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le +

ube



1  
00:00:06,869 --> 00:00:04,630  
good afternoon and welcome to nasa

2  
00:00:09,270 --> 00:00:06,879  
headquarters thank you for joining us

3  
00:00:11,270 --> 00:00:09,280  
this afternoon for a nasa tweet up our

4  
00:00:13,990 --> 00:00:11,280  
very special guest today is space

5  
00:00:16,470 --> 00:00:14,000  
station astronaut ron garan known to

6  
00:00:19,510 --> 00:00:16,480  
those of you on twitter as at astro

7  
00:00:22,150 --> 00:00:19,520  
underscore ron the hashtag for our event

8  
00:00:24,150 --> 00:00:22,160  
today is nasa tweet up which will allow

9  
00:00:25,750 --> 00:00:24,160  
you to follow along and participate in

10  
00:00:29,509 --> 00:00:25,760  
the conversation

11  
00:00:32,310 --> 00:00:29,519  
colonel ron garan spent 164 days in

12  
00:00:34,389 --> 00:00:32,320  
space during the expedition 27 and

13  
00:00:36,310 --> 00:00:34,399

expedition 28 missions to the

14

00:00:38,709 --> 00:00:36,320

international space station

15

00:00:39,790 --> 00:00:38,719

he and his crewmates launched on april

16

00:00:43,110 --> 00:00:39,800

4th

17

00:00:46,069 --> 00:00:43,120

2011 and a soyuz spacecraft dubbed

18

00:00:48,310 --> 00:00:46,079

gagarin the launch was from the same

19

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

place that yuri gagarin had launched

20

00:00:52,869 --> 00:00:50,640

nearly 50 years previously

21

00:00:55,670 --> 00:00:52,879

aboard the station the crew worked on a

22

00:00:56,830 --> 00:00:55,680

variety of microgravity experiments and

23

00:00:59,830 --> 00:00:56,840

hosted the

24

00:01:01,910 --> 00:00:59,840

sts-134 and sts-135

25

00:01:03,990 --> 00:01:01,920

space shuttle missions

26

00:01:05,990 --> 00:01:04,000

colonel garan also participated in a

27

00:01:08,870 --> 00:01:06,000

spacewalk from the space station during

28

00:01:11,270 --> 00:01:08,880

the sts-135 mission

29

00:01:15,670 --> 00:01:11,280

he and expedition 28 landed in

30

00:01:19,390 --> 00:01:15,680

kazakhstan on september 15 2011 after

31

00:01:24,789 --> 00:01:19,400

traveling more than 65 million miles in

32

00:01:26,789 --> 00:01:24,799

2624 orbits during 164 days in space

33

00:01:29,190 --> 00:01:26,799

that was not colonel garan's first space

34

00:01:32,230 --> 00:01:29,200

flight his first space flight was aboard

35

00:01:34,950 --> 00:01:32,240

space shuttle discovery for the sts-124

36

00:01:36,630 --> 00:01:34,960

mission in the spring of 2008. during

37

00:01:39,109 --> 00:01:36,640

that mission the crew delivered the

38

00:01:41,830 --> 00:01:39,119

japanese experiment module pressurized

39

00:01:44,389 --> 00:01:41,840

module the japanese remote manipulator

40

00:01:46,149 --> 00:01:44,399

system and the kibo lab

41

00:01:49,590 --> 00:01:46,159

colonel garan participated in three

42

00:01:52,550 --> 00:01:49,600

spacewalks during that mission

43

00:01:55,670 --> 00:01:52,560

he has logged more than 178 days in

44

00:01:58,069 --> 00:01:55,680

space and 27 hours and three minutes of

45

00:02:00,469 --> 00:01:58,079

spacewalking time

46

00:02:02,709 --> 00:02:00,479

colonel garan is retired from the u.s

47

00:02:04,950 --> 00:02:02,719

air force and holds master's degrees in

48

00:02:06,149 --> 00:02:04,960

both aeronautical science and aerospace

49

00:02:08,150 --> 00:02:06,159

engineering

50

00:02:23,030 --> 00:02:08,160

i'd like to welcome colonel garan to

51

00:02:23,040 --> 00:02:27,190

ron thank you

52

00:02:31,430 --> 00:02:29,350

thank you so much for taking time today

53

00:02:33,430 --> 00:02:31,440

to interact with us and answer questions

54

00:02:35,030 --> 00:02:33,440

from the our twitter fans all right

55

00:02:36,390 --> 00:02:35,040

thank you stephanie thank you for that

56

00:02:38,309 --> 00:02:36,400

great introduction

57

00:02:39,990 --> 00:02:38,319

so i just want to say welcome welcome to

58

00:02:42,949 --> 00:02:40,000

nasa headquarters uh

59

00:02:45,509 --> 00:02:42,959

i appreciate you all being here and um

60

00:02:47,430 --> 00:02:45,519

i i don't have a big presentation and a

61

00:02:49,990 --> 00:02:47,440

lot of video i do have some videos we

62

00:02:52,630 --> 00:02:50,000

can show if you guys like but what i

63

00:02:54,550 --> 00:02:52,640

what i really want to do is i want to

64

00:02:56,070 --> 00:02:54,560

spend as much time as i can

65

00:02:57,830 --> 00:02:56,080

answering your questions and talking to

66

00:02:59,830 --> 00:02:57,840

you and

67

00:03:02,309 --> 00:02:59,840

before i do that though i just want to

68

00:03:04,390 --> 00:03:02,319

say thank you to all of you and

69

00:03:06,630 --> 00:03:04,400

everybody else uh who was involved with

70

00:03:08,630 --> 00:03:06,640

our mission uh who you know maybe is not

71

00:03:09,350 --> 00:03:08,640

in the room right now um

72

00:03:11,910 --> 00:03:09,360

but

73

00:03:14,229 --> 00:03:11,920

through social media uh through twitter

74

00:03:16,949 --> 00:03:14,239

and the other platforms through facebook

75

00:03:18,710 --> 00:03:16,959

through through google plus uh and and

76

00:03:21,110 --> 00:03:18,720

many of the other uh

77

00:03:23,750 --> 00:03:21,120

social media platforms that we have

78

00:03:25,990 --> 00:03:23,760

you enable us to

79

00:03:27,750 --> 00:03:26,000

bring the public along on our missions

80

00:03:30,070 --> 00:03:27,760

not just as spectators but as fellow

81

00:03:31,750 --> 00:03:30,080

crew members and

82

00:03:33,350 --> 00:03:31,760

on my particular mission i was up there

83

00:03:35,350 --> 00:03:33,360

for five and a half months and it was

84

00:03:36,470 --> 00:03:35,360

really nice to be able to send down

85

00:03:38,070 --> 00:03:36,480

pictures

86

00:03:39,509 --> 00:03:38,080

and um

87

00:03:40,789 --> 00:03:39,519

get the feedback on those pictures

88

00:03:43,110 --> 00:03:40,799

because we were interacting back and

89

00:03:45,670 --> 00:03:43,120

forth and that was really neat and i'll

90

00:03:47,430 --> 00:03:45,680

just tell you one of the stories

91

00:03:48,789 --> 00:03:47,440

is you know you we don't have a lot of

92

00:03:50,229 --> 00:03:48,799

time on board we don't have a lot of

93

00:03:51,910 --> 00:03:50,239

free time so

94

00:03:53,270 --> 00:03:51,920

um you know whenever we get a spare

95

00:03:55,350 --> 00:03:53,280

moment we

96

00:03:56,710 --> 00:03:55,360

fly on over to the cupola you know that

97

00:03:58,390 --> 00:03:56,720

windowed observatory we have on the

98

00:03:59,910 --> 00:03:58,400

bottom of the space station and

99

00:04:01,429 --> 00:03:59,920

takes some pictures and then we download

100

00:04:03,110 --> 00:04:01,439

them real quick and we we send them to

101

00:04:05,350 --> 00:04:03,120

the earth and you know a lot of times we

102

00:04:07,990 --> 00:04:05,360

don't know exactly where we are over the

103

00:04:10,390 --> 00:04:08,000

earth and uh we have a pretty good idea

104

00:04:11,830 --> 00:04:10,400

but you know sometimes we don't exactly

105

00:04:13,190 --> 00:04:11,840

get it right you know we say that this

106

00:04:16,469 --> 00:04:13,200

is one place when it's really another

107

00:04:18,229 --> 00:04:16,479

place and um i was corrected several

108

00:04:19,509 --> 00:04:18,239

times on twitter

109

00:04:22,550 --> 00:04:19,519

and uh

110

00:04:25,749 --> 00:04:22,560

and that was great and so there so

111

00:04:26,710 --> 00:04:25,759

who knows uh you guys know peter caltner

112

00:04:29,270 --> 00:04:26,720

you do

113

00:04:32,230 --> 00:04:29,280

so it's with pc-010

114

00:04:33,909 --> 00:04:32,240

yeah so i got smart real fast because

115

00:04:36,550 --> 00:04:33,919

what i would do then is i would email

116

00:04:39,670 --> 00:04:36,560

him to him first

117

00:04:41,350 --> 00:04:39,680

and i'd say hey where is this

118

00:04:44,230 --> 00:04:41,360

yeah so so

119

00:04:46,310 --> 00:04:44,240

that is a perfect example of how

120

00:04:48,550 --> 00:04:46,320

we can engage the public in in what we

121

00:04:51,510 --> 00:04:48,560

do in this in the space flight business

122

00:04:53,670 --> 00:04:51,520

um and you know in a real

123

00:04:55,270 --> 00:04:53,680

way in a contributing way

124

00:04:56,950 --> 00:04:55,280

um and

125

00:04:59,110 --> 00:04:56,960

it made things a lot more interesting

126  
00:05:01,110 --> 00:04:59,120  
because not only was i saying you know

127  
00:05:02,950 --> 00:05:01,120  
this is this part of the world

128  
00:05:04,950 --> 00:05:02,960  
there i could give some background on it

129  
00:05:07,029 --> 00:05:04,960  
and uh it you know we don't have the

130  
00:05:08,390 --> 00:05:07,039  
time to do all that research on board so

131  
00:05:11,749 --> 00:05:08,400  
it was really good to

132  
00:05:14,550 --> 00:05:11,759  
to do that so um i think

133  
00:05:17,430 --> 00:05:14,560  
what i wanted to do really um

134  
00:05:19,270 --> 00:05:17,440  
is just open it up right off the bat to

135  
00:05:21,270 --> 00:05:19,280  
questions and we do like i said we do

136  
00:05:23,110 --> 00:05:21,280  
have some videos that we can pull up we

137  
00:05:25,430 --> 00:05:23,120  
have some pictures that we could pull up

138  
00:05:27,990 --> 00:05:25,440

that uh that we can if you guys are

139

00:05:30,469 --> 00:05:28,000

interested i i want this to be your time

140

00:05:32,870 --> 00:05:30,479

so i want you guys to uh to lead where

141

00:05:34,390 --> 00:05:32,880

we go here so again we're you guys are

142

00:05:36,070 --> 00:05:34,400

not spectators we're all in this

143

00:05:38,710 --> 00:05:36,080

together so we're gonna we're gonna do

144

00:05:40,870 --> 00:05:38,720

this together so can we uh can we open

145

00:05:43,110 --> 00:05:40,880

up for questions right now we have two

146

00:05:44,790 --> 00:05:43,120

people with microphones so make sure

147

00:05:46,870 --> 00:05:44,800

that they um

148

00:05:49,029 --> 00:05:46,880

see you raise your hand when you get the

149

00:05:51,590 --> 00:05:49,039

microphone hold it close to your mouth

150

00:05:56,390 --> 00:05:51,600

so we can all hear you and state your

151  
00:06:01,189 --> 00:05:58,469  
patriana stastrodoyo

152  
00:06:04,950 --> 00:06:01,199  
at hearts underscore app

153  
00:06:06,390 --> 00:06:04,960  
as a fellow suco graduate

154  
00:06:08,150 --> 00:06:06,400  
just want to know i mean how do you go

155  
00:06:10,870 --> 00:06:08,160  
from becoming a business economics major

156  
00:06:12,230 --> 00:06:10,880  
which i was to becoming an astronaut

157  
00:06:14,870 --> 00:06:12,240  
well um

158  
00:06:17,029 --> 00:06:14,880  
it was a long road um

159  
00:06:18,150 --> 00:06:17,039  
so suco is a state university college at

160  
00:06:20,309 --> 00:06:18,160  
oneonta

161  
00:06:21,350 --> 00:06:20,319  
state in the state university new york

162  
00:06:24,790 --> 00:06:21,360  
program

163  
00:06:27,990 --> 00:06:26,390

there's a really short version and a

164

00:06:30,230 --> 00:06:28,000

really long version but i'll try and do

165

00:06:32,150 --> 00:06:30,240

something in between um

166

00:06:34,390 --> 00:06:32,160

i had wanted to be an astronaut since i

167

00:06:35,830 --> 00:06:34,400

was seven years old since the day i

168

00:06:37,430 --> 00:06:35,840

along with millions of people around the

169

00:06:40,230 --> 00:06:37,440

world watched that black and white image

170

00:06:42,309 --> 00:06:40,240

of the first footsteps on the moon and i

171

00:06:43,189 --> 00:06:42,319

carried that with me through most of my

172

00:06:45,270 --> 00:06:43,199

life

173

00:06:46,790 --> 00:06:45,280

but i think when i was in high school i

174

00:06:48,790 --> 00:06:46,800

lost that dream

175

00:06:52,070 --> 00:06:48,800

and the reason why i did is because it

176

00:06:53,909 --> 00:06:52,080

was after skylab it was before the space

177

00:06:55,670 --> 00:06:53,919

shuttle had started flying and to some

178

00:06:57,270 --> 00:06:55,680

kid in new york you know we didn't have

179

00:06:58,230 --> 00:06:57,280

a space program so why would anyone want

180

00:07:00,150 --> 00:06:58,240

to be an astronaut i wouldn't have a

181

00:07:01,990 --> 00:07:00,160

space program didn't make any sense

182

00:07:03,350 --> 00:07:02,000

so i went off to college i didn't really

183

00:07:04,870 --> 00:07:03,360

know what to do

184

00:07:06,790 --> 00:07:04,880

and

185

00:07:08,150 --> 00:07:06,800

what made perfect sense was to be become

186

00:07:10,230 --> 00:07:08,160

a business major

187

00:07:13,110 --> 00:07:10,240

when i was a sophomore at college sts

188

00:07:15,670 --> 00:07:13,120

one landed the very next day i went to

189

00:07:17,589 --> 00:07:15,680

my advisors and i started

190

00:07:20,870 --> 00:07:17,599

looking into taking courses in math and

191

00:07:23,749 --> 00:07:20,880

science and that day that seven-year-old

192

00:07:25,350 --> 00:07:23,759

boy's dream got reawakened and i wanted

193

00:07:27,990 --> 00:07:25,360

to be you know an astronaut from that

194

00:07:29,189 --> 00:07:28,000

point on again and so i think what that

195

00:07:31,270 --> 00:07:29,199

shows a couple of things i think one

196

00:07:34,950 --> 00:07:31,280

thing it shows is the power of our space

197

00:07:36,550 --> 00:07:34,960

program to inspire kids to study hard to

198

00:07:38,629 --> 00:07:36,560

study math and science

199

00:07:40,550 --> 00:07:38,639

we have a great need not only in our

200

00:07:41,589 --> 00:07:40,560

country but in the world right now

201  
00:07:44,150 --> 00:07:41,599  
for

202  
00:07:46,390 --> 00:07:44,160  
students to study math and science

203  
00:07:48,710 --> 00:07:46,400  
and engineering as well

204  
00:07:51,110 --> 00:07:48,720  
and i think that's

205  
00:07:52,790 --> 00:07:51,120  
you know really indicative of what the

206  
00:07:55,510 --> 00:07:52,800  
space station and the space program in

207  
00:07:57,670 --> 00:07:55,520  
particular can do so

208  
00:07:58,950 --> 00:07:57,680  
but after that i joined the military

209  
00:08:00,469 --> 00:07:58,960  
became a fighter pilot and then

210  
00:08:01,909 --> 00:08:00,479  
eventually test pilot

211  
00:08:03,189 --> 00:08:01,919  
and was selected so that was the route

212  
00:08:05,909 --> 00:08:03,199  
that i took

213  
00:08:07,510 --> 00:08:05,919

however we have astronauts from

214

00:08:09,430 --> 00:08:07,520

many many different walks of life we

215

00:08:11,430 --> 00:08:09,440

have veterinarians and chemists and

216

00:08:14,710 --> 00:08:11,440

teachers and engineers and scientists

217

00:08:20,230 --> 00:08:14,720

and pilots and and so um there's lots of

218

00:08:20,240 --> 00:08:22,790

right there

219

00:08:27,830 --> 00:08:24,629

how do you get all the food supplies

220

00:08:29,430 --> 00:08:27,840

when you spend 170 days in space okay

221

00:08:31,270 --> 00:08:29,440

that's a lot of food we need a lot of

222

00:08:32,389 --> 00:08:31,280

food for that and some guys like me eat

223

00:08:33,430 --> 00:08:32,399

a lot so

224

00:08:34,389 --> 00:08:33,440

um

225

00:08:35,110 --> 00:08:34,399

you know

226

00:08:41,350 --> 00:08:35,120

we

227

00:08:43,430 --> 00:08:41,360

has to be launched from the earth so

228

00:08:44,949 --> 00:08:43,440

all that food has to be launched and we

229

00:08:47,590 --> 00:08:44,959

have some here i think here's some

230

00:08:49,509 --> 00:08:47,600

examples of it over here so

231

00:08:50,550 --> 00:08:49,519

what we don't launch well we don't

232

00:08:52,550 --> 00:08:50,560

launch any

233

00:08:54,550 --> 00:08:52,560

we don't watch all of the water that we

234

00:08:56,230 --> 00:08:54,560

drink we launched some of it still

235

00:08:58,790 --> 00:08:56,240

yeah we've got some here so this is

236

00:09:01,750 --> 00:08:58,800

example of some dehydrated

237

00:09:03,190 --> 00:09:01,760

food and so basically it's it's lighter

238

00:09:04,949 --> 00:09:03,200

when it's dehydrated so we launch it

239

00:09:07,990 --> 00:09:04,959

that way and then

240

00:09:10,230 --> 00:09:08,000

we put water in it and and we eat it so

241

00:09:12,790 --> 00:09:10,240

we have a number of different cargo

242

00:09:15,030 --> 00:09:12,800

ships cargo spacecraft that come up

243

00:09:16,630 --> 00:09:15,040

we've got ones from russia from japan

244

00:09:19,030 --> 00:09:16,640

from europe

245

00:09:20,790 --> 00:09:19,040

we're about to have one from the u.s as

246

00:09:23,269 --> 00:09:20,800

well and

247

00:09:24,710 --> 00:09:23,279

we have to periodically bring those uh

248

00:09:27,350 --> 00:09:24,720

packed with supplies and some of those

249

00:09:29,350 --> 00:09:27,360

supplies are food um and that's and

250

00:09:31,110 --> 00:09:29,360

that's what we eat now other things

251

00:09:32,550 --> 00:09:31,120

though like water

252

00:09:34,470 --> 00:09:32,560

we recycle

253

00:09:36,389 --> 00:09:34,480

so we do we do launch some water but

254

00:09:38,870 --> 00:09:36,399

most of the water that we drink

255

00:09:41,509 --> 00:09:38,880

is recycled from urine and from

256

00:09:43,750 --> 00:09:41,519

perspiration and um and those are the

257

00:09:45,990 --> 00:09:43,760

type of things that when we go beyond

258

00:09:48,790 --> 00:09:46,000

the earth orbit when we go

259

00:09:49,910 --> 00:09:48,800

back to the moon to asteroids to mars

260

00:09:51,350 --> 00:09:49,920

we're not going to be able to carry

261

00:09:52,870 --> 00:09:51,360

everything with us we're going to have

262

00:09:54,949 --> 00:09:52,880

to do a lot of those type of recycling

263

00:09:57,030 --> 00:09:54,959

including food and so that's why we're

264

00:09:58,230 --> 00:09:57,040

trying to study how to grow food in

265

00:10:02,790 --> 00:09:58,240

space

266

00:10:04,949 --> 00:10:02,800

exploration but it also has applications

267

00:10:06,470 --> 00:10:04,959

on the earth of how to grow how to grow

268

00:10:08,550 --> 00:10:06,480

crops better on earth and there's a lot

269

00:10:10,470 --> 00:10:08,560

of research being conducted on board the

270

00:10:15,190 --> 00:10:10,480

space station that's looking at just

271

00:10:20,470 --> 00:10:18,230

what was your best memory in being space

272

00:10:22,310 --> 00:10:20,480

wow the best memory of being in space i

273

00:10:23,910 --> 00:10:22,320

don't i don't think i can pick just one

274

00:10:26,550 --> 00:10:23,920

there is a

275

00:10:28,550 --> 00:10:26,560

there's a lot of things i miss about

276

00:10:29,990 --> 00:10:28,560

living and working in space i miss

277

00:10:31,910 --> 00:10:30,000

obviously looking down at our beautiful

278

00:10:33,110 --> 00:10:31,920

planet which is indescribably beautiful

279

00:10:36,630 --> 00:10:33,120

and and

280

00:10:38,310 --> 00:10:36,640

we tried as best we can to to share that

281

00:10:40,470 --> 00:10:38,320

uh but it still doesn't do justice to

282

00:10:42,790 --> 00:10:40,480

the absolutely exquisite beauty of our

283

00:10:44,310 --> 00:10:42,800

planet so miss looking at that i miss

284

00:10:47,110 --> 00:10:44,320

looking at uh

285

00:10:48,470 --> 00:10:47,120

at thunderstorms uh right on the horizon

286

00:10:51,509 --> 00:10:48,480

as the sun's setting because they cast

287

00:10:53,750 --> 00:10:51,519

these big shadows and and the they start

288

00:10:54,870 --> 00:10:53,760

to turn pink and then they get darker

289

00:10:57,110 --> 00:10:54,880

and and

290

00:10:58,069 --> 00:10:57,120

uh watching lightning storms at night

291

00:10:59,269 --> 00:10:58,079

which

292

00:11:01,509 --> 00:10:59,279

really i don't know if you've seen some

293

00:11:02,310 --> 00:11:01,519

of the time-lapse photography it's sped

294

00:11:04,150 --> 00:11:02,320

up

295

00:11:06,310 --> 00:11:04,160

so you've seen you know like paparazzi

296

00:11:09,030 --> 00:11:06,320

flash bulbs but even though it's sped up

297

00:11:10,550 --> 00:11:09,040

it's only capturing a small percentage

298

00:11:11,829 --> 00:11:10,560

of the lightning so it's that that's

299

00:11:14,150 --> 00:11:11,839

actually what it looks like it really

300

00:11:16,550 --> 00:11:14,160

does flash like that

301  
00:11:18,630 --> 00:11:16,560  
very very quickly i miss seeing shooting

302  
00:11:19,829 --> 00:11:18,640  
stars from above meteorites

303  
00:11:20,949 --> 00:11:19,839  
burning up as they pass through the

304  
00:11:22,710 --> 00:11:20,959  
atmosphere

305  
00:11:24,790 --> 00:11:22,720  
the auroras

306  
00:11:26,310 --> 00:11:24,800  
from space are just absolutely beautiful

307  
00:11:27,509 --> 00:11:26,320  
and i think one of my favorite things

308  
00:11:29,910 --> 00:11:27,519  
though is

309  
00:11:31,990 --> 00:11:29,920  
it was watching the earth come alive as

310  
00:11:34,630 --> 00:11:32,000  
we pass from daytime and tonight and we

311  
00:11:36,069 --> 00:11:34,640  
do that 16 times a day but it was it was

312  
00:11:38,310 --> 00:11:36,079  
just amazing to see the lights of the

313  
00:11:40,630 --> 00:11:38,320

cities come up and to watch

314

00:11:42,790 --> 00:11:40,640

that line pass below us that defines the

315

00:11:44,870 --> 00:11:42,800

difference between nighttime and daytime

316

00:11:46,790 --> 00:11:44,880

and to see okay everybody on this side

317

00:11:48,870 --> 00:11:46,800

is uh probably asleep in their beds and

318

00:11:51,110 --> 00:11:48,880

everybody on this side is a you know at

319

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

work or whatever and it's just a really

320

00:11:55,350 --> 00:11:53,839

special thing to see that so and then

321

00:11:56,470 --> 00:11:55,360

obviously the you know the friend the

322

00:11:58,389 --> 00:11:56,480

friends that you're with and the people

323

00:12:00,310 --> 00:11:58,399

that you share that experience with is a

324

00:12:02,150 --> 00:12:00,320

you know a very memorable part of the

325

00:12:05,030 --> 00:12:02,160

experience i don't i don't think i could

326

00:12:09,269 --> 00:12:05,040

just pick one so

327

00:12:14,470 --> 00:12:11,910

uh yeah mark is done i tweet with the at

328

00:12:17,110 --> 00:12:14,480

marcus c dunn pretty unique i know

329

00:12:19,350 --> 00:12:17,120

yeah thanks for uh having us here

330

00:12:21,509 --> 00:12:19,360

in the uh i guess the primary or well

331

00:12:24,310 --> 00:12:21,519

we'll just say a presidential candidate

332

00:12:25,430 --> 00:12:24,320

had mentioned uh the idea of colonizing

333

00:12:28,069 --> 00:12:25,440

the moon

334

00:12:29,590 --> 00:12:28,079

and it was kind of laughed off different

335

00:12:31,430 --> 00:12:29,600

takes on it i was just going to see you

336

00:12:34,710 --> 00:12:31,440

know what are your thoughts on that

337

00:12:37,670 --> 00:12:34,720

endeavor if you think it's realistic in

338

00:12:39,269 --> 00:12:37,680

what time frame or maybe the next

339

00:12:40,870 --> 00:12:39,279

big thing i think there was a

340

00:12:42,710 --> 00:12:40,880

publication the other day about the

341

00:12:44,870 --> 00:12:42,720

budget coming out saying that

342

00:12:46,470 --> 00:12:44,880

uh mark the mark missions to mars we're

343

00:12:47,350 --> 00:12:46,480

going to pull back on the on the probe

344

00:12:48,470 --> 00:12:47,360

side

345

00:12:49,990 --> 00:12:48,480

so

346

00:12:52,949 --> 00:12:50,000

i'm curious is what you think the big

347

00:12:55,829 --> 00:12:52,959

next thing is for us as a country

348

00:12:57,350 --> 00:12:55,839

but you know as nasa okay the the

349

00:12:59,190 --> 00:12:57,360

there's actually a couple questions

350

00:13:01,509 --> 00:12:59,200

there and there for the first one is is

351

00:13:02,949 --> 00:13:01,519

it feasible uh or is it possible i mean

352

00:13:05,190 --> 00:13:02,959

it's certainly possible but is it

353

00:13:06,949 --> 00:13:05,200

feasible and i think

354

00:13:09,110 --> 00:13:06,959

anything is feasible anything is

355

00:13:11,590 --> 00:13:09,120

possible that we set our mind to so

356

00:13:13,910 --> 00:13:11,600

whatever we choose to do whether that's

357

00:13:15,590 --> 00:13:13,920

you know have an outpost on the moon uh

358

00:13:17,110 --> 00:13:15,600

use the resources on the moon go to an

359

00:13:18,710 --> 00:13:17,120

asteroid go to mars whatever we choose

360

00:13:20,470 --> 00:13:18,720

to do we can do we just have to choose

361

00:13:22,230 --> 00:13:20,480

to do it and have the will to follow it

362

00:13:24,710 --> 00:13:22,240

through um

363

00:13:25,590 --> 00:13:24,720

there are a lot of reasons to go back to

364

00:13:28,150 --> 00:13:25,600

the moon

365

00:13:30,069 --> 00:13:28,160

uh a lot of really good reasons to go

366

00:13:31,670 --> 00:13:30,079

back to the moon and to stay this time

367

00:13:34,069 --> 00:13:31,680

uh if we were to build an outpost on the

368

00:13:35,910 --> 00:13:34,079

moon well first if we were to establish

369

00:13:37,350 --> 00:13:35,920

a transportation system between the

370

00:13:39,590 --> 00:13:37,360

earth and the moon to make it

371

00:13:41,110 --> 00:13:39,600

economically feasible to to travel from

372

00:13:42,310 --> 00:13:41,120

the earth to the moon

373

00:13:44,790 --> 00:13:42,320

that would open up all kinds of

374

00:13:45,990 --> 00:13:44,800

possibilities uh there is commercial

375

00:13:47,829 --> 00:13:46,000

activities that can be done on the moon

376

00:13:50,710 --> 00:13:47,839

there's tons of science you know the

377

00:13:52,550 --> 00:13:50,720

moon's surface is relatively undisturbed

378

00:13:54,069 --> 00:13:52,560

so studying the the

379

00:13:55,430 --> 00:13:54,079

geological features of the moon will

380

00:13:56,629 --> 00:13:55,440

help us better understand our own

381

00:13:58,790 --> 00:13:56,639

geology

382

00:14:00,550 --> 00:13:58,800

we could put radio telescopes on the on

383

00:14:02,150 --> 00:14:00,560

the far side of the moon

384

00:14:04,629 --> 00:14:02,160

there's enough energy on the moon to

385

00:14:07,110 --> 00:14:04,639

power the planet for centuries

386

00:14:08,870 --> 00:14:07,120

so there's a there's a benefit there uh

387

00:14:10,949 --> 00:14:08,880

there's a there's enough energy to power

388

00:14:12,470 --> 00:14:10,959

our planet without destroying our planet

389

00:14:14,829 --> 00:14:12,480

so there's a lot of environmental

390

00:14:19,030 --> 00:14:14,839

reasons uh to go back to the moon

391

00:14:21,509 --> 00:14:19,040

so also if we're going to go to mars

392

00:14:24,310 --> 00:14:21,519

it's possible that it might be easier to

393

00:14:26,790 --> 00:14:24,320

go to mars launching from the moon so

394

00:14:28,949 --> 00:14:26,800

it's a lot cheaper to launch

395

00:14:30,629 --> 00:14:28,959

materials from the moon that it is from

396

00:14:31,750 --> 00:14:30,639

the earth now that means that you have

397

00:14:34,069 --> 00:14:31,760

to develop

398

00:14:36,550 --> 00:14:34,079

you know basically an infrastructure and

399

00:14:40,310 --> 00:14:36,560

a production facility on the moon that's

400

00:14:41,750 --> 00:14:40,320

that's no small task but again if we

401  
00:14:43,829 --> 00:14:41,760  
if we as the federal government i mean

402  
00:14:45,670 --> 00:14:43,839  
we've had big federal expenditures we've

403  
00:14:48,870 --> 00:14:45,680  
built the railroad we built a interstate

404  
00:14:51,030 --> 00:14:48,880  
highway system and so that opened up

405  
00:14:52,870 --> 00:14:51,040  
you know opportunities for further

406  
00:14:54,870 --> 00:14:52,880  
development and i think if we were to

407  
00:14:56,310 --> 00:14:54,880  
create a

408  
00:14:57,750 --> 00:14:56,320  
transportation system between the earth

409  
00:14:59,269 --> 00:14:57,760  
and the moon we would see those same

410  
00:15:02,069 --> 00:14:59,279  
type of things you know when the when

411  
00:15:03,590 --> 00:15:02,079  
the early settlers went went westward

412  
00:15:05,430 --> 00:15:03,600  
they didn't carry with them everything

413  
00:15:07,590 --> 00:15:05,440

that they they needed they had to live

414

00:15:09,670 --> 00:15:07,600

off the land and we have the ability

415

00:15:11,590 --> 00:15:09,680

to live off the land we can go to the

416

00:15:13,030 --> 00:15:11,600

moon we can go to asteroids we can we

417

00:15:14,550 --> 00:15:13,040

can basically create that infrastructure

418

00:15:16,230 --> 00:15:14,560

now i'm not don't i'm not

419

00:15:17,750 --> 00:15:16,240

underestimating the the difficulty of

420

00:15:19,590 --> 00:15:17,760

that it's it's very hard but that's why

421

00:15:21,590 --> 00:15:19,600

i started off by saying

422

00:15:22,870 --> 00:15:21,600

we can do whatever we set our mind to

423

00:15:24,870 --> 00:15:22,880

and there is

424

00:15:27,350 --> 00:15:24,880

you know there was a huge expenditure in

425

00:15:29,749 --> 00:15:27,360

the railroad and we asked

426

00:15:32,150 --> 00:15:29,759

the early railroad developers to make

427

00:15:34,629 --> 00:15:32,160

enormous investments

428

00:15:36,150 --> 00:15:34,639

on long-term payback on investments and

429

00:15:38,710 --> 00:15:36,160

we did that we had some help from the

430

00:15:41,030 --> 00:15:38,720

federal government to do that and we can

431

00:15:42,629 --> 00:15:41,040

have a similar model and and really

432

00:15:44,790 --> 00:15:42,639

uh create

433

00:15:45,910 --> 00:15:44,800

you know an enormous capability uh from

434

00:15:46,629 --> 00:15:45,920

the moon so

435

00:15:47,990 --> 00:15:46,639

uh

436

00:15:49,110 --> 00:15:48,000

i could spend the rest of the you know

437

00:15:50,870 --> 00:15:49,120

hour and a half that we have here

438

00:15:52,629 --> 00:15:50,880

talking about that but because i i

439

00:15:54,230 --> 00:15:52,639

really do feel that uh you know there's

440

00:15:56,550 --> 00:15:54,240

a lot of benefit and i'm speaking

441

00:15:58,069 --> 00:15:56,560

personally here so

442

00:15:59,269 --> 00:15:58,079

okay

443

00:16:01,269 --> 00:15:59,279

um

444

00:16:02,310 --> 00:16:01,279

where's the microphone

445

00:16:04,870 --> 00:16:02,320

okay

446

00:16:07,350 --> 00:16:04,880

just right there

447

00:16:09,829 --> 00:16:07,360

uh eric underscore right underscore now

448

00:16:11,990 --> 00:16:09,839

uh the dreaded two-part question you

449

00:16:13,670 --> 00:16:12,000

mentioned in an earlier uh answer

450

00:16:15,670 --> 00:16:13,680

aspirations of being an astronaut when

451  
00:16:17,430 --> 00:16:15,680  
you were a child i noticed your birthday

452  
00:16:20,310 --> 00:16:17,440  
is pretty close to halloween did you

453  
00:16:21,829 --> 00:16:20,320  
ever trick-or-treat as an astronaut and

454  
00:16:23,749 --> 00:16:21,839  
park well you're thinking about that

455  
00:16:25,509 --> 00:16:23,759  
part two um we noticed that you were

456  
00:16:27,590 --> 00:16:25,519  
using an instrument a guitar up in the

457  
00:16:29,829 --> 00:16:27,600  
iss and we're wondering if it

458  
00:16:31,590 --> 00:16:29,839  
handled or sounded differently or if

459  
00:16:34,150 --> 00:16:31,600  
katie's flute sounded differently is it

460  
00:16:35,749 --> 00:16:34,160  
different in zero g than it is down here

461  
00:16:39,509 --> 00:16:35,759  
in earth

462  
00:16:41,269 --> 00:16:39,519  
so i i never halloweened as i never

463  
00:16:43,350 --> 00:16:41,279

trick-or-treated as an astronaut well

464

00:16:44,550 --> 00:16:43,360

until up until about last year

465

00:16:45,670 --> 00:16:44,560

yeah

466

00:16:46,710 --> 00:16:45,680

so

467

00:16:51,110 --> 00:16:46,720

um

468

00:16:53,430 --> 00:16:51,120

the but but i i mean as a kid i did you

469

00:16:54,069 --> 00:16:53,440

know play you know pretend that i you

470

00:16:55,509 --> 00:16:54,079

know

471

00:16:57,269 --> 00:16:55,519

put my feet up my feet up on the bed

472

00:16:58,550 --> 00:16:57,279

with my back on the floor and do the

473

00:17:00,949 --> 00:16:58,560

countdown and all that kind of stuff as

474

00:17:03,110 --> 00:17:00,959

a little kid but um

475

00:17:04,710 --> 00:17:03,120

sound i i do not did not notice any

476

00:17:06,230 --> 00:17:04,720

difference in the sound i mean we are at

477

00:17:08,710 --> 00:17:06,240

sea level pressure

478

00:17:11,350 --> 00:17:08,720

inside the space station and so the

479

00:17:13,189 --> 00:17:11,360

the sound waves travel as if they're on

480

00:17:14,949 --> 00:17:13,199

the earth now i don't think there's any

481

00:17:16,390 --> 00:17:14,959

effect to gravity now there is a lot of

482

00:17:18,150 --> 00:17:16,400

background noise

483

00:17:19,110 --> 00:17:18,160

on the space station so you have to oh

484

00:17:20,309 --> 00:17:19,120

you know

485

00:17:22,870 --> 00:17:20,319

that's that's something that you have to

486

00:17:24,789 --> 00:17:22,880

raise the volume to to get above but

487

00:17:25,669 --> 00:17:24,799

it's and it's not bad it's just

488

00:17:26,949 --> 00:17:25,679

um

489

00:17:35,110 --> 00:17:26,959

i

490

00:17:37,590 --> 00:17:35,120

um where

491

00:17:39,270 --> 00:17:37,600

the mic for okay so

492

00:17:41,029 --> 00:17:39,280

i don't

493

00:17:42,070 --> 00:17:41,039

why it doesn't

494

00:17:43,669 --> 00:17:42,080

why don't

495

00:17:46,950 --> 00:17:43,679

they build

496

00:17:49,029 --> 00:17:46,960

more underwater laboratories why don't

497

00:17:51,590 --> 00:17:49,039

they build more underwater laboratories

498

00:17:53,669 --> 00:17:51,600

uh i wish they would uh i i think we

499

00:17:55,110 --> 00:17:53,679

only have one it's called aquarius it's

500

00:17:56,950 --> 00:17:55,120

off the coast of key largo i got to

501  
00:17:59,990 --> 00:17:56,960  
spend three weeks there once

502  
00:18:02,390 --> 00:18:00,000  
uh which was pretty cool and i think um

503  
00:18:04,230 --> 00:18:02,400  
there is a lot to be gained by not only

504  
00:18:06,390 --> 00:18:04,240  
studying space but also studying our

505  
00:18:08,870 --> 00:18:06,400  
oceans and and uh getting a better

506  
00:18:09,830 --> 00:18:08,880  
understanding of our planet overall and

507  
00:18:12,230 --> 00:18:09,840  
um

508  
00:18:14,630 --> 00:18:12,240  
you know that was in 2006 i was on the

509  
00:18:17,029 --> 00:18:14,640  
the nemo 9 mission on the bottom of the

510  
00:18:19,110 --> 00:18:17,039  
ocean and that was just an absolutely

511  
00:18:21,110 --> 00:18:19,120  
incredible experience we were like i

512  
00:18:21,990 --> 00:18:21,120  
said three weeks in a beautiful coral

513  
00:18:24,549 --> 00:18:22,000

reef

514

00:18:27,430 --> 00:18:24,559

and we did a lot of science on board our

515

00:18:29,110 --> 00:18:27,440

mission basically had two big we had a

516

00:18:30,310 --> 00:18:29,120

lot of different experiments but the the

517

00:18:32,230 --> 00:18:30,320

overall

518

00:18:33,669 --> 00:18:32,240

goals were number one to

519

00:18:35,029 --> 00:18:33,679

work on the procedures that we're going

520

00:18:37,029 --> 00:18:35,039

to use

521

00:18:39,830 --> 00:18:37,039

at the time we the moon program was

522

00:18:41,750 --> 00:18:39,840

still intact and so we were going down

523

00:18:42,950 --> 00:18:41,760

that road and

524

00:18:44,870 --> 00:18:42,960

we were working on procedures for

525

00:18:46,310 --> 00:18:44,880

exploring the lunar surface

526

00:18:48,710 --> 00:18:46,320

but we also were doing a lot of

527

00:18:50,710 --> 00:18:48,720

telemedicine we're doing telementoring

528

00:18:52,710 --> 00:18:50,720

telerobotic surgery

529

00:18:54,470 --> 00:18:52,720

so that when we go out into space if we

530

00:18:56,470 --> 00:18:54,480

don't have you know whatever surgeon we

531

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

need if we have some kind of problem we

532

00:19:00,390 --> 00:18:58,000

can still

533

00:19:02,870 --> 00:19:00,400

help that astronaut that crew member

534

00:19:06,070 --> 00:19:02,880

remotely from the earth and so we

535

00:19:09,110 --> 00:19:06,080

actually had at one point a surgeon in

536

00:19:10,710 --> 00:19:09,120

canada operating the robotic controls on

537

00:19:12,470 --> 00:19:10,720

a surgical robot that we had on the

538

00:19:14,230 --> 00:19:12,480

bottom of the ocean in our habitat that

539

00:19:15,830 --> 00:19:14,240

was doing a mock operation and we

540

00:19:16,630 --> 00:19:15,840

actually put the delay in that you would

541

00:19:19,190 --> 00:19:16,640

have

542

00:19:20,710 --> 00:19:19,200

on the moon and the really

543

00:19:23,029 --> 00:19:20,720

critical thing here the really important

544

00:19:24,070 --> 00:19:23,039

thing here and this applies to i'd say

545

00:19:28,789 --> 00:19:24,080

99

546

00:19:30,470 --> 00:19:28,799

space station is its application to

547

00:19:32,390 --> 00:19:30,480

earth so in this particular case we were

548

00:19:34,310 --> 00:19:32,400

doing this so that we could potentially

549

00:19:37,430 --> 00:19:34,320

operate on an astronaut on the moon or

550

00:19:39,669 --> 00:19:37,440

on mars but what we learned from it and

551  
00:19:44,070 --> 00:19:39,679  
the ability to operate on someone

552  
00:19:45,830 --> 00:19:44,080  
remotely will affect um any area on the

553  
00:19:48,150 --> 00:19:45,840  
planet that does not have access to a

554  
00:19:50,789 --> 00:19:48,160  
major medical center uh this could be in

555  
00:19:52,630 --> 00:19:50,799  
a disaster response it could be just in

556  
00:19:54,549 --> 00:19:52,640  
a developing world

557  
00:19:56,390 --> 00:19:54,559  
and it really is a tremendous capability

558  
00:19:58,549 --> 00:19:56,400  
and we really learned a lot from that

559  
00:20:00,470 --> 00:19:58,559  
mission so i wish there were more

560  
00:20:02,390 --> 00:20:00,480  
undersea laboratories i think it's a

561  
00:20:03,830 --> 00:20:02,400  
it's a very valuable investment in our

562  
00:20:06,149 --> 00:20:03,840  
future just like our investment in the

563  
00:20:07,830 --> 00:20:06,159

space program is so i think it's best if

564

00:20:09,990 --> 00:20:07,840

you guys picked the people so i don't

565

00:20:12,630 --> 00:20:10,000

have to keep finding you

566

00:20:14,390 --> 00:20:12,640

hi eric bjorner at kaya roth uh when you

567

00:20:16,710 --> 00:20:14,400

were in space what did you miss most

568

00:20:18,630 --> 00:20:16,720

about earth or did you were you having

569

00:20:20,230 --> 00:20:18,640

too much fun well i no i missed i mean

570

00:20:21,750 --> 00:20:20,240

obviously i miss my family the most and

571

00:20:24,230 --> 00:20:21,760

i'd like to say happy valentine's day to

572

00:20:25,110 --> 00:20:24,240

my beautiful wife

573

00:20:27,830 --> 00:20:25,120

so

574

00:20:30,950 --> 00:20:29,270

i probably would be in big trouble if i

575

00:20:33,750 --> 00:20:30,960

didn't say that so

576

00:20:35,590 --> 00:20:33,760

i would not i wouldn't so um

577

00:20:37,350 --> 00:20:35,600

i mean besides my family it was really

578

00:20:39,430 --> 00:20:37,360

interesting when i got ready to leave

579

00:20:41,029 --> 00:20:39,440

houston and this was two months before

580

00:20:43,029 --> 00:20:41,039

launching into space

581

00:20:43,909 --> 00:20:43,039

i started as a as i'm

582

00:20:45,669 --> 00:20:43,919

you know

583

00:20:48,310 --> 00:20:45,679

driving around or

584

00:20:50,149 --> 00:20:48,320

just living my life i started noticing

585

00:20:51,590 --> 00:20:50,159

things and i was saying to myself you

586

00:20:53,750 --> 00:20:51,600

know what i'm not going to see that for

587

00:20:55,990 --> 00:20:53,760

six months see those birds flying across

588

00:20:57,830 --> 00:20:56,000

see what let's see the sunset smell that

589

00:20:59,909 --> 00:20:57,840

the flowers you know hear that the birds

590

00:21:00,870 --> 00:20:59,919

chirping i started to real to take note

591

00:21:02,710 --> 00:21:00,880

of things

592

00:21:03,830 --> 00:21:02,720

that i wasn't going to get to

593

00:21:05,909 --> 00:21:03,840

get to see

594

00:21:08,789 --> 00:21:05,919

and you do you when you're in space for

595

00:21:10,470 --> 00:21:08,799

that long of a time you start to miss

596

00:21:11,990 --> 00:21:10,480

all those things that define the beauty

597

00:21:13,350 --> 00:21:12,000

of living on our planet i mean really

598

00:21:16,230 --> 00:21:13,360

miss them and you and

599

00:21:17,590 --> 00:21:16,240

and to the point where you realize that

600

00:21:19,990 --> 00:21:17,600

most of these things you really took for

601  
00:21:22,549 --> 00:21:20,000  
granted and

602  
00:21:24,630 --> 00:21:22,559  
but having returned to earth now

603  
00:21:26,310 --> 00:21:24,640  
i also miss a lot of the things that

604  
00:21:29,430 --> 00:21:26,320  
define the beauty of living in space a

605  
00:21:32,230 --> 00:21:29,440  
lot of which i said up front and so

606  
00:21:34,789 --> 00:21:32,240  
it's it is a totally different existence

607  
00:21:36,549 --> 00:21:34,799  
we are very uh removed from life on

608  
00:21:38,549 --> 00:21:36,559  
earth but by the same token in some

609  
00:21:40,630 --> 00:21:38,559  
respects we're more connected

610  
00:21:41,909 --> 00:21:40,640  
we get the news up there and so imagine

611  
00:21:43,029 --> 00:21:41,919  
we're watching the news and we hear

612  
00:21:45,750 --> 00:21:43,039  
about

613  
00:21:47,190 --> 00:21:45,760

the wildfires out in texas and then we

614

00:21:48,950 --> 00:21:47,200

look at the map and say oh we'll be

615

00:21:51,909 --> 00:21:48,960

there in three minutes and you go to the

616

00:21:53,270 --> 00:21:51,919

window and there they are so it seeing

617

00:21:55,029 --> 00:21:53,280

seeing those type of things you know

618

00:21:57,190 --> 00:21:55,039

seeing the hurricanes

619

00:21:59,190 --> 00:21:57,200

seeing places on the earth were you know

620

00:22:00,870 --> 00:21:59,200

significant events just happened and

621

00:22:02,310 --> 00:22:00,880

actually seeing them with your own eye

622

00:22:03,350 --> 00:22:02,320

made us feel in some respects more

623

00:22:04,950 --> 00:22:03,360

connected

624

00:22:06,870 --> 00:22:04,960

so um

625

00:22:09,029 --> 00:22:06,880

back to your question what did i miss i

626

00:22:11,270 --> 00:22:09,039

think i missed all those things that

627

00:22:13,430 --> 00:22:11,280

define uh the beauty of life in space

628

00:22:15,190 --> 00:22:13,440

just like i missed all those things that

629

00:22:19,669 --> 00:22:15,200

define the beauty of life on earth when

630

00:22:27,350 --> 00:22:24,549

my name is mike isbell at space fan 59

631

00:22:30,789 --> 00:22:27,360

and my question is since you were chosen

632

00:22:33,029 --> 00:22:30,799

as a pilot astronaut how did you come to

633

00:22:34,630 --> 00:22:33,039

fly as a mission specialist rather than

634

00:22:37,830 --> 00:22:34,640

as a pilot

635

00:22:41,590 --> 00:22:37,840

yeah so um back around

636

00:22:42,390 --> 00:22:41,600

2006 2007 we were looking at the number

637

00:22:44,149 --> 00:22:42,400

of

638

00:22:46,630 --> 00:22:44,159

projected shuttle flights that we had

639

00:22:49,430 --> 00:22:46,640

left um we saw the number of pilots that

640

00:22:51,430 --> 00:22:49,440

we had and a call was went out to the to

641

00:22:52,870 --> 00:22:51,440

all the pilot astronauts you know who

642

00:22:54,710 --> 00:22:52,880

who would be willing to fly as a mission

643

00:22:55,990 --> 00:22:54,720

specialist and not fly as a pilot and i

644

00:22:59,029 --> 00:22:56,000

said i'll fly wherever you want me to

645

00:23:01,990 --> 00:22:59,039

fly um you know where whatever you know

646

00:23:04,310 --> 00:23:02,000

wherever we can make a contribution and

647

00:23:05,750 --> 00:23:04,320

there was no promises but as it turns

648

00:23:07,510 --> 00:23:05,760

out it was a pretty good deal because i

649

00:23:09,750 --> 00:23:07,520

got to do three spacewalks

650

00:23:11,750 --> 00:23:09,760

on that first mission and so

651  
00:23:14,310 --> 00:23:11,760  
that um

652  
00:23:16,789 --> 00:23:14,320  
you know we i flew on sts-124 as mission

653  
00:23:18,149 --> 00:23:16,799  
specialist too as the flight engineer um

654  
00:23:20,470 --> 00:23:18,159  
it was a totally different experience

655  
00:23:22,149 --> 00:23:20,480  
than i would have had as a pilot

656  
00:23:23,750 --> 00:23:22,159  
i'm not saying if it was better or worse

657  
00:23:25,029 --> 00:23:23,760  
i i don't know

658  
00:23:26,630 --> 00:23:25,039  
but i think it was a pretty good

659  
00:23:29,750 --> 00:23:26,640  
experience and i'm very grateful to have

660  
00:23:31,909 --> 00:23:29,760  
had it uh and then after that mission i

661  
00:23:34,470 --> 00:23:31,919  
was given the opportunity to

662  
00:23:36,470 --> 00:23:34,480  
fly as a long-duration crew member

663  
00:23:37,830 --> 00:23:36,480

and i realized when

664

00:23:39,590 --> 00:23:37,840

i said yes to that that meant i would

665

00:23:40,870 --> 00:23:39,600

never fly as a pilot on the space

666

00:23:42,149 --> 00:23:40,880

shuttle but again

667

00:23:44,149 --> 00:23:42,159

um

668

00:23:47,029 --> 00:23:44,159

you know i i don't take my

669

00:23:48,070 --> 00:23:47,039

profession lightly and it doesn't matter

670

00:23:49,830 --> 00:23:48,080

to me

671

00:23:52,549 --> 00:23:49,840

how how i can as long as i'm able to

672

00:23:54,789 --> 00:23:52,559

contribute it it didn't matter and again

673

00:23:57,029 --> 00:23:54,799

um you know that was an experience that

674

00:23:59,510 --> 00:23:57,039

i'm really really fortunate to have had

675

00:24:01,830 --> 00:23:59,520

uh basically i

676

00:24:03,510 --> 00:24:01,840

my first time in space i visited space

677

00:24:05,110 --> 00:24:03,520

my second time in space i lived in space

678

00:24:07,350 --> 00:24:05,120

and became a resident of space and it's

679

00:24:09,510 --> 00:24:07,360

a totally totally different experience

680

00:24:11,110 --> 00:24:09,520

you know you have one little snapshot on

681

00:24:12,950 --> 00:24:11,120

a shuttle mission

682

00:24:13,830 --> 00:24:12,960

where you see the earth in one moment of

683

00:24:15,350 --> 00:24:13,840

time

684

00:24:17,350 --> 00:24:15,360

one season

685

00:24:19,510 --> 00:24:17,360

but when you're in space for months on

686

00:24:21,669 --> 00:24:19,520

end you actually watch the earth

687

00:24:23,909 --> 00:24:21,679

transform you watch the turns you know

688

00:24:26,149 --> 00:24:23,919

the seasons change from space

689

00:24:28,630 --> 00:24:26,159

you see the the ice breaking up you see

690

00:24:30,230 --> 00:24:28,640

icebergs i mean you it's a totally

691

00:24:32,149 --> 00:24:30,240

different experience you see a living

692

00:24:33,909 --> 00:24:32,159

organism that's the earth that you

693

00:24:35,990 --> 00:24:33,919

really can't get from a from a short

694

00:24:38,630 --> 00:24:36,000

duration flight so

695

00:24:41,110 --> 00:24:38,640

i think it was a very very fortunate

696

00:24:43,110 --> 00:24:41,120

opportunity that i had to do that

697

00:24:48,310 --> 00:24:43,120

so

698

00:24:51,269 --> 00:24:48,320

sarah farrell at spf 2j uva hi um i was

699

00:24:54,549 --> 00:24:51,279

wondering about what inspired you to

700

00:24:56,870 --> 00:24:54,559

create the fragile oasis project and how

701  
00:24:59,430 --> 00:24:56,880  
ordinary people can help with that yeah

702  
00:25:02,070 --> 00:24:59,440  
the fragile aces project it has a number

703  
00:25:05,430 --> 00:25:02,080  
of objectives and where is elise where

704  
00:25:08,870 --> 00:25:06,870  
okay there's elise david back there

705  
00:25:10,789 --> 00:25:08,880  
she's the executive producer of fragile

706  
00:25:12,870 --> 00:25:10,799  
oasis and we have beth beck here i think

707  
00:25:14,549 --> 00:25:12,880  
everybody knows beth beck but she's a

708  
00:25:15,350 --> 00:25:14,559  
very instrumental and fragile oasis as

709  
00:25:21,269 --> 00:25:15,360  
well

710  
00:25:24,710 --> 00:25:23,750  
so the the has the number objectives

711  
00:25:26,870 --> 00:25:24,720  
like i said

712  
00:25:28,390 --> 00:25:26,880  
one of them is to use

713  
00:25:29,830 --> 00:25:28,400

this perspective that we have of our

714

00:25:32,310 --> 00:25:29,840

planet from space to use what we call

715

00:25:33,590 --> 00:25:32,320

the orbital perspective to hopefully

716

00:25:34,630 --> 00:25:33,600

inspire people to go out and make a

717

00:25:35,750 --> 00:25:34,640

difference and make the world a better

718

00:25:37,510 --> 00:25:35,760

place

719

00:25:40,549 --> 00:25:37,520

there's also a very big education

720

00:25:42,470 --> 00:25:40,559

outreach aspect of it

721

00:25:44,149 --> 00:25:42,480

the other thing we want to do is we have

722

00:25:45,990 --> 00:25:44,159

a tremendous success story with the

723

00:25:47,990 --> 00:25:46,000

international space station you know we

724

00:25:50,070 --> 00:25:48,000

have 15 nations that all came together

725

00:25:52,310 --> 00:25:50,080

to build this amazing complex

726

00:25:53,669 --> 00:25:52,320

that is going to change the world the

727

00:25:55,350 --> 00:25:53,679

research that's being conducted on the

728

00:25:57,029 --> 00:25:55,360

international space station cannot be

729

00:25:59,190 --> 00:25:57,039

done anywhere else on the planet it's a

730

00:26:00,789 --> 00:25:59,200

very unique facility for research and

731

00:26:03,909 --> 00:26:00,799

there's going to be a lot of

732

00:26:06,149 --> 00:26:03,919

changes a lot of discoveries a lot of

733

00:26:08,149 --> 00:26:06,159

increased understanding of not only you

734

00:26:09,669 --> 00:26:08,159

know the universe but our planet

735

00:26:12,470 --> 00:26:09,679

ourselves in a lot of studies on the

736

00:26:14,630 --> 00:26:12,480

human bodies materials medicines etc so

737

00:26:17,350 --> 00:26:14,640

there's it's just an amazing success

738

00:26:18,950 --> 00:26:17,360

story and this is another way to tell

739

00:26:21,269 --> 00:26:18,960

the success story so

740

00:26:22,630 --> 00:26:21,279

um plus you know we wanted to have a

741

00:26:24,710 --> 00:26:22,640

place to have an online community it's

742

00:26:26,390 --> 00:26:24,720

about one percent or ten percent maybe

743

00:26:28,950 --> 00:26:26,400

of what it's going to be and what it was

744

00:26:29,990 --> 00:26:28,960

what the vision is for it um and but

745

00:26:31,590 --> 00:26:30,000

we're getting there we're getting there

746

00:26:33,750 --> 00:26:31,600

slowly so it's i think it's a wonderful

747

00:26:36,310 --> 00:26:33,760

place and it's a it's a place where we

748

00:26:38,390 --> 00:26:36,320

can share living and working in space uh

749

00:26:40,630 --> 00:26:38,400

where the astronauts on board

750

00:26:41,830 --> 00:26:40,640

can talk about it can send videos can

751  
00:26:44,230 --> 00:26:41,840  
can

752  
00:26:46,630 --> 00:26:44,240  
send pictures and really just share that

753  
00:26:50,950 --> 00:26:46,640  
as best they can so it's just one of the

754  
00:26:55,029 --> 00:26:53,350  
uh hello oh it's a fragile oasis.org

755  
00:26:58,070 --> 00:26:55,039  
thank you

756  
00:27:01,269 --> 00:26:58,080  
hello um i'm zoe uh

757  
00:27:03,110 --> 00:27:01,279  
i um i go to boston university and a few

758  
00:27:06,950 --> 00:27:03,120  
a few months ago in december i went to

759  
00:27:08,149 --> 00:27:06,960  
mit and i saw katie coleman um uh i uh

760  
00:27:12,149 --> 00:27:08,159  
she said that i should ask you if you

761  
00:27:14,950 --> 00:27:13,909  
that's a very good question

762  
00:27:16,870 --> 00:27:14,960  
um

763  
00:27:19,510 --> 00:27:16,880

yeah katie's kitty's playing a little

764

00:27:20,870 --> 00:27:19,520

trick on me so so it seemed like uh i

765

00:27:22,789 --> 00:27:20,880

don't know how this happened but

766

00:27:24,470 --> 00:27:22,799

whenever we brushed our teeth it just

767

00:27:25,750 --> 00:27:24,480

happened to be at the same time so and

768

00:27:27,029 --> 00:27:25,760

then after a while it just got to be

769

00:27:28,710 --> 00:27:27,039

funny that we were brushing our teeth

770

00:27:31,029 --> 00:27:28,720

and then when

771

00:27:33,430 --> 00:27:31,039

she came back you know she left um four

772

00:27:35,830 --> 00:27:33,440

months before i did so she she would

773

00:27:37,110 --> 00:27:35,840

send me notes on you know right actually

774

00:27:38,950 --> 00:27:37,120

i think the first one was i sent her a

775

00:27:41,750 --> 00:27:38,960

note today i was brushing my teeth today

776

00:27:44,070 --> 00:27:41,760

and i noticed you weren't there so

777

00:27:45,350 --> 00:27:44,080

so it was just a that's an inside joke

778

00:27:47,350 --> 00:27:45,360

so

779

00:27:49,830 --> 00:27:47,360

serious question um

780

00:27:52,310 --> 00:27:49,840

i i it's hard to describe um

781

00:27:54,230 --> 00:27:52,320

sometimes i i have dreams where i'm

782

00:27:55,669 --> 00:27:54,240

flying and i have a certain feeling in

783

00:27:56,710 --> 00:27:55,679

my stomach and i've i talked to some

784

00:27:58,470 --> 00:27:56,720

people and i said they've had dreams

785

00:28:00,470 --> 00:27:58,480

like that and they they know how it

786

00:28:02,230 --> 00:28:00,480

feels but they can't describe it have

787

00:28:04,230 --> 00:28:02,240

you ever had a dream like that and if

788

00:28:06,549 --> 00:28:04,240

you have does being actually in

789

00:28:08,549 --> 00:28:06,559

microgravity feel like that in the dream

790

00:28:10,230 --> 00:28:08,559

well i did on the space station once i

791

00:28:11,590 --> 00:28:10,240

did have a dream that i was fallen and

792

00:28:13,830 --> 00:28:11,600

then i woke up and i realized i really

793

00:28:14,950 --> 00:28:13,840

was

794

00:28:17,350 --> 00:28:14,960

okay

795

00:28:18,470 --> 00:28:17,360

um i know what you mean um

796

00:28:19,669 --> 00:28:18,480

you know

797

00:28:23,590 --> 00:28:19,679

floating

798

00:28:25,909 --> 00:28:23,600

but not so like if you go upside down in

799

00:28:27,029 --> 00:28:25,919

a pool you feel upside down but if you

800

00:28:28,389 --> 00:28:27,039

go upside down in space there is no

801  
00:28:30,630 --> 00:28:28,399  
upside down you don't feel anything

802  
00:28:32,230 --> 00:28:30,640  
differently although you see you know

803  
00:28:33,269 --> 00:28:32,240  
it's really interesting on a shuttle

804  
00:28:34,710 --> 00:28:33,279  
flight

805  
00:28:35,990 --> 00:28:34,720  
since you're only up there for a brief

806  
00:28:38,149 --> 00:28:36,000  
amount of time there is no up and down

807  
00:28:39,990 --> 00:28:38,159  
there is no you're you know there is no

808  
00:28:42,149 --> 00:28:40,000  
preferred orientation if you will i mean

809  
00:28:44,070 --> 00:28:42,159  
there is but you're not used to it yet

810  
00:28:46,070 --> 00:28:44,080  
after you're up there for you know weeks

811  
00:28:49,590 --> 00:28:46,080  
or months at a time there does be coming

812  
00:28:51,669 --> 00:28:49,600  
up and down visually and so when you

813  
00:28:53,510 --> 00:28:51,679

go upside down you feel a little bit

814

00:28:56,310 --> 00:28:53,520

like you're upside down for a little bit

815

00:28:57,830 --> 00:28:56,320

but then your brain rapidly switches

816

00:28:58,950 --> 00:28:57,840

gears and goes okay the ceiling just

817

00:29:00,950 --> 00:28:58,960

became the floor on the floor just came

818

00:29:02,070 --> 00:29:00,960

the ceiling and you're you're good but

819

00:29:04,470 --> 00:29:02,080

initially

820

00:29:05,830 --> 00:29:04,480

you it feels a little awkward but um

821

00:29:06,870 --> 00:29:05,840

that's because you've been there so long

822

00:29:09,190 --> 00:29:06,880

so

823

00:29:10,710 --> 00:29:09,200

it's hard to describe the feeling it

824

00:29:13,669 --> 00:29:10,720

other than to say it's wonderful i mean

825

00:29:15,269 --> 00:29:13,679

it really feels very liberating

826

00:29:17,110 --> 00:29:15,279

there's a freedom involved with it you

827

00:29:18,870 --> 00:29:17,120

know my commute to work every day was

828

00:29:21,110 --> 00:29:18,880

flying you know i

829

00:29:22,710 --> 00:29:21,120

i'd fly to the u.s lab or fly to

830

00:29:24,310 --> 00:29:22,720

columbus or wherever else i was working

831

00:29:26,950 --> 00:29:24,320

that day and

832

00:29:27,669 --> 00:29:26,960

it's a lot of fun and um you know like i

833

00:29:29,029 --> 00:29:27,679

said

834

00:29:30,310 --> 00:29:29,039

if you know you don't have to like if

835

00:29:31,590 --> 00:29:30,320

something's on the floor and you want to

836

00:29:33,029 --> 00:29:31,600

work on it you don't have to bend down

837

00:29:35,110 --> 00:29:33,039

and grab it you just flip upside down

838

00:29:36,470 --> 00:29:35,120

and and so there's a

839

00:29:37,350 --> 00:29:36,480

there's a there's a lot of freedom with

840

00:29:39,269 --> 00:29:37,360

that but

841

00:29:41,029 --> 00:29:39,279

beyond that it's hard to hard to

842

00:29:42,710 --> 00:29:41,039

describe

843

00:29:46,149 --> 00:29:42,720

so

844

00:29:48,070 --> 00:29:46,159

hi there i'm neil glick neil 095

845

00:29:49,909 --> 00:29:48,080

and um

846

00:29:53,510 --> 00:29:49,919

two quick questions i worked on the ils

847

00:29:55,590 --> 00:29:53,520

joint venture 20 years ago in moscow so

848

00:29:57,510 --> 00:29:55,600

my question is what's the difference

849

00:29:59,510 --> 00:29:57,520

between going on you know

850

00:30:00,950 --> 00:29:59,520

like launch and riding on a soyuz rocket

851

00:30:02,789 --> 00:30:00,960

versus a shuttle

852

00:30:04,389 --> 00:30:02,799

and then my second question is did you

853

00:30:06,310 --> 00:30:04,399

get to plant a tree

854

00:30:08,950 --> 00:30:06,320

uh after your flight at the cosmonauts

855

00:30:11,350 --> 00:30:08,960

dormitory at baikonur you actually plant

856

00:30:13,430 --> 00:30:11,360

it before you launch so and we did and

857

00:30:14,950 --> 00:30:13,440

that was pretty cool the launch to

858

00:30:17,430 --> 00:30:14,960

planetary in the same place that yuri

859

00:30:19,430 --> 00:30:17,440

gagarin did 50 years earlier uh after

860

00:30:23,029 --> 00:30:19,440

launching from the same or right before

861

00:30:24,549 --> 00:30:23,039

launching from the same pad but um

862

00:30:26,310 --> 00:30:24,559

there's a number of ways to answer that

863

00:30:27,909 --> 00:30:26,320

question i mean technically the

864

00:30:29,430 --> 00:30:27,919

experience was

865

00:30:31,190 --> 00:30:29,440

in the space shuttle you're in this

866

00:30:33,269 --> 00:30:31,200

massive powerful vehicle and you're

867

00:30:34,630 --> 00:30:33,279

riding inside of it and it's a you know

868

00:30:37,590 --> 00:30:34,640

it's a very at least the first part of

869

00:30:40,310 --> 00:30:37,600

it is a very violent ride into space

870

00:30:42,310 --> 00:30:40,320

the soyuz on the other hand

871

00:30:43,909 --> 00:30:42,320

it as opposed to riding in the soyuz you

872

00:30:45,750 --> 00:30:43,919

actually at least i actually felt like i

873

00:30:47,750 --> 00:30:45,760

was wearing it i mean you're strapped in

874

00:30:49,590 --> 00:30:47,760

there so tight you know your knees are

875

00:30:51,510 --> 00:30:49,600

in your chest it's so small

876

00:30:53,990 --> 00:30:51,520

and every you know everything is right

877

00:30:55,990 --> 00:30:54,000

there so every valve that that opens

878

00:30:59,110 --> 00:30:56,000

every pump that turns on every engine

879

00:31:01,990 --> 00:30:59,120

that lights you feel it and and you know

880

00:31:04,389 --> 00:31:02,000

every explosive bolt that fires so it's

881

00:31:06,310 --> 00:31:04,399

a it is a really remarkable spacecraft

882

00:31:09,029 --> 00:31:06,320

and it really

883

00:31:10,630 --> 00:31:09,039

um it was really enjoyable you know the

884

00:31:12,549 --> 00:31:10,640

launch into space i don't you guys ever

885

00:31:13,750 --> 00:31:12,559

see the movie rocket man

886

00:31:15,350 --> 00:31:13,760

so there's a scene in there where he

887

00:31:16,630 --> 00:31:15,360

finally launches into space and he gets

888

00:31:17,990 --> 00:31:16,640

in the space and he's like

889

00:31:19,509 --> 00:31:18,000

he's throwing this up that's what i felt

890

00:31:22,149 --> 00:31:19,519

like when

891

00:31:24,470 --> 00:31:22,159

when i launched on the soyuz um

892

00:31:25,830 --> 00:31:24,480

you know i think it's just a

893

00:31:27,590 --> 00:31:25,840

it's similar in a lot of ways you know

894

00:31:28,950 --> 00:31:27,600

it's the same amount of time it's about

895

00:31:30,230 --> 00:31:28,960

i guess it's a little bit more g's on

896

00:31:32,230 --> 00:31:30,240

the soyuz but you know it's in the same

897

00:31:34,470 --> 00:31:32,240

ballpark

898

00:31:36,630 --> 00:31:34,480

the coming home though is a big is a lot

899

00:31:38,389 --> 00:31:36,640

different so

900

00:31:43,269 --> 00:31:38,399

that's another story

901  
00:31:47,990 --> 00:31:45,590  
we recently saw

902  
00:31:50,549 --> 00:31:48,000  
a thing about

903  
00:31:52,630 --> 00:31:50,559  
a documentary about the building of this

904  
00:31:54,630 --> 00:31:52,640  
the space station

905  
00:31:57,430 --> 00:31:54,640  
and

906  
00:32:00,870 --> 00:31:57,440  
i guess what i wanted to know is

907  
00:32:02,470 --> 00:32:00,880  
did it feel like living in a

908  
00:32:05,110 --> 00:32:02,480  
modular home

909  
00:32:07,269 --> 00:32:05,120  
or did it feel like living in a bomb

910  
00:32:08,310 --> 00:32:07,279  
a bomb shelter

911  
00:32:37,830 --> 00:32:08,320  
a

912  
00:32:39,750 --> 00:32:37,840  
if you need some some quiet time or or

913  
00:32:40,549 --> 00:32:39,760

um it's i mean you could actually get

914

00:32:42,630 --> 00:32:40,559

lost

915

00:32:44,470 --> 00:32:42,640

if if you i mean

916

00:32:47,029 --> 00:32:44,480

not really but i mean pretty close it's

917

00:32:49,190 --> 00:32:47,039

it's almost that big so um it's a very

918

00:32:52,310 --> 00:32:49,200

comfortable place to live um we got

919

00:32:53,750 --> 00:32:52,320

great great uh scenery great views

920

00:32:55,509 --> 00:32:53,760

um

921

00:32:57,350 --> 00:32:55,519

you know we we control the temperature

922

00:32:59,909 --> 00:32:57,360

to whatever temperature we want we've

923

00:33:01,990 --> 00:32:59,919

got plenty of food plenty of light

924

00:33:04,149 --> 00:33:02,000

you know every everything that we we

925

00:33:06,070 --> 00:33:04,159

need we have and so it's a it's a very

926

00:33:08,549 --> 00:33:06,080

comfortable existence we've done an

927

00:33:09,990 --> 00:33:08,559

unbelievable job building it

928

00:33:11,750 --> 00:33:10,000

the design the engineering the

929

00:33:14,149 --> 00:33:11,760

construction of it is just tremendous

930

00:33:16,470 --> 00:33:14,159

and it it really is i mean it is awe

931

00:33:17,669 --> 00:33:16,480

inspiring to to see that from you know

932

00:33:20,310 --> 00:33:17,679

as you approach the space station

933

00:33:21,430 --> 00:33:20,320

whether or not on a space shuttle or on

934

00:33:23,669 --> 00:33:21,440

a soyuz

935

00:33:25,110 --> 00:33:23,679

uh or on a space walk and to be out

936

00:33:27,029 --> 00:33:25,120

there and looking back at the space

937

00:33:29,029 --> 00:33:27,039

station it's just it is an amazing

938

00:33:31,029 --> 00:33:29,039

accomplishment of humanity it really is

939

00:33:33,029 --> 00:33:31,039

um and so it's a it's a wonderful

940

00:33:34,789 --> 00:33:33,039

experience to live and work on there so

941

00:33:37,430 --> 00:33:34,799

i hope that answers your question it was

942

00:33:38,789 --> 00:33:37,440

it i guess in a nutshell the answer to

943

00:33:41,190 --> 00:33:38,799

your question is it felt like home it

944

00:33:43,430 --> 00:33:41,200

did i mean it didn't feel cramped like a

945

00:33:45,430 --> 00:33:43,440

like um you know a small home it just

946

00:33:49,509 --> 00:33:45,440

felt like a nice comfortable place to

947

00:33:53,509 --> 00:33:51,669

my name is jean brooks i'm the director

948

00:33:55,509 --> 00:33:53,519

of innovation and community engagement

949

00:33:58,630 --> 00:33:55,519

with the online news association i'm

950

00:34:00,789 --> 00:33:58,640

also um the founder of a tumblr called

951  
00:34:04,149 --> 00:34:00,799  
spaceshares.tumblr.com

952  
00:34:05,909 --> 00:34:04,159  
where we feature a lot of gifts that

953  
00:34:08,149 --> 00:34:05,919  
are gifs depending on how you like to

954  
00:34:09,990 --> 00:34:08,159  
say it i think nasa sort of

955  
00:34:12,629 --> 00:34:10,000  
underutilizes them so i guess this first

956  
00:34:15,510 --> 00:34:12,639  
part is just a question or a request

957  
00:34:16,710 --> 00:34:15,520  
to say um i think that on the internet

958  
00:34:17,829 --> 00:34:16,720  
that they

959  
00:34:19,109 --> 00:34:17,839  
um

960  
00:34:21,430 --> 00:34:19,119  
photos of

961  
00:34:23,270 --> 00:34:21,440  
the universe come across clearer and

962  
00:34:25,510 --> 00:34:23,280  
more like 3d when they're in the gif

963  
00:34:27,270 --> 00:34:25,520

format so that's just a small request

964

00:34:29,109 --> 00:34:27,280

and then my question actually comes from

965

00:34:31,430 --> 00:34:29,119

one of my twitter followers

966

00:34:33,430 --> 00:34:31,440

in response to

967

00:34:34,389 --> 00:34:33,440

my tweet about how

968

00:34:36,230 --> 00:34:34,399

um

969

00:34:37,990 --> 00:34:36,240

the moon

970

00:34:39,510 --> 00:34:38,000

could actually provide enough energy for

971

00:34:41,349 --> 00:34:39,520

the earth for

972

00:34:43,909 --> 00:34:41,359

centuries and so

973

00:34:45,829 --> 00:34:43,919

he asks um is it likely more viable than

974

00:34:48,069 --> 00:34:45,839

the solar energy that already falls on

975

00:34:49,990 --> 00:34:48,079

the earth and how does moon to earth

976  
00:34:51,669 --> 00:34:50,000  
energy transfer work

977  
00:34:54,389 --> 00:34:51,679  
well that that is a

978  
00:34:57,270 --> 00:34:54,399  
that is a very complicated uh

979  
00:34:59,349 --> 00:34:57,280  
question to answer um but i'll try and

980  
00:35:01,349 --> 00:34:59,359  
do it on a high level there's a number

981  
00:35:03,190 --> 00:35:01,359  
of different uh

982  
00:35:05,430 --> 00:35:03,200  
energy sources on the boom there is

983  
00:35:07,190 --> 00:35:05,440  
potential fuel for fusion reactors that

984  
00:35:08,150 --> 00:35:07,200  
don't exist right now but hopefully will

985  
00:35:10,950 --> 00:35:08,160  
exist

986  
00:35:13,030 --> 00:35:10,960  
uh there is solar energy that that falls

987  
00:35:15,829 --> 00:35:13,040  
on on the earth that could be sent back

988  
00:35:17,589 --> 00:35:15,839

uh either to geosynchronous satellites

989

00:35:19,510 --> 00:35:17,599

through microwave or laser

990

00:35:21,670 --> 00:35:19,520

that can then be transported down to the

991

00:35:22,550 --> 00:35:21,680

ground the same way

992

00:35:24,550 --> 00:35:22,560

they

993

00:35:26,710 --> 00:35:24,560

these would not be hampered by weather

994

00:35:29,030 --> 00:35:26,720

they would not be hampered by volcanic

995

00:35:30,550 --> 00:35:29,040

ash if we had a

996

00:35:32,870 --> 00:35:30,560

you know volcanic eruption that in

997

00:35:34,550 --> 00:35:32,880

interfered with uh solar

998

00:35:36,470 --> 00:35:34,560

transfer you know in the earth's

999

00:35:38,310 --> 00:35:36,480

atmosphere there's platinum on the moon

1000

00:35:39,270 --> 00:35:38,320

that is used as a catalyst for fuel

1001  
00:35:41,750 --> 00:35:39,280  
cells

1002  
00:35:44,630 --> 00:35:41,760  
uh and so the list goes on there's um

1003  
00:35:46,069 --> 00:35:44,640  
these are difficult engineering probably

1004  
00:35:48,550 --> 00:35:46,079  
in the case of fusion reactors we don't

1005  
00:35:51,589 --> 00:35:48,560  
even have them yet so this is down the

1006  
00:35:53,190 --> 00:35:51,599  
road uh but there is you know you it

1007  
00:35:55,589 --> 00:35:53,200  
does it's not too hard to imagine that

1008  
00:35:57,430 --> 00:35:55,599  
we'll have that technology soon and we

1009  
00:35:58,950 --> 00:35:57,440  
have a potential fuel source for that on

1010  
00:35:59,910 --> 00:35:58,960  
on the moon

1011  
00:36:02,150 --> 00:35:59,920  
and then

1012  
00:36:03,990 --> 00:36:02,160  
the big thing with the solar energy is

1013  
00:36:05,349 --> 00:36:04,000

that it would be it would be greater

1014

00:36:07,270 --> 00:36:05,359

first of all because it doesn't have to

1015

00:36:08,230 --> 00:36:07,280

go through the atmosphere but also it

1016

00:36:13,030 --> 00:36:08,240

would be

1017

00:36:17,349 --> 00:36:13,040

unhampered by any natural disaster or by

1018

00:36:22,150 --> 00:36:20,230

hi my name is sarah smith smith5sc at

1019

00:36:24,310 --> 00:36:22,160

twitter i have two questions for you one

1020

00:36:26,630 --> 00:36:24,320

for me and then one from camilla sdo's

1021

00:36:27,829 --> 00:36:26,640

account but first the ansi person next

1022

00:36:29,109 --> 00:36:27,839

to me who's too shy to ask for the

1023

00:36:31,190 --> 00:36:29,119

microphone has something she wants to

1024

00:36:38,870 --> 00:36:31,200

say

1025

00:36:42,950 --> 00:36:41,109

so my question is um

1026

00:36:44,950 --> 00:36:42,960

there's a big difference between your

1027

00:36:47,670 --> 00:36:44,960

first mission and your second mission uh

1028

00:36:49,670 --> 00:36:47,680

your first mission was in 2008 before tj

1029

00:36:51,430 --> 00:36:49,680

so lovingly hooked you guys up on the

1030

00:36:53,190 --> 00:36:51,440

iss with internet

1031

00:36:55,670 --> 00:36:53,200

and your second mission

1032

00:36:58,470 --> 00:36:55,680

um between your two missions did you

1033

00:37:00,069 --> 00:36:58,480

find it a lot nicer to be able to freely

1034

00:37:01,990 --> 00:37:00,079

communicate with those of us down here

1035

00:37:04,069 --> 00:37:02,000

on earth was it nicer to have that

1036

00:37:06,390 --> 00:37:04,079

ability to pass your time you know if

1037

00:37:07,990 --> 00:37:06,400

you get sad or miss home did you find it

1038

00:37:09,990 --> 00:37:08,000

nice that you guys were able to just

1039

00:37:11,750 --> 00:37:10,000

freely communicate with us

1040

00:37:13,349 --> 00:37:11,760

compared to your first time up there

1041

00:37:16,550 --> 00:37:13,359

yeah definitely actually i was talking

1042

00:37:18,630 --> 00:37:16,560

to tj before i launched and

1043

00:37:20,390 --> 00:37:18,640

uh the way he described how the internet

1044

00:37:21,670 --> 00:37:20,400

was on board

1045

00:37:23,190 --> 00:37:21,680

you know i was really disappointed

1046

00:37:25,349 --> 00:37:23,200

because it wasn't going to really work

1047

00:37:27,430 --> 00:37:25,359

it was too slow but i guess from the

1048

00:37:29,430 --> 00:37:27,440

time he flew to the time i flew there

1049

00:37:31,030 --> 00:37:29,440

was some modifications made and i was

1050

00:37:33,589 --> 00:37:31,040

really pleasantly surprised when i got

1051  
00:37:35,670 --> 00:37:33,599  
there and i mean it wasn't fast but it

1052  
00:37:37,589 --> 00:37:35,680  
was usable and that was a big surprise

1053  
00:37:40,470 --> 00:37:37,599  
to me and that's what and i that's why i

1054  
00:37:41,990 --> 00:37:40,480  
immediately started trying to use it and

1055  
00:37:43,990 --> 00:37:42,000  
i'm the type of person that if i'm doing

1056  
00:37:46,870 --> 00:37:44,000  
something really spectacular and really

1057  
00:37:48,550 --> 00:37:46,880  
cool it's it's so much more so if i

1058  
00:37:50,710 --> 00:37:48,560  
could share it you know it almost seems

1059  
00:37:52,069 --> 00:37:50,720  
like you're wasting it you know

1060  
00:37:53,829 --> 00:37:52,079  
like if you're in the cupola and you see

1061  
00:37:56,390 --> 00:37:53,839  
this amazing view

1062  
00:37:59,750 --> 00:37:56,400  
you know i almost felt bad if i couldn't

1063  
00:38:01,829 --> 00:37:59,760

somehow capture that and share it and so

1064

00:38:03,589 --> 00:38:01,839

uh through these through having the

1065

00:38:05,670 --> 00:38:03,599

internet on board

1066

00:38:07,109 --> 00:38:05,680

i was able to do that real time so

1067

00:38:08,550 --> 00:38:07,119

there's a difference between you know

1068

00:38:11,109 --> 00:38:08,560

taking a picture and sending it down and

1069

00:38:13,829 --> 00:38:11,119

then weeks later eventually it it gets

1070

00:38:15,349 --> 00:38:13,839

to to be public versus flying over

1071

00:38:16,550 --> 00:38:15,359

tripoli on the day that tripoli fell and

1072

00:38:18,790 --> 00:38:16,560

taking a picture of it and sending it

1073

00:38:20,150 --> 00:38:18,800

down to the immediately within hours

1074

00:38:21,750 --> 00:38:20,160

sending it to down to the earth or

1075

00:38:23,030 --> 00:38:21,760

flying over a hurricane and looking

1076

00:38:24,870 --> 00:38:23,040

right down into the eye and taking a

1077

00:38:26,710 --> 00:38:24,880

picture and sending it to the earth i

1078

00:38:29,190 --> 00:38:26,720

mean there's a big difference

1079

00:38:31,109 --> 00:38:29,200

uh from you know i'm sure there is on

1080

00:38:33,349 --> 00:38:31,119

your end it's more interesting but from

1081

00:38:35,750 --> 00:38:33,359

our end too it's it's more interesting

1082

00:38:37,430 --> 00:38:35,760

to do that it requires more work but we

1083

00:38:39,030 --> 00:38:37,440

have the capability the technology the

1084

00:38:40,230 --> 00:38:39,040

technology on board now to do that and

1085

00:38:41,430 --> 00:38:40,240

it's getting better every day and so

1086

00:38:42,790 --> 00:38:41,440

hopefully

1087

00:38:44,470 --> 00:38:42,800

we'll be able to continue that because i

1088

00:38:47,030 --> 00:38:44,480

think it's a really important aspect of

1089

00:38:49,670 --> 00:38:47,040

our outreach

1090

00:38:52,109 --> 00:38:49,680

and we had one more okay this was from

1091

00:38:54,870 --> 00:38:52,119

uh camilla sdo's follower

1092

00:38:56,230 --> 00:38:54,880

tigergirl528 um her son who's not old

1093

00:38:58,310 --> 00:38:56,240

enough to have a twitter account yet

1094

00:39:01,510 --> 00:38:58,320

would like to know what you love most

1095

00:39:03,109 --> 00:39:01,520

about being an astronaut

1096

00:39:05,430 --> 00:39:03,119

that's a tough one again

1097

00:39:07,589 --> 00:39:05,440

so um

1098

00:39:08,870 --> 00:39:07,599

i'd say right now what i love about most

1099

00:39:10,870 --> 00:39:08,880

about being astronaut is being able to

1100

00:39:13,510 --> 00:39:10,880

share the amazing stuff that we do in

1101

00:39:15,349 --> 00:39:13,520

space i mean it really is

1102

00:39:17,589 --> 00:39:15,359

some of the most incredible some of the

1103

00:39:20,790 --> 00:39:17,599

most awe-inspiring things that we do as

1104

00:39:23,349 --> 00:39:20,800

as humanity is step off the planet

1105

00:39:25,670 --> 00:39:23,359

get it outside of our world and to be

1106

00:39:27,190 --> 00:39:25,680

able to not just only explore but to

1107

00:39:30,069 --> 00:39:27,200

look back on ourselves look back at our

1108

00:39:32,790 --> 00:39:30,079

earth and learn a little bit more about

1109

00:39:33,750 --> 00:39:32,800

who we are here on this planet and so

1110

00:39:37,670 --> 00:39:33,760

i think

1111

00:39:39,750 --> 00:39:37,680

rewarding and one of my favorite things

1112

00:39:40,950 --> 00:39:39,760

to do right now so

1113

00:39:43,430 --> 00:39:40,960

flying in space is pretty cool too

1114

00:39:45,829 --> 00:39:43,440

though so

1115

00:39:47,510 --> 00:39:45,839

hi i'm veronica brown my twitter handle

1116

00:39:50,069 --> 00:39:47,520

is v e e brown

1117

00:39:52,550 --> 00:39:50,079

um obviously there is a ton of

1118

00:39:55,270 --> 00:39:52,560

preparation that goes on down here on

1119

00:39:58,069 --> 00:39:55,280

earth before you guys get up to space

1120

00:39:59,589 --> 00:39:58,079

um did anything catch you off guard or

1121

00:40:05,829 --> 00:39:59,599

surprise you either about living in

1122

00:40:08,950 --> 00:40:07,430

does anything catch me off guard you

1123

00:40:10,150 --> 00:40:08,960

know one of the things that was a

1124

00:40:12,150 --> 00:40:10,160

surprise i don't think i don't think it

1125

00:40:14,230 --> 00:40:12,160

caught me off guard but uh

1126

00:40:15,990 --> 00:40:14,240

what really surprised me is how much i

1127

00:40:18,550 --> 00:40:16,000

enjoyed taking still pictures i i was

1128

00:40:19,910 --> 00:40:18,560

always like a video guy and so i imagine

1129

00:40:21,109 --> 00:40:19,920

i was going to take all these videos

1130

00:40:22,790 --> 00:40:21,119

when i got i was going to be up there

1131

00:40:24,630 --> 00:40:22,800

for a long time and i'd be sending down

1132

00:40:26,710 --> 00:40:24,640

all these i hardly took any video i mean

1133

00:40:28,550 --> 00:40:26,720

i took video but not to the extent that

1134

00:40:31,190 --> 00:40:28,560

i thought i was but the picture the

1135

00:40:32,710 --> 00:40:31,200

cameras that we have on board right now

1136

00:40:33,990 --> 00:40:32,720

enable you know people like me who

1137

00:40:36,390 --> 00:40:34,000

aren't photographers to take great

1138

00:40:37,589 --> 00:40:36,400

pictures and that was really rewarding

1139

00:40:40,150 --> 00:40:37,599

to actually

1140

00:40:42,470 --> 00:40:40,160

what was rewarding about it is to see

1141

00:40:44,069 --> 00:40:42,480

this amazing site take a picture of it

1142

00:40:46,150 --> 00:40:44,079

and then look at it and go that's really

1143

00:40:48,309 --> 00:40:46,160

what it looks like it actually captures

1144

00:40:49,829 --> 00:40:48,319

it this is pretty cool so to me that was

1145

00:40:51,270 --> 00:40:49,839

a really pleasant surprise i talked

1146

00:40:52,790 --> 00:40:51,280

about the internet being

1147

00:40:55,829 --> 00:40:52,800

faster than i thought it was going to be

1148

00:40:57,589 --> 00:40:55,839

um most of the time um but it you know

1149

00:40:59,510 --> 00:40:57,599

that was a pleasant surprise too so i i

1150

00:41:00,870 --> 00:40:59,520

think the only surprises were pleasant

1151

00:41:01,990 --> 00:41:00,880

ones

1152

00:41:04,470 --> 00:41:02,000

the landing was a little hard too that

1153

00:41:05,750 --> 00:41:04,480

was a surprise so so i sent out a tweet

1154

00:41:09,190 --> 00:41:05,760

um

1155

00:41:10,870 --> 00:41:09,200

a little while ago that said i was gonna

1156

00:41:12,069 --> 00:41:10,880

say i've had a surprise no one's gonna

1157

00:41:13,270 --> 00:41:12,079

well i'm not

1158

00:41:19,270 --> 00:41:13,280

we'll see if anybody asks about it and

1159

00:41:22,950 --> 00:41:21,510

yeah i'll tell you what i'm gonna well

1160

00:41:24,630 --> 00:41:22,960

while we're asking the next question i'm

1161

00:41:34,150 --> 00:41:24,640

gonna try and take a picture of you guys

1162

00:41:37,750 --> 00:41:36,390

matthew bound matthew jlb um i was a

1163

00:41:39,270 --> 00:41:37,760

history major so i wanted to ask you

1164

00:41:41,510 --> 00:41:39,280

this you obviously grew up during the

1165

00:41:43,829 --> 00:41:41,520

latter years of the cold war so what was

1166

00:41:46,390 --> 00:41:43,839

it like visiting red square and all the

1167

00:41:48,710 --> 00:41:46,400

associated attractions like where yuri

1168

00:41:49,510 --> 00:41:48,720

gagarin and the

1169

00:41:51,349 --> 00:41:49,520

other

1170

00:41:53,750 --> 00:41:51,359

cosmonauts who died

1171

00:41:56,230 --> 00:41:53,760

visit the site of their their graves

1172

00:41:59,349 --> 00:41:56,240

that's an awesome question i mean i

1173

00:42:01,109 --> 00:41:59,359

i was born the year that yuri gagarin

1174

00:42:03,670 --> 00:42:01,119

became the first person to fly in space

1175

00:42:05,670 --> 00:42:03,680

and i was a military officer and if you

1176

00:42:07,510 --> 00:42:05,680

would you if you would ask me

1177

00:42:08,790 --> 00:42:07,520

30 years ago or you if you would have

1178

00:42:10,390 --> 00:42:08,800

told me 30 years ago that i was gonna

1179

00:42:12,069 --> 00:42:10,400

fly in space i would say wow that's

1180

00:42:13,430 --> 00:42:12,079

really cool you know people told me i

1181

00:42:15,109 --> 00:42:13,440

would fly in space as a member of a

1182

00:42:17,349 --> 00:42:15,119

russian crew on a russian rocket that

1183

00:42:19,349 --> 00:42:17,359

had an american flag on it i i would

1184

00:42:21,910 --> 00:42:19,359

have thought you were nuts so

1185

00:42:24,470 --> 00:42:21,920

and i think this is another huge aspect

1186

00:42:26,230 --> 00:42:24,480

of our space program is that we can have

1187

00:42:27,589 --> 00:42:26,240

nations that that weren't always the

1188

00:42:29,910 --> 00:42:27,599

best of friends

1189

00:42:32,550 --> 00:42:29,920

work together towards a common goal to

1190

00:42:34,870 --> 00:42:32,560

do something incredible for humanity and

1191

00:42:37,349 --> 00:42:34,880

that to me i mean to me the the novelty

1192

00:42:39,430 --> 00:42:37,359

has never worn off um going to lay

1193

00:42:42,230 --> 00:42:39,440

flowers on the tomb of uh sergey korloff

1194

00:42:43,430 --> 00:42:42,240

and and and your gagarin and red square

1195

00:42:46,630 --> 00:42:43,440

just the fact that i'm strapped to a

1196

00:42:49,109 --> 00:42:46,640

russian rocket you know just it was

1197

00:42:51,030 --> 00:42:49,119

amazing and you know in a good way i

1198

00:42:53,990 --> 00:42:51,040

mean it was really just

1199

00:42:57,430 --> 00:42:54,000

heartwarming to think where we were what

1200

00:42:58,870 --> 00:42:57,440

could have been and what has become and

1201  
00:43:00,150 --> 00:42:58,880  
you know again

1202  
00:43:02,069 --> 00:43:00,160  
you know we have this example of

1203  
00:43:03,670 --> 00:43:02,079  
international collaboration and we can

1204  
00:43:06,230 --> 00:43:03,680  
apply that on earth you know if we can

1205  
00:43:07,829 --> 00:43:06,240  
do this in space work together for this

1206  
00:43:09,990 --> 00:43:07,839  
to do this amazing thing we can work

1207  
00:43:11,109 --> 00:43:10,000  
together and have uh

1208  
00:43:14,309 --> 00:43:11,119  
you know

1209  
00:43:15,750 --> 00:43:14,319  
lot of the problems facing our planet

1210  
00:43:17,270 --> 00:43:15,760  
overcome a lot of the challenges facing

1211  
00:43:18,870 --> 00:43:17,280  
our planet and so

1212  
00:43:20,550 --> 00:43:18,880  
that that to me was one of the coolest

1213  
00:43:23,030 --> 00:43:20,560

parts of this whole thing was

1214

00:43:24,470 --> 00:43:23,040

was uh was doing that and uh and paying

1215

00:43:25,829 --> 00:43:24,480

respect for those people that that we

1216

00:43:28,710 --> 00:43:25,839

should pay respect for those those

1217

00:43:31,349 --> 00:43:28,720

pioneers no matter where they're from uh

1218

00:43:33,030 --> 00:43:31,359

that basically you know we're we're

1219

00:43:35,190 --> 00:43:33,040

standing on their shoulders right now

1220

00:43:37,829 --> 00:43:35,200

and what they've done so i haven't said

1221

00:43:39,270 --> 00:43:37,839

tweet yet but i'm gonna do that

1222

00:43:41,589 --> 00:43:39,280

and

1223

00:43:42,550 --> 00:43:41,599

you know what um we had the question

1224

00:43:44,470 --> 00:43:42,560

over there

1225

00:43:45,910 --> 00:43:44,480

so i'm gonna i'm gonna send out this

1226

00:43:47,430 --> 00:43:45,920

tweet it's gonna have a link in it but

1227

00:43:49,510 --> 00:43:47,440

we're gonna show this video but let me

1228

00:43:50,710 --> 00:43:49,520

set it up first

1229

00:43:53,190 --> 00:43:50,720

because some

1230

00:43:54,630 --> 00:43:53,200

ah i don't know if that worked or not

1231

00:43:55,910 --> 00:43:54,640

so

1232

00:43:56,870 --> 00:43:55,920

we'll see

1233

00:44:00,309 --> 00:43:56,880

apparently there's a lot of people

1234

00:44:02,150 --> 00:44:00,319

tweeting right now in here so

1235

00:44:04,470 --> 00:44:02,160

so um

1236

00:44:05,349 --> 00:44:04,480

about two weeks before i was set to come

1237

00:44:06,390 --> 00:44:05,359

home

1238

00:44:07,589 --> 00:44:06,400

to earth

1239

00:44:09,349 --> 00:44:07,599

we got word that we were going to be up

1240

00:44:11,349 --> 00:44:09,359

there another two months

1241

00:44:13,030 --> 00:44:11,359

and so um you know you're sprinting to

1242

00:44:15,270 --> 00:44:13,040

the finish line and then they move the

1243

00:44:18,230 --> 00:44:15,280

finish line a couple miles away and so

1244

00:44:20,150 --> 00:44:18,240

um that was you know we love being there

1245

00:44:21,990 --> 00:44:20,160

but you get kind of ready to come home

1246

00:44:24,710 --> 00:44:22,000

and and you get your mind set on coming

1247

00:44:25,990 --> 00:44:24,720

home and and that was uh kind of big

1248

00:44:27,190 --> 00:44:26,000

news to get that we're going to stay

1249

00:44:29,270 --> 00:44:27,200

another two months and i knew that

1250

00:44:30,309 --> 00:44:29,280

didn't only affect me it affected a lot

1251  
00:44:31,670 --> 00:44:30,319  
of people on the ground you know there

1252  
00:44:33,510 --> 00:44:31,680  
was people who were going to have to

1253  
00:44:34,630 --> 00:44:33,520  
cancel vacations and and you know they

1254  
00:44:36,150 --> 00:44:34,640  
thought that their mission was going to

1255  
00:44:37,510 --> 00:44:36,160  
be over on the ground and though

1256  
00:44:38,390 --> 00:44:37,520  
and um

1257  
00:44:41,030 --> 00:44:38,400  
now they're going to have to work

1258  
00:44:43,109 --> 00:44:41,040  
another two months and so i tried to

1259  
00:44:44,470 --> 00:44:43,119  
i made a video while i was on board to

1260  
00:44:45,589 --> 00:44:44,480  
try and

1261  
00:44:47,510 --> 00:44:45,599  
show everybody hey we're all in this

1262  
00:44:49,190 --> 00:44:47,520  
together we're you know we could we can

1263  
00:44:51,270 --> 00:44:49,200

make fun of this and

1264

00:44:53,910 --> 00:44:51,280

and still have a good time it turns out

1265

00:44:55,829 --> 00:44:53,920

that i only stayed an extra week um

1266

00:44:59,030 --> 00:44:55,839

and so we made this video raise your

1267

00:45:00,390 --> 00:44:59,040

hand if you saw the video iss blues

1268

00:45:02,710 --> 00:45:00,400

okay so

1269

00:45:05,589 --> 00:45:02,720

you guys will get it so

1270

00:45:07,589 --> 00:45:05,599

so we made a sequel to that and i if we

1271

00:45:09,670 --> 00:45:07,599

have that if we can cue that up and play

1272

00:45:11,510 --> 00:45:09,680

it i'd like to i'd like to introduce it

1273

00:45:12,390 --> 00:45:11,520

here and i'm hoping

1274

00:45:14,630 --> 00:45:12,400

that

1275

00:45:16,550 --> 00:45:14,640

one of the stars of this video might

1276

00:45:19,670 --> 00:45:16,560

pop in later if he can get here soon

1277

00:45:22,790 --> 00:45:19,680

enough but we'll see so

1278

00:45:26,069 --> 00:45:22,800

again this is uh the sequel to this and

1279

00:45:30,829 --> 00:45:26,079

it was obviously filmed on board

1280

00:45:36,710 --> 00:45:34,470

blues where's ron

1281

00:45:38,790 --> 00:45:36,720

i need to find him i i saw him hitting

1282

00:45:43,510 --> 00:45:38,800

the russian segment going to the russian

1283

00:45:48,069 --> 00:45:45,750

going to go go we were supposed to go

1284

00:45:49,670 --> 00:45:48,079

home a week from thursday and uh

1285

00:45:51,510 --> 00:45:49,680

it looks like we're going to be up here

1286

00:45:53,510 --> 00:45:51,520

a little bit longer yeah a couple more

1287

00:45:54,870 --> 00:45:53,520

months yes it does but uh

1288

00:46:01,510 --> 00:45:54,880

well i'll just give a shot here see how

1289

00:46:01,520 --> 00:46:15,030

got those space stations

1290

00:46:19,589 --> 00:46:17,750

oh man come on

1291

00:46:21,670 --> 00:46:19,599

oh man

1292

00:46:24,150 --> 00:46:21,680

dadgum tricorder is malfunctioning it's

1293

00:46:25,990 --> 00:46:24,160

the day before ron goes home

1294

00:46:28,390 --> 00:46:26,000

and he's not around he's the only one

1295

00:46:30,870 --> 00:46:28,400

who knows how to reboot this thing i

1296

00:46:32,550 --> 00:46:30,880

need to go get him

1297

00:46:38,150 --> 00:46:32,560

i know where he's at now

1298

00:46:43,510 --> 00:46:40,150

okay i think i see him down here just

1299

00:46:53,750 --> 00:46:45,829

exactly what i figured

1300

00:47:07,750 --> 00:47:03,670

ronnie

1301  
00:47:09,510 --> 00:47:07,760  
dude what's up hey you're calling home

1302  
00:47:11,190 --> 00:47:09,520  
tomorrow

1303  
00:47:13,190 --> 00:47:11,200  
all right yeah sure

1304  
00:47:14,710 --> 00:47:13,200  
no man really really tomorrow they

1305  
00:47:16,309 --> 00:47:14,720  
announced it you're going home i haven't

1306  
00:47:17,750 --> 00:47:16,319  
finished the song yet man i know you've

1307  
00:47:19,349 --> 00:47:17,760  
been working hard on it i think you've

1308  
00:47:21,430 --> 00:47:19,359  
been spending half your time up here and

1309  
00:47:23,510 --> 00:47:21,440  
that's awesome but ron no they they

1310  
00:47:24,470 --> 00:47:23,520  
announce it everybody's agreed

1311  
00:47:26,630 --> 00:47:24,480  
uh

1312  
00:47:29,109 --> 00:47:26,640  
you anytime start packing man you need

1313  
00:47:30,069 --> 00:47:29,119

to you you're going home tomorrow it's

1314

00:47:31,510 --> 00:47:30,079

happening

1315

00:47:35,190 --> 00:47:31,520

you know that's pretty cruel mike you

1316

00:47:39,270 --> 00:47:37,030

dude what would i mess with you like

1317

00:47:42,230 --> 00:47:39,280

that about a lot of things yeah but not

1318

00:47:44,069 --> 00:47:42,240

about that you it it is it's time you're

1319

00:47:47,430 --> 00:47:44,079

you know you're setting this up yeah

1320

00:47:48,630 --> 00:47:47,440

yeah i'm serious really yes tomorrow

1321

00:47:50,630 --> 00:47:48,640

tomorrow

1322

00:47:52,870 --> 00:47:50,640

what's today's date

1323

00:47:55,430 --> 00:47:52,880

i don't even know

1324

00:47:57,670 --> 00:47:55,440

it's the 14th today's the 14th 14th of

1325

00:47:59,510 --> 00:47:57,680

september it's not the end of october

1326

00:48:01,430 --> 00:47:59,520

and you're going home tomorrow

1327

00:48:02,870 --> 00:48:01,440

hey all right man that's good ron

1328

00:48:04,390 --> 00:48:02,880

there's one thing i need though yeah but

1329

00:48:06,069 --> 00:48:04,400

wait wait a minute you're in your soyuz

1330

00:48:07,910 --> 00:48:06,079

you're like ready to suit up and go the

1331

00:48:09,270 --> 00:48:07,920

suit's right behind me i know it is i

1332

00:48:09,990 --> 00:48:09,280

know but ron

1333

00:48:22,790 --> 00:48:10,000

i

1334

00:48:25,430 --> 00:48:22,800

anymore just

1335

00:48:27,430 --> 00:48:25,440

just easy just ease it over ease it over

1336

00:48:30,390 --> 00:48:27,440

just unclench it all right all right all

1337

00:48:35,589 --> 00:48:30,400

right but get mike you know come on just

1338

00:48:40,549 --> 00:48:37,910

got to take care of this thing

1339

00:48:43,510 --> 00:48:40,559

it's staying you might be going home the

1340

00:48:45,589 --> 00:48:43,520

guitar is staying with me

1341

00:48:48,950 --> 00:48:45,599

you don't know how to play ronnie i may

1342

00:48:49,990 --> 00:48:48,960

not know how to play yet but i have a

1343

00:49:02,549 --> 00:48:50,000

feeling

1344

00:49:05,829 --> 00:49:04,309

oh that last part said to be continued

1345

00:49:07,270 --> 00:49:05,839

question mark

1346

00:49:08,950 --> 00:49:07,280

with dan playing the guitar so we we

1347

00:49:10,790 --> 00:49:08,960

actually filmed that the day before i i

1348

00:49:11,829 --> 00:49:10,800

came back and it looks like dan's going

1349

00:49:13,109 --> 00:49:11,839

to be up there a little bit longer but

1350

00:49:16,390 --> 00:49:13,119

he actually knows how to play the guitar

1351

00:49:18,230 --> 00:49:16,400

so he he'll do a lot better job so

1352

00:49:19,510 --> 00:49:18,240

um that was fun to make that so i

1353

00:49:22,549 --> 00:49:19,520

thought i'd share that with you and i

1354

00:49:25,030 --> 00:49:22,559

don't did my tweet go out

1355

00:49:26,309 --> 00:49:25,040

okay all right elise can you send these

1356

00:49:27,829 --> 00:49:26,319

guys the link

1357

00:49:30,069 --> 00:49:27,839

on the tweet

1358

00:49:31,589 --> 00:49:30,079

where are you

1359

00:49:33,910 --> 00:49:31,599

all right so if you guys follow at least

1360

00:49:38,470 --> 00:49:33,920

david you'll see the the link to that

1361

00:49:44,150 --> 00:49:40,630

hi my name is angela gibson i actually

1362

00:49:45,270 --> 00:49:44,160

have a question from a twitter follower

1363

00:49:48,790 --> 00:49:45,280

of yours

1364

00:49:51,990 --> 00:49:48,800

who was at the mls mars curiosity tweet

1365

00:49:53,910 --> 00:49:52,000

up and spoke to astra wheels

1366

00:49:55,430 --> 00:49:53,920

commander doug wetlock asking him this

1367

00:49:57,990 --> 00:49:55,440

question and has the same question for

1368

00:50:01,670 --> 00:49:58,000

you and by the way the twitter uh

1369

00:50:03,589 --> 00:50:01,680

individual is that so brandon hi brandon

1370

00:50:05,670 --> 00:50:03,599

and his question is

1371

00:50:08,630 --> 00:50:05,680

do you dream of weightlessness or the

1372

00:50:10,069 --> 00:50:08,640

auroras like astro wheels doug wetlock

1373

00:50:12,470 --> 00:50:10,079

does

1374

00:50:13,990 --> 00:50:12,480

yeah i have not had uh one of those

1375

00:50:15,670 --> 00:50:14,000

dreams yet i'm looking forward to that

1376

00:50:17,270 --> 00:50:15,680

that day but uh

1377

00:50:21,910 --> 00:50:17,280

um

1378

00:50:24,470 --> 00:50:21,920

on my first flight

1379

00:50:25,750 --> 00:50:24,480

i uh i had a lot more

1380

00:50:28,230 --> 00:50:25,760

of those type of things where i would

1381

00:50:29,750 --> 00:50:28,240

dream like i was floating or or even at

1382

00:50:31,910 --> 00:50:29,760

times feel like i was floating when i

1383

00:50:34,309 --> 00:50:31,920

came back and i think that's because

1384

00:50:36,069 --> 00:50:34,319

um the human mind is really an amazing

1385

00:50:38,150 --> 00:50:36,079

thing and i i i think there's like

1386

00:50:40,710 --> 00:50:38,160

switchers that get turned on and off

1387

00:50:42,950 --> 00:50:40,720

based on your experience so i know that

1388

00:50:45,030 --> 00:50:42,960

when i had my first spacewalk i remember

1389

00:50:47,349 --> 00:50:45,040

thinking wow this is just incredibly

1390

00:50:48,710 --> 00:50:47,359

beautiful look at this this is amazing

1391

00:50:50,549 --> 00:50:48,720

one part of my brain was saying that the

1392

00:50:52,630 --> 00:50:50,559

other part was saying yeah it's really

1393

00:50:54,150 --> 00:50:52,640

beautiful but it's not real you know the

1394

00:50:55,430 --> 00:50:54,160

part of me would not believe what i was

1395

00:50:59,270 --> 00:50:55,440

seeing was real because i had no

1396

00:51:01,030 --> 00:50:59,280

experience base to base it to and so um

1397

00:51:03,190 --> 00:51:01,040

after being in space for four months and

1398

00:51:04,630 --> 00:51:03,200

doing three previous spacewalks there

1399

00:51:06,470 --> 00:51:04,640

was not you know there was a switch that

1400

00:51:07,829 --> 00:51:06,480

went off on my brain and said okay

1401  
00:51:10,069 --> 00:51:07,839  
you've had this experience before you

1402  
00:51:12,630 --> 00:51:10,079  
know what it is this is real so be

1403  
00:51:13,510 --> 00:51:12,640  
careful and um

1404  
00:51:15,510 --> 00:51:13,520  
so

1405  
00:51:16,710 --> 00:51:15,520  
another example of that is coming back

1406  
00:51:18,230 --> 00:51:16,720  
to earth when i flew on the space

1407  
00:51:20,870 --> 00:51:18,240  
shuttle i had only been on in space for

1408  
00:51:22,150 --> 00:51:20,880  
two weeks and when i came back to earth

1409  
00:51:24,230 --> 00:51:22,160  
i crawled out of the space shuttle and

1410  
00:51:25,670 --> 00:51:24,240  
somebody handed me a t-shirt to change

1411  
00:51:28,150 --> 00:51:25,680  
into and it felt like it was made out of

1412  
00:51:28,950 --> 00:51:28,160  
lead i mean my arm dropped

1413  
00:51:30,950 --> 00:51:28,960

so

1414

00:51:33,670 --> 00:51:30,960

when i came back from space after five

1415

00:51:35,190 --> 00:51:33,680

and a half months we landed in the soyuz

1416

00:51:37,109 --> 00:51:35,200

crawled out of the capsule and somebody

1417

00:51:38,710 --> 00:51:37,119

handed me a bottle of water and it felt

1418

00:51:40,710 --> 00:51:38,720

like a bottle of water it was like the

1419

00:51:41,990 --> 00:51:40,720

moment we touched the ground a switch

1420

00:51:43,349 --> 00:51:42,000

went off in my brain and said okay

1421

00:51:45,910 --> 00:51:43,359

you're back on earth

1422

00:51:48,150 --> 00:51:45,920

and it just reset the you know control

1423

00:51:50,150 --> 00:51:48,160

alternate delete and

1424

00:51:51,589 --> 00:51:50,160

you're about you're back on earth and so

1425

00:51:53,510 --> 00:51:51,599

um

1426

00:51:55,349 --> 00:51:53,520

you know i think part of that is the

1427

00:51:58,390 --> 00:51:55,359

reason why i think my brain has been

1428

00:52:00,630 --> 00:51:58,400

reset to earth and uh i i wish i could

1429

00:52:02,309 --> 00:52:00,640

get a little taste of that but

1430

00:52:05,270 --> 00:52:02,319

um not yet

1431

00:52:08,069 --> 00:52:05,280

so

1432

00:52:10,309 --> 00:52:08,079

ramona ponce at ramona right now

1433

00:52:12,069 --> 00:52:10,319

you spent so much time in the soyuz

1434

00:52:13,910 --> 00:52:12,079

how's your russian

1435

00:52:15,910 --> 00:52:13,920

implore

1436

00:52:18,390 --> 00:52:15,920

can you say happy valentine's day in

1437

00:52:21,829 --> 00:52:18,400

russia i know i don't i can't

1438

00:52:22,870 --> 00:52:21,839

i can't i'm sorry uh it's it's it's okay

1439

00:52:24,069 --> 00:52:22,880

i mean

1440

00:52:25,430 --> 00:52:24,079

it's not great it's not as good as it

1441

00:52:27,270 --> 00:52:25,440

should be it's a

1442

00:52:29,990 --> 00:52:27,280

uh it's a very difficult language to

1443

00:52:32,150 --> 00:52:30,000

learn and uh i'm beyond the age where

1444

00:52:36,150 --> 00:52:32,160

learning language is easy way beyond the

1445

00:52:37,589 --> 00:52:36,160

age and so um but it's you know if the i

1446

00:52:40,630 --> 00:52:37,599

was in a russian spacecraft a crew

1447

00:52:42,950 --> 00:52:40,640

member on a russian spacecraft and

1448

00:52:45,510 --> 00:52:42,960

you need to have

1449

00:52:47,510 --> 00:52:45,520

some capability in the language and

1450

00:52:49,349 --> 00:52:47,520

i think between

1451

00:52:50,630 --> 00:52:49,359

my crewmates and i we we were able to

1452

00:52:52,150 --> 00:52:50,640

communicate because what i didn't know

1453

00:52:55,190 --> 00:52:52,160

in russian they knew in english and vice

1454

00:52:59,670 --> 00:52:55,200

versa and so we were able to communicate

1455

00:53:05,670 --> 00:53:02,390

hi uh john at soul toasty uh with the

1456

00:53:08,150 --> 00:53:05,680

recent budget cuts uh with from nasa the

1457

00:53:10,230 --> 00:53:08,160

end of the shuttle program and um you

1458

00:53:12,630 --> 00:53:10,240

know the james webb telescope being in

1459

00:53:14,630 --> 00:53:12,640

danger of losing its funding altogether

1460

00:53:16,950 --> 00:53:14,640

uh where do you see nasa headed and

1461

00:53:19,910 --> 00:53:16,960

where would you like to see nasa headed

1462

00:53:21,829 --> 00:53:19,920

well there um

1463

00:53:22,630 --> 00:53:21,839

you know we're in a big transition right

1464

00:53:24,309 --> 00:53:22,640

now

1465

00:53:25,510 --> 00:53:24,319

and some of that is some of that is

1466

00:53:28,870 --> 00:53:25,520

really good

1467

00:53:30,710 --> 00:53:28,880

we need as an agency actually the the

1468

00:53:33,190 --> 00:53:30,720

big government agencies what we do best

1469

00:53:35,910 --> 00:53:33,200

is push the envelope and to go past the

1470

00:53:38,630 --> 00:53:35,920

next hill and and to do exploration

1471

00:53:39,750 --> 00:53:38,640

and so in order to do that we need to

1472

00:53:41,190 --> 00:53:39,760

turn over

1473

00:53:43,030 --> 00:53:41,200

some i don't want to call them routine

1474

00:53:45,829 --> 00:53:43,040

because they're not routine but

1475

00:53:47,750 --> 00:53:45,839

the the more of the business that we

1476  
00:53:48,710 --> 00:53:47,760  
really know how to do very well at this

1477  
00:53:50,549 --> 00:53:48,720  
point

1478  
00:53:53,589 --> 00:53:50,559  
uh over to commercial activities and

1479  
00:53:54,870 --> 00:53:53,599  
that's that is low earth orbit so we

1480  
00:53:56,470 --> 00:53:54,880  
pretty much

1481  
00:53:58,710 --> 00:53:56,480  
you know we have a lot to learn still

1482  
00:54:00,790 --> 00:53:58,720  
but we have a our experience base and

1483  
00:54:02,549 --> 00:54:00,800  
our knowledge level is at the point just

1484  
00:54:04,470 --> 00:54:02,559  
like it was in the airline industry you

1485  
00:54:06,630 --> 00:54:04,480  
know way back in the turn you know

1486  
00:54:08,069 --> 00:54:06,640  
100 years ago or so

1487  
00:54:09,589 --> 00:54:08,079  
that we can start to turn those

1488  
00:54:10,950 --> 00:54:09,599

operations over to commercial activities

1489

00:54:13,750 --> 00:54:10,960

and we need to do that because we need

1490

00:54:16,150 --> 00:54:13,760

to free up uh our our focus and and we

1491

00:54:18,150 --> 00:54:16,160

need to free up our resources towards

1492

00:54:19,349 --> 00:54:18,160

pushing pushing that envelope as far as

1493

00:54:21,829 --> 00:54:19,359

we can

1494

00:54:23,589 --> 00:54:21,839

the end of the space shuttle program

1495

00:54:25,430 --> 00:54:23,599

is in the same vein here we built the

1496

00:54:27,990 --> 00:54:25,440

space shuttle primarily to build a space

1497

00:54:28,870 --> 00:54:28,000

station we built the space station um it

1498

00:54:39,510 --> 00:54:28,880

is

1499

00:54:41,990 --> 00:54:39,520

program you know i rang the space

1500

00:54:44,150 --> 00:54:42,000

station's bell to signal not only

1501  
00:54:46,470 --> 00:54:44,160  
atlantis's departure but the closing of

1502  
00:54:48,069 --> 00:54:46,480  
that chapter in our in our space program

1503  
00:54:49,829 --> 00:54:48,079  
but i truly believed as i was ringing

1504  
00:54:52,230 --> 00:54:49,839  
that bell that we're opening up the next

1505  
00:54:53,829 --> 00:54:52,240  
chapter which will see humans go beyond

1506  
00:54:55,589 --> 00:54:53,839  
low-earth orbit

1507  
00:54:57,670 --> 00:54:55,599  
maybe to the moon to asteroids

1508  
00:55:00,309 --> 00:54:57,680  
eventually to mars

1509  
00:55:01,670 --> 00:55:00,319  
and to really put our reach further out

1510  
00:55:04,150 --> 00:55:01,680  
into the solar system and that was a

1511  
00:55:06,549 --> 00:55:04,160  
necessary step to that but the the other

1512  
00:55:07,990 --> 00:55:06,559  
side of that coin is it will be a long

1513  
00:55:09,829 --> 00:55:08,000

time before we have the capabilities

1514

00:55:11,750 --> 00:55:09,839

that the space shuttle provide us it was

1515

00:55:13,190 --> 00:55:11,760

an amazing vehicle

1516

00:55:16,549 --> 00:55:13,200

very versatile

1517

00:55:17,670 --> 00:55:16,559

very capable you know it was

1518

00:55:19,510 --> 00:55:17,680

you know we would not have the space

1519

00:55:22,150 --> 00:55:19,520

station right now if it wasn't for

1520

00:55:23,750 --> 00:55:22,160

the space shuttle and uh you know that

1521

00:55:25,270 --> 00:55:23,760

was that was the bittersweet part of it

1522

00:55:27,670 --> 00:55:25,280

is we realized that it was freeing up

1523

00:55:29,829 --> 00:55:27,680

resources to do the next big thing

1524

00:55:31,190 --> 00:55:29,839

but it was it was pretty cool while it

1525

00:55:33,030 --> 00:55:31,200

lasted too so

1526

00:55:36,150 --> 00:55:33,040

um it was it was definitely bittersweet

1527

00:55:37,910 --> 00:55:36,160

so i hope that answered your question

1528

00:55:39,829 --> 00:55:37,920

hi my name is stav steckel at

1529

00:55:41,829 --> 00:55:39,839

stoshdeckel on twitter um i was just

1530

00:55:43,430 --> 00:55:41,839

wondering besides like gravity what was

1531

00:55:46,309 --> 00:55:43,440

the biggest adjustment coming back to

1532

00:55:51,430 --> 00:55:49,349

i mean gravity is the big one um

1533

00:55:53,670 --> 00:55:51,440

so and again you know going back to that

1534

00:55:55,990 --> 00:55:53,680

your mind resetting i know that on my

1535

00:55:57,670 --> 00:55:56,000

first flight uh you know you're you're

1536

00:55:59,270 --> 00:55:57,680

basically at three g's in the space

1537

00:56:00,789 --> 00:55:59,280

shuttle and you're getting pushed into

1538

00:56:03,190 --> 00:56:00,799

like like an elephant is sitting on your

1539

00:56:04,789 --> 00:56:03,200

chest and then all of a sudden instantly

1540

00:56:06,390 --> 00:56:04,799

that goes away and you're floating when

1541

00:56:07,990 --> 00:56:06,400

the main engine's cut off

1542

00:56:09,670 --> 00:56:08,000

and i remember thinking

1543

00:56:11,109 --> 00:56:09,680

maybe not consciously but

1544

00:56:12,470 --> 00:56:11,119

yeah okay everything's cool i've been

1545

00:56:13,910 --> 00:56:12,480

you know i'm a test pilot i've been here

1546

00:56:16,230 --> 00:56:13,920

before this is zero g i've been in

1547

00:56:18,549 --> 00:56:16,240

aircraft with zero g i had an experience

1548

00:56:20,230 --> 00:56:18,559

base to compare it to so it wasn't that

1549

00:56:21,270 --> 00:56:20,240

big a deal but after about two or three

1550

00:56:22,950 --> 00:56:21,280

hours

1551  
00:56:24,230 --> 00:56:22,960  
all of a sudden you know the light bulb

1552  
00:56:25,829 --> 00:56:24,240  
came on and said wait a minute this is

1553  
00:56:27,510 --> 00:56:25,839  
not supposed to be lasting this long

1554  
00:56:29,430 --> 00:56:27,520  
something is wrong

1555  
00:56:35,670 --> 00:56:29,440  
and you know

1556  
00:56:37,190 --> 00:56:35,680  
next day and i was fine but but again

1557  
00:56:39,430 --> 00:56:37,200  
you know that experience space this time

1558  
00:56:41,990 --> 00:56:39,440  
on the soyuz rocket you know we hit

1559  
00:56:43,190 --> 00:56:42,000  
zero g when the main engines cut off the

1560  
00:56:44,710 --> 00:56:43,200  
flip the

1561  
00:56:46,470 --> 00:56:44,720  
switch flipped in my brain and said okay

1562  
00:56:47,910 --> 00:56:46,480  
you're back in space you know what you

1563  
00:56:50,230 --> 00:56:47,920

know where this is and and there was

1564

00:56:51,670 --> 00:56:50,240

none of that it was it felt completely

1565

00:56:54,230 --> 00:56:51,680

normal uh

1566

00:56:56,069 --> 00:56:54,240

because again i had something to compare

1567

00:56:58,069 --> 00:56:56,079

it to and this this is i mean i'm this

1568

00:56:59,190 --> 00:56:58,079

is all subconscious by the way i mean

1569

00:57:01,030 --> 00:56:59,200

you know i'm not actually thinking of

1570

00:57:03,190 --> 00:57:01,040

this stuff but in hindsight looking back

1571

00:57:04,630 --> 00:57:03,200

on the experience that's that's the only

1572

00:57:06,549 --> 00:57:04,640

thing i can i can

1573

00:57:12,470 --> 00:57:06,559

think of

1574

00:57:15,030 --> 00:57:13,990

well you know the first time i was at

1575

00:57:16,230 --> 00:57:15,040

the space station we didn't have the

1576  
00:57:17,349 --> 00:57:16,240  
cupola

1577  
00:57:19,430 --> 00:57:17,359  
and that

1578  
00:57:20,870 --> 00:57:19,440  
you know that was it wasn't a surprise i

1579  
00:57:22,309 --> 00:57:20,880  
mean i expect i knew what i was

1580  
00:57:24,309 --> 00:57:22,319  
expecting but i didn't expect how much

1581  
00:57:26,230 --> 00:57:24,319  
emotional impact that would happen it's

1582  
00:57:28,470 --> 00:57:26,240  
kind of like doing an eva doing a space

1583  
00:57:29,910 --> 00:57:28,480  
walk without the stress

1584  
00:57:31,829 --> 00:57:29,920  
so you get the view but you don't have

1585  
00:57:33,750 --> 00:57:31,839  
the stress of being out in the vacuum of

1586  
00:57:36,789 --> 00:57:33,760  
space so it's pretty cool

1587  
00:57:38,230 --> 00:57:36,799  
paul strassfield at paul strassfield

1588  
00:57:41,109 --> 00:57:38,240

zoe's dad

1589

00:57:44,470 --> 00:57:41,119

i'm over here oh there you are and ryan

1590

00:57:46,630 --> 00:57:44,480

uh kobrik dr ryan kobreck uh the um

1591

00:57:48,870 --> 00:57:46,640

yuri's night exec he wants to know where

1592

00:57:50,470 --> 00:57:48,880

you're going to be spending yuri's night

1593

00:57:51,910 --> 00:57:50,480

that's i know where i'm not i'm not

1594

00:57:54,789 --> 00:57:51,920

going to spend the same place i spent it

1595

00:57:55,910 --> 00:57:54,799

last year which was in space but um i

1596

00:57:58,150 --> 00:57:55,920

don't i don't know that's a good

1597

00:57:59,589 --> 00:57:58,160

question um i'll celebrate it somewhere

1598

00:58:00,950 --> 00:57:59,599

that's a fun that's a fun thing to

1599

00:58:04,069 --> 00:58:00,960

celebrate so

1600

00:58:05,270 --> 00:58:04,079

um so we got we had the great honor um

1601  
00:58:07,750 --> 00:58:05,280  
you know we launched very close to the

1602  
00:58:10,470 --> 00:58:07,760  
50th anniversary and then you know got

1603  
00:58:12,150 --> 00:58:10,480  
to spend uh the actual anniversary in

1604  
00:58:13,910 --> 00:58:12,160  
space and that was that was wonderful

1605  
00:58:15,990 --> 00:58:13,920  
and i flew a yuri's night i flew six

1606  
00:58:18,150 --> 00:58:16,000  
years t-shirts actually for the crew

1607  
00:58:19,430 --> 00:58:18,160  
members and i i gave um the one i had

1608  
00:58:21,910 --> 00:58:19,440  
back to the uh

1609  
00:58:23,670 --> 00:58:21,920  
back to those folks and i i made a joke

1610  
00:58:25,270 --> 00:58:23,680  
um about that i was going to give it

1611  
00:58:27,829 --> 00:58:25,280  
back to them but they might want to wash

1612  
00:58:29,589 --> 00:58:27,839  
it first and actually you know i was

1613  
00:58:31,510 --> 00:58:29,599

getting ready to wash it to give it back

1614

00:58:33,510 --> 00:58:31,520

to them and i smelled it and it actually

1615

00:58:34,950 --> 00:58:33,520

had the smell of space in it and the

1616

00:58:36,470 --> 00:58:34,960

smell and the smell of space is like

1617

00:58:39,430 --> 00:58:36,480

this metallic

1618

00:58:41,510 --> 00:58:39,440

metal you know this burnt metallic smell

1619

00:58:43,109 --> 00:58:41,520

and so i i didn't think it smelled too

1620

00:58:45,589 --> 00:58:43,119

bad so i just i didn't wash it and sent

1621

00:58:47,270 --> 00:58:45,599

it sent it with the metallic space smell

1622

00:58:48,470 --> 00:58:47,280

just so they could they could experience

1623

00:58:51,750 --> 00:58:48,480

that so

1624

00:58:54,069 --> 00:58:51,760

hopefully it's not too offensive

1625

00:58:55,910 --> 00:58:54,079

thank you ron we're uh not going to take

1626  
00:58:57,670 --> 00:58:55,920  
any more questions because we're almost

1627  
00:58:59,829 --> 00:58:57,680  
finished i just want to thank you for

1628  
00:59:02,390 --> 00:58:59,839  
taking so much time to answer all of our

1629  
00:59:03,510 --> 00:59:02,400  
questions and join us today for those of

1630  
00:59:05,829 --> 00:59:03,520  
you who

1631  
00:59:08,309 --> 00:59:05,839  
are following along online thank you for

1632  
00:59:09,829 --> 00:59:08,319  
joining us for today's nasa tweet up you

1633  
00:59:12,030 --> 00:59:09,839  
can learn about future tweet up

1634  
00:59:15,030 --> 00:59:12,040  
activities at

1635  
00:59:16,789 --> 00:59:15,040  
[www.nasa.gov](http://www.nasa.gov) tweetup and you can find

1636  
00:59:21,270 --> 00:59:16,799  
all the ways to engage with nasa on

1637  
00:59:25,430 --> 00:59:23,270  
connect

1638  
00:59:27,589 --> 00:59:25,440

and i just want to close by thanking all

1639

00:59:28,870 --> 00:59:27,599

of you for helping us tell us the

1640

00:59:30,870 --> 00:59:28,880

success story of the space program

1641

00:59:32,710 --> 00:59:30,880

helping us to share the experience of

1642

00:59:34,390 --> 00:59:32,720

living in space with everybody and you

1643

00:59:36,230 --> 00:59:34,400

guys make make it happen and i really