



1
00:00:08,150 --> 00:00:03,830
station this is houston are you ready

2
00:00:14,470 --> 00:00:09,830
houston station we are ready for the

3
00:00:19,029 --> 00:00:16,310
nbc this is mission control houston

4
00:00:21,590 --> 00:00:19,039
please call station for voice check

5
00:00:25,910 --> 00:00:21,600
station this is chuck todd with nbc how

6
00:00:30,230 --> 00:00:28,070
hey hello from the international space

7
00:00:31,750 --> 00:00:30,240
station i've got you loud and clear

8
00:00:36,069 --> 00:00:31,760
excellent

9
00:00:40,310 --> 00:00:38,470
yep we are on board international space

10
00:00:41,590 --> 00:00:40,320
station as part of the expedition 49

11
00:00:45,910 --> 00:00:41,600
crew

12
00:00:49,910 --> 00:00:47,590
all right so we can get started all

13
00:00:49,920 --> 00:01:02,549

ah okay

14

00:01:07,109 --> 00:01:04,390

all right joining me now is astronaut

15

00:01:08,789 --> 00:01:07,119

kate rubin she's a virologist on the

16

00:01:11,190 --> 00:01:08,799

international space station she launched

17

00:01:13,350 --> 00:01:11,200

for space in early july for a four-month

18

00:01:15,030 --> 00:01:13,360

mission since she's been in orbit rubens

19

00:01:16,550 --> 00:01:15,040

has become the first person to sequence

20

00:01:18,230 --> 00:01:16,560

dna in space

21

00:01:19,910 --> 00:01:18,240

she added a piece of equipment to the

22

00:01:22,070 --> 00:01:19,920

outside of the space station during a

23

00:01:23,830 --> 00:01:22,080

space walk and when she helped replace

24

00:01:26,630 --> 00:01:23,840

some toilet parts on the space station

25

00:01:29,429 --> 00:01:26,640

she called herself a janitor tate

26

00:01:31,429 --> 00:01:29,439

welcome to 1947. so

27

00:01:32,950 --> 00:01:31,439

tell me where you are right now what do

28

00:01:35,190 --> 00:01:32,960

you see

29

00:01:39,030 --> 00:01:35,200

where are you orbiting over earth what's

30

00:01:43,749 --> 00:01:41,590

yeah so uh we actually are just coming

31

00:01:46,950 --> 00:01:43,759

up the coast of africa we're going to

32

00:01:48,789 --> 00:01:46,960

pass through angola central congo which

33

00:01:50,149 --> 00:01:48,799

is actually where i used to work and

34

00:01:53,429 --> 00:01:50,159

then we're going to head up north

35

00:01:55,910 --> 00:01:53,439

towards kazakhstan and as high as we get

36

00:01:56,870 --> 00:01:55,920

at 51 degrees and head up towards the

37

00:01:58,789 --> 00:01:56,880

poles

38

00:02:01,030 --> 00:01:58,799

it all happens very quickly you actually

39

00:02:02,870 --> 00:02:01,040

have to be pretty good on the space

40

00:02:05,429 --> 00:02:02,880

station at recognizing things because

41

00:02:06,630 --> 00:02:05,439

we're going along at 17 500 miles an

42

00:02:09,749 --> 00:02:06,640

hour up here

43

00:02:13,589 --> 00:02:09,759

how long do you gaze down

44

00:02:17,589 --> 00:02:15,670

so we're pretty busy during the day we

45

00:02:20,309 --> 00:02:17,599

actually work about a 12-hour day we've

46

00:02:22,309 --> 00:02:20,319

got so much research experiments and

47

00:02:23,430 --> 00:02:22,319

also just maintaining the space station

48

00:02:26,390 --> 00:02:23,440

up here

49

00:02:28,150 --> 00:02:26,400

but every time we pass by a window you

50

00:02:30,070 --> 00:02:28,160

do have to stop for a second and look at

51
00:02:31,350 --> 00:02:30,080
the earth sometimes you don't even know

52
00:02:32,869 --> 00:02:31,360
where you are you've got to stop and

53
00:02:34,949 --> 00:02:32,879
check the map but

54
00:02:36,790 --> 00:02:34,959
it's so amazing outside it's so

55
00:02:38,390 --> 00:02:36,800
incredibly beautiful it does draw you in

56
00:02:42,630 --> 00:02:38,400
quite a bit

57
00:02:43,589 --> 00:02:42,640
so you're a bio virologist so just give

58
00:02:45,670 --> 00:02:43,599
me the

59
00:02:47,509 --> 00:02:45,680
obviously it's about uh you're you're

60
00:02:50,390 --> 00:02:47,519
trying to

61
00:02:52,390 --> 00:02:50,400
study viruses how they come about how

62
00:02:54,150 --> 00:02:52,400
you stop them things like that but

63
00:02:59,030 --> 00:02:54,160

why are you doing this in space why is

64

00:03:02,550 --> 00:03:00,550

yeah so actually

65

00:03:04,710 --> 00:03:02,560

when nasa hires virologists or

66

00:03:07,589 --> 00:03:04,720

biologists or any scientists of that

67

00:03:10,149 --> 00:03:07,599

kind they are really training astronauts

68

00:03:11,750 --> 00:03:10,159

to do a little bit of everything so for

69

00:03:14,149 --> 00:03:11,760

example today i was doing a

70

00:03:17,030 --> 00:03:14,159

pharmacological experiment sometimes

71

00:03:19,030 --> 00:03:17,040

we're doing material science experiments

72

00:03:21,030 --> 00:03:19,040

we're doing uh my crewmate is setting up

73

00:03:21,830 --> 00:03:21,040

a combustion experiment right now for

74

00:03:25,350 --> 00:03:21,840

the

75

00:03:27,190 --> 00:03:25,360

for uh jaxa so you end up being a bit of

76

00:03:29,589 --> 00:03:27,200

a generalist we also teach our

77

00:03:31,990 --> 00:03:29,599

scientists how to fly airplanes and we

78

00:03:33,509 --> 00:03:32,000

teach our pilots how to be scientists so

79

00:03:36,229 --> 00:03:33,519

you get to be a jack of all trades up

80

00:03:38,470 --> 00:03:36,239

here you have to be a plumber some days

81

00:03:40,630 --> 00:03:38,480

potentially a dentist or a doctor we

82

00:03:41,910 --> 00:03:40,640

train as chief medical officers and you

83

00:03:43,750 --> 00:03:41,920

need to be able to fix anything on the

84

00:03:46,309 --> 00:03:43,760

space station and do any science

85

00:03:47,750 --> 00:03:46,319

experiment the researchers send up so

86

00:03:49,509 --> 00:03:47,760

you would just we're talking about how

87

00:03:51,990 --> 00:03:49,519

you did a lot of research in the congo

88

00:03:57,750 --> 00:03:52,000

what motivated you to think i need to go

89

00:04:01,589 --> 00:03:59,990

yeah so this is this is i would have to

90

00:04:03,830 --> 00:04:01,599

say not where i thought i was going to

91

00:04:06,309 --> 00:04:03,840

end up uh you know you always could

92

00:04:08,149 --> 00:04:06,319

dream about being an astronaut but uh

93

00:04:11,910 --> 00:04:08,159

for me i was planning on having a

94

00:04:13,350 --> 00:04:11,920

research career on viruses i applied a

95

00:04:15,270 --> 00:04:13,360

little bit out of the blue to be an

96

00:04:17,830 --> 00:04:15,280

astronaut one day and thought maybe it

97

00:04:19,909 --> 00:04:17,840

would be a good story at some point to

98

00:04:22,550 --> 00:04:19,919

tell how i'd applied to be an astronaut

99

00:04:23,990 --> 00:04:22,560

and how nasa turned me down and you kind

100

00:04:25,590 --> 00:04:24,000

of never know where you're going to end

101
00:04:26,830 --> 00:04:25,600
up in life i ended up on the space

102
00:04:30,150 --> 00:04:26,840
station

103
00:04:32,230 --> 00:04:30,160
here so your research is it

104
00:04:34,070 --> 00:04:32,240
is this research you wanted to do are

105
00:04:35,030 --> 00:04:34,080
you doing research that nasa wants you

106
00:04:37,030 --> 00:04:35,040
to do

107
00:04:39,270 --> 00:04:37,040
in order to

108
00:04:41,590 --> 00:04:39,280
help space exploration i mean obviously

109
00:04:44,150 --> 00:04:41,600
if we end up testing the limits and

110
00:04:45,670 --> 00:04:44,160
going to farther into space people will

111
00:04:47,110 --> 00:04:45,680
have to be up there even longer and

112
00:04:48,710 --> 00:04:47,120
fight viruses

113
00:04:52,790 --> 00:04:48,720

is that is that the ultimate goal of

114

00:04:56,070 --> 00:04:54,710

yeah so actually the the research that i

115

00:04:59,030 --> 00:04:56,080

want to do in the research that nasa

116

00:05:01,830 --> 00:04:59,040

wants to do coincide quite well and it's

117

00:05:04,790 --> 00:05:01,840

not just about viruses it's really about

118

00:05:07,510 --> 00:05:04,800

all of microbiology looking at what

119

00:05:10,310 --> 00:05:07,520

happens to not just viruses but to

120

00:05:12,870 --> 00:05:10,320

bacteria in space we have this whole

121

00:05:15,029 --> 00:05:12,880

microbiome on the space station that's a

122

00:05:17,830 --> 00:05:15,039

little bit unknown it's been up here for

123

00:05:20,390 --> 00:05:17,840

16 years and has had all kinds of

124

00:05:22,390 --> 00:05:20,400

effects of radiation and microgravity

125

00:05:23,990 --> 00:05:22,400

we're we're all in we're in free fall

126

00:05:27,270 --> 00:05:24,000

right now i'm floating as i'm talking to

127

00:05:29,590 --> 00:05:27,280

you and so what that does to microbial

128

00:05:31,749 --> 00:05:29,600

life is fascinating what that does to

129

00:05:34,390 --> 00:05:31,759

physiology is fascinating as well and

130

00:05:36,870 --> 00:05:34,400

this isn't just for us

131

00:05:38,230 --> 00:05:36,880

at nasa working on exploring and going

132

00:05:40,070 --> 00:05:38,240

beyond low earth orbit this really

133

00:05:41,430 --> 00:05:40,080

there's a lot of implications for human

134

00:05:43,270 --> 00:05:41,440

health and disease

135

00:05:46,550 --> 00:05:43,280

we can learn some basic principles by

136

00:05:51,189 --> 00:05:49,510

do you have a lay example of a disease

137

00:05:54,390 --> 00:05:51,199

or a virus that

138

00:05:56,710 --> 00:05:54,400

you already can tell would be you know

139

00:05:58,710 --> 00:05:56,720

its impact would be limited uh in a

140

00:06:04,070 --> 00:05:58,720

space environment versus

141

00:06:09,110 --> 00:06:06,629

so we actually don't get

142

00:06:10,790 --> 00:06:09,120

transmission of viruses up here which is

143

00:06:13,350 --> 00:06:10,800

fascinating when you think about it we

144

00:06:15,670 --> 00:06:13,360

only have three human beings in space

145

00:06:17,670 --> 00:06:15,680

right now and we're all perfectly

146

00:06:19,909 --> 00:06:17,680

healthy when there's no human beings

147

00:06:22,629 --> 00:06:19,919

around there's nobody to transmit a

148

00:06:24,710 --> 00:06:22,639

virus to you you do have some examples

149

00:06:25,990 --> 00:06:24,720

of viruses that we carry in our bodies

150

00:06:27,430 --> 00:06:26,000

for example

151
00:06:29,430 --> 00:06:27,440
you know everybody gets the chickenpox

152
00:06:32,390 --> 00:06:29,440
vaccine now but if you're exposed to

153
00:06:34,230 --> 00:06:32,400
chickenpox as a child you have that with

154
00:06:36,790 --> 00:06:34,240
you dormant and that actually can

155
00:06:38,950 --> 00:06:36,800
reactivate sometimes in space flight so

156
00:06:41,029 --> 00:06:38,960
we do have examples of

157
00:06:43,189 --> 00:06:41,039
some really interesting things happening

158
00:06:45,670 --> 00:06:43,199
with viruses in flight

159
00:06:47,350 --> 00:06:45,680
we also have some examples of ways that

160
00:06:49,110 --> 00:06:47,360
it's sometimes a little bit nice to be

161
00:06:51,029 --> 00:06:49,120
off the planet we don't have to worry

162
00:06:53,670 --> 00:06:51,039
about catching a cold up here

163
00:06:54,870 --> 00:06:53,680

now you yourself right you're you're

164

00:07:02,550 --> 00:06:54,880

you're

165

00:07:06,950 --> 00:07:04,950

absolutely i'm participating uh in over

166

00:07:09,029 --> 00:07:06,960

100 different research experiments so we

167

00:07:10,870 --> 00:07:09,039

take our blood uh we look at every

168

00:07:13,510 --> 00:07:10,880

physiological parameter we even

169

00:07:15,749 --> 00:07:13,520

ultrasound our eyeballs which sounds

170

00:07:17,830 --> 00:07:15,759

horrible at first and it's actually

171

00:07:19,430 --> 00:07:17,840

pretty cool we can do that with water up

172

00:07:21,589 --> 00:07:19,440

here we don't need ultrasound gel

173

00:07:23,990 --> 00:07:21,599

because the surface tension

174

00:07:25,110 --> 00:07:24,000

and you can see things like your optic

175

00:07:27,270 --> 00:07:25,120

nerve

176

00:07:30,790 --> 00:07:27,280

you can see your cornea we're very

177

00:07:33,830 --> 00:07:30,800

interested in how vision is affected by

178

00:07:36,390 --> 00:07:33,840

microgravity we have a fluid shift

179

00:07:38,390 --> 00:07:36,400

upwards in space and this is doing some

180

00:07:40,710 --> 00:07:38,400

interesting things to our visual systems

181

00:07:42,550 --> 00:07:40,720

so as an example of a lot of things that

182

00:07:45,670 --> 00:07:42,560

nasa is learning about

183

00:07:47,909 --> 00:07:45,680

just basic uh medical things from

184

00:07:49,670 --> 00:07:47,919

putting human beings into microgravity

185

00:07:52,390 --> 00:07:49,680

what's what's the biggest change you've

186

00:07:53,990 --> 00:07:52,400

noticed is it you talked about eyesight

187

00:07:58,550 --> 00:07:54,000

is is it

188

00:08:03,189 --> 00:08:01,029

so we have had examples of astronaut

189

00:08:05,749 --> 00:08:03,199

eyesight changing the biggest thing that

190

00:08:07,909 --> 00:08:05,759

i've noticed is the fluid shift uh

191

00:08:10,309 --> 00:08:07,919

upwards so when you're walking around on

192

00:08:12,869 --> 00:08:10,319

earth you have this constant gravity

193

00:08:15,029 --> 00:08:12,879

vector that pulls all the fluid down

194

00:08:16,469 --> 00:08:15,039

into your legs and you probably have

195

00:08:18,790 --> 00:08:16,479

never thought about this before you just

196

00:08:21,029 --> 00:08:18,800

take this as a as a given when you're

197

00:08:24,790 --> 00:08:21,039

walking around on the planet but as soon

198

00:08:26,710 --> 00:08:24,800

as you are in free fall all that fluid

199

00:08:28,550 --> 00:08:26,720

floats up so we actually lose some of

200

00:08:32,469 --> 00:08:28,560

our plasma volume

201
00:08:33,909 --> 00:08:32,479
and we can feel a kind of a pressure in

202
00:08:35,110 --> 00:08:33,919
our head and so that's doing some

203
00:08:37,750 --> 00:08:35,120
interesting things and has some

204
00:08:40,469 --> 00:08:37,760
implications for understanding diseases

205
00:08:42,389 --> 00:08:40,479
on earth like intracranial pressure and

206
00:08:44,630 --> 00:08:42,399
increased pressure on the back of your

207
00:08:46,550 --> 00:08:44,640
eyeball so that's what i feel the most

208
00:08:48,790 --> 00:08:46,560
up here you feel it really acutely the

209
00:08:49,750 --> 00:08:48,800
first few weeks and then like most

210
00:08:51,190 --> 00:08:49,760
things

211
00:08:51,910 --> 00:08:51,200
you just get used to it after a little

212
00:08:54,150 --> 00:08:51,920
bit

213
00:08:56,710 --> 00:08:54,160

all right tell me about downtime you say

214

00:08:58,710 --> 00:08:56,720

12-hour days and by the way do you

215

00:09:02,470 --> 00:08:58,720

how do you orient a day

216

00:09:04,550 --> 00:09:02,480

do you just assume there's

217

00:09:05,750 --> 00:09:04,560

you know do you have to okay this is

218

00:09:07,430 --> 00:09:05,760

going to be our up time and this is

219

00:09:09,430 --> 00:09:07,440

going to do you orient your day to

220

00:09:13,509 --> 00:09:09,440

houston's time

221

00:09:18,150 --> 00:09:16,070

so we're actually on greenwich mean time

222

00:09:20,230 --> 00:09:18,160

and that helps us out because we're an

223

00:09:22,630 --> 00:09:20,240

international space station we have

224

00:09:25,590 --> 00:09:22,640

partner agencies we are working with

225

00:09:29,750 --> 00:09:25,600

russia japan countries all over europe

226
00:09:32,070 --> 00:09:29,760
canada and the u.s and so we pick gmt

227
00:09:35,269 --> 00:09:32,080
and set that as our day it's a little

228
00:09:37,910 --> 00:09:35,279
artificial we have 16 sunrises and 16

229
00:09:39,910 --> 00:09:37,920
sunsets so you could pick any time that

230
00:09:42,230 --> 00:09:39,920
you wanted to but we need a circadian

231
00:09:44,710 --> 00:09:42,240
rhythm so we pick a time each day and

232
00:09:46,470 --> 00:09:44,720
that's when we start our schedule

233
00:09:48,310 --> 00:09:46,480
and all the control centers around the

234
00:09:49,990 --> 00:09:48,320
world will start

235
00:09:52,470 --> 00:09:50,000
working with the crew at a certain

236
00:09:55,190 --> 00:09:52,480
wake-up time they're actually working 24

237
00:09:57,750 --> 00:09:55,200
7 at all of these locations to run the

238
00:10:00,630 --> 00:09:57,760

space station uh to keep all the systems

239

00:10:02,710 --> 00:10:00,640

going and then we have a scheduled time

240

00:10:04,550 --> 00:10:02,720

where we we start our work

241

00:10:06,790 --> 00:10:04,560

and we start going

242

00:10:08,389 --> 00:10:06,800

what uh how do you

243

00:10:09,509 --> 00:10:08,399

what what is your downtime what do you

244

00:10:11,350 --> 00:10:09,519

do with it

245

00:10:15,509 --> 00:10:11,360

you're reading you're communicating what

246

00:10:18,389 --> 00:10:17,030

you're probably gonna laugh but i do

247

00:10:19,269 --> 00:10:18,399

experiments

248

00:10:22,310 --> 00:10:19,279

so

249

00:10:24,230 --> 00:10:22,320

i uh i've gotten really interested in

250

00:10:25,350 --> 00:10:24,240

yeah it's

251

00:10:29,990 --> 00:10:25,360

i know

252

00:10:32,550 --> 00:10:30,000

it's not work it's it's it's fascinating

253

00:10:33,509 --> 00:10:32,560

to be in an environment where all of a

254

00:10:35,190 --> 00:10:33,519

sudden

255

00:10:37,190 --> 00:10:35,200

it seems like the laws of physics have

256

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

changed so everything you've ever known

257

00:10:41,350 --> 00:10:39,600

you probably just have not thought about

258

00:10:43,190 --> 00:10:41,360

gravity very much maybe when you drop

259

00:10:44,870 --> 00:10:43,200

something or trip and fall

260

00:10:47,269 --> 00:10:44,880

you're a little annoyed at gravity but

261

00:10:50,150 --> 00:10:47,279

other than that it's uh it's actually a

262

00:10:52,790 --> 00:10:50,160

profound and incredibly strong force and

263

00:10:55,350 --> 00:10:52,800

so what happens to fluids

264

00:10:57,750 --> 00:10:55,360

what happens to small amounts of fluids

265

00:11:00,150 --> 00:10:57,760

large amounts of fluids the overwhelming

266

00:11:01,509 --> 00:11:00,160

force of surface tension is all

267

00:11:03,269 --> 00:11:01,519

fascinating

268

00:11:04,949 --> 00:11:03,279

my other hobby has started to be

269

00:11:06,949 --> 00:11:04,959

photography

270

00:11:08,870 --> 00:11:06,959

so if you take a look at the

271

00:11:10,230 --> 00:11:08,880

international space station facebook

272

00:11:12,150 --> 00:11:10,240

page

273

00:11:14,069 --> 00:11:12,160

i went a little crazy last weekend and

274

00:11:16,630 --> 00:11:14,079

took over 2000 photos i think they

275

00:11:18,630 --> 00:11:16,640

posted a few of them uh my my crewmate

276

00:11:20,069 --> 00:11:18,640

takuya is also an excellent photographer

277

00:11:22,389 --> 00:11:20,079

and and between the two of us we're

278

00:11:23,990 --> 00:11:22,399

always shutter bugs uh looking out the

279

00:11:26,550 --> 00:11:24,000

windows at earth

280

00:11:29,430 --> 00:11:26,560

so i read your uh you're a scuba you you

281

00:11:31,269 --> 00:11:29,440

like scuba dive i like to scuba dive um

282

00:11:32,389 --> 00:11:31,279

what

283

00:11:33,430 --> 00:11:32,399

there's some

284

00:11:35,670 --> 00:11:33,440

what's the

285

00:11:38,069 --> 00:11:35,680

what are the similarities between

286

00:11:40,310 --> 00:11:38,079

scuba diving and being in space and i

287

00:11:41,990 --> 00:11:40,320

i'm sure there's obvious differences but

288

00:11:45,590 --> 00:11:42,000

i am curious of what similarities there

289

00:11:48,949 --> 00:11:47,269

there's actually a lot of similarities

290

00:11:51,110 --> 00:11:48,959

and that was one of the things i was

291

00:11:53,829 --> 00:11:51,120

thinking when i first got up here is wow

292

00:11:55,269 --> 00:11:53,839

this is pretty similar to diving so all

293

00:11:57,590 --> 00:11:55,279

the things that you have to do for

294

00:11:59,670 --> 00:11:57,600

example if you're balancing

295

00:12:02,310 --> 00:11:59,680

on the tips of your fins and you're

296

00:12:05,030 --> 00:12:02,320

trying to just balance back and forth

297

00:12:05,829 --> 00:12:05,040

that's pretty similar to weightlessness

298

00:12:07,350 --> 00:12:05,839

the

299

00:12:09,190 --> 00:12:07,360

attention to detail that you have to

300

00:12:11,590 --> 00:12:09,200

have with your equipment is very similar

301
00:12:12,629 --> 00:12:11,600
up here that you know we are living in a

302
00:12:14,550 --> 00:12:12,639
machine

303
00:12:16,470 --> 00:12:14,560
we're surrounded by our life support

304
00:12:17,990 --> 00:12:16,480
equipment everything is about don't die

305
00:12:19,829 --> 00:12:18,000
don't die don't die right if you don't

306
00:12:21,670 --> 00:12:19,839
follow a certain protocol

307
00:12:22,710 --> 00:12:21,680
you'll you're risking your life i mean

308
00:12:23,910 --> 00:12:22,720
when you go through the training on

309
00:12:25,350 --> 00:12:23,920
scuba diving i always feel like they're

310
00:12:27,190 --> 00:12:25,360
trying to scare the living daylights out

311
00:12:31,030 --> 00:12:27,200
of you but is it that that's the same

312
00:12:35,350 --> 00:12:33,190
well space is an inherently dangerous

313
00:12:38,550 --> 00:12:35,360

business and you do get that feeling

314

00:12:41,269 --> 00:12:38,560

that you are in a remote environment and

315

00:12:43,670 --> 00:12:41,279

nasa and all of the partner agencies are

316

00:12:46,389 --> 00:12:43,680

incredible at what they do but it is a

317

00:12:49,350 --> 00:12:46,399

dangerous business and you're surrounded

318

00:12:52,389 --> 00:12:49,360

outside by absolute vacuums so it is

319

00:12:54,470 --> 00:12:52,399

critical at all times to really

320

00:12:55,590 --> 00:12:54,480

pay attention to have that attention to

321

00:12:57,269 --> 00:12:55,600

detail

322

00:13:00,150 --> 00:12:57,279

one of the things that helps us up here

323

00:13:02,790 --> 00:13:00,160

is we have ground teams 24 7 supporting

324

00:13:05,269 --> 00:13:02,800

us so we've got folks in mission control

325

00:13:07,350 --> 00:13:05,279

that are looking out for us all the time

326

00:13:08,550 --> 00:13:07,360

uh and and the one time that i really

327

00:13:09,670 --> 00:13:08,560

felt like

328

00:13:11,990 --> 00:13:09,680

okay

329

00:13:13,750 --> 00:13:12,000

you're on your own uh you really better

330

00:13:15,590 --> 00:13:13,760

do this right is when we're doing our

331

00:13:17,590 --> 00:13:15,600

space walk outside that's the point

332

00:13:19,590 --> 00:13:17,600

where it's you and your buddy outside

333

00:13:21,269 --> 00:13:19,600

and uh you've got folks watching you

334

00:13:22,470 --> 00:13:21,279

they're watching the spacesuit but you

335

00:13:23,829 --> 00:13:22,480

need to

336

00:13:25,190 --> 00:13:23,839

absolutely

337

00:13:27,350 --> 00:13:25,200

uh be

338

00:13:29,910 --> 00:13:27,360

on the top of your game every second

339

00:13:32,310 --> 00:13:29,920

when you're outside in absolute vacuum

340

00:13:33,269 --> 00:13:32,320

speaking of that you apparently said

341

00:13:35,829 --> 00:13:33,279

that

342

00:13:37,990 --> 00:13:35,839

you can tell space does have a smell

343

00:13:43,750 --> 00:13:38,000

and you noticed it during uh during a

344

00:13:48,949 --> 00:13:46,310

it's a little bit metallic it smells a

345

00:13:51,990 --> 00:13:48,959

little bit like like ozone and it's got

346

00:13:54,550 --> 00:13:52,000

a sharp metallic smell to it i could

347

00:13:56,310 --> 00:13:54,560

almost taste it uh when we were taking

348

00:13:57,269 --> 00:13:56,320

off the spacesuits after we'd been

349

00:13:58,870 --> 00:13:57,279

outside

350

00:14:01,189 --> 00:13:58,880

it's interesting

351
00:14:02,949 --> 00:14:01,199
so are you following current events did

352
00:14:08,550 --> 00:14:02,959
you guys watch the debate

353
00:14:12,710 --> 00:14:10,710
we are enjoying very much being off the

354
00:14:15,590 --> 00:14:12,720
planet right now

355
00:14:17,990 --> 00:14:15,600
we are i we're a little detached from

356
00:14:19,670 --> 00:14:18,000
current events so uh

357
00:14:21,430 --> 00:14:19,680
we catch the news every now and then you

358
00:14:30,790 --> 00:14:21,440
know

359
00:14:33,269 --> 00:14:30,800
there's an overview effect for

360
00:14:35,430 --> 00:14:33,279
astronauts and you do feel that um when

361
00:14:36,870 --> 00:14:35,440
you when you get a little bit far away

362
00:14:38,949 --> 00:14:36,880
from humanity

363
00:14:41,030 --> 00:14:38,959

you can see the planet down below you

364

00:14:42,949 --> 00:14:41,040

know all your loved ones are there

365

00:14:45,590 --> 00:14:42,959

but sometimes it's a little bit nice

366

00:14:47,750 --> 00:14:45,600

just to get away from it all and

367

00:14:50,150 --> 00:14:47,760

and you see the beauty of the earth

368

00:14:51,189 --> 00:14:50,160

you see the stars

369

00:14:55,110 --> 00:14:51,199

they don't

370

00:14:56,389 --> 00:14:55,120

shining you can see the entire milky way

371

00:14:58,710 --> 00:14:56,399

and i think that gives you a little bit

372

00:15:00,870 --> 00:14:58,720

of a perspective about our universe

373

00:15:02,069 --> 00:15:00,880

and what's important

374

00:15:03,509 --> 00:15:02,079

and

375

00:15:06,310 --> 00:15:03,519

sometimes you can leave some of these

376

00:15:09,030 --> 00:15:06,320

earthly things behind

377

00:15:11,590 --> 00:15:09,040

your replacement crew has been delayed

378

00:15:12,470 --> 00:15:11,600

it means you may be delayed

379

00:15:15,350 --> 00:15:12,480

was

380

00:15:16,550 --> 00:15:15,360

have it sounds like you're enjoying your

381

00:15:18,389 --> 00:15:16,560

time up there

382

00:15:23,189 --> 00:15:18,399

but i'm sure you miss

383

00:15:28,069 --> 00:15:24,870

yeah we do miss family we get a chance

384

00:15:29,590 --> 00:15:28,079

to keep in touch with our loved ones and

385

00:15:30,949 --> 00:15:29,600

you know it's really incredibly

386

00:15:33,430 --> 00:15:30,959

important to take care of the space

387

00:15:35,749 --> 00:15:33,440

station so this is something that

388

00:15:39,430 --> 00:15:35,759

that folks have built from hundreds of

389

00:15:41,350 --> 00:15:39,440

countries over decades and so we are

390

00:15:42,870 --> 00:15:41,360

enjoying the opportunity to take care of

391

00:15:44,310 --> 00:15:42,880

the space station and we're certainly

392

00:15:46,629 --> 00:15:44,320

going to look forward to welcoming

393

00:15:48,069 --> 00:15:46,639

welcoming our new crewmates up here

394

00:15:49,749 --> 00:15:48,079

and showing them

395

00:15:50,949 --> 00:15:49,759

this amazing machine that people have

396

00:15:53,350 --> 00:15:50,959

built i think they're going to love it

397

00:15:55,269 --> 00:15:53,360

as their new home

398

00:16:00,150 --> 00:15:55,279

you may miss the election

399

00:16:06,230 --> 00:16:03,749

yes so i registered as a absentee ballot

400

00:16:08,230 --> 00:16:06,240

address to low earth orbit and they do

401
00:16:09,749 --> 00:16:08,240
let you vote from space address to low

402
00:16:11,749 --> 00:16:09,759
earth over

403
00:16:14,310 --> 00:16:11,759
does it count as what's what state i

404
00:16:16,389 --> 00:16:14,320
mean you know that that matters what

405
00:16:18,710 --> 00:16:16,399
does it uh

406
00:16:23,430 --> 00:16:18,720
what state does your vote count in is it

407
00:16:28,150 --> 00:16:25,430
well we live in we live in houston so

408
00:16:29,670 --> 00:16:28,160
houston texas is where my uh my ballot

409
00:16:31,430 --> 00:16:29,680
will be counted from

410
00:16:33,829 --> 00:16:31,440
all right

411
00:16:36,470 --> 00:16:33,839
do uh

412
00:16:38,310 --> 00:16:36,480
when you if you do any free time that

413
00:16:41,829 --> 00:16:38,320

isn't experimenting

414

00:16:44,069 --> 00:16:41,839

do you binge tv is it more reading

415

00:16:48,949 --> 00:16:44,079

is it just

416

00:16:54,470 --> 00:16:51,269

yeah i'll make phone calls to family and

417

00:16:57,910 --> 00:16:54,480

friends uh i read some magazines and and

418

00:17:00,870 --> 00:16:57,920

newspapers up here i actually took my um

419

00:17:02,629 --> 00:17:00,880

my ipad into the cupola and and tucked

420

00:17:04,789 --> 00:17:02,639

in the window so i could just completely

421

00:17:05,750 --> 00:17:04,799

see the earth and read a magazine last

422

00:17:08,390 --> 00:17:05,760

weekend

423

00:17:10,630 --> 00:17:08,400

that was a pretty phenomenal experience

424

00:17:13,590 --> 00:17:10,640

so i i understand you're a fan of

425

00:17:15,029 --> 00:17:13,600

battlestar galactica

426

00:17:18,470 --> 00:17:15,039

how

427

00:17:20,230 --> 00:17:18,480

off is battlestar galactica

428

00:17:25,270 --> 00:17:20,240

in its uh

429

00:17:29,510 --> 00:17:26,470

you know one of the things that i was

430

00:17:31,750 --> 00:17:29,520

the most struck here when i i'm a fan of

431

00:17:33,029 --> 00:17:31,760

science fiction in general and

432

00:17:35,590 --> 00:17:33,039

when you watch science fiction they

433

00:17:38,150 --> 00:17:35,600

always show a small craft orbiting a

434

00:17:40,630 --> 00:17:38,160

planet and i don't know how

435

00:17:41,909 --> 00:17:40,640

the folks in hollywood know so

436

00:17:44,310 --> 00:17:41,919

accurately

437

00:17:46,390 --> 00:17:44,320

what that looks like but they have just

438

00:17:48,150 --> 00:17:46,400

absolutely gotten it right and and any

439

00:17:50,230 --> 00:17:48,160

show that you watch

440

00:17:52,230 --> 00:17:50,240

where you've got a small ship

441

00:17:54,470 --> 00:17:52,240

orbiting this huge planet that is

442

00:17:56,230 --> 00:17:54,480

exactly what it looks like up here i had

443

00:17:58,549 --> 00:17:56,240

that sensation the first time i looked

444

00:18:01,510 --> 00:17:58,559

at the earth that we really do live on a

445

00:18:02,710 --> 00:18:01,520

planet uh and it and it looks like

446

00:18:04,710 --> 00:18:02,720

what you see

447

00:18:06,710 --> 00:18:04,720

with all the special effects that

448

00:18:08,230 --> 00:18:06,720

actually i would say that's pretty close

449

00:18:10,470 --> 00:18:08,240

it brings it home

450

00:18:11,350 --> 00:18:10,480

is there any movie recently that there

451
00:18:14,230 --> 00:18:11,360
was a

452
00:18:15,750 --> 00:18:14,240
was it there was the movie the mar the

453
00:18:16,549 --> 00:18:15,760
uh the martian

454
00:18:19,190 --> 00:18:16,559
that

455
00:18:21,909 --> 00:18:19,200
got into the whole idea of

456
00:18:24,230 --> 00:18:21,919
trying to create i guess

457
00:18:27,029 --> 00:18:24,240
an earth by a earth biologic a

458
00:18:29,270 --> 00:18:27,039
biological atmosphere similar similar

459
00:18:31,029 --> 00:18:29,280
earth how did they do

460
00:18:32,789 --> 00:18:31,039
how did the how did hollywood do in the

461
00:18:37,909 --> 00:18:32,799
depiction of that versus what you're

462
00:18:42,470 --> 00:18:40,549
i have to say we do uh comment sometimes

463
00:18:43,909 --> 00:18:42,480

that we feel like the the martian up

464

00:18:46,870 --> 00:18:43,919

here so

465

00:18:48,549 --> 00:18:46,880

we can grow plants up here uh right now

466

00:18:50,630 --> 00:18:48,559

we're doing some experiments with them

467

00:18:52,230 --> 00:18:50,640

so the seedlings are just about the size

468

00:18:55,590 --> 00:18:52,240

of your finger and i'm not allowed to

469

00:19:00,950 --> 00:18:59,110

but we uh we are doing a lot just in in

470

00:19:03,029 --> 00:19:00,960

reality i mean this is this is an

471

00:19:05,510 --> 00:19:03,039

interesting case of sometimes the

472

00:19:07,990 --> 00:19:05,520

reality in hollywood are

473

00:19:10,230 --> 00:19:08,000

uh in a race and and i think the reality

474

00:19:12,390 --> 00:19:10,240

sometimes is outpacing hollywood we have

475

00:19:15,110 --> 00:19:12,400

a life support system up here that

476

00:19:16,950 --> 00:19:15,120

recycles 90 percent of our water we

477

00:19:19,430 --> 00:19:16,960

completely recycle our air we're a

478

00:19:21,270 --> 00:19:19,440

closed-loop system so we don't have to

479

00:19:24,549 --> 00:19:21,280

launch a lot of that from earth anymore

480

00:19:26,390 --> 00:19:24,559

we can turn water into air we can turn

481

00:19:28,789 --> 00:19:26,400

coffee into water

482

00:19:31,270 --> 00:19:28,799

we can completely support human beings

483

00:19:32,150 --> 00:19:31,280

with just a little bit of maintenance

484

00:19:36,390 --> 00:19:32,160

and

485

00:19:38,150 --> 00:19:36,400

addition to the system but you would

486

00:19:39,909 --> 00:19:38,160

think it's science fiction and and we

487

00:19:41,270 --> 00:19:39,919

are proving that technology every day on

488

00:19:43,190 --> 00:19:41,280

the space station

489

00:19:45,110 --> 00:19:43,200

all right when you come home

490

00:19:50,230 --> 00:19:45,120

what's the first food you want to eat

491

00:19:55,110 --> 00:19:52,549

i would say any fresh fruit or vegetable

492

00:19:56,870 --> 00:19:55,120

we get those occasionally on a supply

493

00:19:59,029 --> 00:19:56,880

ship that comes up but

494

00:20:00,310 --> 00:19:59,039

the taste of something crunchy

495

00:20:02,070 --> 00:20:00,320

that's grown in the earth would be

496

00:20:03,669 --> 00:20:02,080

pretty good right now

497

00:20:05,270 --> 00:20:03,679

well kate rubens i know you've got a lot

498

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

of work to do

499

00:20:10,310 --> 00:20:06,960

thanks for taking the time this was fun

500

00:20:14,630 --> 00:20:12,230

absolutely thanks for joining us my

501
00:20:16,390 --> 00:20:14,640
crewmates wanted to say hi as well and

502
00:20:17,909 --> 00:20:16,400
we'll sign off from the international

503
00:20:20,310 --> 00:20:17,919
space station

504
00:20:21,590 --> 00:20:20,320
great tell them hello and we hope they

505
00:20:27,029 --> 00:20:21,600
love watching meet the press we'll keep

506
00:20:34,789 --> 00:20:29,669
station this is houston acr thank you

507
00:20:38,390 --> 00:20:36,870
thank you nbc station we are now