21:43,830 --> 00:21:42,400

was commander of expedition 28 on the

600

00:21:45,590 --> 00:21:43,840

space station i was thinking of

601
00:21:48,630 --> 00:21:45,600
everything else and forgot to mention

602
00:21:49,990 --> 00:21:48,640
that so each of you in your long tenure

603
00:21:52,070 --> 00:21:50,000
and your different flights have done

604
00:21:54,710 --> 00:21:52,080
many different jobs i'm going to ask

605
00:21:56,230 --> 00:21:54,720
each of you about two of your jobs and

606
00:21:58,630 --> 00:21:56,240
for you would you talk to us a little

607
00:22:00,149 --> 00:21:58,640
bit more about space walking and then

608
00:22:04,470 --> 00:22:00,159
would you also tell us how much

609
00:22:07,029 --> 00:22:04,480
commanding does a commander do not much

610
00:22:09,669 --> 00:22:07,039
of space walking it's uh it's outrageous

611
00:22:11,110 --> 00:22:09,679
it's uh it's um

612
00:22:12,870 --> 00:22:11,120
we train for hundreds of hundreds of

613
00:22:14,549 --> 00:22:12,880

hours in the in a pool a neutral

614

00:22:16,789 --> 00:22:14,559

buoyancy laboratory where they wait us

615

00:22:18,310 --> 00:22:16,799

out so we don't sink or float and you'll

616

00:22:20,630 --> 00:22:18,320

learn that choreography because

617

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

maintaining a safety tether attached to

618

00:22:24,390 --> 00:22:22,640

the structures is very important it's

619

00:22:29,350 --> 00:22:24,400

kind of like a leash

620

00:22:31,350 --> 00:22:29,360

uh as you know a safety line and

621

00:22:34,950 --> 00:22:31,360

and and we practiced this and the first

622

00:22:39,029 --> 00:22:34,960

time i i kind of slid out of the airlock

623

00:22:41,110 --> 00:22:39,039

where there's two things one is i i

624

00:22:42,950 --> 00:22:41,120

it was a shock to see the space station

625

00:22:45,270 --> 00:22:42,960

suspended in

626

00:22:46,870 --> 00:22:45,280

the sky with nothing underneath it

627

00:22:48,470 --> 00:22:46,880

because i've all this time in the pool

628

00:22:50,630 --> 00:22:48,480

there's all this iron structure and

629

00:22:52,630 --> 00:22:50,640

there's a concrete floor down there and

630

00:22:54,310 --> 00:22:52,640

there's scuba divers

631

00:22:57,029 --> 00:22:54,320

and none of this stuff of course is in

632

00:22:59,750 --> 00:22:57,039

space and it's just hanging there and

633

00:23:01,430 --> 00:22:59,760

uh i mean just shiny and you know

634

00:23:02,870 --> 00:23:01,440

amazing and then you look down and you

635

00:23:05,110 --> 00:23:02,880

see this very disturbing blue and white

636

00:23:06,549 --> 00:23:05,120

ball going by at five miles a second

637

00:23:08,710 --> 00:23:06,559

it's like oh that's that's a mistake

638

00:23:10,470 --> 00:23:08,720

don't look down

639

00:23:12,149 --> 00:23:10,480

and the space station is the size of a

640

00:23:13,669 --> 00:23:12,159

football field right the station is the

641

00:23:15,590 --> 00:23:13,679

size of a football field and so you

642

00:23:17,430 --> 00:23:15,600

learn how to move around out there and

643

00:23:19,430 --> 00:23:17,440

not think about where you are you just

644

00:23:21,190 --> 00:23:19,440

have to get to work

645

00:23:23,990 --> 00:23:21,200

and and can let the training kind of

646

00:23:25,990 --> 00:23:24,000

kick in um it's i'm a little nervous

647

00:23:27,350 --> 00:23:26,000

outside and i even after seven space

648

00:23:30,630 --> 00:23:27,360

walks about

649

00:23:32,390 --> 00:23:30,640

48 hours outside um because and i think

650

00:23:33,990 --> 00:23:32,400

anybody that's not a little bit nervous

651
00:23:36,310 --> 00:23:34,000
doesn't belong there

652
00:23:38,310 --> 00:23:36,320
and you stay outside for the equivalent

653
00:23:39,270 --> 00:23:38,320
of a whole work day or a whole school

654
00:23:41,669 --> 00:23:39,280
day

655
00:23:43,750 --> 00:23:41,679
but uh do you get to have lunch

656
00:23:46,470 --> 00:23:43,760
no you get a good snack before you head

657
00:23:48,230 --> 00:23:46,480
out the door uh we we uh it's we're in

658
00:23:50,630 --> 00:23:48,240
the suit it's pretty much a minimum of

659
00:23:53,350 --> 00:23:50,640
six and a half hours and mine have gone

660
00:23:54,870 --> 00:23:53,360
as long as seven and a half um and and

661
00:23:56,310 --> 00:23:54,880
so you get a good snack before you go

662
00:23:58,310 --> 00:23:56,320
out and you have a drink

663
00:24:00,950 --> 00:23:58,320

water bottle it's a bag that's kind of

664

00:24:01,909 --> 00:24:00,960

inside the suit and a little bite valve

665

00:24:03,990 --> 00:24:01,919

here

666

00:24:05,430 --> 00:24:04,000

to uh to you know get a little water but

667

00:24:07,430 --> 00:24:05,440

it's not as much as you wish you had

668

00:24:09,190 --> 00:24:07,440

that's for sure so all you youngsters

669

00:24:11,269 --> 00:24:09,200

out there imagine you know going to

670

00:24:14,310 --> 00:24:11,279

school in the morning

671

00:24:15,830 --> 00:24:14,320

work work working all day no lunch break

672

00:24:18,390 --> 00:24:15,840

no recess

673

00:24:20,149 --> 00:24:18,400

no going down the hall to the restroom

674

00:24:23,190 --> 00:24:20,159

you have to just do your work all day

675

00:24:25,350 --> 00:24:23,200

long until eight hours are over then you

676

00:24:26,789 --> 00:24:25,360

get to come in

677

00:24:28,950 --> 00:24:26,799

we should talk about that part because

678

00:24:30,470 --> 00:24:28,960

everybody thinks about it right

679

00:24:32,149 --> 00:24:30,480

and so you know just to be really clear

680

00:24:34,390 --> 00:24:32,159

you know up on the space station and in

681

00:24:36,789 --> 00:24:34,400

the soyuz and we have we have bathroom

682

00:24:37,590 --> 00:24:36,799

and bathrooms too we're a two-bathroom

683

00:24:39,350 --> 00:24:37,600

house

684

00:24:41,269 --> 00:24:39,360

um and so there you know there's there's

685

00:24:42,710 --> 00:24:41,279

one at either end of the space station

686

00:24:43,909 --> 00:24:42,720

and you know and that works just fine

687

00:24:45,909 --> 00:24:43,919

but when you're in your own little

688

00:24:48,149 --> 00:24:45,919

spaceship in the space suit then there

689

00:24:50,149 --> 00:24:48,159

isn't a bathroom there and so you know

690

00:24:52,230 --> 00:24:50,159

we just go back to the basics it's the

691

00:24:54,549 --> 00:24:52,240

most efficient way to do things and if

692

00:24:56,230 --> 00:24:54,559

you need to go you know you can do that

693

00:24:58,390 --> 00:24:56,240

and not get everything all messy because

694

00:25:00,310 --> 00:24:58,400

we go prepared and we wear diapers

695

00:25:02,630 --> 00:25:00,320

that's true

696

00:25:04,470 --> 00:25:02,640

the glamour of space flight

697

00:25:06,470 --> 00:25:04,480

my son likes to tell his friends no they

698

00:25:09,269 --> 00:25:06,480

have a special name um

699

00:25:10,390 --> 00:25:09,279

maximum maximum absorbency got garment

700

00:25:12,230 --> 00:25:10,400

but

701

00:25:13,750 --> 00:25:12,240

i had to call you know this was before i

702

00:25:15,669 --> 00:25:13,760

had kids and i had to call my sister and

703

00:25:17,909 --> 00:25:15,679

go okay so the things they have they go

704

00:25:20,149 --> 00:25:17,919

in the front or how does that go kerry

705

00:25:23,990 --> 00:25:22,149

okay how about commanding when you're a

706

00:25:26,390 --> 00:25:24,000

commander how much bossing around do you

707

00:25:27,269 --> 00:25:26,400

get to do i was very fortunate that the

708

00:25:28,549 --> 00:25:27,279

crew

709

00:25:30,070 --> 00:25:28,559

it's it's it's really more of a

710

00:25:32,070 --> 00:25:30,080

collaborative effort somebody needs to

711

00:25:34,549 --> 00:25:32,080

be the spokesperson and that's really

712

00:25:36,950 --> 00:25:34,559

all that boils down to um you know it

713

00:25:39,029 --> 00:25:36,960

for for me it was uh we we had some

714

00:25:40,470 --> 00:25:39,039

challenges uh we were a three-person

715

00:25:41,269 --> 00:25:40,480

crew for a while and that was easy but

716

00:25:43,990 --> 00:25:41,279

we had

717

00:25:46,390 --> 00:25:44,000

the the crew that was intended really to

718

00:25:48,310 --> 00:25:46,400

join us right after ron left was not

719

00:25:50,630 --> 00:25:48,320

able to they were delayed by a couple of

720

00:25:52,710 --> 00:25:50,640

months and so we had to figure out how

721

00:25:56,710 --> 00:25:52,720

to get ready to hand them the keys to

722

00:25:59,029 --> 00:25:56,720

the to the shop the house the garage

723

00:26:01,029 --> 00:25:59,039

in a couple of just four days

724

00:26:02,549 --> 00:26:01,039

and uh that kind of handover normally

725

00:26:04,710 --> 00:26:02,559

takes weeks

726

00:26:06,630 --> 00:26:04,720

uh or months really we like to have a

727

00:26:08,630 --> 00:26:06,640

cup you know a couple of months to help

728

00:26:10,549 --> 00:26:08,640

the new guys learn where everything's

729

00:26:13,269 --> 00:26:10,559

located it's kind of like having right

730

00:26:15,909 --> 00:26:13,279

now we have the 30th crew serving on the

731

00:26:17,430 --> 00:26:15,919

space station really the 31st too with

732

00:26:20,470 --> 00:26:17,440

uh kononenko's crew that's up there with

733

00:26:22,310 --> 00:26:20,480

dan and and this is like uh like

734

00:26:24,470 --> 00:26:22,320

somebody else literally moving into your

735

00:26:26,390 --> 00:26:24,480

house and then after six months they

736

00:26:28,710 --> 00:26:26,400

hand it over the house and the shop and

737

00:26:31,669 --> 00:26:28,720

the garage to the next person

738

00:26:33,909 --> 00:26:31,679

who manages it for the their time and so

739

00:26:35,590 --> 00:26:33,919

it evolves over time there's a lot to do

740

00:26:36,789 --> 00:26:35,600

so our challenge was more trying to

741

00:26:38,950 --> 00:26:36,799

figure out how to prepare training

742

00:26:40,149 --> 00:26:38,960

videos and get them trained on the

743

00:26:42,230 --> 00:26:40,159

ground and working with them on the

744

00:26:44,149 --> 00:26:42,240

ground before they got there and i've

745

00:26:46,230 --> 00:26:44,159

actually been continuing to support them

746

00:26:48,310 --> 00:26:46,240

almost every week i've gone into mission

747

00:26:50,830 --> 00:26:48,320

control to talk to them and answer their

748

00:26:52,710 --> 00:26:50,840

questions about where i hid the

749

00:26:53,990 --> 00:26:52,720

camera cell phone number they do have my

750

00:26:54,870 --> 00:26:54,000

cell phone number

751
00:26:57,590 --> 00:26:54,880
yeah

752
00:26:59,750 --> 00:26:57,600
okay now katie uh you are obviously a

753
00:27:02,070 --> 00:26:59,760
trained scientist with a specialty in

754
00:27:04,470 --> 00:27:02,080
chemistry but on the space station you

755
00:27:06,630 --> 00:27:04,480
end up doing experiments for all

756
00:27:09,350 --> 00:27:06,640
different kinds of people uh different

757
00:27:11,269 --> 00:27:09,360
kinds of experiments so can you talk to

758
00:27:13,669 --> 00:27:11,279
us a little bit about being a scientist

759
00:27:15,909 --> 00:27:13,679
in space and what's different and then

760
00:27:18,230 --> 00:27:15,919
your other specialty is controlling the

761
00:27:20,470 --> 00:27:18,240
robotic arm that the astronauts are

762
00:27:21,909 --> 00:27:20,480
using outside so

763
00:27:23,430 --> 00:27:21,919

just shed a little light on there you

764

00:27:25,110 --> 00:27:23,440

know i'll talk about both those things

765

00:27:27,430 --> 00:27:25,120

but i think when you're thinking about

766

00:27:29,590 --> 00:27:27,440

maybe being an astronaut the thing to

767

00:27:32,310 --> 00:27:29,600

realize is that all of us are something

768

00:27:35,110 --> 00:27:32,320

else first i happen to be a chemist mike

769

00:27:37,029 --> 00:27:35,120

happens to be an air force uh pilot and

770

00:27:39,830 --> 00:27:37,039

a navigator and all those things

771

00:27:41,750 --> 00:27:39,840

engineer and uh um

772

00:27:43,430 --> 00:27:41,760

and so you know that's the job we come

773

00:27:44,870 --> 00:27:43,440

in with but then once we join the

774

00:27:47,029 --> 00:27:44,880

astronaut corps we're actually all

775

00:27:48,870 --> 00:27:47,039

trained to do almost all the things and

776

00:27:50,630 --> 00:27:48,880

so mike could just as easily be talking

777

00:27:52,870 --> 00:27:50,640

about either robotics or and i could be

778

00:27:54,549 --> 00:27:52,880

talking about spacewalking um for the

779

00:27:56,070 --> 00:27:54,559

science experiments

780

00:27:57,990 --> 00:27:56,080

and i started to joke around that even

781

00:27:59,430 --> 00:27:58,000

eating is a science experiment because

782

00:28:01,909 --> 00:27:59,440

it's really interesting how things

783

00:28:03,590 --> 00:28:01,919

behave up there and that's why we go i

784

00:28:05,590 --> 00:28:03,600

mean if you have like mike's bag of

785

00:28:06,789 --> 00:28:05,600

instant coffee that he talked about well

786

00:28:08,310 --> 00:28:06,799

it's just like a juice bag that you

787

00:28:10,310 --> 00:28:08,320

might have down here but you poke a

788

00:28:12,470 --> 00:28:10,320

straw into it and our straws have

789

00:28:14,470 --> 00:28:12,480

special little fold-over clips so that

790

00:28:16,789 --> 00:28:14,480

stuff doesn't just keep coming out of

791

00:28:18,389 --> 00:28:16,799

the bag right and so if he spilled his

792

00:28:19,830 --> 00:28:18,399

coffee so to speak it would be that he

793

00:28:22,310 --> 00:28:19,840

squeezed it and stuff came out of the

794

00:28:24,470 --> 00:28:22,320

straw and it would make a sphere of

795

00:28:25,750 --> 00:28:24,480

coffee and down here on the ground that

796

00:28:27,430 --> 00:28:25,760

would be just like a puddle on the

797

00:28:30,710 --> 00:28:27,440

ground because the force of gravity is

798

00:28:32,470 --> 00:28:30,720

overwhelming and up there where without

799

00:28:34,950 --> 00:28:32,480

gravity or without much gravity we can

800

00:28:36,149 --> 00:28:34,960

find out what do liquids really really

801
00:28:38,149 --> 00:28:36,159
want to do

802
00:28:39,750 --> 00:28:38,159
well the reason we want to know that is

803
00:28:42,470 --> 00:28:39,760
that every single thing that happens

804
00:28:44,630 --> 00:28:42,480
down here that involves flow through a

805
00:28:47,029 --> 00:28:44,640
pipe okay and that means the way the

806
00:28:48,630 --> 00:28:47,039
sewer system works wait the way the food

807
00:28:50,070 --> 00:28:48,640
factories work every food that is made

808
00:28:52,149 --> 00:28:50,080
that involves liquids coming together

809
00:28:54,389 --> 00:28:52,159
and being added in and mixed around and

810
00:28:56,870 --> 00:28:54,399
shoved down a pipe making something like

811
00:28:58,710 --> 00:28:56,880
your skis and skateboards and fabrics

812
00:29:01,190 --> 00:28:58,720
and everything probably that we could

813
00:29:03,510 --> 00:29:01,200

even look at in this room was made using

814

00:29:05,830 --> 00:29:03,520

flow through some kind of a pipe so

815

00:29:07,750 --> 00:29:05,840

understanding how that really works the

816

00:29:11,110 --> 00:29:07,760

tiny forces turn out to make a really

817

00:29:12,630 --> 00:29:11,120

big difference flames flames yep and so

818

00:29:14,470 --> 00:29:12,640

combustion

819

00:29:17,590 --> 00:29:14,480

um that's one of my favorite examples

820

00:29:19,110 --> 00:29:17,600

too is uh how things burn things burn a

821

00:29:20,470 --> 00:29:19,120

little bit differently up there you know

822

00:29:22,470 --> 00:29:20,480

we don't have a candle flame that looks

823

00:29:23,909 --> 00:29:22,480

like that nice little candle flame we

824

00:29:26,549 --> 00:29:23,919

think about here on the earth because

825

00:29:28,870 --> 00:29:26,559

the lighter gases aren't going to be any

826

00:29:31,590 --> 00:29:28,880

different than the heavier gases and so

827

00:29:33,750 --> 00:29:31,600

it's not going to be having those things

828

00:29:34,950 --> 00:29:33,760

rise the new fuel rushing in down here

829

00:29:37,350 --> 00:29:34,960

on the earth it's hard to study

830

00:29:38,710 --> 00:29:37,360

combustion it's hard to study pollution

831

00:29:41,029 --> 00:29:38,720

because those things are happening all

832

00:29:43,590 --> 00:29:41,039

the time really fast but up in space

833

00:29:45,590 --> 00:29:43,600

because of the weightless environment

834

00:29:47,750 --> 00:29:45,600

those things happen really slowly and we

835

00:29:49,830 --> 00:29:47,760

can measure them as scientists so we can

836

00:29:51,269 --> 00:29:49,840

understand how things burn to make more

837

00:29:52,870 --> 00:29:51,279

fuel efficient

838

00:29:55,510 --> 00:29:52,880

kinds of you know

839

00:29:58,789 --> 00:29:55,520

energy energy use in a more fuel

840

00:30:00,630 --> 00:29:58,799

efficient kind of way um and we can uh

841

00:30:03,590 --> 00:30:00,640

i don't know the the possibilities are

842

00:30:05,669 --> 00:30:03,600

really endless and so science is really

843

00:30:07,590 --> 00:30:05,679

fun up there it's fun down here too but

844

00:30:09,269 --> 00:30:07,600

i'll tell you it's really fun up there

845

00:30:11,430 --> 00:30:09,279

and i can go on and on we have a i mean

846

00:30:13,590 --> 00:30:11,440

we do hundreds of experiments uh up

847

00:30:15,590 --> 00:30:13,600

there and we do them every single day

848

00:30:17,510 --> 00:30:15,600

and we also love robotics i think all of

849

00:30:18,470 --> 00:30:17,520

us love to like actually make something

850

00:30:20,710 --> 00:30:18,480

happen

851
00:30:23,830 --> 00:30:20,720
and so we're using controls and then

852
00:30:26,230 --> 00:30:23,840
outside the robotic arm is moving around

853
00:30:27,269 --> 00:30:26,240
and in palos in my case we actually got

854
00:30:30,149 --> 00:30:27,279
to catch

855
00:30:32,630 --> 00:30:30,159
a supply ship so this is a supply ship

856
00:30:35,110 --> 00:30:32,640
from japan it comes it launches on a

857
00:30:37,750 --> 00:30:35,120
rocket comes up to the space station

858
00:30:39,510 --> 00:30:37,760
flies in formation with us just about

859
00:30:41,430 --> 00:30:39,520
like from here into

860
00:30:43,350 --> 00:30:41,440
where you guys are away and then with

861
00:30:45,430 --> 00:30:43,360
the robotic arm i'm on the controls and

862
00:30:47,990 --> 00:30:45,440
paulo is calling distances for me i'm

863
00:30:49,750 --> 00:30:48,000

reaching out to then grab that

864

00:30:51,669 --> 00:30:49,760

and then we actually swing it around and

865

00:30:53,750 --> 00:30:51,679

stick it onto the space station open up

866

00:30:55,909 --> 00:30:53,760

the hatches and find our care packages

867

00:30:58,389 --> 00:30:55,919

from our families so you know that's

868

00:31:00,149 --> 00:30:58,399

robotics you know at work and and it

869

00:31:02,310 --> 00:31:00,159

translates down here on the ground in

870

00:31:04,789 --> 00:31:02,320

that there are new surgeries that can be

871

00:31:06,870 --> 00:31:04,799

done robotically because of what we've

872

00:31:09,350 --> 00:31:06,880

learned about how robots work that's

873

00:31:12,789 --> 00:31:09,360

part of the purpose of robonaut up there

874

00:31:15,430 --> 00:31:12,799

is to understand how how robots can work

875

00:31:17,590 --> 00:31:15,440

with people and in you know in some of

876

00:31:19,269 --> 00:31:17,600

the uses of robotics here on the ground

877

00:31:20,630 --> 00:31:19,279

so that's a long lecture about cool

878

00:31:23,110 --> 00:31:20,640

stuff i think

879

00:31:24,710 --> 00:31:23,120

very cool stuff very cool stuff well i

880

00:31:26,549 --> 00:31:24,720

think we probably have people in the

881

00:31:28,230 --> 00:31:26,559

audience who have questions of their own

882

00:31:30,470 --> 00:31:28,240

they would like to

883

00:31:31,909 --> 00:31:30,480

ask and we would ask that

884

00:31:33,750 --> 00:31:31,919

when you have the microphone if you

885

00:31:34,870 --> 00:31:33,760

would just say your first name and where

886

00:31:36,870 --> 00:31:34,880

you're from

887

00:31:40,230 --> 00:31:36,880

because we like to know who comes to the

888

00:31:43,990 --> 00:31:41,430

yeah we've got to have our first one

889

00:31:45,190 --> 00:31:44,000

right here miss nikolai and um

890

00:31:50,789 --> 00:31:45,200

i came

891

00:31:52,389 --> 00:31:50,799

want to be the first astronaut to go

892

00:31:56,710 --> 00:31:52,399

into space and i

893

00:31:58,470 --> 00:31:56,720

can speak read and write russian

894

00:32:01,669 --> 00:31:58,480

and you're the last part

895

00:32:03,509 --> 00:32:01,679

his name is nikolai from atlanta georgia

896

00:32:05,909 --> 00:32:03,519

you'd want to be an astronaut and you're

897

00:32:07,830 --> 00:32:05,919

dressed for the part already and what

898

00:32:11,909 --> 00:32:07,840

was the last part

899

00:32:11,919 --> 00:32:15,350

um

900

00:32:19,830 --> 00:32:17,590

i want to be the first astronaut kid to

901
00:32:21,750 --> 00:32:19,840
go into space

902
00:32:23,190 --> 00:32:21,760
so nikolai what was your favorite what

903
00:32:26,470 --> 00:32:23,200
would your favorite part of being in

904
00:32:30,149 --> 00:32:27,669
i want to

905
00:32:32,070 --> 00:32:30,159
go on other planets that people haven't

906
00:32:33,830 --> 00:32:32,080
been on yet

907
00:32:36,070 --> 00:32:33,840
that that would be a great thing and you

908
00:32:37,669 --> 00:32:36,080
know we're going to do this it takes a

909
00:32:40,070 --> 00:32:37,679
little more time than we would like but

910
00:32:43,750 --> 00:32:40,080
nikolai is the right age

911
00:32:48,389 --> 00:32:46,710
and so am i to be the ones who are going

912
00:32:49,830 --> 00:32:48,399
you know to leave even low earth orbit

913
00:32:52,789 --> 00:32:49,840

right around our planet to go to other

914

00:32:54,870 --> 00:32:52,799

planets like mars you are the right age

915

00:32:57,110 --> 00:32:54,880

but here's your responsibility and it's

916

00:32:59,029 --> 00:32:57,120

why mike and i are here today is because

917

00:33:02,310 --> 00:32:59,039

you need to be ready

918

00:33:04,310 --> 00:33:02,320

so nikolai in school do you do reading

919

00:33:05,669 --> 00:33:04,320

yes writing

920

00:33:07,430 --> 00:33:05,679

arithmetic

921

00:33:09,590 --> 00:33:07,440

i don't know what that is like counting

922

00:33:11,669 --> 00:33:09,600

do you do counting yup so you are

923

00:33:13,190 --> 00:33:11,679

already on your way to do some of the

924

00:33:15,110 --> 00:33:13,200

things you need to be ready you're an

925

00:33:17,990 --> 00:33:15,120

astronaut training it's true it's what

926

00:33:19,350 --> 00:33:18,000

we do all the time i do lots of science

927

00:33:21,430 --> 00:33:19,360

and math

928

00:33:23,110 --> 00:33:21,440

okay that is good do you clean up your

929

00:33:25,750 --> 00:33:23,120

messes

930

00:33:27,830 --> 00:33:25,760

space

931

00:33:30,230 --> 00:33:27,840

it's true and so all of you that are

932

00:33:32,149 --> 00:33:30,240

nikolai's age a little older a little

933

00:33:33,590 --> 00:33:32,159

older than that you know

934

00:33:35,590 --> 00:33:33,600

we've got a lot of really exciting

935

00:33:37,190 --> 00:33:35,600

things to do and actually big challenges

936

00:33:39,909 --> 00:33:37,200

on our planet as well and the way to be

937

00:33:42,470 --> 00:33:39,919

ready for those is to be in school to be

938

00:33:44,470 --> 00:33:42,480

practicing to be learning your math and

939

00:33:46,630 --> 00:33:44,480

your science but your reading and your

940

00:33:48,389 --> 00:33:46,640

writing and and don't forget all those

941

00:33:50,630 --> 00:33:48,399

other things too like you know being in

942

00:33:52,149 --> 00:33:50,640

gym class and art and all those things

943

00:33:54,230 --> 00:33:52,159

but all that learning that you do in

944

00:33:56,950 --> 00:33:54,240

school it's part of being ready and i

945

00:33:58,549 --> 00:33:56,960

think there's some fun things to do

946

00:34:00,230 --> 00:33:58,559

thanks nicholas thanks nikolai thank you

947

00:34:05,029 --> 00:34:00,240

nikolai

948

00:34:10,389 --> 00:34:08,149

i'm jim ryan from kensington maryland

949

00:34:12,950 --> 00:34:10,399

um do you have any idea when americans

950

00:34:13,909 --> 00:34:12,960

will go back into space on an american

951
00:34:16,629 --> 00:34:13,919
vehicle

952
00:34:19,750 --> 00:34:16,639
and what it will be

953
00:34:22,230 --> 00:34:19,760
the we we have ideas there's a lot of uh

954
00:34:24,550 --> 00:34:22,240
there's uh there is uncertainty about

955
00:34:26,629 --> 00:34:24,560
that right now with the retirement of

956
00:34:29,109 --> 00:34:26,639
the space shuttle program

957
00:34:31,589 --> 00:34:29,119
uh you know we we do not have a huma an

958
00:34:33,589 --> 00:34:31,599
american human launch capability uh

959
00:34:34,389 --> 00:34:33,599
katie and i both launched on a russian

960
00:34:35,909 --> 00:34:34,399
rocket

961
00:34:37,909 --> 00:34:35,919
which is almost

962
00:34:39,349 --> 00:34:37,919
it was harder for me to believe was

963
00:34:41,430 --> 00:34:39,359

happening than the fact that i was

964

00:34:42,869 --> 00:34:41,440

flying into space because i imagined

965

00:34:44,869 --> 00:34:42,879

growing up that we'd all be flying in

966

00:34:45,990 --> 00:34:44,879

space by now but to fly on a russian

967

00:34:47,349 --> 00:34:46,000

rocket was

968

00:34:51,909 --> 00:34:47,359

beyond

969

00:34:54,550 --> 00:34:51,919

it there are a number of companies that

970

00:34:57,510 --> 00:34:54,560

are working first to get cargo

971

00:34:59,750 --> 00:34:57,520

capabilities up to the space station

972

00:35:01,349 --> 00:34:59,760

to augment the the capabilities we have

973

00:35:02,950 --> 00:35:01,359

and there are there's you know human

974

00:35:05,670 --> 00:35:02,960

derivatives of those

975

00:35:07,829 --> 00:35:05,680

though there there's a lot of work in a

976

00:35:09,589 --> 00:35:07,839

handful of private companies

977

00:35:11,670 --> 00:35:09,599

that are working on those right now it's

978

00:35:13,430 --> 00:35:11,680

kind of a race i i think we're going to

979

00:35:15,510 --> 00:35:13,440

see the next human launch somewhere

980

00:35:17,430 --> 00:35:15,520

around five or six years from now i'm

981

00:35:19,910 --> 00:35:17,440

kind of optimistic that they're they're

982

00:35:21,910 --> 00:35:19,920

gonna push through and and come up with

983

00:35:23,510 --> 00:35:21,920

the first capability the the reason

984

00:35:26,150 --> 00:35:23,520

these companies most of them are

985

00:35:28,310 --> 00:35:26,160

involved with with this getting uh

986

00:35:30,310 --> 00:35:28,320

getting astronauts american astronauts

987

00:35:32,710 --> 00:35:30,320

up to the space station with this rocket

988

00:35:34,150 --> 00:35:32,720

is they want to develop this technology

989

00:35:35,750 --> 00:35:34,160

and they want to

990

00:35:37,750 --> 00:35:35,760

they want to build more of them and fly

991

00:35:40,710 --> 00:35:37,760

more of them than nasa needs so they

992

00:35:42,310 --> 00:35:40,720

want to sell you a ticket and so they

993

00:35:44,390 --> 00:35:42,320

are motivated because they think that

994

00:35:46,470 --> 00:35:44,400

they can get this cheap enough

995

00:35:47,910 --> 00:35:46,480

that that not maybe not all of us but

996

00:35:50,069 --> 00:35:47,920

some of us can

997

00:35:51,589 --> 00:35:50,079

can can buy you know a ride to space

998

00:35:53,430 --> 00:35:51,599

like that i think in the meantime i

999

00:35:55,589 --> 00:35:53,440

think to keep the thing to keep in mind

1000

00:35:58,230 --> 00:35:55,599

is we spent years building our space

1001
00:36:01,030 --> 00:35:58,240
station yeah we meaning 16 different

1002
00:36:03,510 --> 00:36:01,040
countries the space station is up there

1003
00:36:06,550 --> 00:36:03,520
right now there are almost always six

1004
00:36:08,470 --> 00:36:06,560
people on board and we used to spend a

1005
00:36:10,710 --> 00:36:08,480
lot of time building it but now we're

1006
00:36:12,710 --> 00:36:10,720
done building and we are working and

1007
00:36:14,470 --> 00:36:12,720
doing really amazing and interesting

1008
00:36:16,470 --> 00:36:14,480
science and engineering projects up

1009
00:36:18,630 --> 00:36:16,480
there so the space station is up there

1010
00:36:20,870 --> 00:36:18,640
we have a way to space it is with our

1011
00:36:22,950 --> 00:36:20,880
russian partners mike and i are here to

1012
00:36:24,790 --> 00:36:22,960
attest to the fact that it works and you

1013
00:36:27,190 --> 00:36:24,800

can go back and see your family when you

1014

00:36:28,790 --> 00:36:27,200

get done and so you know and that's the

1015

00:36:30,230 --> 00:36:28,800

place that space station is the place

1016

00:36:32,310 --> 00:36:30,240

that we learn some of the things we need

1017

00:36:35,109 --> 00:36:32,320

to know before we go to mars which is

1018

00:36:36,390 --> 00:36:35,119

how to recycle air and water how to take

1019

00:36:37,829 --> 00:36:36,400

care of people and make sure when they

1020

00:36:39,190 --> 00:36:37,839

land on mars they're actually not like

1021

00:36:40,870 --> 00:36:39,200

you know rubber chickens and can't do

1022

00:36:43,349 --> 00:36:40,880

anything we're learning all those

1023

00:36:45,349 --> 00:36:43,359

lessons and so we um you know we

1024

00:36:47,030 --> 00:36:45,359

impatiently we are waiting impatiently

1025

00:36:49,430 --> 00:36:47,040

for that american capability to go back

1026
00:36:50,230 --> 00:36:49,440
to space but in the meantime the program

1027
00:36:51,750 --> 00:36:50,240
is

1028
00:36:54,550 --> 00:36:51,760
alive and well

1029
00:36:56,870 --> 00:36:54,560
and there is always at least one u.s

1030
00:36:58,870 --> 00:36:56,880
citizen on the space station is that

1031
00:37:00,550 --> 00:36:58,880
right yep

1032
00:37:01,829 --> 00:37:00,560
do we have a question from this side of

1033
00:37:04,950 --> 00:37:01,839
the room

1034
00:37:05,910 --> 00:37:04,960
all right here comes one

1035
00:37:07,510 --> 00:37:05,920
hi

1036
00:37:10,870 --> 00:37:07,520
my name is valeria i come from south

1037
00:37:12,950 --> 00:37:10,880
america from chile and uh i came with my

1038
00:37:14,790 --> 00:37:12,960

children a little late to this meeting

1039

00:37:16,870 --> 00:37:14,800

so i'm not sure if you mentioned already

1040

00:37:18,470 --> 00:37:16,880

about the kind of food you have there if

1041

00:37:20,310 --> 00:37:18,480

it is so different from the one that we

1042

00:37:22,390 --> 00:37:20,320

eat usually here

1043

00:37:24,470 --> 00:37:22,400

the the food up there is is actually

1044

00:37:26,550 --> 00:37:24,480

very similar to camping food in a lot of

1045

00:37:28,630 --> 00:37:26,560

ways we have a wide variety of foods

1046

00:37:30,870 --> 00:37:28,640

with a you know u.s provided food

1047

00:37:33,270 --> 00:37:30,880

russian provided food i had a japanese

1048

00:37:35,510 --> 00:37:33,280

crew mate so he flew a lot of special

1049

00:37:38,630 --> 00:37:35,520

you know mackerel with miso sauce

1050

00:37:41,910 --> 00:37:38,640

and and things like that um some of it's

1051

00:37:44,550 --> 00:37:41,920

dehydrated uh add hot water wait 15

1052

00:37:46,310 --> 00:37:44,560

minutes and you have scrambled eggs yum

1053

00:37:48,870 --> 00:37:46,320

i said that all of it looks bad but most

1054

00:37:50,870 --> 00:37:48,880

of it tastes okay it's uh but it's it's

1055

00:37:53,829 --> 00:37:50,880

you know heating up a pouch with a pork

1056

00:37:55,030 --> 00:37:53,839

chop in it uh very similar to a military

1057

00:37:57,670 --> 00:37:55,040

mres

1058

00:37:59,589 --> 00:37:57,680

or emergency food uh you know it the

1059

00:38:01,589 --> 00:37:59,599

parts of it get a little old but not bad

1060

00:38:03,349 --> 00:38:01,599

one thing that's a little odd

1061

00:38:05,270 --> 00:38:03,359

is a bread doesn't work real well in

1062

00:38:07,589 --> 00:38:05,280

space when you finish eating that peanut

1063

00:38:08,790 --> 00:38:07,599

butter sandwich what's left on the plate

1064

00:38:10,470 --> 00:38:08,800

crumbs

1065

00:38:12,150 --> 00:38:10,480

they don't go to the plate in space they

1066

00:38:14,230 --> 00:38:12,160

float in the air they're in your nose

1067

00:38:17,109 --> 00:38:14,240

they're in your computers

1068

00:38:18,390 --> 00:38:17,119

and so we use tortillas we eat a lot of

1069

00:38:20,470 --> 00:38:18,400

tortillas up there because they work

1070

00:38:22,870 --> 00:38:20,480

really great they hold together better

1071

00:38:26,310 --> 00:38:22,880

so you just take that pork chop

1072

00:38:27,430 --> 00:38:26,320

slap it in a tortilla add a little salsa

1073

00:38:28,310 --> 00:38:27,440

and uh

1074

00:38:30,310 --> 00:38:28,320

you know when you're good you know

1075

00:38:33,190 --> 00:38:30,320

better and jelly or peanut butter and

1076

00:38:34,790 --> 00:38:33,200

jelly absolutely i'm willing to try that

1077

00:38:36,150 --> 00:38:34,800

i eat a lot of peanut butter sandwiches

1078

00:38:38,310 --> 00:38:36,160

and i didn't miss out on my peanut

1079

00:38:40,230 --> 00:38:38,320

butter and space i ate it nicole i tried

1080

00:38:41,910 --> 00:38:40,240

that at home that will be more training

1081

00:38:44,630 --> 00:38:41,920

for you

1082

00:38:46,790 --> 00:38:44,640

see what you can eat with tortillas

1083

00:38:48,550 --> 00:38:46,800

and you each get to choose your own menu

1084

00:38:50,630 --> 00:38:48,560

right there are hundreds of choices and

1085

00:38:52,550 --> 00:38:50,640

you get to achieve whatever there is

1086

00:38:54,390 --> 00:38:52,560

there is a standard menu that repeats

1087

00:38:56,310 --> 00:38:54,400

every nine days

1088

00:38:58,390 --> 00:38:56,320

but yours isn't the same as him yes it

1089

00:39:00,790 --> 00:38:58,400

is oh it is it is now at the beginning

1090

00:39:02,630 --> 00:39:00,800

there was more uh more

1091

00:39:04,470 --> 00:39:02,640

uh more freedom but because of the way

1092

00:39:06,470 --> 00:39:04,480

the crews are stacking up we send a

1093

00:39:07,190 --> 00:39:06,480

standard thing up you know and we go for

1094

00:39:15,430 --> 00:39:07,200

the

1095

00:39:16,870 --> 00:39:15,440

hossein sauce mashed potatoes macaroni

1096

00:39:19,190 --> 00:39:16,880

and cheese but then we each get to bring

1097

00:39:20,870 --> 00:39:19,200

up some food that is our you know our

1098

00:39:22,630 --> 00:39:20,880

choice or or whatever

1099

00:39:25,510 --> 00:39:22,640

from the main menu and then other stuff

1100

00:39:27,109 --> 00:39:25,520

that's either certified um you know so

1101

00:39:28,710 --> 00:39:27,119

we do get to tailor it a little bit

1102

00:39:30,470 --> 00:39:28,720

coffees and teas too and i was really

1103

00:39:33,030 --> 00:39:30,480

lucky because katie's stuff got there

1104

00:39:34,550 --> 00:39:33,040

late and so i had a whole lot of really

1105

00:39:37,430 --> 00:39:34,560

great coffees that she'd ordered and i

1106

00:39:39,510 --> 00:39:37,440

hadn't thought about like oh bonus

1107

00:39:41,750 --> 00:39:39,520

do you find that after a while you're

1108

00:39:45,109 --> 00:39:41,760

craving for a fresh apple or a fresh

1109

00:39:47,349 --> 00:39:45,119

tomato or we get apples and tomatoes

1110

00:39:49,030 --> 00:39:47,359

they come up on the cargo ships yeah

1111

00:39:50,950 --> 00:39:49,040

i mean the things that with crumbs like

1112

00:39:52,310 --> 00:39:50,960

i like cookies you know and it's the

1113

00:39:54,470 --> 00:39:52,320

same bread thing it's not really all

1114

00:39:56,150 --> 00:39:54,480

that practical up there and so uh and

1115

00:39:58,390 --> 00:39:56,160

pizza i think all of us were kind of on

1116

00:40:01,270 --> 00:39:58,400

the pizza hunt i flew with an italian so

1117

00:40:03,030 --> 00:40:01,280

he was always on the pizza hunt

1118

00:40:04,309 --> 00:40:03,040

down here okay here we have another

1119

00:40:07,190 --> 00:40:04,319

question

1120

00:40:10,550 --> 00:40:07,200

well firstly congratulations on a great

1121

00:40:11,910 --> 00:40:10,560

expose my name is chris i'm australian

1122

00:40:14,550 --> 00:40:11,920

here on a visit

1123

00:40:15,990 --> 00:40:14,560

um my question deals with your mental

1124

00:40:19,670 --> 00:40:16,000

processes

1125

00:40:22,309 --> 00:40:19,680

really do you suffer boredom do you read

1126
00:40:25,190 --> 00:40:22,319
or are you so busy with your schedules

1127
00:40:28,710 --> 00:40:25,200
that you really totally focused mentally

1128
00:40:31,750 --> 00:40:28,720
for the whole of this particular period

1129
00:40:33,990 --> 00:40:31,760
thank you wow you can welcome

1130
00:40:35,349 --> 00:40:34,000
i mean i think we can both answer i

1131
00:40:37,430 --> 00:40:35,359
don't know if i've actually ever been

1132
00:40:39,190 --> 00:40:37,440
bored in my entire life

1133
00:40:40,710 --> 00:40:39,200
well i mean i don't know i

1134
00:40:42,550 --> 00:40:40,720
i think there's always something to

1135
00:40:43,829 --> 00:40:42,560
think about there's always something to

1136
00:40:45,829 --> 00:40:43,839
to learn

1137
00:40:47,670 --> 00:40:45,839
i do like to read i didn't choose to

1138
00:40:49,750 --> 00:40:47,680

take use my spare time that way on the

1139

00:40:51,589 --> 00:40:49,760

station i think a lot of us choose to

1140

00:40:53,510 --> 00:40:51,599

look out the window i would say you're

1141

00:40:55,670 --> 00:40:53,520

busy every single minute of the day and

1142

00:40:56,950 --> 00:40:55,680

i myself probably wish i had slept a

1143

00:40:58,630 --> 00:40:56,960

little bit more it's not like they don't

1144

00:41:00,630 --> 00:40:58,640

let you sleep or i couldn't sleep

1145

00:41:02,550 --> 00:41:00,640

there's just so much to do work wise and

1146

00:41:04,309 --> 00:41:02,560

also just personal wise spending time

1147

00:41:06,550 --> 00:41:04,319

you get to talk to your family you can

1148

00:41:08,950 --> 00:41:06,560

call them on the phone every single day

1149

00:41:10,630 --> 00:41:08,960

certainly once a day if you wanted to um

1150

00:41:12,870 --> 00:41:10,640

i mean more than that if you if you had

1151

00:41:15,190 --> 00:41:12,880

time which we don't um so there's time

1152

00:41:17,109 --> 00:41:15,200

just sharing and and maybe typing emails

1153

00:41:18,870 --> 00:41:17,119

to to sort of tell people what you've

1154

00:41:20,790 --> 00:41:18,880

been seeing mike did a really marvelous

1155

00:41:22,550 --> 00:41:20,800

job of writing emails that kind of went

1156

00:41:24,630 --> 00:41:22,560

to a large group and keeping in touch

1157

00:41:27,190 --> 00:41:24,640

with the scouts yeah

1158

00:41:29,030 --> 00:41:27,200

i read a little i had a book on the

1159

00:41:29,829 --> 00:41:29,040

shackleton expedition

1160

00:41:31,430 --> 00:41:29,839

that

1161

00:41:33,910 --> 00:41:31,440

was a failure as far as getting to the

1162

00:41:36,950 --> 00:41:33,920

south pole but it was a remarkable story

1163

00:41:37,990 --> 00:41:36,960

of leadership and survival and we saw

1164

00:41:41,030 --> 00:41:38,000

one of the

1165

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

the islands that is way down south

1166

00:41:47,349 --> 00:41:43,760

that's that i'd never seen before

1167

00:41:49,510 --> 00:41:47,359

that was uh elephant island no i'm

1168

00:41:50,950 --> 00:41:49,520

know south georgia island which is uh

1169

00:41:53,030 --> 00:41:50,960

kind of key to that whole story and we

1170

00:41:54,790 --> 00:41:53,040

saw that we managed to get photos of

1171

00:41:56,470 --> 00:41:54,800

that island i also read a little bit of

1172

00:41:58,150 --> 00:41:56,480

a book called the

1173

00:42:01,270 --> 00:41:58,160

closing of the american frontier written

1174

00:42:04,069 --> 00:42:01,280

by john turner um and

1175

00:42:05,670 --> 00:42:04,079

it which talked it's the book's very old

1176

00:42:08,230 --> 00:42:05,680

but it talks about the chain you know

1177

00:42:09,750 --> 00:42:08,240

the the development of the of the us you

1178

00:42:12,150 --> 00:42:09,760

know frontier and that frontier

1179

00:42:14,630 --> 00:42:12,160

mentality that kind of has shaped who we

1180

00:42:17,270 --> 00:42:14,640

are as a nation and then the impact you

1181

00:42:19,349 --> 00:42:17,280

know on our national psyche when when we

1182

00:42:21,190 --> 00:42:19,359

hit the west coast and you know there

1183

00:42:22,630 --> 00:42:21,200

was no more you know the front the

1184

00:42:25,109 --> 00:42:22,640

nature of the frontier changed and i

1185

00:42:27,109 --> 00:42:25,119

thought it was interesting to to read

1186

00:42:28,710 --> 00:42:27,119

about that at the same time we're

1187

00:42:31,990 --> 00:42:28,720

opening up you know we're really

1188

00:42:33,670 --> 00:42:32,000

settling in to another you know new area

1189

00:42:35,430 --> 00:42:33,680

i enjoyed photography

1190

00:42:36,790 --> 00:42:35,440

uh and figuring out how to capture these

1191

00:42:39,589 --> 00:42:36,800

views so we could share them with you

1192

00:42:41,190 --> 00:42:39,599

today i also am uh active in the boy

1193

00:42:43,190 --> 00:42:41,200

scouting program i'm a scout master and

1194

00:42:45,589 --> 00:42:43,200

i stayed in touch with all of my boys

1195

00:42:47,510 --> 00:42:45,599

from space and sent out greetings to

1196

00:42:49,430 --> 00:42:47,520

scout camps around the country and had

1197

00:42:51,190 --> 00:42:49,440

some fun doing that and i read i read

1198

00:42:53,589 --> 00:42:51,200

actually just what i would do down here

1199

00:42:55,430 --> 00:42:53,599

i read actually books to my son who was

1200

00:42:58,069 --> 00:42:55,440

down here uh there's a really neat

1201
00:42:59,990 --> 00:42:58,079
series called peter and the starcatchers

1202
00:43:01,829 --> 00:43:00,000
and it has it's it's like about peter

1203
00:43:03,190 --> 00:43:01,839
pan before he was peter pan and i

1204
00:43:05,030 --> 00:43:03,200
thought it was especially appropriate

1205
00:43:07,190 --> 00:43:05,040
because when i'm flying up there i

1206
00:43:08,710 --> 00:43:07,200
really feel like peter pan like if you

1207
00:43:10,390 --> 00:43:08,720
think about that you know that fairy

1208
00:43:12,470 --> 00:43:10,400
dust and suddenly you could fly that's

1209
00:43:13,829 --> 00:43:12,480
what i felt like up there in this series

1210
00:43:16,390 --> 00:43:13,839
that was written by dave berry and

1211
00:43:19,270 --> 00:43:16,400
ridley pearson it's got you know smart

1212
00:43:20,950 --> 00:43:19,280
girls and smart boys and pirates and

1213
00:43:22,870 --> 00:43:20,960

fighting and treasure and everything

1214

00:43:25,349 --> 00:43:22,880

that uh everything that anybody under

1215

00:43:27,190 --> 00:43:25,359

the age of 65 could like

1216

00:43:29,430 --> 00:43:27,200

and we saw one scene of you with your

1217

00:43:31,589 --> 00:43:29,440

musical instruments yep

1218

00:43:33,030 --> 00:43:31,599

actually i played i brought uh some

1219

00:43:34,150 --> 00:43:33,040

irish flutes up there that i think

1220

00:43:35,270 --> 00:43:34,160

you'll hear a little bit more uh

1221

00:43:37,349 --> 00:43:35,280

starting

1222

00:43:39,750 --> 00:43:37,359

this week the chieftains actually used

1223

00:43:41,430 --> 00:43:39,760

what i played uh um in an album that

1224

00:43:43,750 --> 00:43:41,440

they're just about to release their 50th

1225

00:43:45,910 --> 00:43:43,760

anniversary album and so i played those

1226

00:43:47,990 --> 00:43:45,920

irish flutes one of which was 150 years

1227

00:43:50,309 --> 00:43:48,000

old so it's kind of this contrast of a

1228

00:43:51,910 --> 00:43:50,319

brand new space station in a and making

1229

00:43:53,670 --> 00:43:51,920

music in a way that they've been making

1230

00:43:56,550 --> 00:43:53,680

it for hundreds and hundreds and

1231

00:43:58,390 --> 00:43:56,560

hundreds of years uh and also played a

1232

00:43:59,910 --> 00:43:58,400

neat duet on my silver flute with

1233

00:44:03,030 --> 00:43:59,920

actually on his silver flute with ian

1234

00:44:04,790 --> 00:44:03,040

anderson of jethro tulle

1235

00:44:06,630 --> 00:44:04,800

and i imagine that your crewmates

1236

00:44:08,069 --> 00:44:06,640

enjoyed having your musical ability you

1237

00:44:09,750 --> 00:44:08,079

know you'll have to check with them

1238

00:44:11,430 --> 00:44:09,760

about that

1239

00:44:13,109 --> 00:44:11,440

i played late at night in the cupola

1240

00:44:16,150 --> 00:44:13,119

because it had the best view on earth so

1241

00:44:18,870 --> 00:44:16,160

to speak oh yes and uh and it was kind

1242

00:44:21,910 --> 00:44:19,910

hello

1243

00:44:23,750 --> 00:44:21,920

my name is andrew and i work here at the

1244

00:44:26,150 --> 00:44:23,760

how things fly gallery mostly with the

1245

00:44:27,910 --> 00:44:26,160

kids and i was wondering uh what your

1246

00:44:30,309 --> 00:44:27,920

opinions are on the

1247

00:44:31,750 --> 00:44:30,319

growth of the private industry into

1248

00:44:34,230 --> 00:44:31,760

going into space and

1249

00:44:36,390 --> 00:44:34,240

when the rest of us can maybe hope to

1250

00:44:39,109 --> 00:44:36,400

maybe be able to go into space as well i

1251

00:44:41,829 --> 00:44:39,119

think it's exciting there's there's it

1252

00:44:43,829 --> 00:44:41,839

it's exciting and it's also unsettling

1253

00:44:45,670 --> 00:44:43,839

in ways because we're not completely

1254

00:44:48,230 --> 00:44:45,680

sure how the next chapters are going to

1255

00:44:51,109 --> 00:44:48,240

play out there are a lot of really smart

1256

00:44:53,030 --> 00:44:51,119

people really motivated companies

1257

00:44:56,630 --> 00:44:53,040

that are working on this

1258

00:44:58,150 --> 00:44:56,640

they're taking a non-nasa approach to it

1259

00:44:59,990 --> 00:44:58,160

there's good things about that and

1260

00:45:01,750 --> 00:45:00,000

there's things about that that that i

1261

00:45:04,710 --> 00:45:01,760

don't you know that i want to look at a

1262

00:45:07,430 --> 00:45:04,720

little bit more before i decide but um i

1263

00:45:08,870 --> 00:45:07,440

i think that you know we're

1264

00:45:10,710 --> 00:45:08,880

we will we'll see

1265

00:45:12,309 --> 00:45:10,720

you know some breakthroughs in different

1266

00:45:13,829 --> 00:45:12,319

areas and we've already seen some of

1267

00:45:15,829 --> 00:45:13,839

those as they're all taking kind of a

1268

00:45:18,950 --> 00:45:15,839

different approach to it and we're going

1269

00:45:21,109 --> 00:45:18,960

to find ways that work and and in the

1270

00:45:22,950 --> 00:45:21,119

early days of flying airplanes it was

1271

00:45:23,829 --> 00:45:22,960

the us government that flew airplanes

1272

00:45:25,829 --> 00:45:23,839

and

1273

00:45:27,750 --> 00:45:25,839

you know for military purposes in the

1274

00:45:29,349 --> 00:45:27,760

beginning and then

1275

00:45:31,430 --> 00:45:29,359

you know we built bombers that could fly

1276

00:45:32,550 --> 00:45:31,440

across oceans and then we built

1277

00:45:34,790 --> 00:45:32,560

passenger

1278

00:45:37,349 --> 00:45:34,800

airplanes that could fly across oceans

1279

00:45:39,270 --> 00:45:37,359

and so i think we're we're seeing that

1280

00:45:41,510 --> 00:45:39,280

you know it's just been 50 years since

1281

00:45:43,270 --> 00:45:41,520

uh you know in a few months since the

1282

00:45:45,589 --> 00:45:43,280

first human launched into space and what

1283

00:45:47,190 --> 00:45:45,599

a difference you know what what

1284

00:45:49,990 --> 00:45:47,200

changes we have seen

1285

00:45:52,150 --> 00:45:50,000

and that took place only 50 years after

1286

00:45:54,230 --> 00:45:52,160

the first airplane flew

1287

00:45:56,870 --> 00:45:54,240

so aviation itself is just over 100

1288

00:45:58,150 --> 00:45:56,880

years old and and so there's been a you

1289

00:46:00,550 --> 00:45:58,160

know an incredible amount of changes and

1290

00:46:02,790 --> 00:46:00,560

those changes accelerate as the

1291

00:46:05,990 --> 00:46:02,800

technology accelerates and so we're

1292

00:46:09,349 --> 00:46:06,000

going to see it we're going to see it

1293

00:46:10,950 --> 00:46:09,359

do we have one last question

1294

00:46:13,190 --> 00:46:10,960

okay

1295

00:46:14,630 --> 00:46:13,200

and then i'll turn it on

1296

00:46:16,550 --> 00:46:14,640

hi guys i'm whitney i had a quick

1297

00:46:18,069 --> 00:46:16,560

question for you um it's a two-parter

1298

00:46:19,589 --> 00:46:18,079

i'm here with my colleague megan who's

1299

00:46:21,270 --> 00:46:19,599

actually a student pharmacist from the

1300

00:46:22,710 --> 00:46:21,280

university of rhode island so i've been

1301
00:46:24,790 --> 00:46:22,720
bribing her that she needs to become a

1302
00:46:26,550 --> 00:46:24,800
nasa fellow as quickly as humanly

1303
00:46:28,309 --> 00:46:26,560
possible to do some studies with you

1304
00:46:30,550 --> 00:46:28,319
guys um she had a really great question

1305
00:46:32,470 --> 00:46:30,560
about becoming sick and what happens if

1306
00:46:34,870 --> 00:46:32,480
on the off chance a strange little virus

1307
00:46:36,470 --> 00:46:34,880
passes through your

1308
00:46:37,670 --> 00:46:36,480
gates and gets on the shuttle and how

1309
00:46:39,349 --> 00:46:37,680
you guys handle that when you're up at

1310
00:46:41,510 --> 00:46:39,359
iss and it's there

1311
00:46:43,349 --> 00:46:41,520
and i had to ask not everybody can see

1312
00:46:46,870 --> 00:46:43,359
your boots but they have a patch on them

1313
00:46:47,910 --> 00:46:46,880

and i was curious what the story was

1314

00:46:49,910 --> 00:46:47,920

okay

1315

00:46:51,430 --> 00:46:49,920

i'll answer that first

1316

00:46:53,270 --> 00:46:51,440

i'm a texan

1317

00:46:55,510 --> 00:46:53,280

and and so i just wear boots all the

1318

00:46:57,829 --> 00:46:55,520

time this is a patch these are some

1319

00:46:59,589 --> 00:46:57,839

custom boots with a patch from my second

1320

00:47:00,950 --> 00:46:59,599

shuttle mission

1321

00:47:03,190 --> 00:47:00,960

actually

1322

00:47:05,030 --> 00:47:03,200

built in sewed into the boots themselves

1323

00:47:07,190 --> 00:47:05,040

it's just for fun you know keep in mind

1324

00:47:09,030 --> 00:47:07,200

that we did a lot of training in russia

1325

00:47:10,790 --> 00:47:09,040

and so you know you saw the soyuz i mean

1326

00:47:12,710 --> 00:47:10,800

so we have soyuz simulators and they're

1327

00:47:14,390 --> 00:47:12,720

just like little soyuz right and there's

1328

00:47:16,069 --> 00:47:14,400

a kind of a like a three-step thing to

1329

00:47:17,990 --> 00:47:16,079

get up to the platform boots in houston

1330

00:47:19,510 --> 00:47:18,000

no big deal and yeah and we have

1331

00:47:22,069 --> 00:47:19,520

similar in houston and you leave your

1332

00:47:24,069 --> 00:47:22,079

shoes outside often but uh but in the in

1333

00:47:25,750 --> 00:47:24,079

russia you always leave your your shoes

1334

00:47:28,069 --> 00:47:25,760

outside the simulator and they'll just

1335

00:47:29,589 --> 00:47:28,079

be like you know shoes a couple pairs of

1336

00:47:31,670 --> 00:47:29,599

shoes two pairs of shoes and then mike's

1337

00:47:33,829 --> 00:47:31,680

boots cowboy boots and you know people

1338

00:47:35,349 --> 00:47:33,839

would be like taking pictures of those

1339

00:47:36,549 --> 00:47:35,359

cowboy boots outside

1340

00:47:40,710 --> 00:47:36,559

of the simulator there'd be people

1341

00:47:44,309 --> 00:47:42,710

they knew when i was in town but the

1342

00:47:47,109 --> 00:47:44,319

other question was about getting sick up

1343

00:47:49,030 --> 00:47:47,119

there um first we undergo a quarantine

1344

00:47:50,950 --> 00:47:49,040

before we go to try not to be sick and

1345

00:47:53,109 --> 00:47:50,960

not to bring things up to the station

1346

00:47:55,270 --> 00:47:53,119

with us and at the same time you know

1347

00:47:56,790 --> 00:47:55,280

they thought ahead we have every drug

1348

00:47:58,309 --> 00:47:56,800

imaginable

1349

00:48:00,309 --> 00:47:58,319

and we've got directions on board in

1350

00:48:01,750 --> 00:48:00,319

case we couldn't get hold of anybody we

1351

00:48:03,109 --> 00:48:01,760

almost always could get a hold of

1352

00:48:05,349 --> 00:48:03,119

someone and actually the way we are

1353

00:48:06,549 --> 00:48:05,359

forced to do medicine in terms of you

1354

00:48:07,990 --> 00:48:06,559

know if we could get hold of someone and

1355

00:48:10,390 --> 00:48:08,000

get some coaching and even let's say

1356

00:48:12,390 --> 00:48:10,400

somebody gets cut or hurt you know you'd

1357

00:48:13,910 --> 00:48:12,400

like a doctor to look at that especially

1358

00:48:15,430 --> 00:48:13,920

you know i always say that the only

1359

00:48:17,190 --> 00:48:15,440

thing scarier than a doctor coming at

1360

00:48:19,190 --> 00:48:17,200

you a needle with a needle is a pilot

1361

00:48:20,950 --> 00:48:19,200

coming at you with a needle right

1362

00:48:22,309 --> 00:48:20,960

but um but you know we don't even though

1363

00:48:23,670 --> 00:48:22,319

they're not up here none of us have i

1364

00:48:25,109 --> 00:48:23,680

guess the toshi was a doctor on your

1365

00:48:27,670 --> 00:48:25,119

crew but we didn't happen to have any on

1366

00:48:29,990 --> 00:48:27,680

our crew but you know we can show our

1367

00:48:31,829 --> 00:48:30,000

hand or whatever to the camera and our

1368

00:48:33,349 --> 00:48:31,839

docs can take a look and we can all talk

1369

00:48:35,589 --> 00:48:33,359

about well you know if you were gonna do

1370

00:48:36,710 --> 00:48:35,599

lace that up then you should do some

1371

00:48:38,470 --> 00:48:36,720

stitches you know you should do the

1372

00:48:40,309 --> 00:48:38,480

painkilling shots here and here and do

1373

00:48:43,670 --> 00:48:40,319

the stitches this way and but we're also

1374

00:48:45,270 --> 00:48:43,680

trained like that beforehand um and so

1375

00:48:47,030 --> 00:48:45,280

you know we all take when we take that

1376

00:48:50,150 --> 00:48:47,040

that training pretty seriously even to

1377

00:48:52,309 --> 00:48:50,160

the we have defibrillators um up there

1378

00:48:53,430 --> 00:48:52,319

and i urge all of you to

1379

00:48:54,870 --> 00:48:53,440

kind of notice when you're walking

1380

00:48:56,390 --> 00:48:54,880

around some public place and you're in

1381

00:48:57,829 --> 00:48:56,400

the subway or wherever i mean those

1382

00:49:00,230 --> 00:48:57,839

defibrillators that's the way people

1383

00:49:01,910 --> 00:49:00,240

survive heart attacks and uh you know so

1384

00:49:03,670 --> 00:49:01,920

it was really felt very privileged to

1385

00:49:04,870 --> 00:49:03,680

get trained to do that and they're not

1386

00:49:07,430 --> 00:49:04,880

hard to use they give you all the

1387

00:49:10,309 --> 00:49:07,440

directions and so uh we we i think we

1388

00:49:11,750 --> 00:49:10,319

bring telemedicine a ways um by what

1389

00:49:13,270 --> 00:49:11,760

we're forced to do up there on the space

1390

00:49:14,829 --> 00:49:13,280

station

1391

00:49:17,750 --> 00:49:14,839

did you talk about

1392

00:49:19,750 --> 00:49:17,760

quarantine yeah okay okay since we have

1393

00:49:21,990 --> 00:49:19,760

more time so we can keep going

1394

00:49:23,510 --> 00:49:22,000

time to do one or two more yeah okay

1395

00:49:25,349 --> 00:49:23,520

apparently we do have time for a couple

1396

00:49:27,990 --> 00:49:25,359

more questions so is there anyone else

1397

00:49:29,510 --> 00:49:28,000

over on this we're having fun

1398

00:49:31,910 --> 00:49:29,520

we'll get those we don't want to go back

1399

00:49:33,589 --> 00:49:31,920

to work so you guys just ask away

1400

00:49:34,950 --> 00:49:33,599

mary winstead from greensboro north

1401
00:49:36,230 --> 00:49:34,960
carolina

1402
00:49:37,430 --> 00:49:36,240
i um

1403
00:49:39,190 --> 00:49:37,440
years ago

1404
00:49:41,750 --> 00:49:39,200
my husband and i

1405
00:49:42,549 --> 00:49:41,760
we visited the grand canyon

1406
00:49:46,950 --> 00:49:42,559
and

1407
00:49:48,470 --> 00:49:46,960
canyon it just made me feel a little

1408
00:49:52,150 --> 00:49:48,480
insignificant

1409
00:49:54,309 --> 00:49:52,160
because you know how huge the area is

1410
00:49:56,710 --> 00:49:54,319
and i was just wondering well how can

1411
00:49:59,829 --> 00:49:56,720
you tell can you please tell us how it

1412
00:50:02,150 --> 00:49:59,839
makes you feel being outside you know of

1413
00:50:05,349 --> 00:50:02,160

the earth looking down looking back at

1414

00:50:08,069 --> 00:50:05,359

the earth how it makes you feel

1415

00:50:10,069 --> 00:50:08,079

okay i got it how does it make you feel

1416

00:50:13,270 --> 00:50:10,079

significant looking down

1417

00:50:16,710 --> 00:50:14,230

and

1418

00:50:19,190 --> 00:50:16,720

you know i'm a technical person but i

1419

00:50:22,710 --> 00:50:19,200

you know try to you know see it you know

1420

00:50:23,910 --> 00:50:22,720

with you know with an artistic eye also

1421

00:50:29,190 --> 00:50:23,920

for me

1422

00:50:30,710 --> 00:50:29,200

flight on the shuttle my job was to jump

1423

00:50:32,870 --> 00:50:30,720

out of my seat as soon as we got to

1424

00:50:34,870 --> 00:50:32,880

orbit and unstrapped and the engines cut

1425

00:50:36,870 --> 00:50:34,880

off and immediately unstrap grab a

1426
00:50:38,870 --> 00:50:36,880
camera and a camcorder and jump up to

1427
00:50:41,349 --> 00:50:38,880
the window to get

1428
00:50:43,510 --> 00:50:41,359
pictures of our fuel tank as it as it

1429
00:50:44,309 --> 00:50:43,520
fell away

1430
00:50:46,069 --> 00:50:44,319
and

1431
00:50:48,470 --> 00:50:46,079
i've dreamed about this

1432
00:50:49,910 --> 00:50:48,480
since i was a little kid and worked you

1433
00:50:51,990 --> 00:50:49,920
know very hard for a lot of years for

1434
00:50:53,270 --> 00:50:52,000
the opportunity and i'm finally here and

1435
00:50:55,030 --> 00:50:53,280
you go through all the emotions of

1436
00:50:56,549 --> 00:50:55,040
riding you know on top of four and a

1437
00:50:59,430 --> 00:50:56,559
half million pounds of explosive

1438
00:51:01,109 --> 00:50:59,440

propellant and uh now you're in space

1439

00:51:02,309 --> 00:51:01,119

and you're floating but to jump up to

1440

00:51:04,390 --> 00:51:02,319

that window

1441

00:51:06,549 --> 00:51:04,400

and look at the north atlantic with the

1442

00:51:08,230 --> 00:51:06,559

blue ocean down below with a dappling of

1443

00:51:10,390 --> 00:51:08,240

white clouds spread across the top to

1444

00:51:11,270 --> 00:51:10,400

see the horizon there's a curve

1445

00:51:13,589 --> 00:51:11,280

that

1446

00:51:15,190 --> 00:51:13,599

blot intensely black sky up above even

1447

00:51:16,790 --> 00:51:15,200

though it's daylight

1448

00:51:18,390 --> 00:51:16,800

and then see the little thin band of

1449

00:51:20,790 --> 00:51:18,400

atmosphere about half the thickness of

1450

00:51:23,190 --> 00:51:20,800

the little finger on the horizon to see

1451
00:51:25,190 --> 00:51:23,200
that with my own eyes not a video not a

1452
00:51:28,950 --> 00:51:25,200
picture but my own eyes

1453
00:51:30,230 --> 00:51:28,960
was just stunning and i i just i it

1454
00:51:32,549 --> 00:51:30,240
dawned on me i'm looking at the world

1455
00:51:35,430 --> 00:51:32,559
like god sees the world took it from out

1456
00:51:36,870 --> 00:51:35,440
like like this and uh it was just i was

1457
00:51:39,030 --> 00:51:36,880
shocked for a moment

1458
00:51:41,349 --> 00:51:39,040
uh said a quick thanks and now it's time

1459
00:51:43,270 --> 00:51:41,359
to get to work yes exactly you know on

1460
00:51:44,549 --> 00:51:43,280
the on the lighter side i flew on my

1461
00:51:46,950 --> 00:51:44,559
first flight with that other guy from

1462
00:51:48,710 --> 00:51:46,960
massachusetts so cape cod was glad to be

1463
00:51:51,349 --> 00:51:48,720

from a place that has such a you know

1464

00:51:53,589 --> 00:51:51,359

very visual recognizable you know

1465

00:51:55,190 --> 00:51:53,599

geographical feature there and we looked

1466

00:51:56,790 --> 00:51:55,200

out the first time that we saw cape cod

1467

00:51:58,950 --> 00:51:56,800

and he has kind of a massachusetts

1468

00:52:03,270 --> 00:51:58,960

accent and he looks down and goes oh my

1469

00:52:05,910 --> 00:52:04,470

but it's pretty neat i mean i've been

1470

00:52:07,430 --> 00:52:05,920

looking over here at the the sort of

1471

00:52:09,750 --> 00:52:07,440

google earth thing you have over here

1472

00:52:12,630 --> 00:52:09,760

and it's uh it's it's pretty planet we

1473

00:52:14,390 --> 00:52:12,640

have well and we have um our view from

1474

00:52:17,270 --> 00:52:14,400

the shuttle and space station here

1475

00:52:19,190 --> 00:52:17,280

projected on the wall and

1476
00:52:22,150 --> 00:52:19,200
when we don't have these bright lights

1477
00:52:23,430 --> 00:52:22,160
on for the program it really makes us

1478
00:52:25,349 --> 00:52:23,440
feel as if

1479
00:52:27,510 --> 00:52:25,359
we're drifting out into space it's

1480
00:52:29,990 --> 00:52:27,520
beautiful we've got time for one more

1481
00:52:32,710 --> 00:52:30,000
okay hi i'm peter from kensington

1482
00:52:35,109 --> 00:52:32,720
maryland i understand the space

1483
00:52:36,470 --> 00:52:35,119
station will be visible tonight at about

1484
00:52:38,950 --> 00:52:36,480
6 15

1485
00:52:41,670 --> 00:52:38,960
provided it's not snowing could you say

1486
00:52:45,589 --> 00:52:41,680
something about how often the station

1487
00:52:47,030 --> 00:52:45,599
comes over and how often you can see it

1488
00:52:50,069 --> 00:52:47,040

that's a great question part of it

1489

00:52:51,589 --> 00:52:50,079

depends on on how far north or south you

1490

00:52:53,349 --> 00:52:51,599

happen to live i

1491

00:52:54,630 --> 00:52:53,359

i'm embarrassed i did not know that it

1492

00:52:56,549 --> 00:52:54,640

was going to be visible this evening

1493

00:52:58,870 --> 00:52:56,559

that's a really cool thing to share

1494

00:53:00,710 --> 00:52:58,880

if you have not seen it before go

1495

00:53:03,510 --> 00:53:00,720

outside um

1496

00:53:04,870 --> 00:53:03,520

it the the what the time when you can

1497

00:53:06,549 --> 00:53:04,880

see it is

1498

00:53:07,829 --> 00:53:06,559

after sunset

1499

00:53:10,390 --> 00:53:07,839

you know how sometimes you can see the

1500

00:53:12,829 --> 00:53:10,400

airline flying it's the sun is set here

1501
00:53:15,109 --> 00:53:12,839
but you could see maybe even the

1502
00:53:16,470 --> 00:53:15,119
mountaintops not here obviously but if

1503
00:53:18,069 --> 00:53:16,480
you're around mountains you see that the

1504
00:53:20,069 --> 00:53:18,079
sun is still shining on the mountaintop

1505
00:53:21,510 --> 00:53:20,079
even though in the valleys it's it's the

1506
00:53:25,030 --> 00:53:21,520
sun has set

1507
00:53:26,790 --> 00:53:25,040
same thing we're 220 to 40 miles up

1508
00:53:28,870 --> 00:53:26,800
and so when it's dark on the ground the

1509
00:53:31,910 --> 00:53:28,880
space station you know aft just after

1510
00:53:34,630 --> 00:53:31,920
sun set and just before sunrise within

1511
00:53:35,829 --> 00:53:34,640
an hour or two hours sunrise and sunset

1512
00:53:37,829 --> 00:53:35,839
it's it's visible because it's

1513
00:53:39,990 --> 00:53:37,839

illuminated even though and so you could

1514

00:53:41,829 --> 00:53:40,000

see it and it's really big and those big

1515

00:53:44,150 --> 00:53:41,839

solar panels and stuff reflect a lot of

1516

00:53:45,990 --> 00:53:44,160

light i mean i urge you to uh go to the

1517

00:53:48,150 --> 00:53:46,000

internet maybe find out the exact time i

1518

00:53:51,670 --> 00:53:48,160

mean is it exactly 6 15

1519

00:53:54,790 --> 00:53:51,680

is it exactly 6 15 tonight

1520

00:53:57,589 --> 00:53:54,800

i believe it is 6 15 tonight it's about

1521

00:54:00,069 --> 00:53:57,599

51 degrees altitude and it'll be

1522

00:54:01,670 --> 00:54:00,079

traveling from southwest to

1523

00:54:03,589 --> 00:54:01,680

north northwest so he just said

1524

00:54:05,030 --> 00:54:03,599

everything that's important which when i

1525

00:54:06,950 --> 00:54:05,040

look at that chart it's a look on the

1526
00:54:08,710 --> 00:54:06,960
internet it's on the nasa site you know

1527
00:54:11,030 --> 00:54:08,720
you can put in wherever you live and

1528
00:54:12,390 --> 00:54:11,040
it'll tell you and you may think oh i'm

1529
00:54:14,150 --> 00:54:12,400
not the kind of person that can see that

1530
00:54:15,990 --> 00:54:14,160
kind of thing it's going to be the

1531
00:54:17,990 --> 00:54:16,000
brightest star given that it's clear out

1532
00:54:20,710 --> 00:54:18,000
it's the brightest star and it's going

1533
00:54:22,710 --> 00:54:20,720
to go over at about this fast when he

1534
00:54:24,549 --> 00:54:22,720
said about 50 degrees anything over

1535
00:54:25,910 --> 00:54:24,559
about 30 is going to look like it's up

1536
00:54:27,589 --> 00:54:25,920
there and anything like 50 is going to

1537
00:54:30,230 --> 00:54:27,599
look like it's directly overhead even

1538
00:54:31,430 --> 00:54:30,240

though that's actually 90. um and so

1539

00:54:33,829 --> 00:54:31,440

it's the thing it's just going to be a

1540

00:54:34,790 --> 00:54:33,839

really bright star going about this

1541

00:54:36,549 --> 00:54:34,800

speed

1542

00:54:38,870 --> 00:54:36,559

and there's six people aboard no

1543

00:54:40,630 --> 00:54:38,880

flashing lights and no flashing lights

1544

00:54:42,390 --> 00:54:40,640

otherwise it's an airplane but you can

1545

00:54:43,910 --> 00:54:42,400

see it and i just urge you i think it's

1546

00:54:45,990 --> 00:54:43,920

just pretty neat when you talked about

1547

00:54:47,510 --> 00:54:46,000

the grand canyon and stand on the edge i

1548

00:54:49,349 --> 00:54:47,520

feel a little bit like that when i'm

1549

00:54:51,190 --> 00:54:49,359

standing on the earth and i look up and

1550

00:54:53,750 --> 00:54:51,200

i know my friends are at work or on

1551
00:54:55,750 --> 00:54:53,760
their way to bed up on the space station

1552
00:54:57,750 --> 00:54:55,760
yeah

1553
00:54:59,510 --> 00:54:57,760
would you two like to make any closing

1554
00:55:00,470 --> 00:54:59,520
comments

1555
00:55:03,589 --> 00:55:00,480
sure

1556
00:55:06,150 --> 00:55:03,599
yeah you close okay okay

1557
00:55:09,109 --> 00:55:06,160
i i hope you do get to see it it's the

1558
00:55:13,349 --> 00:55:09,119
space station was actually begun the

1559
00:55:15,829 --> 00:55:13,359
program was begun about 30 years ago

1560
00:55:17,349 --> 00:55:15,839
and it took a long time to get there

1561
00:55:19,030 --> 00:55:17,359
there were a lot of twists and turns

1562
00:55:20,630 --> 00:55:19,040
along the way some delays along the way

1563
00:55:24,470 --> 00:55:20,640

and that 30 years ago it was a concept

1564

00:55:25,510 --> 00:55:24,480

it was a few a few briefing charts um

1565

00:55:27,270 --> 00:55:25,520

but it

1566

00:55:29,990 --> 00:55:27,280

you know the space shuttle has really

1567

00:55:31,589 --> 00:55:30,000

fulfilled its you know final really

1568

00:55:33,910 --> 00:55:31,599

really huge mission the mission for

1569

00:55:35,990 --> 00:55:33,920

which it was built hauling big pieces of

1570

00:55:37,990 --> 00:55:36,000

stuff to space

1571

00:55:40,950 --> 00:55:38,000

and and the space station that we have

1572

00:55:42,950 --> 00:55:40,960

today the size of the the modules the

1573

00:55:45,589 --> 00:55:42,960

pieces the internal volume that we have

1574

00:55:47,430 --> 00:55:45,599

to fly in i mean that's because of the

1575

00:55:49,109 --> 00:55:47,440

space shuttle program because that big

1576

00:55:51,349 --> 00:55:49,119

cargo bay had the ability to haul those

1577

00:55:53,109 --> 00:55:51,359

things the other parts of the station

1578

00:55:55,990 --> 00:55:53,119

that did not fly up on the shuttle or

1579

00:55:57,910 --> 00:55:56,000

smaller diameter uh with you know less

1580

00:56:00,309 --> 00:55:57,920

commensurate less capability it's an

1581

00:56:02,309 --> 00:56:00,319

amazing thing that we've done

1582

00:56:05,030 --> 00:56:02,319

and it's a testament to you know the

1583

00:56:06,710 --> 00:56:05,040

dreams and commitment of of really tens

1584

00:56:09,109 --> 00:56:06,720

of thousands hundreds of thousands of

1585

00:56:11,109 --> 00:56:09,119

people around the planet with 15

1586

00:56:12,870 --> 00:56:11,119

countries participating in this

1587

00:56:14,829 --> 00:56:12,880

countries that don't have a long history

1588

00:56:17,349 --> 00:56:14,839

of you know friendly relations and

1589

00:56:18,470 --> 00:56:17,359

cooperation you know like russia

1590

00:56:20,789 --> 00:56:18,480

um

1591

00:56:23,430 --> 00:56:20,799

but it you know it really is a testament

1592

00:56:24,630 --> 00:56:23,440

though to to the human ingenuity and

1593

00:56:27,270 --> 00:56:24,640

persistence

1594

00:56:29,589 --> 00:56:27,280

and the the the drive to turn this kind

1595

00:56:31,589 --> 00:56:29,599

of a dream into a reality you know we

1596

00:56:33,270 --> 00:56:31,599

had personal dreams to participate in

1597

00:56:35,349 --> 00:56:33,280

the program in some way

1598

00:56:38,069 --> 00:56:35,359

and and each of us has our own story for

1599

00:56:40,390 --> 00:56:38,079

how we we managed to you know persevere

1600

00:56:42,470 --> 00:56:40,400

and go through school and and seize on

1601
00:56:43,990 --> 00:56:42,480
different opportunities to you know to

1602
00:56:45,910 --> 00:56:44,000
prepare ourselves if we ever got the

1603
00:56:48,710 --> 00:56:45,920
opportunity to do this and we're very

1604
00:56:51,109 --> 00:56:48,720
blessed in so many ways but and we we

1605
00:56:53,190 --> 00:56:51,119
also take our responsibility in that

1606
00:56:55,349 --> 00:56:53,200
seriously because we know we're flying

1607
00:56:58,150 --> 00:56:55,359
for you but not everybody's going to get

1608
00:57:00,390 --> 00:56:58,160
the opportunity to do this now and we

1609
00:57:01,910 --> 00:57:00,400
would do our best you know to to make

1610
00:57:03,109 --> 00:57:01,920
the best of that experience to get our

1611
00:57:05,109 --> 00:57:03,119
work done

1612
00:57:06,630 --> 00:57:05,119
and then find ways to to share the

1613
00:57:09,750 --> 00:57:06,640

experience and a little bit of the

1614

00:57:12,950 --> 00:57:09,760

wonder but it's what it's really like

1615

00:57:13,750 --> 00:57:12,960

and i just say again that welcome to the

1616

00:57:16,549 --> 00:57:13,760

uh

1617

00:57:19,270 --> 00:57:16,559

the air and space museum it it's a

1618

00:57:20,630 --> 00:57:19,280

magical place with the stories behind

1619

00:57:22,789 --> 00:57:20,640

each one of these amazing flying

1620

00:57:25,510 --> 00:57:22,799

machines through the halls around here

1621

00:57:26,950 --> 00:57:25,520

and it's really an honor for us to to be

1622

00:57:29,190 --> 00:57:26,960

here to be part of this to tell our

1623

00:57:31,510 --> 00:57:29,200

stories thank you very much thank you

1624

00:57:35,910 --> 00:57:31,520

thank you

1625

00:57:38,069 --> 00:57:35,920

you two have certainly both added to the

1626
00:57:39,910 --> 00:57:38,079
stories that we can tell here in this

1627
00:57:41,990 --> 00:57:39,920
gallery and that we'll be able to tell

1628
00:57:43,190 --> 00:57:42,000
when we have discovery on display and

1629
00:57:45,109 --> 00:57:43,200
think about it you know each of the

1630
00:57:47,030 --> 00:57:45,119
little beasts around here that you see

1631
00:57:48,870 --> 00:57:47,040
these big things i mean

1632
00:57:51,030 --> 00:57:48,880
there's people that that was their life

1633
00:57:52,390 --> 00:57:51,040
to get that thing built and operating

1634
00:57:55,589 --> 00:57:52,400
and so there's these kind of stories

1635
00:57:57,750 --> 00:57:55,599
around every everything in this museum

1636
00:57:59,589 --> 00:57:57,760
so we so appreciate your spending this

1637
00:58:01,670 --> 00:57:59,599
time this afternoon with us and we

1638
00:58:03,910 --> 00:58:01,680

appreciate all of you who came today

1639

00:58:06,309 --> 00:58:03,920

great question to the museum and came to

1640

00:58:09,349 --> 00:58:06,319

this talk uh let's give our astronauts

1641

00:58:11,030 --> 00:58:09,359

one more round of applause

1642

00:58:13,030 --> 00:58:11,040

oops i guess i'm giving myself a hand

1643

00:58:16,069 --> 00:58:13,040

yeah it's okay