



 **#askNASA**
Ask Questions on Twitter



john

1
00:01:25,840 --> 00:01:42,870

you

2
00:01:46,710 --> 00:01:45,109

hello to everyone joining nasa in this

3
00:01:48,950 --> 00:01:46,720

google plus hangout

4
00:01:50,789 --> 00:01:48,960

i'm expedition 38 flight engineer mike

5
00:01:51,830 --> 00:01:50,799

hopkins aboard the international space

6
00:01:53,510 --> 00:01:51,840

station

7
00:01:55,749 --> 00:01:53,520

on behalf of my crewmates i would like

8
00:02:01,030 --> 00:01:55,759

to wish this amazing complex a very

9
00:02:06,870 --> 00:02:03,429

the xera module was launched into orbit

10
00:02:09,430 --> 00:02:06,880

on november 20th 1998 along with the u.s

11
00:02:11,990 --> 00:02:09,440

unity and russia's vista modules these

12
00:02:14,630 --> 00:02:12,000

first components enabled expedition 1 to

13
00:02:17,030 --> 00:02:14,640

begin on november 2nd 2000 to mark the

14

00:02:19,830 --> 00:02:17,040

start of permanent human presence in

15

00:02:23,589 --> 00:02:21,750

since then more than 200 people have

16

00:02:24,550 --> 00:02:23,599

visited the station from nations around

17

00:02:26,390 --> 00:02:24,560

the world

18

00:02:28,790 --> 00:02:26,400

as well as a variety of international

19

00:02:31,110 --> 00:02:28,800

and commercial spacecraft including the

20

00:02:36,949 --> 00:02:31,120

dragon and cygnus capsules from nasa's

21

00:02:41,670 --> 00:02:39,190

the international space station stands

22

00:02:43,910 --> 00:02:41,680

testament for worldwide cooperation a

23

00:02:46,229 --> 00:02:43,920

providing ground for science and human

24

00:02:49,190 --> 00:02:46,239

innovation and a test bed for the

25

00:02:53,830 --> 00:02:49,200

technologies we will need as we planned

26

00:03:12,070 --> 00:02:56,070

thanks for the first 15 years and here's

27

00:03:12,080 --> 00:03:22,550

uh

28

00:03:27,270 --> 00:03:24,869

hello hey everybody how are you out

29

00:03:27,280 --> 00:03:31,270

good to see you

30

00:03:34,630 --> 00:03:32,710

you guys are looking great out there

31

00:03:38,949 --> 00:03:34,640

especially the guy on the uh maroon

32

00:03:38,959 --> 00:03:41,670

yeah you

33

00:03:41,680 --> 00:03:46,949

all right

34

00:03:51,830 --> 00:03:50,149

oh hey i'm chris i'm leland

35

00:03:53,670 --> 00:03:51,840

we're really excited to be here 15 years

36

00:03:55,750 --> 00:03:53,680

of the anniversary of the space station

37

00:03:57,350 --> 00:03:55,760

going up and uh chris just came back

38

00:03:58,789 --> 00:03:57,360

with a few months ago yeah just two

39

00:04:00,949 --> 00:03:58,799

months ago i can't believe it i was up

40

00:04:02,550 --> 00:04:00,959

there for six months and uh happy to be

41

00:04:04,390 --> 00:04:02,560

back on earth and i feel just like my

42

00:04:05,750 --> 00:04:04,400

normal self again you look good man yeah

43

00:04:07,509 --> 00:04:05,760

you too well you know i have to suck

44

00:04:09,990 --> 00:04:07,519

into my flight so you know bureaucrat

45

00:04:11,990 --> 00:04:10,000

for a little while

46

00:04:18,949 --> 00:04:12,000

yeah so you guys got some questions out

47

00:04:21,509 --> 00:04:20,390

hello and welcome to today's google plus

48

00:04:23,430 --> 00:04:21,519

hangout

49

00:04:25,350 --> 00:04:23,440

so we're going to be joining uh chris

50

00:04:26,950 --> 00:04:25,360

cassidy here with a 6th grade science

51
00:04:29,670 --> 00:04:26,960
class here you guys may have already

52
00:04:31,510 --> 00:04:29,680
seen them um and they are

53
00:04:33,350 --> 00:04:31,520
hello this is miss casey hines in her

54
00:04:34,710 --> 00:04:33,360
sixth grade science class

55
00:04:37,030 --> 00:04:34,720
additionally we're joined by two

56
00:04:39,030 --> 00:04:37,040
astronauts astronaut chris cassidy and

57
00:04:42,230 --> 00:04:39,040
astronaut lela melvin today here in nasa

58
00:04:43,830 --> 00:04:42,240
tv studios

59
00:04:45,590 --> 00:04:43,840
and we're also going to be hearing

60
00:04:47,670 --> 00:04:45,600
questions from social media we're going

61
00:04:50,070 --> 00:04:47,680
to be taking questions using the hashtag

62
00:04:52,150 --> 00:04:50,080
ask nasa

63
00:04:54,550 --> 00:04:52,160

and so today if you're following us on

64

00:04:56,790 --> 00:04:54,560

twitter on facebook or google plus we're

65

00:04:58,629 --> 00:04:56,800

going to be getting to your questions um

66

00:05:00,870 --> 00:04:58,639

and so please send them in as soon as

67

00:05:01,590 --> 00:05:00,880

possible

68

00:05:02,790 --> 00:05:01,600

right

69

00:05:03,830 --> 00:05:02,800

at the top here though we want to go

70

00:05:05,749 --> 00:05:03,840

ahead and hear a little bit about

71

00:05:07,749 --> 00:05:05,759

somebody who just uh came back from

72

00:05:09,189 --> 00:05:07,759

outer space from the international space

73

00:05:11,029 --> 00:05:09,199

station we're gonna hear a little bit

74

00:05:13,189 --> 00:05:11,039

from astronaut chris cassidy who

75

00:05:14,550 --> 00:05:13,199

recently returned

76

00:05:15,830 --> 00:05:14,560

and so to tell us a little bit more

77

00:05:18,550 --> 00:05:15,840

about what it's like to live and work in

78

00:05:19,430 --> 00:05:18,560

space here's chris cassidy

79

00:05:21,670 --> 00:05:19,440

well

80

00:05:23,430 --> 00:05:21,680

hello everybody again really it's so

81

00:05:25,670 --> 00:05:23,440

cool to be talking with you because i'm

82

00:05:27,749 --> 00:05:25,680

so excited about my experiences that i

83

00:05:31,430 --> 00:05:27,759

just had on the space station just a

84

00:05:33,110 --> 00:05:31,440

phenomenal place uh to be about the size

85

00:05:34,710 --> 00:05:33,120

if you can see a picture that we're

86

00:05:36,629 --> 00:05:34,720

looking at a picture here i'm not sure

87

00:05:38,629 --> 00:05:36,639

if you can see it out there but about

88

00:05:41,029 --> 00:05:38,639

the size of a whole entire football

89

00:05:43,830 --> 00:05:41,039

field or a five-bedroom house it's a

90

00:05:45,830 --> 00:05:43,840

gigantic complex and uh

91

00:05:48,790 --> 00:05:45,840

the way we get to the space station now

92

00:05:50,710 --> 00:05:48,800

is on a russian soyuz rocket a tiny

93

00:05:52,629 --> 00:05:50,720

little three-person spaceship with we

94

00:05:54,550 --> 00:05:52,639

sit shoulder to shoulder about we put

95

00:05:56,629 --> 00:05:54,560

another guy in between leland and i and

96

00:05:58,790 --> 00:05:56,639

and just squished in there on our backs

97

00:06:01,350 --> 00:05:58,800

for about two hours before liftoff three

98

00:06:03,749 --> 00:06:01,360

two one blast off we go into the middle

99

00:06:05,590 --> 00:06:03,759

of night in kazakhstan about three hours

100

00:06:07,430 --> 00:06:05,600

from moscow out in the middle of nowhere

101
00:06:09,749 --> 00:06:07,440
is where we launched from

102
00:06:11,590 --> 00:06:09,759
we did a new thing on our rendezvous we

103
00:06:13,749 --> 00:06:11,600
actually got the space station in six

104
00:06:15,510 --> 00:06:13,759
hours typically you launch you go to bed

105
00:06:17,590 --> 00:06:15,520
you spend one day doing maneuvers and

106
00:06:19,270 --> 00:06:17,600
then go to bed again and launch and run

107
00:06:21,590 --> 00:06:19,280
it with the third day but we were there

108
00:06:22,870 --> 00:06:21,600
six hours later and you can imagine

109
00:06:25,110 --> 00:06:22,880
rendezvous i mean lily and you've done

110
00:06:27,270 --> 00:06:25,120
run everywhere and a big hunk of metal

111
00:06:29,270 --> 00:06:27,280
the space station is going five miles a

112
00:06:31,110 --> 00:06:29,280
second and we're going five miles a

113
00:06:33,029 --> 00:06:31,120

second plus a tiny little bit to catch

114

00:06:34,870 --> 00:06:33,039

up and make that docking that you just

115

00:06:36,309 --> 00:06:34,880

see right there in the picture just an

116

00:06:38,230 --> 00:06:36,319

incredible thing

117

00:06:40,230 --> 00:06:38,240

then we do some pressure checks and open

118

00:06:42,150 --> 00:06:40,240

the hatches and fly in and meet our new

119

00:06:44,230 --> 00:06:42,160

crewmates my canadian crewmate chris

120

00:06:46,150 --> 00:06:44,240

shadfield has a big black bushy mustache

121

00:06:47,749 --> 00:06:46,160

so i thought it'd be funny to join him

122

00:06:49,990 --> 00:06:47,759

with the same one and you see that there

123

00:06:51,430 --> 00:06:50,000

in the in the picture

124

00:06:53,029 --> 00:06:51,440

but there's six people on the space

125

00:06:56,070 --> 00:06:53,039

station and uh

126
00:06:57,830 --> 00:06:56,080
and you get up there and now how do you

127
00:06:59,270 --> 00:06:57,840
live how do you float around how do

128
00:07:00,629 --> 00:06:59,280
where's your stuff where's your clothes

129
00:07:02,469 --> 00:07:00,639
where's your food you spend the first

130
00:07:04,150 --> 00:07:02,479
day just learning where all your

131
00:07:06,309 --> 00:07:04,160
creature comfort things are and how to

132
00:07:07,749 --> 00:07:06,319
put your sleeping bag on and get more

133
00:07:09,430 --> 00:07:07,759
more comfortable floating around and

134
00:07:11,270 --> 00:07:09,440
maneuvering in the space station without

135
00:07:13,110 --> 00:07:11,280
the use of without

136
00:07:15,589 --> 00:07:13,120
relying on gravity

137
00:07:18,150 --> 00:07:15,599
this robot here is called robonaut he's

138
00:07:19,909 --> 00:07:18,160

a pretty cool guy you can look through

139

00:07:22,230 --> 00:07:19,919

the visors that we see and you see what

140

00:07:24,070 --> 00:07:22,240

he sees and move his arms his arms match

141

00:07:25,830 --> 00:07:24,080

what yours do we did a lot of

142

00:07:27,430 --> 00:07:25,840

experiments includes those soccer ball

143

00:07:29,830 --> 00:07:27,440

sized satellites and maintenance of

144

00:07:31,749 --> 00:07:29,840

course is what we have that silver box

145

00:07:34,070 --> 00:07:31,759

that you just saw was the device that

146

00:07:36,150 --> 00:07:34,080

turns yesterday's pea into today's

147

00:07:38,870 --> 00:07:36,160

drinking water and i swear the machine

148

00:07:39,670 --> 00:07:38,880

works it really it really does work and

149

00:07:40,550 --> 00:07:39,680

uh

150

00:07:42,230 --> 00:07:40,560

um

151
00:07:44,469 --> 00:07:42,240
but this glove box that you're seeing is

152
00:07:46,469 --> 00:07:44,479
where we did that fire the fire tick

153
00:07:47,510 --> 00:07:46,479
experiment and we don't certainly keep

154
00:07:50,070 --> 00:07:47,520
an open

155
00:07:51,430 --> 00:07:50,080
cabin flame but experiments and research

156
00:07:53,909 --> 00:07:51,440
is the name of the game on the space

157
00:07:56,150 --> 00:07:53,919
station we spend most of our time during

158
00:07:58,950 --> 00:07:56,160
the week doing just that this is the

159
00:08:00,390 --> 00:07:58,960
cupola an amazing view down at the at

160
00:08:03,430 --> 00:08:00,400
the planet

161
00:08:05,270 --> 00:08:03,440
you can see here's the persian gulf in

162
00:08:08,070 --> 00:08:05,280
florida at night that's not florida but

163
00:08:09,029 --> 00:08:08,080

that's a river at night just incredible

164

00:08:10,710 --> 00:08:09,039

views

165

00:08:14,070 --> 00:08:10,720

the other practical joke i played in

166

00:08:15,909 --> 00:08:14,080

space was my italian cremate luca he's

167

00:08:18,150 --> 00:08:15,919

bald so i thought it'd be fun to greet

168

00:08:20,070 --> 00:08:18,160

him at the door with a bald head and the

169

00:08:21,029 --> 00:08:20,080

same cheesy goatee mustache that he

170

00:08:22,629 --> 00:08:21,039

wears

171

00:08:24,150 --> 00:08:22,639

and uh and that's

172

00:08:26,629 --> 00:08:24,160

kind of like yours and that's the two of

173

00:08:28,469 --> 00:08:26,639

us saying hi um about halfway through my

174

00:08:30,629 --> 00:08:28,479

mission when we rotated out the cruise

175

00:08:32,870 --> 00:08:30,639

and there there we are

176

00:08:35,430 --> 00:08:32,880

we luke and i got to do a couple space

177

00:08:37,750 --> 00:08:35,440

walks together as well um

178

00:08:39,509 --> 00:08:37,760

and uh one one of them actually was a

179

00:08:42,230 --> 00:08:39,519

little bit scary some

180

00:08:44,550 --> 00:08:42,240

water that was leaking in his backpack

181

00:08:46,630 --> 00:08:44,560

the cooling water that keeps us our body

182

00:08:48,630 --> 00:08:46,640

temperature right the water was leaking

183

00:08:51,110 --> 00:08:48,640

into his air that was coming into his

184

00:08:52,949 --> 00:08:51,120

helmet so his helmet was filling up with

185

00:08:54,550 --> 00:08:52,959

water and instead of

186

00:08:56,470 --> 00:08:54,560

oxygen which was a really scary

187

00:08:57,990 --> 00:08:56,480

situation we got him back inside and you

188

00:09:00,470 --> 00:08:58,000

can see all the

189

00:09:02,470 --> 00:09:00,480

russian guys and karen getting ready to

190

00:09:05,110 --> 00:09:02,480

take his helmet off and and

191

00:09:07,509 --> 00:09:05,120

clean off the water and get fresh fresh

192

00:09:10,710 --> 00:09:07,519

air to his face so that was really nice

193

00:09:13,829 --> 00:09:10,720

but the time went by super fast and

194

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

part of that time is spent moving cargo

195

00:09:17,269 --> 00:09:15,600

we need a lot of equipment to come up on

196

00:09:19,590 --> 00:09:17,279

the space station including food that

197

00:09:21,430 --> 00:09:19,600

you see here and new spare parts and

198

00:09:23,910 --> 00:09:21,440

equipment for experiments and whatnot

199

00:09:25,350 --> 00:09:23,920

and their various cargo ships come and

200

00:09:26,870 --> 00:09:25,360

go from the space station they spend

201

00:09:28,470 --> 00:09:26,880

about a month with us

202

00:09:30,070 --> 00:09:28,480

then we send them on their way to a

203

00:09:32,070 --> 00:09:30,080

fiery death that you just saw there in

204

00:09:34,230 --> 00:09:32,080

the in the video as they burn up in the

205

00:09:35,829 --> 00:09:34,240

atmosphere and of course exercise is a

206

00:09:38,470 --> 00:09:35,839

huge part leela and i both like to

207

00:09:40,070 --> 00:09:38,480

exercise a lot and we do that a couple

208

00:09:41,670 --> 00:09:40,080

hours every day on the space station not

209

00:09:43,509 --> 00:09:41,680

only keep our muscles strong but to keep

210

00:09:45,509 --> 00:09:43,519

our bones healthy that's a really really

211

00:09:47,269 --> 00:09:45,519

important thing for us to do

212

00:09:48,870 --> 00:09:47,279

and then coming back into the atmosphere

213

00:09:50,870 --> 00:09:48,880

think of all the flame and smoke and

214

00:09:53,190 --> 00:09:50,880

fire that you see on launch all that

215

00:09:55,190 --> 00:09:53,200

same energy has to come back out of the

216

00:09:57,269 --> 00:09:55,200

vehicle and you do that as you pound

217

00:09:59,190 --> 00:09:57,279

your way through the atmosphere down to

218

00:10:00,870 --> 00:09:59,200

a parachute landing in the middle of

219

00:10:03,670 --> 00:10:00,880

kazakhstan

220

00:10:07,190 --> 00:10:03,680

and then just 18 or 20 hours later after

221

00:10:08,870 --> 00:10:07,200

that touchdown i was back in houston

222

00:10:11,430 --> 00:10:08,880

which is a really neat thing it used to

223

00:10:13,350 --> 00:10:11,440

be we spent some time in a couple weeks

224

00:10:15,350 --> 00:10:13,360

in star city in russia before getting

225

00:10:17,670 --> 00:10:15,360

the opportunity to come back home

226

00:10:20,389 --> 00:10:17,680

but now i landed took a helicopter to a

227

00:10:22,230 --> 00:10:20,399

nasa plane cleared customs in bangor

228

00:10:24,870 --> 00:10:22,240

maine you can't escape transportation

229

00:10:26,630 --> 00:10:24,880

security guys homeland security and then

230

00:10:27,910 --> 00:10:26,640

uh found myself back in houston and that

231

00:10:29,750 --> 00:10:27,920

was just a couple

232

00:10:31,910 --> 00:10:29,760

months ago in mid-september so it's

233

00:10:33,509 --> 00:10:31,920

really really cool to be here today and

234

00:10:35,030 --> 00:10:33,519

share a little bit of that with you guys

235

00:10:37,590 --> 00:10:35,040

and i don't know if we're taking

236

00:10:41,829 --> 00:10:37,600

questions now or or or what but that's

237

00:10:45,030 --> 00:10:41,839

uh that's my been my last eight months

238

00:10:48,310 --> 00:10:45,040

that's fantastic yeah

239

00:10:49,509 --> 00:10:48,320

are we taking questions now or or uh

240

00:10:51,509 --> 00:10:49,519

yeah why don't we take some questions

241

00:10:52,949 --> 00:10:51,519

now uh chris uh this is uh i'm john i'm

242

00:10:54,790 --> 00:10:52,959

with the nasa social media team and we

243

00:10:57,350 --> 00:10:54,800

have our first question from google plus

244

00:10:59,430 --> 00:10:57,360

it's sion o'regan who asks uh with the

245

00:11:01,110 --> 00:10:59,440

year-long mission iss coming up in a few

246

00:11:02,949 --> 00:11:01,120

years do you feel that now is the right

247

00:11:04,230 --> 00:11:02,959

time to attempt a mission as long as

248

00:11:05,829 --> 00:11:04,240

this and what do you think will be the

249

00:11:06,790 --> 00:11:05,839

biggest challenge facing the one-year

250

00:11:08,310 --> 00:11:06,800

crew

251

00:11:10,630 --> 00:11:08,320

all the best from ireland

252

00:11:12,230 --> 00:11:10,640

yeah so that's a good question and uh

253

00:11:14,230 --> 00:11:12,240

scott kelly is our colleague that will

254

00:11:17,190 --> 00:11:14,240

be doing that on the nasa side there's a

255

00:11:21,030 --> 00:11:17,200

a russian cosmonaut that will be joining

256

00:11:21,990 --> 00:11:21,040

him and and my my um experience

257

00:11:23,910 --> 00:11:22,000

on

258

00:11:25,350 --> 00:11:23,920

coming home day the day i came home as

259

00:11:26,310 --> 00:11:25,360

we're closing the hatch i thought to

260

00:11:28,470 --> 00:11:26,320

myself

261

00:11:30,470 --> 00:11:28,480

what would i think if i was halfway done

262

00:11:31,269 --> 00:11:30,480

right now how would i feel what would i

263

00:11:33,829 --> 00:11:31,279

need

264

00:11:35,430 --> 00:11:33,839

and um i to be honest i felt a little

265

00:11:37,829 --> 00:11:35,440

bit of cumulative

266

00:11:40,069 --> 00:11:37,839

fatigue when you're living at your

267

00:11:41,829 --> 00:11:40,079

workplace and you can't

268

00:11:43,590 --> 00:11:41,839

shut the door to work and go home in the

269

00:11:46,150 --> 00:11:43,600

evening and kick back and watch monday

270

00:11:48,150 --> 00:11:46,160

night football um

271

00:11:50,230 --> 00:11:48,160

you're there all the time and the and

272

00:11:51,190 --> 00:11:50,240

and it eventually catches up to you and

273

00:11:54,230 --> 00:11:51,200

i think

274

00:11:56,230 --> 00:11:54,240

my my recommendation would be to in

275

00:11:57,910 --> 00:11:56,240

months seven through 12 the second half

276

00:11:59,910 --> 00:11:57,920

of the year to have a three-day weekend

277

00:12:02,389 --> 00:11:59,920

every month because you really need a

278

00:12:04,389 --> 00:12:02,399

you know a good charge every sunday a

279

00:12:06,870 --> 00:12:04,399

sunday is a really good nice recharge

280

00:12:08,389 --> 00:12:06,880

and have an extra sunday uh thrown in

281

00:12:10,230 --> 00:12:08,399

the mix every now and then i think would

282

00:12:11,590 --> 00:12:10,240

go a long way to to recharge you but to

283

00:12:14,069 --> 00:12:11,600

specifically answer your question now is

284

00:12:15,430 --> 00:12:14,079

a great time to do it i think we'll uh

285

00:12:17,030 --> 00:12:15,440

you know we'll

286

00:12:19,030 --> 00:12:17,040

get a little bit more data on some of

287

00:12:21,430 --> 00:12:19,040

the medical science that we already are

288

00:12:23,350 --> 00:12:21,440

know about and and sharpen our pencils

289

00:12:25,670 --> 00:12:23,360

on what we've learned and confirm

290

00:12:27,990 --> 00:12:25,680

all that and it'll be exciting to see

291

00:12:29,269 --> 00:12:28,000

how it works out for those guys

292

00:12:30,710 --> 00:12:29,279

and for the students out there that are

293

00:12:32,710 --> 00:12:30,720

going to go to mars one day we got to

294

00:12:34,949 --> 00:12:32,720

get ready for that longer much longer

295

00:12:36,629 --> 00:12:34,959

trip than one year so we're testing

296

00:12:38,230 --> 00:12:36,639

things out for the bodies and the

297

00:12:42,389 --> 00:12:38,240

equipment and so forth to get us ready

298

00:12:46,310 --> 00:12:44,389

okay thanks can i take a question from

299

00:12:48,470 --> 00:12:46,320

casey hines sixth grade students at

300

00:12:52,389 --> 00:12:48,480

northland preparatory academy in

301

00:12:59,430 --> 00:12:56,550

hi my name is zoey um so chris what

302

00:13:01,990 --> 00:12:59,440

things changed when you went from a navy

303

00:13:03,750 --> 00:13:02,000

seal to an astronaut

304

00:13:05,269 --> 00:13:03,760

yeah that's a good question i'm often

305

00:13:08,629 --> 00:13:05,279

i'm often asked that because people

306

00:13:10,949 --> 00:13:08,639

think underwater and you know seals you

307

00:13:13,590 --> 00:13:10,959

know breathing scuba gear how does that

308

00:13:17,190 --> 00:13:13,600

relate to being an astronaut but

309

00:13:19,269 --> 00:13:17,200

what changed specifically was um

310

00:13:21,670 --> 00:13:19,279

not a whole lot i'm still the same

311

00:13:22,790 --> 00:13:21,680

person but what i brought to the

312

00:13:26,069 --> 00:13:22,800

astronaut

313

00:13:28,310 --> 00:13:26,079

office was my experiences that that uh i

314

00:13:30,389 --> 00:13:28,320

think really set me up to be a good

315

00:13:31,990 --> 00:13:30,399

operator in space that's what we do when

316

00:13:34,150 --> 00:13:32,000

we're up there is

317

00:13:37,030 --> 00:13:34,160

we fix broken things we think about a

318

00:13:40,310 --> 00:13:37,040

problem um logically and analytically

319

00:13:42,310 --> 00:13:40,320

and uh time in the military for me was

320

00:13:44,710 --> 00:13:42,320

what helped me do that and i happened to

321

00:13:46,829 --> 00:13:44,720

spend my years in the seal teams but the

322

00:13:49,509 --> 00:13:46,839

people get that experience in various

323

00:13:52,389 --> 00:13:49,519

backgrounds um and and leland has his

324

00:13:54,949 --> 00:13:52,399

own uh story to tell about his path of

325

00:13:55,990 --> 00:13:54,959

getting there and uh but this what

326

00:13:57,829 --> 00:13:56,000

changed

327

00:13:59,590 --> 00:13:57,839

i feel not a whole lot i was still the

328

00:14:01,269 --> 00:13:59,600

same guy i was still the same dad to my

329

00:14:03,110 --> 00:14:01,279

kids my daughter was a fifth grade

330

00:14:04,949 --> 00:14:03,120

student that's just a year younger than

331

00:14:06,949 --> 00:14:04,959

you guys when we showed up there in

332

00:14:09,350 --> 00:14:06,959

houston texas and now she's a big big

333

00:14:14,550 --> 00:14:09,360

kid in college so the times that gone by

334

00:14:17,990 --> 00:14:16,230

okay we'll come back to the prep school

335

00:14:19,350 --> 00:14:18,000

in a minute but uh there's a question

336

00:14:20,949 --> 00:14:19,360

from twitter and leland this one's kind

337

00:14:22,949 --> 00:14:20,959

of interesting we had a

338

00:14:25,990 --> 00:14:22,959

uh a gamma ray burst announcement

339

00:14:27,269 --> 00:14:26,000

earlier today and uh s swobels 59ms

340

00:14:29,269 --> 00:14:27,279

would it be possible for an astronaut to

341

00:14:32,389 --> 00:14:29,279

be on a spacewalk to become the hulk

342

00:14:34,870 --> 00:14:32,399

exposed to gamma radiation and uh i know

343

00:14:37,030 --> 00:14:34,880

you want to talk about uh some of the

344

00:14:38,790 --> 00:14:37,040

challenges in human space flight and the

345

00:14:41,030 --> 00:14:38,800

uh the exploration challenge on space

346

00:14:42,470 --> 00:14:41,040

radiation great well i really hope that

347

00:14:43,670 --> 00:14:42,480

gamma ray burst wouldn't cause you to be

348

00:14:44,470 --> 00:14:43,680

the hull because you go out of your suit

349

00:14:46,069 --> 00:14:44,480

you

350

00:14:48,470 --> 00:14:46,079

need a little bit of problem there with

351

00:14:50,150 --> 00:14:48,480

uh no air in space and the vacuum of

352

00:14:51,910 --> 00:14:50,160

space but one of the things that we're

353

00:14:53,430 --> 00:14:51,920

having to look at is yeah there's the

354

00:14:55,189 --> 00:14:53,440

hulk right there one of the things to

355

00:14:57,750 --> 00:14:55,199

look at for the future

356

00:14:59,670 --> 00:14:57,760

is how do we send astronauts on these

357

00:15:01,030 --> 00:14:59,680

long duration flights to mars you know

358

00:15:02,790 --> 00:15:01,040

an eight-month trip

359

00:15:05,189 --> 00:15:02,800

and have to go through these serious

360

00:15:06,710 --> 00:15:05,199

radiation challenges and what we're

361

00:15:07,829 --> 00:15:06,720

challenging many of you students out

362

00:15:09,910 --> 00:15:07,839

there with is something called the

363

00:15:12,949 --> 00:15:09,920

exploration design challenge where you

364

00:15:15,030 --> 00:15:12,959

can actually be part of our virtual crew

365

00:15:16,790 --> 00:15:15,040

of astronauts but we're going to have

366

00:15:19,350 --> 00:15:16,800

you doing assignments learning about

367

00:15:20,710 --> 00:15:19,360

radiation learning about how to build

368

00:15:22,870 --> 00:15:20,720

radiation shields so that when

369

00:15:24,629 --> 00:15:22,880

astronauts go to mars we'll actually be

370

00:15:27,269 --> 00:15:24,639

shielded from that and so if you're in

371

00:15:29,430 --> 00:15:27,279

middle school k through k through eighth

372

00:15:31,430 --> 00:15:29,440

grade you can actually do some projects

373

00:15:32,790 --> 00:15:31,440

and actually have your name fly on the

374

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

next vehicle that's gonna go up from

375

00:15:36,870 --> 00:15:35,360

america is the orion capsule

376

00:15:39,030 --> 00:15:36,880

if you're in high school you can

377

00:15:41,110 --> 00:15:39,040

actually build a radiation shield and

378

00:15:43,110 --> 00:15:41,120

this radiation shield if you win the

379

00:15:45,269 --> 00:15:43,120

down select that shield will go on the

380

00:15:47,030 --> 00:15:45,279

orion capsule which is flying the fall

381

00:15:48,949 --> 00:15:47,040

of next year and so we'll put a

382

00:15:50,389 --> 00:15:48,959

radiation sensor behind it we'll

383

00:15:51,990 --> 00:15:50,399

actually measure how effective your

384

00:15:54,069 --> 00:15:52,000

radiation shield is you will be actually

385

00:15:56,150 --> 00:15:54,079

doing hands-on experiential activities

386

00:15:57,430 --> 00:15:56,160

which will fly in space so for those of

387

00:15:59,030 --> 00:15:57,440

you who haven't signed up for the

388

00:16:02,230 --> 00:15:59,040

expiration design challenge

389

00:16:03,910 --> 00:16:02,240

go to [nasa.gov](https://www.nasa.gov/education) education and take a look

390

00:16:05,749 --> 00:16:03,920

and sign up and be part of this mission

391

00:16:07,189 --> 00:16:05,759

we have a video from one of my

392

00:16:09,590 --> 00:16:07,199

classmates suni williams who was on

393

00:16:13,990 --> 00:16:09,600

space for about six months so take a

394

00:16:18,470 --> 00:16:16,389

nasa is currently developing a new heavy

395

00:16:20,870 --> 00:16:18,480

lift rocket to carry a human-rated

396

00:16:22,550 --> 00:16:20,880

spacecraft called orion multi-purpose

397

00:16:24,470 --> 00:16:22,560

crew vehicle

398

00:16:25,990 --> 00:16:24,480

orion will support deep space missions

399

00:16:27,189 --> 00:16:26,000

to asteroids

400

00:16:29,189 --> 00:16:27,199

the moon

401
00:16:31,269 --> 00:16:29,199
and mars

402
00:16:34,230 --> 00:16:31,279
we are building an exciting future of

403
00:16:36,230 --> 00:16:34,240
discovery science and exploration that

404
00:16:37,829 --> 00:16:36,240
will challenge our world through lessons

405
00:16:39,509 --> 00:16:37,839
we are learning today

406
00:16:41,670 --> 00:16:39,519
the international space station is

407
00:16:44,470 --> 00:16:41,680
helping prepare for these steps further

408
00:16:46,150 --> 00:16:44,480
into space hi my name is sunny williams

409
00:16:48,470 --> 00:16:46,160
i'm a flight engineer on the

410
00:16:50,629 --> 00:16:48,480
international space station outside the

411
00:16:52,550 --> 00:16:50,639
protection of earth's atmosphere is a

412
00:16:53,590 --> 00:16:52,560
universe full of radiation it's

413
00:16:56,230 --> 00:16:53,600

everywhere

414

00:16:58,310 --> 00:16:56,240

space radiation sometimes called cosmic

415

00:17:00,949 --> 00:16:58,320

radiation is different from the types of

416

00:17:03,590 --> 00:17:00,959

radiation you find on earth it has very

417

00:17:05,669 --> 00:17:03,600

different effect on human dna cells and

418

00:17:07,990 --> 00:17:05,679

tissues and it's very difficult to

419

00:17:10,309 --> 00:17:08,000

predict the long-term effects of space

420

00:17:11,669 --> 00:17:10,319

radiation on the human body

421

00:17:13,270 --> 00:17:11,679

because of this uncertainty we are

422

00:17:14,390 --> 00:17:13,280

running experiments to learn more about

423

00:17:18,150 --> 00:17:14,400

radiation

424

00:17:19,669 --> 00:17:18,160

small others are a little bit bigger

425

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

outside of the space station we also

426

00:17:24,949 --> 00:17:21,919

have materials international space

427

00:17:26,870 --> 00:17:24,959

station experiment 8 called missy 8 and

428

00:17:28,950 --> 00:17:26,880

it's also gathering data to help us

429

00:17:31,110 --> 00:17:28,960

understand radiation protection required

430

00:17:33,669 --> 00:17:31,120

for interplanetary flight we are

431

00:17:36,549 --> 00:17:33,679

charting a pathway for your generation's

432

00:17:38,230 --> 00:17:36,559

journey further into space and we need

433

00:17:40,150 --> 00:17:38,240

your help

434

00:17:42,710 --> 00:17:40,160

so get involved with nasa's newest

435

00:17:45,029 --> 00:17:42,720

design challenge the exploration design

436

00:17:47,350 --> 00:17:45,039

challenge this challenge is charting

437

00:17:49,669 --> 00:17:47,360

your journey to mars tracking one of the

438

00:17:51,510 --> 00:17:49,679

major challenges to deep space long

439

00:17:53,590 --> 00:17:51,520

duration exploration

440

00:17:54,870 --> 00:17:53,600

namely the dangers associated with

441

00:17:56,870 --> 00:17:54,880

radiation

442

00:17:58,549 --> 00:17:56,880

and the need to protect our astronauts

443

00:18:00,549 --> 00:17:58,559

as they venture into places never

444

00:18:02,789 --> 00:18:00,559

visited by humans before

445

00:18:05,510 --> 00:18:02,799

register now for the exploration design

446

00:18:07,830 --> 00:18:05,520

challenge you and your team may be the

447

00:18:09,750 --> 00:18:07,840

student engineers who help nasa develop

448

00:18:12,230 --> 00:18:09,760

the technology needed to protect

449

00:18:15,430 --> 00:18:12,240

astronauts from space radiation as they

450

00:18:17,110 --> 00:18:15,440

travel to the moon asteroids and mars

451

00:18:23,430 --> 00:18:17,120

aboard the orion

452

00:18:27,110 --> 00:18:25,190

so we need your help out there you know

453

00:18:28,630 --> 00:18:27,120

chris and i we may not go to mars one

454

00:18:30,470 --> 00:18:28,640

day but it's going to be one of you out

455

00:18:32,230 --> 00:18:30,480

there and you can start building your

456

00:18:33,830 --> 00:18:32,240

spaceship now with this exploration

457

00:18:36,150 --> 00:18:33,840

design challenge so

458

00:18:37,510 --> 00:18:36,160

thanks that that video reminded me of

459

00:18:39,110 --> 00:18:37,520

something isn't it neat when you're

460

00:18:41,110 --> 00:18:39,120

trying to go to sleep and you're seeing

461

00:18:42,230 --> 00:18:41,120

those glasses of light fly through your

462

00:18:44,390 --> 00:18:42,240

eyeball what does it like to look like

463

00:18:46,470 --> 00:18:44,400

green green flashes like little flashes

464

00:18:48,070 --> 00:18:46,480

and i think it's the radiation or the

465

00:18:49,669 --> 00:18:48,080

particles or something but the particle

466

00:18:51,110 --> 00:18:49,679

is hitting your optical nerve and making

467

00:18:53,270 --> 00:18:51,120

you think you're seeing

468

00:18:54,710 --> 00:18:53,280

okay yeah but it's it's really kind of a

469

00:18:56,070 --> 00:18:54,720

strange thing the first couple nights

470

00:18:57,430 --> 00:18:56,080

you try to go to sleep and you're seeing

471

00:19:04,070 --> 00:18:57,440

that

472

00:19:07,190 --> 00:19:05,830

thanks guys why don't we go back to uh

473

00:19:12,950 --> 00:19:07,200

the sixth grade students at northland

474

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

hi i'm casey um so i've been reading

475

00:19:19,590 --> 00:19:17,360

chris hadfield's new book and i've

476
00:19:21,510 --> 00:19:19,600
learned a lot about how many years go

477
00:19:23,909 --> 00:19:21,520
into your actual training for your

478
00:19:25,830 --> 00:19:23,919
missions how do you make time for kids

479
00:19:28,789 --> 00:19:25,840
and family when you're prepping for a

480
00:19:33,669 --> 00:19:31,510
um well i'll answer that because i have

481
00:19:34,950 --> 00:19:33,679
three kids and just completed the two

482
00:19:36,950 --> 00:19:34,960
and a half year

483
00:19:38,230 --> 00:19:36,960
lead up to a six months mission and then

484
00:19:40,150 --> 00:19:38,240
the six month

485
00:19:41,909 --> 00:19:40,160
mission itself and it is an

486
00:19:44,549 --> 00:19:41,919
international space station which means

487
00:19:47,669 --> 00:19:44,559
it's international training half of our

488
00:19:50,950 --> 00:19:47,679

time about is in houston and about half

489

00:19:53,510 --> 00:19:50,960

is in um star city which is near moscow

490

00:19:55,830 --> 00:19:53,520

and then a few other trips we have to

491

00:19:58,470 --> 00:19:55,840

japan for the japanese space agency

492

00:20:00,230 --> 00:19:58,480

equipment and to germany where the

493

00:20:02,870 --> 00:20:00,240

european space

494

00:20:05,830 --> 00:20:02,880

agency trains their astronauts so it's a

495

00:20:08,710 --> 00:20:05,840

lot of travel and you're exactly right

496

00:20:11,029 --> 00:20:08,720

uh we our own families are affected by

497

00:20:13,350 --> 00:20:11,039

all that travel they're excited for us

498

00:20:15,270 --> 00:20:13,360

for the most part to be involved in an

499

00:20:18,630 --> 00:20:15,280

exciting mission but at the end of the

500

00:20:21,029 --> 00:20:18,640

day we're still a family unit and and uh

501
00:20:23,430 --> 00:20:21,039
talking communicating taking advantage

502
00:20:26,470 --> 00:20:23,440
of things like technology like this

503
00:20:27,590 --> 00:20:26,480
facetime skype google uh chat and that

504
00:20:30,870 --> 00:20:27,600
sort of thing

505
00:20:31,750 --> 00:20:30,880
is how we stayed in touch and uh and i

506
00:20:34,149 --> 00:20:31,760
could be

507
00:20:35,510 --> 00:20:34,159
just as much part of long grass in a

508
00:20:36,870 --> 00:20:35,520
green pool

509
00:20:39,590 --> 00:20:36,880
from a far away

510
00:20:42,310 --> 00:20:39,600
as if i was at home so barbecue yeah

511
00:20:44,789 --> 00:20:42,320
barbecue and all that sort of thing so

512
00:20:46,630 --> 00:20:44,799
that's a really good question and

513
00:20:48,549 --> 00:20:46,640

but the other thing is you know when

514

00:20:50,149 --> 00:20:48,559

when chris is away we're all part of an

515

00:20:52,710 --> 00:20:50,159

extended family so

516

00:20:54,149 --> 00:20:52,720

if if his wife and kids are needing help

517

00:20:56,149 --> 00:20:54,159

or something we're all part of this one

518

00:20:59,750 --> 00:20:56,159

big team together so we're we're helping

519

00:21:02,390 --> 00:21:01,029

good question

520

00:21:05,270 --> 00:21:02,400

can we have fun

521

00:21:07,669 --> 00:21:05,280

we've on twitter from den fym says hi

522

00:21:10,230 --> 00:21:07,679

chris and leland do the medical results

523

00:21:16,230 --> 00:21:10,240

of the effects of microgravity indicate

524

00:21:18,710 --> 00:21:17,350

i you want to hit it from a long

525

00:21:21,350 --> 00:21:18,720

duration yeah i'll hit it from the long

526

00:21:24,390 --> 00:21:21,360

duration side of things and uh

527

00:21:26,549 --> 00:21:24,400

you know we we have um

528

00:21:28,870 --> 00:21:26,559

we basically go by the same standards

529

00:21:32,390 --> 00:21:28,880

that a worker in a

530

00:21:35,430 --> 00:21:32,400

nuclear power plant or or navy sailor on

531

00:21:38,310 --> 00:21:35,440

a nuclear submarine goes by and and we

532

00:21:39,750 --> 00:21:38,320

wear a little device that detects how

533

00:21:41,430 --> 00:21:39,760

much radiation we're getting we wear

534

00:21:43,029 --> 00:21:41,440

that on our on our belt the whole time

535

00:21:46,470 --> 00:21:43,039

during during the mission so there's a

536

00:21:48,470 --> 00:21:46,480

cumulative known quantity on that exact

537

00:21:50,950 --> 00:21:48,480

mission and then they for future

538

00:21:52,950 --> 00:21:50,960

missions they'll predict out how much we

539

00:21:54,149 --> 00:21:52,960

would incur if we went again for

540

00:21:56,710 --> 00:21:54,159

instance and

541

00:21:59,510 --> 00:21:56,720

and uh scott kelly will be going for a

542

00:22:02,390 --> 00:21:59,520

year so part of his medical assessment

543

00:22:05,110 --> 00:22:02,400

to see if he was certified for to fly

544

00:22:07,029 --> 00:22:05,120

again is to make was to make sure that

545

00:22:09,270 --> 00:22:07,039

the predicted amount of radiation that

546

00:22:12,070 --> 00:22:09,280

he would receive during that one year is

547

00:22:18,070 --> 00:22:12,080

still going to be below the lifetime

548

00:22:23,270 --> 00:22:20,230

okay we have a question from melissa

549

00:22:25,430 --> 00:22:23,280

abernath who says her first graders uh

550

00:22:27,270 --> 00:22:25,440

would like to know how do you survive in

551
00:22:30,789 --> 00:22:27,280
space and what if you do if you're

552
00:22:34,390 --> 00:22:32,070
well

553
00:22:36,070 --> 00:22:34,400
surviving in space is you know we have a

554
00:22:38,549 --> 00:22:36,080
team of people on the ground that are

555
00:22:41,350 --> 00:22:38,559
really looking out after all of our all

556
00:22:43,350 --> 00:22:41,360
of our medical uh

557
00:22:44,870 --> 00:22:43,360
changes they're also looking at it you

558
00:22:46,470 --> 00:22:44,880
know chris is doing a space walk out

559
00:22:48,630 --> 00:22:46,480
there they're monitoring everything and

560
00:22:50,470 --> 00:22:48,640
making sure that everything is okay um

561
00:22:52,149 --> 00:22:50,480
but i i think the

562
00:22:54,390 --> 00:22:52,159
the main thing is before you sign up to

563
00:22:56,310 --> 00:22:54,400

become an astronaut you you've tried to

564

00:22:57,590 --> 00:22:56,320

get rid of all your fear you know we put

565

00:22:59,270 --> 00:22:57,600

they put you in this little sphere to

566

00:23:00,710 --> 00:22:59,280

see if you're claustrophobic so you're

567

00:23:02,710 --> 00:23:00,720

not going to be afraid of being in small

568

00:23:04,789 --> 00:23:02,720

spaces or you get kind of booted out

569

00:23:06,870 --> 00:23:04,799

from the beginning but you know we have

570

00:23:08,710 --> 00:23:06,880

the training is so good that you know

571

00:23:10,310 --> 00:23:08,720

when i was flying the robotic arm

572

00:23:11,669 --> 00:23:10,320

installing the uh the columbus

573

00:23:14,070 --> 00:23:11,679

laboratory from the european space

574

00:23:15,590 --> 00:23:14,080

agency you know my one of my german

575

00:23:17,510 --> 00:23:15,600

flight controller friends when i first

576
00:23:21,190 --> 00:23:17,520
got that assignment he said leland we've

577
00:23:23,270 --> 00:23:21,200
been waiting 10 years don't screw it up

578
00:23:25,029 --> 00:23:23,280
so i'm sitting here flying this module

579
00:23:26,710 --> 00:23:25,039
into the space station knowing that if i

580
00:23:28,230 --> 00:23:26,720
did something wrong i could damage that

581
00:23:30,470 --> 00:23:28,240
and cause people have to go home in a

582
00:23:32,230 --> 00:23:30,480
hurry but the training is so good that

583
00:23:34,950 --> 00:23:32,240
you just you just keep doing it and you

584
00:23:37,190 --> 00:23:34,960
you just you just you just rock it so i

585
00:23:39,350 --> 00:23:37,200
think you know when when uh we had the

586
00:23:40,549 --> 00:23:39,360
problem with the the eva with the water

587
00:23:42,950 --> 00:23:40,559
in the suit there were some people that

588
00:23:44,630 --> 00:23:42,960

may have been a little scared there but

589

00:23:47,110 --> 00:23:44,640

my neighbor's still here to save the day

590

00:23:48,870 --> 00:23:47,120

calm cool collected and uh you know the

591

00:23:53,270 --> 00:23:48,880

training kicks in it keeps you from

592

00:23:57,029 --> 00:23:54,710

okay thanks

593

00:23:59,270 --> 00:23:57,039

another question from twitter it's lily

594

00:24:01,110 --> 00:23:59,280

underscore hgs

595

00:24:02,390 --> 00:24:01,120

what is the hardest thing to adapt to in

596

00:24:06,549 --> 00:24:02,400

zero g

597

00:24:07,590 --> 00:24:06,559

if you're alpha yeah

598

00:24:08,549 --> 00:24:07,600

yeah

599

00:24:11,430 --> 00:24:08,559

um

600

00:24:14,310 --> 00:24:11,440

so that that's a great question and and

601
00:24:16,789 --> 00:24:14,320
um i would say

602
00:24:19,350 --> 00:24:16,799
it's dealing with small pieces and parts

603
00:24:21,510 --> 00:24:19,360
of of something whether that be

604
00:24:23,830 --> 00:24:21,520
repairing a piece of equipment and you

605
00:24:26,149 --> 00:24:23,840
have screws and springs that weren't

606
00:24:28,310 --> 00:24:26,159
intended to be removed in zero gravity

607
00:24:30,789 --> 00:24:28,320
how do you manage all that stuff for the

608
00:24:32,789 --> 00:24:30,799
most part equipment is designed in such

609
00:24:35,350 --> 00:24:32,799
a way that if it needs to be repaired

610
00:24:37,350 --> 00:24:35,360
you can remove some screws that are kept

611
00:24:39,269 --> 00:24:37,360
in the spot that they are uh and they

612
00:24:40,789 --> 00:24:39,279
remain in that spot and you pull it out

613
00:24:43,510 --> 00:24:40,799

but every now and then we have these

614

00:24:46,950 --> 00:24:43,520

issues where things can kind of float

615

00:24:49,590 --> 00:24:46,960

away and and you have to get tricky with

616

00:24:51,590 --> 00:24:49,600

duct tape and the use of vacuum cleaners

617

00:24:53,990 --> 00:24:51,600

you can put a mesh screen over vacuum

618

00:24:56,149 --> 00:24:54,000

cleaner and hold you use that to hold

619

00:24:56,950 --> 00:24:56,159

pieces of parts down

620

00:24:59,190 --> 00:24:56,960

but

621

00:25:01,430 --> 00:24:59,200

it takes a few weeks or a month or so to

622

00:25:03,269 --> 00:25:01,440

get used to the tricks of the trade to

623

00:25:05,590 --> 00:25:03,279

manage all that um

624

00:25:06,390 --> 00:25:05,600

the desire of things to float away on

625

00:25:09,029 --> 00:25:06,400

you

626
00:25:10,630 --> 00:25:09,039
like the blood draws and the biomedical

627
00:25:12,470 --> 00:25:10,640
types of things and the hardest thing

628
00:25:13,830 --> 00:25:12,480
for me was really you know going to the

629
00:25:15,909 --> 00:25:13,840
bathroom in zero g because you can't

630
00:25:21,430 --> 00:25:15,919
practice out on the ground so

631
00:25:27,110 --> 00:25:23,590
thanks guys uh next question uh it's

632
00:25:28,630 --> 00:25:27,120
from twitter jnla vazquez as a teacher

633
00:25:29,510 --> 00:25:28,640
asked one of my sixth graders wants to

634
00:25:30,710 --> 00:25:29,520
know

635
00:25:32,149 --> 00:25:30,720
you had asked this all the time i'm sure

636
00:25:35,350 --> 00:25:32,159
want to know if you if you've ever seen

637
00:25:38,310 --> 00:25:35,360
evidence of life while in space

638
00:25:40,390 --> 00:25:38,320

well i uh my first flight i was i was in

639

00:25:41,590 --> 00:25:40,400

the back in the flight deck on the

640

00:25:43,430 --> 00:25:41,600

shuttle looking out the back we're

641

00:25:46,310 --> 00:25:43,440

opening the payload bay doors

642

00:25:48,630 --> 00:25:46,320

and we were looking at this white thing

643

00:25:51,269 --> 00:25:48,640

that was kind of floating and turning

644

00:25:52,789 --> 00:25:51,279

and it had kind of curvaceousness to it

645

00:25:54,549 --> 00:25:52,799

and we didn't know what it was it looked

646

00:25:56,390 --> 00:25:54,559

like almost like gastly coming up like a

647

00:25:59,110 --> 00:25:56,400

little ghostly and it was actually ice

648

00:26:01,029 --> 00:25:59,120

that had formed around the the hoses

649

00:26:03,430 --> 00:26:01,039

that were on the uh on the payload bay

650

00:26:05,110 --> 00:26:03,440

doors but none of us had ever seen that

651
00:26:07,269 --> 00:26:05,120
before and we were like what is that it

652
00:26:09,029 --> 00:26:07,279
looked look kind of in a way human-like

653
00:26:10,390 --> 00:26:09,039
but uh but when we called down to the

654
00:26:11,350 --> 00:26:10,400
ground they kind of told us what it was

655
00:26:12,470 --> 00:26:11,360
and but

656
00:26:13,590 --> 00:26:12,480
uh

657
00:26:16,390 --> 00:26:13,600
i don't know if you've seen anything up

658
00:26:18,149 --> 00:26:16,400
there i haven't seen seen anything we we

659
00:26:20,549 --> 00:26:18,159
saw a similar time looking out the

660
00:26:23,190 --> 00:26:20,559
window a cover was floating away and we

661
00:26:25,750 --> 00:26:23,200
said it was an unidentified thing but it

662
00:26:27,590 --> 00:26:25,760
certainly wasn't an unidentified object

663
00:26:29,430 --> 00:26:27,600

with any life to it

664

00:26:31,669 --> 00:26:29,440

now i did get a question from a student

665

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

i was at a school here in dc

666

00:26:36,630 --> 00:26:33,919

and the uh the student asked me that if

667

00:26:38,310 --> 00:26:36,640

i'd ever seen an alien with pink

668

00:26:39,190 --> 00:26:38,320

lipstick

669

00:26:40,470 --> 00:26:39,200

no

670

00:26:48,549 --> 00:26:40,480

they wear red

671

00:26:53,269 --> 00:26:50,710

we'll go back to the class in a second

672

00:26:55,750 --> 00:26:53,279

but uh here's a class uh miss uh sees

673

00:26:57,590 --> 00:26:55,760

class one ass on twitter

674

00:27:00,870 --> 00:26:57,600

it's a first grade class wants to know

675

00:27:03,669 --> 00:27:00,880

how long it takes to get into space

676

00:27:05,909 --> 00:27:03,679

so really good question it it uh

677

00:27:07,669 --> 00:27:05,919

it seems like it's as far away place it

678

00:27:09,750 --> 00:27:07,679

would take forever to get to but we like

679

00:27:11,430 --> 00:27:09,760

that rocket and it and it is going for

680

00:27:13,190 --> 00:27:11,440

about eight and a half or nine minutes

681

00:27:14,470 --> 00:27:13,200

and the engine cuts off and we're in

682

00:27:16,549 --> 00:27:14,480

zero gravity

683

00:27:19,430 --> 00:27:16,559

and uh so it's a pretty quick ride

684

00:27:21,590 --> 00:27:19,440

believe it or not and and um but we do

685

00:27:23,269 --> 00:27:21,600

us a few more maneuvers after that

686

00:27:25,750 --> 00:27:23,279

initial eight minutes to get us in a

687

00:27:28,149 --> 00:27:25,760

more safe position

688

00:27:29,750 --> 00:27:28,159

to get our uh ourselves to the altitude

689

00:27:32,310 --> 00:27:29,760

particularly to rendezvous to the space

690

00:27:35,750 --> 00:27:32,320

station these days which is about 200

691

00:27:37,590 --> 00:27:35,760

250 miles above the surface of our

692

00:27:39,750 --> 00:27:37,600

planet so that's how long it takes to

693

00:27:45,830 --> 00:27:39,760

get there and uh and it's a really fun

694

00:27:53,029 --> 00:27:47,750

okay thanks so why don't we go back to

695

00:27:56,789 --> 00:27:54,549

see you now that's you okay ask your

696

00:27:59,110 --> 00:27:56,799

question hi my name is santo i just

697

00:28:00,470 --> 00:27:59,120

wanted to ask what inspired you to be an

698

00:28:01,590 --> 00:28:00,480

astronaut

699

00:28:04,070 --> 00:28:01,600

hmm

700

00:28:06,549 --> 00:28:04,080

donto uh good question

701

00:28:08,870 --> 00:28:06,559

i well i worked at nasa for about 10

702

00:28:10,149 --> 00:28:08,880

years before um you know before i

703

00:28:11,750 --> 00:28:10,159

thought about applying to the astronaut

704

00:28:14,789 --> 00:28:11,760

corps and a friend of mine charlie

705

00:28:16,630 --> 00:28:14,799

camarda he was uh you know he was he'd

706

00:28:18,549 --> 00:28:16,640

applied he got in a friend of mine said

707

00:28:20,070 --> 00:28:18,559

you'd be a great astronaut and i i never

708

00:28:22,630 --> 00:28:20,080

really thought about myself as becoming

709

00:28:24,389 --> 00:28:22,640

an astronaut and so after charlie got in

710

00:28:26,070 --> 00:28:24,399

he told me about all the fantastic

711

00:28:27,990 --> 00:28:26,080

things he was doing his flying jets and

712

00:28:29,269 --> 00:28:28,000

he was doing these you know spacewalk

713

00:28:30,470 --> 00:28:29,279

training and all these different things

714

00:28:32,789 --> 00:28:30,480

i said well maybe that's something i

715

00:28:34,070 --> 00:28:32,799

should try to try to go after so it

716

00:28:35,750 --> 00:28:34,080

wasn't something that i've always wanted

717

00:28:37,430 --> 00:28:35,760

to do as a child but i think through my

718

00:28:38,950 --> 00:28:37,440

career as a site

719

00:28:40,549 --> 00:28:38,960

here and playing some professional

720

00:28:41,909 --> 00:28:40,559

football getting all the teamwork part

721

00:28:44,549 --> 00:28:41,919

of it because i think one of the biggest

722

00:28:46,230 --> 00:28:44,559

parts of of what we do in space now you

723

00:28:48,310 --> 00:28:46,240

know chris being a navy seal working

724

00:28:49,269 --> 00:28:48,320

together as a team helping save people's

725

00:28:51,029 --> 00:28:49,279

lives

726

00:28:52,149 --> 00:28:51,039

it all has to do with working together

727

00:28:54,070 --> 00:28:52,159

and saving people's lives on space

728

00:28:55,990 --> 00:28:54,080

station too so i think

729

00:28:57,430 --> 00:28:56,000

all my experiences kind of led me to

730

00:28:58,549 --> 00:28:57,440

that but it wasn't something i've always

731

00:29:00,149 --> 00:28:58,559

wanted to do i don't know is that

732

00:29:02,310 --> 00:29:00,159

something you always wanted to do no i'm

733

00:29:04,389 --> 00:29:02,320

kind of like you i was a little bit

734

00:29:06,389 --> 00:29:04,399

older um when i met bill shepard

735

00:29:09,110 --> 00:29:06,399

actually uh another

736

00:29:11,510 --> 00:29:09,120

um astronaut who was in the seal teams

737

00:29:13,909 --> 00:29:11,520

before coming to nasa and

738

00:29:15,830 --> 00:29:13,919

when i met him and realized that my

739

00:29:17,269 --> 00:29:15,840

background was kind of similar and it's

740

00:29:19,669 --> 00:29:17,279

actually just an application that

741

00:29:21,430 --> 00:29:19,679

anybody can fill out right that's i

742

00:29:22,630 --> 00:29:21,440

thought huh i might as well try i've got

743

00:29:25,029 --> 00:29:22,640

nothing to lose i was thoroughly

744

00:29:26,149 --> 00:29:25,039

enjoying my time in the navy so if i

745

00:29:27,750 --> 00:29:26,159

didn't get picked i was just going to

746

00:29:29,750 --> 00:29:27,760

continue doing that if i did get picked

747

00:29:32,470 --> 00:29:29,760

it would be really an exciting career so

748

00:29:34,870 --> 00:29:32,480

that was 1999. you were driving from

749

00:29:37,350 --> 00:29:34,880

maine to san diego to san diego and

750

00:29:40,230 --> 00:29:37,360

where we first first met yeah and then

751

00:29:41,750 --> 00:29:40,240

chef and i head over to uh to star city

752

00:29:42,789 --> 00:29:41,760

to actually get him ready for his launch

753

00:29:44,950 --> 00:29:42,799

to be the first commander of the

754

00:29:48,549 --> 00:29:44,960

international space station 15 years ago

755

00:29:49,830 --> 00:29:48,559

right ten years ago how about that wow

756

00:29:53,430 --> 00:29:49,840

let's take another question for more

757

00:29:59,590 --> 00:29:55,909

hi my name is chloe um what type of

758

00:30:01,029 --> 00:29:59,600

experiments are being run on the iss

759

00:30:03,029 --> 00:30:01,039

well um

760

00:30:05,269 --> 00:30:03,039

there's there's many there's and there's

761

00:30:07,269 --> 00:30:05,279

they come in several different size

762

00:30:08,710 --> 00:30:07,279

shapes and forms some of them

763

00:30:11,510 --> 00:30:08,720

where we

764

00:30:14,470 --> 00:30:11,520

install and just activate them and they

765

00:30:16,070 --> 00:30:14,480

tend to themselves there's others where

766

00:30:18,070 --> 00:30:16,080

we'll be actively involved in

767

00:30:19,669 --> 00:30:18,080

manipulating that experiment and other

768

00:30:22,310 --> 00:30:19,679

other ones where they're just outside

769

00:30:25,909 --> 00:30:22,320

and the crew really doesn't uh interact

770

00:30:28,389 --> 00:30:25,919

at all and the types of them the that

771

00:30:30,389 --> 00:30:28,399

that i worked on most recently

772

00:30:31,990 --> 00:30:30,399

a lot on ourselves you know we had one

773

00:30:33,430 --> 00:30:32,000

where we varied our diet and took

774

00:30:35,269 --> 00:30:33,440

different

775

00:30:37,190 --> 00:30:35,279

samples of our blood and urine at

776

00:30:40,310 --> 00:30:37,200

different times and to see what the

777

00:30:41,909 --> 00:30:40,320

effects of the different diet

778

00:30:43,430 --> 00:30:41,919

really balancing the potassium and

779

00:30:45,990 --> 00:30:43,440

protein but anyways

780

00:30:48,149 --> 00:30:46,000

different diet things and

781

00:30:50,310 --> 00:30:48,159

and then how does our bone loss decay

782

00:30:52,149 --> 00:30:50,320

over the time while we're there so we

783

00:30:54,950 --> 00:30:52,159

take ultrasound images of different

784

00:30:57,669 --> 00:30:54,960

parts of our body our hips our spine and

785

00:31:00,470 --> 00:30:57,679

we'll analyze analyze that

786

00:31:02,549 --> 00:31:00,480

i also was part of an experiment called

787

00:31:04,230 --> 00:31:02,559

bass which

788

00:31:06,710 --> 00:31:04,240

there we tested the combustion

789

00:31:09,669 --> 00:31:06,720

properties how what materials are safer

790

00:31:11,190 --> 00:31:09,679

to protect you against the fire um while

791

00:31:12,549 --> 00:31:11,200

you're in space because the flames do

792

00:31:14,149 --> 00:31:12,559

really interesting things i don't know

793

00:31:16,950 --> 00:31:14,159

if we have any footage of flames in

794

00:31:18,470 --> 00:31:16,960

space but they form like a sphere or a

795

00:31:21,110 --> 00:31:18,480

ball instead of the shape that we

796

00:31:22,789 --> 00:31:21,120

typically know of a candle uh as it

797

00:31:24,310 --> 00:31:22,799

would be here here on earth you haven't

798

00:31:26,710 --> 00:31:24,320

seen the movie gravity yet but i haven't

799

00:31:29,510 --> 00:31:26,720

seen a little fire in gravity that looks

800

00:31:31,430 --> 00:31:29,520

fairly real fairly real very good

801
00:31:32,710 --> 00:31:31,440
and uh so a whole host of other ones

802
00:31:35,590 --> 00:31:32,720
some fluid there's a really cool

803
00:31:37,669 --> 00:31:35,600
experiment we did that

804
00:31:40,149 --> 00:31:37,679
we can you turns out you can vary the

805
00:31:42,950 --> 00:31:40,159
shape of a container of liquid

806
00:31:44,789 --> 00:31:42,960
and and that shape will drive the fluid

807
00:31:47,909 --> 00:31:44,799
in different places if you shape it kind

808
00:31:49,990 --> 00:31:47,919
of like a teardrop the fluid wants to go

809
00:31:52,710 --> 00:31:50,000
in the pointy part of the teardrop and

810
00:31:54,950 --> 00:31:52,720
and you can have a fuel tank that

811
00:31:57,110 --> 00:31:54,960
doesn't need a pump to move it's really

812
00:31:58,470 --> 00:31:57,120
fascinating to watch this fluid just

813
00:32:00,310 --> 00:31:58,480

move right in the direction that you

814

00:32:02,470 --> 00:32:00,320

want it to go so all kinds of different

815

00:32:05,110 --> 00:32:02,480

experiments and and really fun to be a

816

00:32:08,149 --> 00:32:05,120

part of of all of them really and i

817

00:32:10,470 --> 00:32:08,159

should say leland too that lil and i

818

00:32:12,310 --> 00:32:10,480

um we know some stuff about being in

819

00:32:14,950 --> 00:32:12,320

space but we don't know all that needs

820

00:32:16,950 --> 00:32:14,960

to know to execute and and tend to these

821

00:32:19,269 --> 00:32:16,960

experiments so the real subject matter

822

00:32:20,950 --> 00:32:19,279

experts the scientists that designed it

823

00:32:23,830 --> 00:32:20,960

and know the ins and outs of that

824

00:32:25,750 --> 00:32:23,840

equipment are on the ground tied into us

825

00:32:26,950 --> 00:32:25,760

with a video camera and the microphone

826
00:32:29,110 --> 00:32:26,960
usually too

827
00:32:30,789 --> 00:32:29,120
so they can adjust hey chris

828
00:32:33,909 --> 00:32:30,799
turn the knobs this way let's get some

829
00:32:36,230 --> 00:32:33,919
different fluid flow and and and kind of

830
00:32:38,070 --> 00:32:36,240
tweak the experiment that way

831
00:32:39,990 --> 00:32:38,080
and it's really really nice to be tied

832
00:32:42,149 --> 00:32:40,000
in with the scientists right there in

833
00:32:43,909 --> 00:32:42,159
the hip pocket and it really is a nice

834
00:32:51,269 --> 00:32:43,919
fantastic

835
00:32:56,470 --> 00:32:53,830
okay uh let's go to back to twitter we

836
00:32:58,389 --> 00:32:56,480
have underscore cyber ass

837
00:33:00,310 --> 00:32:58,399
how does your feeling of up and down

838
00:33:03,430 --> 00:33:00,320

change of space uh does it change over

839

00:33:07,269 --> 00:33:05,190

when i when i first got the space i was

840

00:33:09,430 --> 00:33:07,279

sitting in the shuttle and i undid my

841

00:33:11,110 --> 00:33:09,440

seatbelt and i pushed myself forward a

842

00:33:13,430 --> 00:33:11,120

little bit and i started kind of

843

00:33:15,669 --> 00:33:13,440

rotating and when you're training on the

844

00:33:17,269 --> 00:33:15,679

ground you know you know what's you know

845

00:33:18,789 --> 00:33:17,279

what down and up are because gravity's

846

00:33:20,870 --> 00:33:18,799

holding you down but when you get the

847

00:33:23,830 --> 00:33:20,880

space there is no up or down and so

848

00:33:26,149 --> 00:33:23,840

after about two days i remember floating

849

00:33:27,590 --> 00:33:26,159

from the space station coming over to

850

00:33:29,669 --> 00:33:27,600

the going through the hatch going

851
00:33:32,549 --> 00:33:29,679
through to the space shuttle

852
00:33:34,149 --> 00:33:32,559
and you have to do this 180 degree turn

853
00:33:36,149 --> 00:33:34,159
for you to be right side up of what you

854
00:33:37,990 --> 00:33:36,159
know is right side up and so when i got

855
00:33:40,710 --> 00:33:38,000
to that point where i could just go down

856
00:33:42,470 --> 00:33:40,720
not do the rotation and continue to keep

857
00:33:44,230 --> 00:33:42,480
working i knew that i had you know

858
00:33:46,789 --> 00:33:44,240
adjusted to not having to know what

859
00:33:49,110 --> 00:33:46,799
right up or down are and that was the

860
00:33:50,389 --> 00:33:49,120
moment when peggy whitson she was the

861
00:33:51,669 --> 00:33:50,399
first female commander of the space

862
00:33:53,830 --> 00:33:51,679
station

863
00:33:55,430 --> 00:33:53,840

she had printed out this

864

00:33:57,430 --> 00:33:55,440

happy birthday leaving because i was in

865

00:33:59,509 --> 00:33:57,440

space on my birthday and i remember

866

00:34:02,230 --> 00:33:59,519

floating over there and i got through

867

00:34:03,590 --> 00:34:02,240

the hatch and she said get back over

868

00:34:05,029 --> 00:34:03,600

there and come back over here and i was

869

00:34:06,789 --> 00:34:05,039

like peggy i didn't do anything you know

870

00:34:08,629 --> 00:34:06,799

go back and this time when i'm coming

871

00:34:10,550 --> 00:34:08,639

back over i float and rotate and i can

872

00:34:11,829 --> 00:34:10,560

see the happy birthday sign so

873

00:34:13,829 --> 00:34:11,839

you know so up and down doesn't mean

874

00:34:16,310 --> 00:34:13,839

much to you after a few days it's your

875

00:34:18,149 --> 00:34:16,320

body your your vestibular system is kind

876
00:34:19,990 --> 00:34:18,159
of not working so now everything's cute

877
00:34:21,990 --> 00:34:20,000
by your eyes and you just you just get

878
00:34:23,030 --> 00:34:22,000
to work in any orientation you you are

879
00:34:25,270 --> 00:34:23,040
in

880
00:34:27,190 --> 00:34:25,280
good question

881
00:34:29,030 --> 00:34:27,200
we have another school asking a question

882
00:34:31,829 --> 00:34:29,040
it's a yes

883
00:34:33,669 --> 00:34:31,839
espill school they're asking

884
00:34:35,909 --> 00:34:33,679
how do you solve hygienic habits in

885
00:34:41,430 --> 00:34:35,919
space do you sweat a lot do you wash

886
00:34:48,790 --> 00:34:42,149
so

887
00:34:50,950 --> 00:34:48,800
but you know to be honest with you i

888
00:34:54,310 --> 00:34:50,960

felt pretty clean the whole time i was

889

00:34:56,230 --> 00:34:54,320

there you have the oils from your body

890

00:34:58,550 --> 00:34:56,240

and if you did nothing you would feel

891

00:35:00,069 --> 00:34:58,560

very oily and your hair would get be

892

00:35:02,390 --> 00:35:00,079

oily

893

00:35:03,910 --> 00:35:02,400

so what we do is we use baby wipes

894

00:35:06,390 --> 00:35:03,920

but really the technique that i

895

00:35:08,470 --> 00:35:06,400

preferred was to take a bag of water and

896

00:35:11,109 --> 00:35:08,480

squirt a blob of it on my chest and my

897

00:35:13,750 --> 00:35:11,119

arms and on my on my head and uh and

898

00:35:15,510 --> 00:35:13,760

then had a bar of soap and just kind of

899

00:35:17,109 --> 00:35:15,520

move the soap around move the bar soap

900

00:35:19,030 --> 00:35:17,119

through the water and then wipe it off

901
00:35:20,069 --> 00:35:19,040
with a washcloth and i and i felt

902
00:35:22,150 --> 00:35:20,079
and span

903
00:35:24,710 --> 00:35:22,160
clean and uh

904
00:35:28,069 --> 00:35:24,720
and then with your toothpaste we don't

905
00:35:30,630 --> 00:35:28,079
have a sink to spit it in and and uh so

906
00:35:33,030 --> 00:35:30,640
you just brush your teeth and you you

907
00:35:35,109 --> 00:35:33,040
swallow it down the hatch it goes

908
00:35:36,630 --> 00:35:35,119
so it takes some getting used to or the

909
00:35:38,870 --> 00:35:36,640
teeth brushing yeah see we didn't do we

910
00:35:40,710 --> 00:35:38,880
just spit it in trouble

911
00:35:42,310 --> 00:35:40,720
but see we had more things i mean we

912
00:35:44,310 --> 00:35:42,320
have change of clothes every day every

913
00:35:45,589 --> 00:35:44,320

day you guys did not so when we were in

914

00:35:47,589 --> 00:35:45,599

space we would change our clothes we

915

00:35:49,109 --> 00:35:47,599

would wash up but then we docked to the

916

00:35:51,670 --> 00:35:49,119

space station we came over through the

917

00:36:10,069 --> 00:35:51,680

fgb we started smelling you see all

918

00:36:13,030 --> 00:36:11,270

we have a lot of questions coming in

919

00:36:14,069 --> 00:36:13,040

guys from various schools across the

920

00:36:16,230 --> 00:36:14,079

country

921

00:36:18,950 --> 00:36:16,240

uh mrs bird's class in texas comes from

922

00:36:21,670 --> 00:36:18,960

at uh magnet

923

00:36:23,750 --> 00:36:21,680

texas wants to know how fast a spaceship

924

00:36:26,470 --> 00:36:23,760

travels

925

00:36:29,910 --> 00:36:26,480

we're going five miles a second

926
00:36:31,910 --> 00:36:29,920
which is really moving out about 17 500

927
00:36:34,790 --> 00:36:31,920
miles an hour that sign's still up there

928
00:36:37,910 --> 00:36:34,800
it is still there right on the hatch

929
00:36:39,990 --> 00:36:37,920
17 500 miles per hour going around the

930
00:36:42,630 --> 00:36:40,000
planet every 90 minutes sunrise and

931
00:36:44,470 --> 00:36:42,640
sunset every 45 minutes a spectacular

932
00:36:46,150 --> 00:36:44,480
sight imagine if on earth you could be

933
00:36:48,069 --> 00:36:46,160
eating your cereal in the morning and go

934
00:36:49,750 --> 00:36:48,079
oh i got one second to be in class and

935
00:36:53,990 --> 00:36:49,760
you go from your house to your classroom

936
00:36:55,589 --> 00:36:54,000
in one second five miles down the road

937
00:36:57,750 --> 00:36:55,599
you can run that fast game yeah i used

938
00:36:58,630 --> 00:36:57,760

to i'm i'm too old now okay all right

939

00:37:00,150 --> 00:36:58,640

all right

940

00:37:02,390 --> 00:37:00,160

down to about four miles

941

00:37:04,069 --> 00:37:02,400

four miles a second

942

00:37:07,990 --> 00:37:04,079

how about we take uh another question

943

00:37:14,150 --> 00:37:11,190

um hi my name is macy um do you have any

944

00:37:16,870 --> 00:37:14,160

advice for us as we are writing

945

00:37:21,030 --> 00:37:16,880

proposals for our school experiment slot

946

00:37:22,390 --> 00:37:21,040

on the iss in april of 2014

947

00:37:24,069 --> 00:37:22,400

hmm

948

00:37:28,069 --> 00:37:24,079

i don't know if i'm going to be judging

949

00:37:32,470 --> 00:37:30,390

but i think the main thing is to uh you

950

00:37:33,430 --> 00:37:32,480

know something that that is meaningful

951
00:37:35,190 --> 00:37:33,440
to you

952
00:37:37,589 --> 00:37:35,200
and be creative and innovative and work

953
00:37:39,030 --> 00:37:37,599
as a team with with your classmates and

954
00:37:43,349 --> 00:37:39,040
come up with something really really

955
00:37:46,310 --> 00:37:44,710
let me hear all you guys scream out

956
00:37:52,069 --> 00:37:46,320
there you guys are kind of dead let me

957
00:37:52,079 --> 00:37:55,430
a little bit better

958
00:37:59,030 --> 00:37:57,270
hey leland i i have a question how's

959
00:38:01,270 --> 00:37:59,040
that going to work if a group of

960
00:38:03,589 --> 00:38:01,280
students is in in sixth grade right now

961
00:38:04,550 --> 00:38:03,599
and then they might not all be the same

962
00:38:06,470 --> 00:38:04,560
team

963
00:38:07,829 --> 00:38:06,480

when it's next year they're in seventh

964

00:38:09,589 --> 00:38:07,839

grade how does it how does it work when

965

00:38:11,109 --> 00:38:09,599

the pr when it spans through or is it

966

00:38:12,790 --> 00:38:11,119

ending before the school year is over

967

00:38:14,870 --> 00:38:12,800

you mean for the the challenge yeah the

968

00:38:16,470 --> 00:38:14,880

challenge the challenge um all the

969

00:38:18,710 --> 00:38:16,480

students that are signed up to it will

970

00:38:21,270 --> 00:38:18,720

have their names flying space the high

971

00:38:23,109 --> 00:38:21,280

school students that are a team

972

00:38:25,829 --> 00:38:23,119

they will you know they could be 9th

973

00:38:26,870 --> 00:38:25,839

graders 12th graders

974

00:38:28,870 --> 00:38:26,880

like a

975

00:38:30,550 --> 00:38:28,880

group that means after school right so

976

00:38:32,710 --> 00:38:30,560

they'll build their radiation shield and

977

00:38:33,430 --> 00:38:32,720

then they will come down to install it

978

00:38:35,270 --> 00:38:33,440

and

979

00:38:36,790 --> 00:38:35,280

okay as i was picturing like a classroom

980

00:38:38,710 --> 00:38:36,800

setting like this but it's not the case

981

00:38:42,630 --> 00:38:38,720

it's a group yeah right okay after

982

00:38:47,349 --> 00:38:44,390

let's uh let's go back to twitter a

983

00:38:48,630 --> 00:38:47,359

connor giant underscore giant ass when

984

00:38:51,109 --> 00:38:48,640

you get back to earth after being in

985

00:38:54,550 --> 00:38:51,119

space is it difficult to regain normal

986

00:38:56,950 --> 00:38:54,560

movement uh when gravity present

987

00:38:58,950 --> 00:38:56,960

well it just happened to me so i'll take

988

00:39:01,750 --> 00:38:58,960

that question the um

989

00:39:03,750 --> 00:39:01,760

the moving around part is

990

00:39:06,470 --> 00:39:03,760

happens right away there's no hesitation

991

00:39:09,109 --> 00:39:06,480

with moving around it's the balance that

992

00:39:10,630 --> 00:39:09,119

that really is is a challenge and

993

00:39:12,550 --> 00:39:10,640

we have really

994

00:39:15,270 --> 00:39:12,560

quality exercise equipment up there

995

00:39:17,430 --> 00:39:15,280

these days a nice weight machine and a

996

00:39:19,030 --> 00:39:17,440

treadmill on a bicycle and those do a

997

00:39:20,870 --> 00:39:19,040

fantastic job of keeping our muscles

998

00:39:23,430 --> 00:39:20,880

strong and our bones healthy

999

00:39:24,870 --> 00:39:23,440

but it's the whole equilibrium balance

1000

00:39:27,030 --> 00:39:24,880

thing that's out of whack and you have

1001

00:39:28,790 --> 00:39:27,040

to tie that back in with all your

1002

00:39:31,270 --> 00:39:28,800

muscles again and that takes a little a

1003

00:39:33,510 --> 00:39:31,280

little practice about uh you know a

1004

00:39:35,990 --> 00:39:33,520

couple weeks worth of time to really be

1005

00:39:38,390 --> 00:39:36,000

fully functional again i found a little

1006

00:39:40,310 --> 00:39:38,400

trick is when you get back if you look

1007

00:39:42,150 --> 00:39:40,320

at the horizon look at the ocean when

1008

00:39:44,150 --> 00:39:42,160

you're in florida it helps you re

1009

00:39:46,230 --> 00:39:44,160

recalibrate your gyros because my first

1010

00:39:47,910 --> 00:39:46,240

flight they had me in crew quarters and

1011

00:39:50,630 --> 00:39:47,920

i didn't get out and really see anything

1012

00:39:52,230 --> 00:39:50,640

yeah and i had a tougher time adjusting

1013

00:39:54,630 --> 00:39:52,240

but the second flight i came back with

1014

00:39:56,150 --> 00:39:54,640

my family down to the condos

1015

00:39:58,230 --> 00:39:56,160

and i just went out on the beach and

1016

00:40:00,630 --> 00:39:58,240

looked at the horizon and it seemed like

1017

00:40:01,430 --> 00:40:00,640

things got a little more adjusted

1018

00:40:03,430 --> 00:40:01,440

yeah

1019

00:40:05,270 --> 00:40:03,440

so your next flight you know yep i have

1020

00:40:06,470 --> 00:40:05,280

to be from florida then all right so

1021

00:40:12,069 --> 00:40:06,480

let's

1022

00:40:16,069 --> 00:40:13,750

okay we have time for a few more

1023

00:40:19,750 --> 00:40:16,079

questions uh this one's from saint joan

1024

00:40:21,589 --> 00:40:19,760

of arc school uh mrs uh hebert's class

1025

00:40:23,430 --> 00:40:21,599

uh what do you eat while you're in space

1026

00:40:25,030 --> 00:40:23,440

what kinds of food do you guys uh have

1027

00:40:26,069 --> 00:40:25,040

available for you

1028

00:40:28,310 --> 00:40:26,079

um

1029

00:40:30,390 --> 00:40:28,320

chocolate pudding cake yeah that is that

1030

00:40:32,069 --> 00:40:30,400

is a good all-time favorite really

1031

00:40:34,230 --> 00:40:32,079

that's good stuff but you guys get the

1032

00:40:36,710 --> 00:40:34,240

really good stuff like the the beef the

1033

00:40:38,470 --> 00:40:36,720

what is it the basmati rice and beef see

1034

00:40:39,829 --> 00:40:38,480

we don't yeah cello crews didn't get all

1035

00:40:42,870 --> 00:40:39,839

the good stuff well i don't know about

1036

00:40:44,870 --> 00:40:42,880

that the true thing is if your crewmate

1037

00:40:46,310 --> 00:40:44,880

is from italy that's a good thing that's

1038

00:40:48,550 --> 00:40:46,320

what i learned is that there's the

1039

00:40:51,349 --> 00:40:48,560

moneymaker right there and we had

1040

00:40:52,390 --> 00:40:51,359

we had some fantastic italian pasta and

1041

00:40:53,829 --> 00:40:52,400

um

1042

00:40:55,589 --> 00:40:53,839

uh i'm drawing a blank what's the really

1043

00:40:58,309 --> 00:40:55,599

yummy dessert that that they have

1044

00:41:01,990 --> 00:41:00,390

and and that sort of thing was was great

1045

00:41:03,750 --> 00:41:02,000

but my personal favorite was seafood

1046

00:41:05,349 --> 00:41:03,760

gumbo and that was made right there at

1047

00:41:07,030 --> 00:41:05,359

nasa some

1048

00:41:10,630 --> 00:41:07,040

really really good food there's never a

1049

00:41:12,630 --> 00:41:10,640

lack of uh of um of to select from and

1050

00:41:14,069 --> 00:41:12,640

and to eat from did you lose your taste

1051

00:41:15,990 --> 00:41:14,079

your sense of taste no i didn't i don't

1052

00:41:18,069 --> 00:41:16,000

either yeah interesting and everything i

1053

00:41:19,430 --> 00:41:18,079

was eating everything and the stuff that

1054

00:41:21,510 --> 00:41:19,440

i felt like i would have grabbed on

1055

00:41:28,069 --> 00:41:21,520

earth is the same stuff i tended to grab

1056

00:41:36,309 --> 00:41:29,670

they got in the back in the blue shirt

1057

00:41:40,390 --> 00:41:38,150

uh we have a question on from facebook

1058

00:41:42,870 --> 00:41:40,400

it's um

1059

00:41:45,349 --> 00:41:42,880

junior astronaut mackenzie

1060

00:41:47,829 --> 00:41:45,359

and says hello chris i'm an aspiring

1061

00:41:49,430 --> 00:41:47,839

astronaut high school i was wondering if

1062

00:41:51,109 --> 00:41:49,440

you have any tips on how to become an

1063

00:41:52,710 --> 00:41:51,119

astronaut i'm sure leland can answer

1064

00:41:55,349 --> 00:41:52,720

this one as well

1065

00:41:57,589 --> 00:41:55,359

well um

1066

00:42:00,470 --> 00:41:57,599

leland and i have a friend named dwayne

1067

00:42:02,550 --> 00:42:00,480

ross who's in charge of of astronaut

1068

00:42:04,470 --> 00:42:02,560

selection and

1069

00:42:07,430 --> 00:42:04,480

i remember when i was going through

1070

00:42:10,790 --> 00:42:07,440

through the process and everybody that i

1071

00:42:13,109 --> 00:42:10,800

met in my interview weeks were so nice

1072

00:42:14,550 --> 00:42:13,119

and so smart and so squared away that i

1073

00:42:16,309 --> 00:42:14,560

thought i don't have

1074

00:42:18,069 --> 00:42:16,319

really a chance i don't know how i'm

1075

00:42:20,470 --> 00:42:18,079

gonna stack up to these people and then

1076

00:42:22,550 --> 00:42:20,480

when i did get picked my wife and i were

1077

00:42:23,829 --> 00:42:22,560

talking to dwayne and said you know

1078

00:42:26,790 --> 00:42:23,839

wayne how

1079

00:42:29,030 --> 00:42:26,800

do you pick from all these really well

1080

00:42:31,270 --> 00:42:29,040

qualified people and his answer has

1081

00:42:33,910 --> 00:42:31,280

stuck with me and that was we we want to

1082

00:42:35,829 --> 00:42:33,920

pick nice people exactly and that makes

1083

00:42:37,829 --> 00:42:35,839

real sense to me now that i've spent six

1084

00:42:40,230 --> 00:42:37,839

months on the space station because if

1085

00:42:42,069 --> 00:42:40,240

you go camping you want to go you want

1086

00:42:43,750 --> 00:42:42,079

to share a tent with somebody that you

1087

00:42:45,990 --> 00:42:43,760

enjoy being out in the woods with and

1088

00:42:47,910 --> 00:42:46,000

camping with and and that's exactly how

1089

00:42:50,150 --> 00:42:47,920

it is on the in a space vehicle you want

1090

00:42:52,710 --> 00:42:50,160

nice people that you enjoy sharing that

1091

00:42:54,630 --> 00:42:52,720

awesome experience with and then along

1092

00:42:56,870 --> 00:42:54,640

the way you have to do your education

1093

00:42:59,510 --> 00:42:56,880

and study hard and and put your nose to

1094

00:43:02,069 --> 00:42:59,520

the grindstone um academically and take

1095

00:43:03,510 --> 00:43:02,079

event which opens up doors for you later

1096

00:43:06,069 --> 00:43:03,520

in life and take advantage of those

1097

00:43:08,630 --> 00:43:06,079

opportunities as they they arise but

1098

00:43:10,870 --> 00:43:08,640

never forget the fact that um we want

1099

00:43:12,710 --> 00:43:10,880

nice people here and that is not only

1100

00:43:14,870 --> 00:43:12,720

true at nasa it will serve you well all

1101
00:43:16,710 --> 00:43:14,880
through life i think that's a perfect

1102
00:43:18,470 --> 00:43:16,720
perfect question

1103
00:43:21,670 --> 00:43:18,480
that's great advice

1104
00:43:23,589 --> 00:43:21,680
uh we have miss sees class one

1105
00:43:28,230 --> 00:43:23,599
who asks our first grade class wants to

1106
00:43:32,790 --> 00:43:30,190
well i was on two shuttle missions

1107
00:43:34,550 --> 00:43:32,800
sts-122 and 129

1108
00:43:37,030 --> 00:43:34,560
and it's a really bad thing if you land

1109
00:43:39,030 --> 00:43:37,040
in the water so we did not land in water

1110
00:43:41,349 --> 00:43:39,040
steve frick and charlie hobart

1111
00:43:43,270 --> 00:43:41,359
did their job very well and landed in

1112
00:43:44,630 --> 00:43:43,280
kennedy space center right down the

1113
00:43:46,470 --> 00:43:44,640

runway so

1114

00:43:48,150 --> 00:43:46,480

we have never landed in water the apollo

1115

00:43:50,470 --> 00:43:48,160

program landed obviously in the water

1116

00:43:53,190 --> 00:43:50,480

but i think you want to talk about your

1117

00:43:55,030 --> 00:43:53,200

your landings yeah we la same thing one

1118

00:43:56,790 --> 00:43:55,040

one shuttle mission landed uh right

1119

00:43:59,270 --> 00:43:56,800

there in kennedy space center and and my

1120

00:44:01,030 --> 00:43:59,280

soyuz landed uh in

1121

00:44:02,470 --> 00:44:01,040

the desert basically but i it made me

1122

00:44:04,630 --> 00:44:02,480

think about the training that we do in

1123

00:44:06,630 --> 00:44:04,640

the in the neutral buoyancy laboratory

1124

00:44:09,750 --> 00:44:06,640

in case we did land in the water we're

1125

00:44:11,349 --> 00:44:09,760

prepared for that we do we practice how

1126

00:44:13,589 --> 00:44:11,359

it would be to get away from your

1127

00:44:16,309 --> 00:44:13,599

parachute as it comes down on you in the

1128

00:44:18,550 --> 00:44:16,319

water and to make yourself safe with a

1129

00:44:20,630 --> 00:44:18,560

life jacket but that's really just

1130

00:44:22,710 --> 00:44:20,640

continuously planning what if what if

1131

00:44:25,190 --> 00:44:22,720

kind of things and it certainly hasn't

1132

00:44:27,430 --> 00:44:25,200

happened before and i think for orion

1133

00:44:29,030 --> 00:44:27,440

we're looking at landing in the water

1134

00:44:31,430 --> 00:44:29,040

again like we did with the apollo

1135

00:44:33,270 --> 00:44:31,440

program so we'll be getting back to that

1136

00:44:34,470 --> 00:44:33,280

you know parachutes coming down and

1137

00:44:36,790 --> 00:44:34,480

landing i don't think we have to use the

1138

00:44:38,390 --> 00:44:36,800

retro rockets that you do when you land

1139

00:44:39,990 --> 00:44:38,400

in kazakhstan to kind of limit the

1140

00:44:40,710 --> 00:44:40,000

number of g's

1141

00:44:41,990 --> 00:44:40,720

but

1142

00:44:46,630 --> 00:44:42,000

we'll be landing back in the water with

1143

00:44:51,589 --> 00:44:48,550

great let's go back to northland prep

1144

00:44:53,510 --> 00:44:51,599

for a question

1145

00:44:56,150 --> 00:44:53,520

hi i'm rory what is it like coming back

1146

00:44:56,950 --> 00:44:56,160

down from space

1147

00:44:59,589 --> 00:44:56,960

yeah

1148

00:45:01,670 --> 00:44:59,599

how about your ride down it's a lot lot

1149

00:45:03,430 --> 00:45:01,680

tougher than rifling on the shuttle

1150

00:45:05,030 --> 00:45:03,440

there's a lot there's a lot going on

1151
00:45:06,550 --> 00:45:05,040
when you're coming back from a space

1152
00:45:09,030 --> 00:45:06,560
mission so

1153
00:45:10,630 --> 00:45:09,040
um let's start with how do you get back

1154
00:45:13,349 --> 00:45:10,640
when you're orbiting the earth you're

1155
00:45:14,790 --> 00:45:13,359
going um you're going really fast but

1156
00:45:16,710 --> 00:45:14,800
you're still falling

1157
00:45:18,870 --> 00:45:16,720
towards the earth you're just going so

1158
00:45:21,349 --> 00:45:18,880
fast forward that as you fall the earth

1159
00:45:22,950 --> 00:45:21,359
curves away underneath you so

1160
00:45:24,870 --> 00:45:22,960
how do we slow that when we turn the

1161
00:45:27,990 --> 00:45:24,880
spaceship around and fire the engine to

1162
00:45:30,870 --> 00:45:28,000
slow us down we slow down to a point so

1163
00:45:33,349 --> 00:45:30,880

as we fall towards earth now we actually

1164

00:45:35,109 --> 00:45:33,359

do start to hit that atmosphere and that

1165

00:45:37,030 --> 00:45:35,119

builds up the

1166

00:45:39,349 --> 00:45:37,040

the heat and the resistance as we come

1167

00:45:43,670 --> 00:45:39,359

into the atmosphere and that's where the

1168

00:45:45,430 --> 00:45:43,680

heat shield comes to play and in a soyuz

1169

00:45:47,430 --> 00:45:45,440

my shoulder was right next to a window

1170

00:45:49,750 --> 00:45:47,440

so i could see all that smoke and fire

1171

00:45:51,589 --> 00:45:49,760

and plasma going by

1172

00:45:53,990 --> 00:45:51,599

and different

1173

00:45:56,069 --> 00:45:54,000

explosions as the bolts that hold

1174

00:45:58,230 --> 00:45:56,079

different pieces and parts to the

1175

00:46:00,230 --> 00:45:58,240

spacecraft that you no longer need at

1176

00:46:02,150 --> 00:46:00,240

different stages they start separating

1177

00:46:04,150 --> 00:46:02,160

you can hear those and you can hear them

1178

00:46:05,510 --> 00:46:04,160

big and loud and then there's a bang it

1179

00:46:06,630 --> 00:46:05,520

shakes the whole vehicle because it's

1180

00:46:09,349 --> 00:46:06,640

really small

1181

00:46:11,349 --> 00:46:09,359

and then the parachute opens and then uh

1182

00:46:13,510 --> 00:46:11,359

and then with our shuttle missions it

1183

00:46:15,109 --> 00:46:13,520

depends where you sit right on how much

1184

00:46:17,109 --> 00:46:15,119

your perspective

1185

00:46:18,550 --> 00:46:17,119

uh downstairs for countries so i was on

1186

00:46:21,670 --> 00:46:18,560

the flight deck so i saw similar things

1187

00:46:23,510 --> 00:46:21,680

that you saw on the soyuz i was ms-1 so

1188

00:46:25,349 --> 00:46:23,520

i was going i was sitting in the back to

1189

00:46:27,750 --> 00:46:25,359

the right i can look on the overhead

1190

00:46:29,670 --> 00:46:27,760

window and see this 3000 degree plasma

1191

00:46:31,109 --> 00:46:29,680

coming over the top of the window i had

1192

00:46:33,109 --> 00:46:31,119

to put video camera up looking at that

1193

00:46:35,030 --> 00:46:33,119

and then as you come in your you know

1194

00:46:37,270 --> 00:46:35,040

the same thing with the soyuz you have

1195

00:46:39,750 --> 00:46:37,280

these black tiles on the bottom that are

1196

00:46:42,309 --> 00:46:39,760

going to be able to absorb that or

1197

00:46:43,750 --> 00:46:42,319

deflect that 3000 degrees plasma and

1198

00:46:45,589 --> 00:46:43,760

then you come in the atmosphere you just

1199

00:46:47,910 --> 00:46:45,599

mass turns and you land on

1200

00:46:51,109 --> 00:46:47,920

the kennedy space center but the same

1201

00:46:53,030 --> 00:46:51,119

same temperatures it's really hot but uh

1202

00:46:55,190 --> 00:46:53,040

the vehicles are built just right to get

1203

00:46:56,950 --> 00:46:55,200

us back home safely yeah and those tiles

1204

00:46:59,510 --> 00:46:56,960

are interesting i remember one one visit

1205

00:47:01,510 --> 00:46:59,520

to kennedy space center the engineer had

1206

00:47:02,950 --> 00:47:01,520

us put our hands on the back side of one

1207

00:47:05,109 --> 00:47:02,960

and they put a torch

1208

00:47:06,630 --> 00:47:05,119

on the other side and you can't feel it

1209

00:47:08,309 --> 00:47:06,640

at all it's pretty cool i guess we can't

1210

00:47:12,230 --> 00:47:08,319

do that in the classroom but yeah the

1211

00:47:15,270 --> 00:47:13,829

we have time to take a couple more from

1212

00:47:17,589 --> 00:47:15,280

social

1213

00:47:19,030 --> 00:47:17,599

and maybe one more from northland prep

1214

00:47:21,430 --> 00:47:19,040

this is from

1215

00:47:23,270 --> 00:47:21,440

uh tyler kirschner who asks is there any

1216

00:47:24,550 --> 00:47:23,280

pressure in space and if so

1217

00:47:26,550 --> 00:47:24,560

how do you deal with that and i think

1218

00:47:30,390 --> 00:47:26,560

means pressure or like a pressurized

1219

00:47:31,750 --> 00:47:30,400

volume not pressure or stress pressure

1220

00:47:36,710 --> 00:47:31,760

there's both

1221

00:47:39,190 --> 00:47:36,720

yeah we have uh in our pressurized

1222

00:47:40,870 --> 00:47:39,200

modules are 14.7 psi same thing as

1223

00:47:43,430 --> 00:47:40,880

what's down here on the ground

1224

00:47:45,349 --> 00:47:43,440

and uh you know we breathe oxygen and

1225

00:47:46,870 --> 00:47:45,359

everything in there uh when you what's

1226

00:47:48,109 --> 00:47:46,880

what's the pressure in your eva suit

1227

00:47:50,790 --> 00:47:48,119

when you're

1228

00:47:52,550 --> 00:47:50,800

4.4.3 which equates to an altitude i

1229

00:47:53,990 --> 00:47:52,560

think about like mount everest kind of

1230

00:47:56,870 --> 00:47:54,000

thing and just like a mount everest

1231

00:47:58,870 --> 00:47:56,880

climber usually wears oxygen masks

1232

00:48:02,950 --> 00:47:58,880

that's how come we can work there we

1233

00:48:06,150 --> 00:48:02,960

have 100 oxygen in the spacesuit right

1234

00:48:12,790 --> 00:48:09,589

okay thank you and i have one here from

1235

00:48:14,630 --> 00:48:12,800

uh sophia pd13 who asks what kind of

1236

00:48:17,510 --> 00:48:14,640

stuff do you guys have to study like is

1237

00:48:20,309 --> 00:48:17,520

it physics mechanics mathematics what's

1238

00:48:22,230 --> 00:48:20,319

the key to success in your jobs

1239

00:48:23,990 --> 00:48:22,240

i think the the biggest thing is for you

1240

00:48:26,549 --> 00:48:24,000

to study something that you love that

1241

00:48:28,390 --> 00:48:26,559

you like to do i was a chemistry major

1242

00:48:30,390 --> 00:48:28,400

undergraduate got a master's degree in

1243

00:48:31,910 --> 00:48:30,400

materials science engineering and worked

1244

00:48:34,230 --> 00:48:31,920

in a phd in mechanical engineering but i

1245

00:48:36,390 --> 00:48:34,240

didn't finish it then i i did use none

1246

00:48:38,790 --> 00:48:36,400

of that and did fiber optic centers for

1247

00:48:40,549 --> 00:48:38,800

my research and uh so i think

1248

00:48:42,950 --> 00:48:40,559

when you when you come to nasa as an

1249

00:48:44,470 --> 00:48:42,960

astronaut they look for people that can

1250

00:48:46,390 --> 00:48:44,480

work with their hands work with other

1251

00:48:47,829 --> 00:48:46,400

people and just do different things if

1252

00:48:50,790 --> 00:48:47,839

the toilet breaks in space who has to

1253

00:48:53,270 --> 00:48:50,800

fix it we do we do right so doing things

1254

00:48:54,630 --> 00:48:53,280

with your hands doing the space walks

1255

00:48:56,390 --> 00:48:54,640

were there times when you went out on

1256

00:48:57,990 --> 00:48:56,400

the space walk that you

1257

00:49:00,309 --> 00:48:58,000

you weren't something wasn't planned

1258

00:49:02,150 --> 00:49:00,319

like the the leak in the helmet yeah

1259

00:49:03,430 --> 00:49:02,160

figure that out use all the information

1260

00:49:05,670 --> 00:49:03,440

that you have available and make good

1261

00:49:07,829 --> 00:49:05,680

decisions right so being curious i think

1262

00:49:09,510 --> 00:49:07,839

is a big part but any technical

1263

00:49:12,230 --> 00:49:09,520

discipline science mathematics

1264

00:49:14,870 --> 00:49:12,240

engineering um are things that we look

1265

00:49:17,109 --> 00:49:14,880

for as astronaut candidates so that you

1266

00:49:21,589 --> 00:49:17,119

can solve these problems build these

1267

00:49:26,630 --> 00:49:23,990

great i'm going to do one more from so

1268

00:49:29,750 --> 00:49:26,640

then a final one from northland prep

1269

00:49:31,670 --> 00:49:29,760

this is from andy andrew koopish

1270

00:49:33,190 --> 00:49:31,680

and his third grade students and this is

1271

00:49:34,470 --> 00:49:33,200

a kind of philosophical question i'm

1272

00:49:36,309 --> 00:49:34,480

sure you guys get asked quite a bit but

1273

00:49:40,390 --> 00:49:36,319

what do you think the chances are of

1274

00:49:44,470 --> 00:49:42,390

well um

1275

00:49:47,030 --> 00:49:44,480

i think we

1276

00:49:49,109 --> 00:49:47,040

using the technology we have now we're

1277

00:49:52,950 --> 00:49:49,119

we've got a little evidence of

1278

00:49:54,630 --> 00:49:52,960

early early basic life forms on mars but

1279

00:49:56,630 --> 00:49:54,640

uh i think people when they ask that

1280

00:49:59,109 --> 00:49:56,640

question they're they're thinking about

1281

00:50:00,549 --> 00:49:59,119

like the et guy or some other person

1282

00:50:01,750 --> 00:50:00,559

that looks like us

1283

00:50:04,470 --> 00:50:01,760

and uh

1284

00:50:07,190 --> 00:50:04,480

it's a gigantic gigantic

1285

00:50:10,069 --> 00:50:07,200

universe out there and and space is so

1286

00:50:12,790 --> 00:50:10,079

vast and we our solar system is just a

1287

00:50:13,589 --> 00:50:12,800

one tiny speck in all of that

1288

00:50:20,150 --> 00:50:13,599

so

1289

00:50:21,670 --> 00:50:20,160

far corner that we may never ever get to

1290

00:50:22,870 --> 00:50:21,680

that they're wondering the same question

1291

00:50:24,150 --> 00:50:22,880

about us

1292

00:50:25,109 --> 00:50:24,160

um

1293

00:50:27,750 --> 00:50:25,119

but

1294

00:50:29,829 --> 00:50:27,760

you know my personal opinion is uh we're

1295

00:50:35,829 --> 00:50:29,839

not going to see that anytime soon at

1296

00:50:42,150 --> 00:50:37,990

okay why don't we go back to uh

1297

00:50:47,990 --> 00:50:46,230

hi my name is rachel i go by natalie and

1298

00:50:50,150 --> 00:50:48,000

my question was have have you ever

1299

00:50:52,870 --> 00:50:50,160

conducted a student experiment like the

1300

00:50:55,190 --> 00:50:52,880

iss project that we're doing

1301
00:50:57,270 --> 00:50:55,200
experiment like the iss project

1302
00:50:58,790 --> 00:50:57,280
so a student experiment in space in

1303
00:51:00,150 --> 00:50:58,800
space

1304
00:51:01,430 --> 00:51:00,160
natalie what what is that experiment

1305
00:51:02,630 --> 00:51:01,440
that you're doing you say the iss

1306
00:51:04,870 --> 00:51:02,640
project

1307
00:51:07,349 --> 00:51:04,880
yeah the space experiment that we're

1308
00:51:09,829 --> 00:51:07,359
doing with the iss

1309
00:51:11,349 --> 00:51:09,839
so the students are writing proposals

1310
00:51:12,790 --> 00:51:11,359
right now to

1311
00:51:15,109 --> 00:51:12,800
um

1312
00:51:16,710 --> 00:51:15,119
one will be chosen to uh be sent to the

1313
00:51:18,390 --> 00:51:16,720

space station in april to the student

1314

00:51:19,990 --> 00:51:18,400

space flight experiment program and

1315

00:51:22,230 --> 00:51:20,000

she's wondering have you ever done that

1316

00:51:23,589 --> 00:51:22,240

before or worked on a student experiment

1317

00:51:26,630 --> 00:51:23,599

in space

1318

00:51:28,710 --> 00:51:26,640

i have not done one of those

1319

00:51:30,950 --> 00:51:28,720

experiments as a student writing a

1320

00:51:32,870 --> 00:51:30,960

proposal i don't think when i was your

1321

00:51:34,549 --> 00:51:32,880

age that we had those things going on at

1322

00:51:37,750 --> 00:51:34,559

the time the space station wasn't wasn't

1323

00:51:39,750 --> 00:51:37,760

built at the time but um you know we you

1324

00:51:41,030 --> 00:51:39,760

know as a kid i was always building

1325

00:51:42,549 --> 00:51:41,040

things and

1326

00:51:44,390 --> 00:51:42,559

i had a chemistry set i was blowing

1327

00:51:46,630 --> 00:51:44,400

things up and doing things and i never

1328

00:51:49,270 --> 00:51:46,640

really had to to write up an experiment

1329

00:51:50,870 --> 00:51:49,280

for something like that but uh but i

1330

00:51:52,390 --> 00:51:50,880

think you know as i said earlier you

1331

00:51:55,030 --> 00:51:52,400

know just be very

1332

00:51:56,470 --> 00:51:55,040

very clever curious use google find out

1333

00:51:57,829 --> 00:51:56,480

some of the experiments that chris was

1334

00:51:59,829 --> 00:51:57,839

doing in space with the flames and

1335

00:52:01,829 --> 00:51:59,839

different things when i was in space we

1336

00:52:04,150 --> 00:52:01,839

were doing some work with e coli

1337

00:52:06,549 --> 00:52:04,160

bacteria looking at how it was affected

1338

00:52:08,230 --> 00:52:06,559

by the gravitational uh gravity and

1339

00:52:10,470 --> 00:52:08,240

without gravity the control group on the

1340

00:52:12,630 --> 00:52:10,480

ground we had mice in space that we were

1341

00:52:14,630 --> 00:52:12,640

looking at how they adapted to

1342

00:52:17,270 --> 00:52:14,640

microgravity butterflies and just

1343

00:52:18,630 --> 00:52:17,280

different different types of things so

1344

00:52:19,910 --> 00:52:18,640

i think the main thing is for you to be

1345

00:52:21,829 --> 00:52:19,920

curious and to do a little bit of

1346

00:52:24,309 --> 00:52:21,839

research to see what's actually gone on

1347

00:52:27,190 --> 00:52:24,319

in space and then maybe take some of

1348

00:52:29,270 --> 00:52:27,200

that work and put it into your into your

1349

00:52:33,589 --> 00:52:29,280

proposal and hopefully get selected in

1350

00:52:38,150 --> 00:52:35,670

thanks guys uh before we conclude wanted

1351
00:52:39,670 --> 00:52:38,160
to see if you had any final thoughts we

1352
00:52:42,150 --> 00:52:39,680
see uh from social media there's a lot

1353
00:52:43,510 --> 00:52:42,160
of class classrooms watching today

1354
00:52:44,710 --> 00:52:43,520
anything you want to share with them

1355
00:52:46,790 --> 00:52:44,720
some final

1356
00:52:48,790 --> 00:52:46,800
final uh inspirational words on on the

1357
00:52:50,630 --> 00:52:48,800
future of human space flight

1358
00:52:52,549 --> 00:52:50,640
well well first of all i'd just like to

1359
00:52:54,390 --> 00:52:52,559
say thank you guys for participating

1360
00:52:56,549 --> 00:52:54,400
today we really appreciate you and i

1361
00:52:57,829 --> 00:52:56,559
know one of you out there or maybe a few

1362
00:52:59,829 --> 00:52:57,839
of you out there will be that next

1363
00:53:01,589 --> 00:52:59,839

generation of explorer that will be

1364

00:53:03,910 --> 00:53:01,599

flying in space and maybe going to mars

1365

00:53:06,069 --> 00:53:03,920

one day or maybe taking our places as

1366

00:53:07,910 --> 00:53:06,079

astronauts one day and i think we we

1367

00:53:10,150 --> 00:53:07,920

definitely need your your creativity

1368

00:53:11,829 --> 00:53:10,160

your innovation and your passion you

1369

00:53:13,190 --> 00:53:11,839

know chris mentioned us working together

1370

00:53:14,470 --> 00:53:13,200

as a team we have people from all around

1371

00:53:16,390 --> 00:53:14,480

the world working together to help

1372

00:53:18,710 --> 00:53:16,400

advance our civilization it's going to

1373

00:53:21,190 --> 00:53:18,720

take you guys be nice

1374

00:53:23,270 --> 00:53:21,200

nice is very important in space

1375

00:53:24,870 --> 00:53:23,280

work hard be the best that you can be

1376

00:53:27,270 --> 00:53:24,880

listen to your parents eat your green

1377

00:53:28,710 --> 00:53:27,280

beans very important health and space is

1378

00:53:30,950 --> 00:53:28,720

very important right

1379

00:53:32,470 --> 00:53:30,960

but uh but just enjoy enjoy yourselves

1380

00:53:34,630 --> 00:53:32,480

and play don't let people bully you

1381

00:53:36,790 --> 00:53:34,640

don't bully other people and just and

1382

00:53:38,630 --> 00:53:36,800

just have a good time but uh you know we

1383

00:53:40,710 --> 00:53:38,640

need you badly we need to advance our

1384

00:53:42,950 --> 00:53:40,720

civilization through space exploration

1385

00:53:44,950 --> 00:53:42,960

and you guys are our future so

1386

00:53:47,829 --> 00:53:44,960

turn over to chris

1387

00:53:49,589 --> 00:53:47,839

and and just remember uh our ours people

1388

00:53:51,990 --> 00:53:49,599

wonder what the where our space program

1389

00:53:54,710 --> 00:53:52,000

is right now without a space shuttle and

1390

00:53:56,710 --> 00:53:54,720

uh and we have people in space every

1391

00:53:58,870 --> 00:53:56,720

single day doing cool things doing

1392

00:54:00,630 --> 00:53:58,880

science experiments and really pushing

1393

00:54:02,630 --> 00:54:00,640

the frontier of knowledge and when you

1394

00:54:05,190 --> 00:54:02,640

guys come to nasa whether it be as an

1395

00:54:07,910 --> 00:54:05,200

astronaut or as an engineer or a flight

1396

00:54:09,349 --> 00:54:07,920

controller uh we'll continue to push

1397

00:54:10,390 --> 00:54:09,359

those boundaries of knowledge even

1398

00:54:11,910 --> 00:54:10,400

further so

1399

00:54:16,069 --> 00:54:11,920

really really excited to be with you

1400

00:54:20,470 --> 00:54:19,270

all right okay thanks guys

1401

00:54:22,150 --> 00:54:20,480

that concludes stays hangout with

1402

00:54:24,390 --> 00:54:22,160

astronauts chris cassidy and leland

1403

00:54:25,670 --> 00:54:24,400

melvin melvin excuse me if you would

1404

00:54:27,589 --> 00:54:25,680

like more information on the future of

1405

00:54:31,190 --> 00:54:27,599

human space flight you can visit on the

1406

00:54:32,870 --> 00:54:31,200

web at www.nasa.gov

1407

00:54:34,150 --> 00:54:32,880

you can also follow us on social media

1408

00:54:36,230 --> 00:54:34,160

on twitter we're on

1409

00:54:37,510 --> 00:54:36,240

nasa we're on facebook plus nasa on

1410

00:54:39,510 --> 00:54:37,520

google plus

1411

00:54:42,150 --> 00:54:39,520

for students visit us on the web as well

1412

00:54:44,069 --> 00:54:42,160

at go.nasa.gov