



airandspace.si.edu/whatsnewinaerospace

Visit our website to ask a question

1
00:00:23,910 --> 00:00:22,150
which is dedicated to human space flight

2
00:00:26,470 --> 00:00:23,920
on the space shuttle and the

3
00:00:28,710 --> 00:00:26,480
international space station

4
00:00:31,750 --> 00:00:28,720
i would like to first of all thank our

5
00:00:34,630 --> 00:00:31,760
sponsor boeing which makes possible this

6
00:00:37,430 --> 00:00:34,640
what's new in aerospace series i'd like

7
00:00:40,310 --> 00:00:37,440
to welcome our live audience visitors

8
00:00:43,270 --> 00:00:40,320
from the museum and middle schoolers

9
00:00:45,430 --> 00:00:43,280
from whitner whittier academic campus

10
00:00:47,270 --> 00:00:45,440
here in washington d.c

11
00:00:48,470 --> 00:00:47,280
it's good to see all you students here

12
00:00:51,830 --> 00:00:48,480
today

13
00:00:54,549 --> 00:00:51,840

welcome also to our online audience and

14

00:00:57,029 --> 00:00:54,559

our television viewing audience

15

00:00:59,110 --> 00:00:57,039

today's program is about science and

16

00:01:01,189 --> 00:00:59,120

space walking on the international space

17

00:01:03,830 --> 00:01:01,199

station and i'm very pleased to

18

00:01:05,030 --> 00:01:03,840

introduce our guest astronaut chell

19

00:01:07,750 --> 00:01:05,040

lindgren

20

00:01:10,390 --> 00:01:07,760

a nasa astronaut who only recently

21

00:01:12,550 --> 00:01:10,400

returned from a five-month stay

22

00:01:14,630 --> 00:01:12,560

on the international space station

23

00:01:17,670 --> 00:01:14,640

you can see a model of the international

24

00:01:20,630 --> 00:01:17,680

space station behind him it's a facility

25

00:01:23,190 --> 00:01:20,640

as big as a football field in space and

26
00:01:24,950 --> 00:01:23,200
it's been occupied by humans since the

27
00:01:27,429 --> 00:01:24,960
year 2000

28
00:01:28,950 --> 00:01:27,439
consecutively we've had human beings in

29
00:01:31,670 --> 00:01:28,960
space

30
00:01:33,749 --> 00:01:31,680
chell is a very interesting person he's

31
00:01:36,469 --> 00:01:33,759
a medical doctor

32
00:01:39,830 --> 00:01:36,479
he is a specialist in emergency medicine

33
00:01:42,870 --> 00:01:39,840
and aerospace medicine he's a dad of

34
00:01:45,830 --> 00:01:42,880
three children and a husband

35
00:01:48,550 --> 00:01:45,840
uh he's a specialist in what happens to

36
00:01:50,469 --> 00:01:48,560
the human body in space and when one

37
00:01:52,870 --> 00:01:50,479
returns to earth so i think we're gonna

38
00:01:54,389 --> 00:01:52,880

have a really interesting program today

39

00:01:56,069 --> 00:01:54,399

thank you for being here thank you so

40

00:01:58,469 --> 00:01:56,079

much dr neil it's uh it's absolute

41

00:02:00,230 --> 00:01:58,479

pleasure to be here um you know i

42

00:02:01,830 --> 00:02:00,240

graduated from high school uh in

43

00:02:03,910 --> 00:02:01,840

northern virginia so

44

00:02:06,389 --> 00:02:03,920

um spent a lot of time coming into dc

45

00:02:08,389 --> 00:02:06,399

and every excuse that i had uh would

46

00:02:10,150 --> 00:02:08,399

come here to the to the air and space

47

00:02:12,309 --> 00:02:10,160

museum um and so i actually have

48

00:02:15,430 --> 00:02:12,319

something for you all

49

00:02:17,910 --> 00:02:15,440

um this is my mission presentation board

50

00:02:20,070 --> 00:02:17,920

and uh and it says presented to the

51
00:02:21,670 --> 00:02:20,080
smithsonian national air and space

52
00:02:23,190 --> 00:02:21,680
museum washington d.c from the

53
00:02:25,830 --> 00:02:23,200
international space station crew of

54
00:02:27,350 --> 00:02:25,840
expedition 44 and 45. so thank you so

55
00:02:32,869 --> 00:02:27,360
much for having me

56
00:02:37,430 --> 00:02:35,270
as chair of the space history department

57
00:02:39,430 --> 00:02:37,440
i will be delighted to add this to our

58
00:02:42,150 --> 00:02:39,440
collection

59
00:02:43,509 --> 00:02:42,160
we're going to do a very format program

60
00:02:45,430 --> 00:02:43,519
today some of it's going to be

61
00:02:47,990 --> 00:02:45,440
conversation

62
00:02:50,150 --> 00:02:48,000
some of it is going to be a video

63
00:02:52,790 --> 00:02:50,160

and some of it's going to be questions

64

00:02:54,790 --> 00:02:52,800

and answers from the audience so be

65

00:02:56,390 --> 00:02:54,800

thinking about what you want to know and

66

00:02:58,790 --> 00:02:56,400

we're going to start by just sitting and

67

00:03:00,229 --> 00:02:58,800

chatting for a minute

68

00:03:03,430 --> 00:03:00,239

um

69

00:03:05,990 --> 00:03:03,440

i'd love to know uh chill about your

70

00:03:08,710 --> 00:03:06,000

journey to becoming an astronaut we have

71

00:03:10,949 --> 00:03:08,720

middle schoolers and younger here today

72

00:03:12,550 --> 00:03:10,959

can you share with us what were you like

73

00:03:15,030 --> 00:03:12,560

when you were their age what were you

74

00:03:16,790 --> 00:03:15,040

interested in what were you doing sure

75

00:03:19,190 --> 00:03:16,800

well i've wanted to be an astronaut for

76

00:03:19,910 --> 00:03:19,200

as long as i can remember um

77

00:03:54,390 --> 00:03:19,920

i

78

00:03:57,429 --> 00:03:54,400

that journey uh to space and and so

79

00:03:59,190 --> 00:03:57,439

teachers instructors mentors coaches um

80

00:04:01,990 --> 00:03:59,200

and family my parents are actually here

81

00:04:04,070 --> 00:04:02,000

today uh who

82

00:04:06,789 --> 00:04:04,080

you know were incredibly supportive

83

00:04:07,589 --> 00:04:06,799

of this dream and so i'm very grateful

84

00:04:09,589 --> 00:04:07,599

uh

85

00:04:11,350 --> 00:04:09,599

to to my parents grateful to my family

86

00:04:13,990 --> 00:04:11,360

and friends and to all those people that

87

00:04:16,069 --> 00:04:14,000

really kind of invested in me um as i

88

00:04:17,270 --> 00:04:16,079

pursued this goal

89

00:04:18,949 --> 00:04:17,280

i think

90

00:04:21,509 --> 00:04:18,959

well in middle school i was interested

91

00:04:22,790 --> 00:04:21,519

in in planes and and

92

00:04:25,990 --> 00:04:22,800

in space

93

00:04:28,790 --> 00:04:26,000

movies and hanging out with my friends

94

00:04:30,790 --> 00:04:28,800

but i think it's important even at the

95

00:04:32,550 --> 00:04:30,800

age of middle school uh i think if

96

00:04:34,469 --> 00:04:32,560

you're if you're very young

97

00:04:37,030 --> 00:04:34,479

for those that are interested in joining

98

00:04:38,950 --> 00:04:37,040

us uh joining us in exploration or just

99

00:04:39,830 --> 00:04:38,960

joining us at nasa

100

00:04:42,469 --> 00:04:39,840

um

101
00:04:45,030 --> 00:04:42,479
reading is critically important and

102
00:04:47,510 --> 00:04:45,040
it just increases your vocabulary it

103
00:04:49,749 --> 00:04:47,520
creates pathways in your brain

104
00:04:51,030 --> 00:04:49,759
for learning and it was so fundamentally

105
00:04:54,550 --> 00:04:51,040
important to me i like to say that

106
00:04:57,030 --> 00:04:54,560
reading that books pave my path to space

107
00:04:59,670 --> 00:04:57,040
that i actually put a uh let's see here

108
00:05:01,749 --> 00:04:59,680
it is i put a book at the bottom of my

109
00:05:03,749 --> 00:05:01,759
expedition patch um just to represent

110
00:05:04,870 --> 00:05:03,759
how foundational it was uh to my

111
00:05:06,710 --> 00:05:04,880
experience

112
00:05:08,070 --> 00:05:06,720
um

113
00:05:10,230 --> 00:05:08,080

i think uh

114

00:05:12,469 --> 00:05:10,240

if you're interested in in

115

00:05:14,310 --> 00:05:12,479

becoming an astronaut you know you find

116

00:05:16,870 --> 00:05:14,320

where you have a passion where you have

117

00:05:18,870 --> 00:05:16,880

a talent um and you pursue that and if

118

00:05:20,629 --> 00:05:18,880

it's within the domain that we are

119

00:05:22,830 --> 00:05:20,639

choosing astronauts from right now so

120

00:05:25,270 --> 00:05:22,840

science technology engineering

121

00:05:27,029 --> 00:05:25,280

mathematics um you know that's where we

122

00:05:28,870 --> 00:05:27,039

go to to look for our new astronauts for

123

00:05:31,670 --> 00:05:28,880

our new explorers and it's doubly

124

00:05:33,110 --> 00:05:31,680

important to be talking um with you all

125

00:05:35,270 --> 00:05:33,120

this morning because you all are the

126

00:05:36,710 --> 00:05:35,280

generation that's going to go to mars

127

00:05:38,870 --> 00:05:36,720

you are going to be building our the

128

00:05:40,710 --> 00:05:38,880

rockets that take us there and there's

129

00:05:42,710 --> 00:05:40,720

somebody in your generation that's gonna

130

00:05:45,189 --> 00:05:42,720

put that first step on mars so i'm i'm

131

00:05:46,790 --> 00:05:45,199

very excited to see you all here today

132

00:05:48,629 --> 00:05:46,800

it's good to hear you comment on the

133

00:05:52,070 --> 00:05:48,639

importance of reading too though because

134

00:05:53,909 --> 00:05:52,080

i think with the emphasis on stem we

135

00:05:56,790 --> 00:05:53,919

also often

136

00:05:58,469 --> 00:05:56,800

kind of neglect or undervalue

137

00:06:00,390 --> 00:05:58,479

the humanities

138

00:06:02,629 --> 00:06:00,400

the importance of being literate being

139

00:06:04,469 --> 00:06:02,639

able to communicate well

140

00:06:06,629 --> 00:06:04,479

and just being a well-versed person a

141

00:06:08,150 --> 00:06:06,639

well-rounded person so well i know that

142

00:06:10,870 --> 00:06:08,160

there's there's even a push now to

143

00:06:11,909 --> 00:06:10,880

include arts in that in that acronym so

144

00:06:14,469 --> 00:06:11,919

steam

145

00:06:15,749 --> 00:06:14,479

uh you know a standing for arts and i

146

00:06:16,790 --> 00:06:15,759

think that's critically important

147

00:06:18,070 --> 00:06:16,800

because

148

00:06:21,029 --> 00:06:18,080

you know we

149

00:06:23,270 --> 00:06:21,039

we have scientists and engineers doctors

150

00:06:24,469 --> 00:06:23,280

um and pilots they're getting us into

151
00:06:26,550 --> 00:06:24,479
space

152
00:06:29,029 --> 00:06:26,560
but we are desperate to communicate that

153
00:06:30,710 --> 00:06:29,039
experience and so

154
00:06:32,469 --> 00:06:30,720
having read a lot being able to

155
00:06:34,390 --> 00:06:32,479
communicate to be able to communicate

156
00:06:37,510 --> 00:06:34,400
that experience through

157
00:06:40,390 --> 00:06:37,520
the mediums of film through words

158
00:06:42,469 --> 00:06:40,400
uh maybe even through poetry or painting

159
00:06:45,350 --> 00:06:42,479
that is how we can reach out and share

160
00:06:47,110 --> 00:06:45,360
that experience even more so

161
00:06:48,390 --> 00:06:47,120
i think it's critically important though

162
00:06:50,309 --> 00:06:48,400
especially for the

163
00:06:51,909 --> 00:06:50,319

for the kids in the audience

164

00:06:53,749 --> 00:06:51,919

as you decide what you want to do you

165

00:06:55,270 --> 00:06:53,759

you really want to identify that area

166

00:06:56,790 --> 00:06:55,280

where you have a passion and a talent

167

00:06:58,550 --> 00:06:56,800

because that's what you're going to be

168

00:06:59,990 --> 00:06:58,560

good at

169

00:07:02,150 --> 00:07:00,000

and nasa

170

00:07:04,070 --> 00:07:02,160

looks in all those various disciplines

171

00:07:05,270 --> 00:07:04,080

for the best people in the field and if

172

00:07:07,670 --> 00:07:05,280

you're good at something you're going to

173

00:07:09,589 --> 00:07:07,680

you're going to do great fine

174

00:07:11,670 --> 00:07:09,599

so you were passionate about aircraft

175

00:07:13,990 --> 00:07:11,680

and you went to the air force academy

176
00:07:15,589 --> 00:07:14,000
but you came into the astronaut corps

177
00:07:17,110 --> 00:07:15,599
through a different path that's right

178
00:07:19,270 --> 00:07:17,120
through medicine

179
00:07:21,510 --> 00:07:19,280
would you like to talk about that

180
00:07:24,150 --> 00:07:21,520
when did you develop that interest in

181
00:07:25,830 --> 00:07:24,160
becoming a physician sure well even in

182
00:07:27,589 --> 00:07:25,840
high school i had an interest and a

183
00:07:29,189 --> 00:07:27,599
talent for biology

184
00:07:31,670 --> 00:07:29,199
and while i was at the air force academy

185
00:07:34,230 --> 00:07:31,680
i figured out that uh that that's really

186
00:07:35,589 --> 00:07:34,240
where my passion and talent lay i i went

187
00:07:37,589 --> 00:07:35,599
into the air force academy thinking i

188
00:07:39,909 --> 00:07:37,599

wanted to do astronomical or

189

00:07:43,270 --> 00:07:39,919

aeronautical engineering but i really

190

00:07:44,950 --> 00:07:43,280

found that i was good at biology and so

191

00:07:47,510 --> 00:07:44,960

i studied pre-med

192

00:07:48,790 --> 00:07:47,520

and i was also interested in service so

193

00:07:50,150 --> 00:07:48,800

the trick about

194

00:07:51,990 --> 00:07:50,160

pursuing that goal of becoming an

195

00:07:53,110 --> 00:07:52,000

astronaut is that i recognized that it

196

00:07:54,790 --> 00:07:53,120

was

197

00:07:58,790 --> 00:07:54,800

it seemed like a near impossible thing

198

00:08:01,430 --> 00:07:58,800

to do and so i pursued a goal um

199

00:08:04,309 --> 00:08:01,440

a career that that i knew that that

200

00:08:06,469 --> 00:08:04,319

would challenge me um it would provide

201

00:08:08,950 --> 00:08:06,479

me the opportunity to serve

202

00:08:11,430 --> 00:08:08,960

which is a priority for me as well

203

00:08:13,270 --> 00:08:11,440

and uh and something that i could do for

204

00:08:16,150 --> 00:08:13,280

the rest of my life and so that's why i

205

00:08:18,390 --> 00:08:16,160

pursued medicine um but i still had that

206

00:08:20,629 --> 00:08:18,400

passion for human space flight and so

207

00:08:23,909 --> 00:08:20,639

found ways that i could kind of merge

208

00:08:26,309 --> 00:08:23,919

those two domains and went off to study

209

00:08:28,390 --> 00:08:26,319

aerospace medicine after i had done

210

00:08:30,390 --> 00:08:28,400

emergency medicine and then got a job as

211

00:08:31,830 --> 00:08:30,400

a physician at uh at johnson space

212

00:08:33,589 --> 00:08:31,840

center and served as a flight surgeon

213

00:08:35,509 --> 00:08:33,599

there for a couple of years before i got

214

00:08:37,269 --> 00:08:35,519

selected into the astronaut office

215

00:08:39,589 --> 00:08:37,279

that was very smart of you i think to

216

00:08:40,550 --> 00:08:39,599

pursue your passion

217

00:08:41,990 --> 00:08:40,560

and

218

00:08:44,070 --> 00:08:42,000

in a field where you knew you could

219

00:08:46,710 --> 00:08:44,080

build a career because thousands of

220

00:08:48,630 --> 00:08:46,720

people apply to become an astronaut and

221

00:08:51,430 --> 00:08:48,640

5 10 20

222

00:08:53,910 --> 00:08:51,440

maybe 35 at the most at a time are ever

223

00:08:56,070 --> 00:08:53,920

selected so it's almost as hard as

224

00:08:58,550 --> 00:08:56,080

becoming a professional athlete

225

00:09:01,509 --> 00:08:58,560

you know um and so i feel very blessed

226

00:09:02,870 --> 00:09:01,519

to to have this opportunity um i think

227

00:09:04,790 --> 00:09:02,880

all of us look back when we're getting

228

00:09:06,949 --> 00:09:04,800

selected and recognized that in that

229

00:09:09,269 --> 00:09:06,959

group that comes out to do interviews

230

00:09:10,870 --> 00:09:09,279

that are absolutely amazing people that

231

00:09:13,670 --> 00:09:10,880

you're interviewing with

232

00:09:15,829 --> 00:09:13,680

and uh and the stats at that time we

233

00:09:18,310 --> 00:09:15,839

interview 120 people and and for our

234

00:09:20,150 --> 00:09:18,320

class we chose nine um so it was like

235

00:09:22,230 --> 00:09:20,160

one out of 20 people were

236

00:09:25,030 --> 00:09:22,240

would would get chosen from that small

237

00:09:26,710 --> 00:09:25,040

interview group and um and

238

00:09:29,030 --> 00:09:26,720

any one of those people could have done

239

00:09:31,590 --> 00:09:29,040

this job as well or better than i'm

240

00:09:33,750 --> 00:09:31,600

doing and uh and so it's very humbling

241

00:09:35,269 --> 00:09:33,760

to to get to do it recognizing the

242

00:09:37,030 --> 00:09:35,279

amazing people that uh that you went

243

00:09:38,870 --> 00:09:37,040

through the interview process with now

244

00:09:40,790 --> 00:09:38,880

you did something rather unusual and

245

00:09:43,430 --> 00:09:40,800

extraordinary when you were at the air

246

00:09:44,790 --> 00:09:43,440

force academy can you share that with us

247

00:09:47,670 --> 00:09:44,800

i'm not sure what you're doing you're

248

00:09:49,269 --> 00:09:47,680

competitive oh i see it yeah um so i was

249

00:09:50,790 --> 00:09:49,279

on the parachute team at the air force

250

00:09:52,470 --> 00:09:50,800

academy

251
00:09:55,350 --> 00:09:52,480
and had the opportunity again to serve

252
00:09:56,870 --> 00:09:55,360
as a jump master and instructor we have

253
00:09:59,590 --> 00:09:56,880
a unique program at the air force

254
00:10:01,430 --> 00:09:59,600
academy where we put our students out in

255
00:10:03,990 --> 00:10:01,440
free fall on their very first jump so no

256
00:10:05,430 --> 00:10:04,000
static line not a tandem jump they go

257
00:10:07,750 --> 00:10:05,440
out on their own with their parachute

258
00:10:11,030 --> 00:10:07,760
into free fall and uh and deploy their

259
00:10:13,269 --> 00:10:11,040
parachutes and so it's an amazing um

260
00:10:15,829 --> 00:10:13,279
it's an amazing team to be a part of and

261
00:10:17,590 --> 00:10:15,839
amazing to to get to invest in in these

262
00:10:20,790 --> 00:10:17,600
other cadets these other students to

263
00:10:21,750 --> 00:10:20,800

help them achieve this uh pretty amazing

264

00:10:23,910 --> 00:10:21,760

um

265

00:10:25,990 --> 00:10:23,920

opportunity of of getting to free fall

266

00:10:27,750 --> 00:10:26,000

parachute and then you compete with

267

00:10:29,829 --> 00:10:27,760

other teams that's right so i was on the

268

00:10:32,389 --> 00:10:29,839

competition team so in addition to being

269

00:10:34,630 --> 00:10:32,399

a jump master and instructor um i was on

270

00:10:36,790 --> 00:10:34,640

the competition team and so our the air

271

00:10:38,630 --> 00:10:36,800

force academy has a tremendous record of

272

00:10:41,509 --> 00:10:38,640

uh just many years of being the

273

00:10:42,949 --> 00:10:41,519

intercollegiate uh champions and art and

274

00:10:45,670 --> 00:10:42,959

they're so good now that they've gone on

275

00:10:47,430 --> 00:10:45,680

to compete at national competition not

276

00:10:49,509 --> 00:10:47,440

just with other college students but

277

00:10:51,430 --> 00:10:49,519

with international parachutists and and

278

00:10:54,150 --> 00:10:51,440

do very well there so can you give us an

279

00:10:55,509 --> 00:10:54,160

example of what is a competitive event

280

00:10:58,069 --> 00:10:55,519

are you trying to

281

00:10:59,990 --> 00:10:58,079

land exactly on that that's actually

282

00:11:02,790 --> 00:11:00,000

that's actually one of the domains it's

283

00:11:06,550 --> 00:11:02,800

um called accuracy and so you jump out

284

00:11:07,910 --> 00:11:06,560

at you know thousands of feet and try to

285

00:11:10,550 --> 00:11:07,920

touch your heel

286

00:11:11,590 --> 00:11:10,560

on a dot the size of a dime as you land

287

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

and so

288

00:11:13,829 --> 00:11:12,480

um

289

00:11:15,269 --> 00:11:13,839

so that's one of the competitions

290

00:11:18,069 --> 00:11:15,279

another one is uh

291

00:11:20,069 --> 00:11:18,079

formations so jumping out with with uh

292

00:11:21,829 --> 00:11:20,079

three other people a formation of four

293

00:11:23,990 --> 00:11:21,839

and doing as many formations as you can

294

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

in a given amount of time uh so that

295

00:11:29,670 --> 00:11:26,560

must be so much fun it's incredible

296

00:11:31,910 --> 00:11:29,680

absolutely oh goodness well um all of

297

00:11:34,389 --> 00:11:31,920

this sounds like you know an extremely

298

00:11:36,630 --> 00:11:34,399

successful path to becoming an astronaut

299

00:11:39,509 --> 00:11:36,640

and fulfilling your childhood dream but

300

00:11:41,430 --> 00:11:39,519

did you ever have any setbacks or

301
00:11:44,310 --> 00:11:41,440
did you ever kind of miss one of your

302
00:11:45,910 --> 00:11:44,320
goals along the way absolutely so i talk

303
00:11:47,350 --> 00:11:45,920
about this quite a bit

304
00:11:49,750 --> 00:11:47,360
when i have the opportunity to talk with

305
00:11:51,350 --> 00:11:49,760
kids and with university students you

306
00:11:52,870 --> 00:11:51,360
know i think about

307
00:11:55,269 --> 00:11:52,880
my time on the international space

308
00:11:57,430 --> 00:11:55,279
station is just one leg

309
00:11:59,110 --> 00:11:57,440
one amazing part of an overall

310
00:12:01,030 --> 00:11:59,120
extraordinary journey and so i think all

311
00:12:02,870 --> 00:12:01,040
of us are on a path

312
00:12:06,230 --> 00:12:02,880
for me my destination my goal is to

313
00:12:11,350 --> 00:12:08,310

but that path is not an even an even

314

00:12:13,110 --> 00:12:11,360

path it's not an easy one and there are

315

00:12:15,269 --> 00:12:13,120

valleys and there are peaks along the

316

00:12:17,030 --> 00:12:15,279

way and the peaks those mountains are

317

00:12:19,990 --> 00:12:17,040

are the challenges that we get to choose

318

00:12:22,150 --> 00:12:20,000

uh going to college or

319

00:12:24,230 --> 00:12:22,160

pursuing a some type of a professional

320

00:12:26,389 --> 00:12:24,240

goal it's difficult and as you're

321

00:12:28,150 --> 00:12:26,399

climbing that mountain you're developing

322

00:12:29,110 --> 00:12:28,160

skills that you're tucking away for

323

00:12:30,069 --> 00:12:29,120

future

324

00:12:32,230 --> 00:12:30,079

um

325

00:12:34,230 --> 00:12:32,240

for future challenges and as you get to

326

00:12:36,310 --> 00:12:34,240

the peak so as you graduate from high

327

00:12:38,550 --> 00:12:36,320

school as you're graduating from college

328

00:12:40,150 --> 00:12:38,560

your view of that challenge of that of

329

00:12:42,550 --> 00:12:40,160

your view of that destination that goal

330

00:12:44,069 --> 00:12:42,560

becomes all the more clear um but there

331

00:12:45,750 --> 00:12:44,079

are valleys along the way too and you

332

00:12:49,350 --> 00:12:45,760

don't get to choose those you slip into

333

00:12:51,509 --> 00:12:49,360

those um and and those are difficult uh

334

00:12:54,949 --> 00:12:51,519

places to climb out of as well but as

335

00:12:59,990 --> 00:12:57,430

you are also building skills uh and

336

00:13:01,670 --> 00:13:00,000

becoming resilient for future challenges

337

00:13:03,750 --> 00:13:01,680

as well

338

00:13:05,190 --> 00:13:03,760

building character absolutely right so

339

00:13:07,269 --> 00:13:05,200

for myself and i'll just ask the

340

00:13:10,069 --> 00:13:07,279

audience who thinks that the path to

341

00:13:12,389 --> 00:13:10,079

becoming an astronaut that thinking that

342

00:13:14,230 --> 00:13:12,399

being medically

343

00:13:16,790 --> 00:13:14,240

washed out of pilot training and being

344

00:13:18,389 --> 00:13:16,800

discharged from the air force is a good

345

00:13:19,990 --> 00:13:18,399

building foundation for becoming an

346

00:13:21,910 --> 00:13:20,000

astronaut

347

00:13:24,710 --> 00:13:21,920

yeah that doesn't sound too good yeah

348

00:13:26,230 --> 00:13:24,720

that's what happened to me so i was uh i

349

00:13:29,110 --> 00:13:26,240

was in the air force even though i was

350

00:13:30,550 --> 00:13:29,120

pre-med i went to pilot training um but

351
00:13:31,910 --> 00:13:30,560
i was diagnosed with a medical condition

352
00:13:33,750 --> 00:13:31,920
and ultimately

353
00:13:35,190 --> 00:13:33,760
discharged from the air force and and so

354
00:13:36,790 --> 00:13:35,200
that was for me

355
00:13:38,150 --> 00:13:36,800
absolutely i mean probably the most

356
00:13:41,030 --> 00:13:38,160
devastating thing to happen in my

357
00:13:43,030 --> 00:13:41,040
professional career and it obliterated

358
00:13:44,470 --> 00:13:43,040
in my mind any possibility of becoming

359
00:13:46,629 --> 00:13:44,480
an astronaut

360
00:13:48,230 --> 00:13:46,639
so not only did i lose this overall

361
00:13:51,750 --> 00:13:48,240
dream of getting to fly in space but

362
00:13:54,310 --> 00:13:51,760
just becoming a pilot um

363
00:13:55,430 --> 00:13:54,320

was you know that dream also was was uh

364

00:13:56,949 --> 00:13:55,440

was lost

365

00:13:57,829 --> 00:13:56,959

um but

366

00:14:00,389 --> 00:13:57,839

again

367

00:14:01,430 --> 00:14:00,399

when you're in that valley you reassess

368

00:14:03,670 --> 00:14:01,440

your map

369

00:14:05,750 --> 00:14:03,680

and and i decided well what are my other

370

00:14:08,150 --> 00:14:05,760

options i reassessed my destination my

371

00:14:09,750 --> 00:14:08,160

goal and decided that uh becoming a

372

00:14:11,030 --> 00:14:09,760

physician that that was still an

373

00:14:14,069 --> 00:14:11,040

opportunity

374

00:14:16,069 --> 00:14:14,079

a worthy pursuit and uh and so i

375

00:14:18,470 --> 00:14:16,079

readjusted and and uh

376

00:14:20,870 --> 00:14:18,480

had the great uh really it's just such a

377

00:14:23,030 --> 00:14:20,880

blessing to come back around be

378

00:14:25,670 --> 00:14:23,040

re-evaluated for that medical condition

379

00:14:28,710 --> 00:14:25,680

um to have it established is not an

380

00:14:30,550 --> 00:14:28,720

issue and then ultimately to to get to

381

00:14:34,069 --> 00:14:30,560

where i am today second chance yeah and

382

00:14:36,069 --> 00:14:34,079

so i look back on that despite uh being

383

00:14:41,030 --> 00:14:36,079

um

384

00:14:43,750 --> 00:14:41,040

back at the path that i've taken i

385

00:14:45,990 --> 00:14:43,760

wouldn't trade it for anything

386

00:14:48,550 --> 00:14:46,000

why don't we move to some questions now

387

00:14:50,790 --> 00:14:48,560

i'm sure people have um questions they

388

00:14:53,030 --> 00:14:50,800

would like to ask you and our first one

389

00:14:53,990 --> 00:14:53,040

will be coming to us from online okay

390

00:14:56,629 --> 00:14:54,000

great

391

00:14:59,670 --> 00:14:56,639

um and the question is how are the

392

00:15:01,189 --> 00:14:59,680

spacesuits stored on the space station

393

00:15:02,870 --> 00:15:01,199

all right that's a great question so we

394

00:15:04,310 --> 00:15:02,880

have the spacesuits that we wear in the

395

00:15:05,590 --> 00:15:04,320

capsule

396

00:15:07,030 --> 00:15:05,600

our launch and entry suits they're

397

00:15:09,269 --> 00:15:07,040

pressure suits that we would just use in

398

00:15:10,949 --> 00:15:09,279

an emergency if

399

00:15:13,110 --> 00:15:10,959

the capsule that we're riding and loses

400

00:15:14,310 --> 00:15:13,120

pressure those are stored in the capsule

401
00:15:16,710 --> 00:15:14,320
itself

402
00:15:18,870 --> 00:15:16,720
we dry them out after we wear them

403
00:15:21,110 --> 00:15:18,880
so that mold and nasty stuff doesn't

404
00:15:22,069 --> 00:15:21,120
grow inside of it and then we

405
00:15:25,269 --> 00:15:22,079
and then we store those in the

406
00:15:27,590 --> 00:15:25,279
spacecraft our emu's the big puffy white

407
00:15:29,350 --> 00:15:27,600
spacesuits that we wear on spacewalks

408
00:15:30,710 --> 00:15:29,360
those are generally stored in the

409
00:15:32,710 --> 00:15:30,720
airlock

410
00:15:33,990 --> 00:15:32,720
two of them are mounted on the side of

411
00:15:35,910 --> 00:15:34,000
the equipment lock where we would

412
00:15:37,509 --> 00:15:35,920
actually go to put them on and the rest

413
00:15:39,430 --> 00:15:37,519

of them are kind of stuffed back into

414

00:15:40,949 --> 00:15:39,440

the crew lock the area that when we're

415

00:15:43,189 --> 00:15:40,959

getting ready to do a spacewalk that has

416

00:15:44,790 --> 00:15:43,199

actually taken down a vacuum um that's

417

00:15:46,710 --> 00:15:44,800

where we keep those spacesuits the two

418

00:15:48,790 --> 00:15:46,720

that are hanging there on the wall

419

00:15:50,550 --> 00:15:48,800

almost look like another person they do

420

00:15:52,470 --> 00:15:50,560

absolutely yeah so if you're not ready

421

00:15:54,629 --> 00:15:52,480

to see them hanging out there that can

422

00:15:56,069 --> 00:15:54,639

be a little bit of a surprise exactly i

423

00:16:01,749 --> 00:15:56,079

see we have a fellow here with the

424

00:16:06,550 --> 00:16:04,150

to be weightless it's amazing and so you

425

00:16:09,910 --> 00:16:06,560

see when you see uh television shows or

426
00:16:11,269 --> 00:16:09,920
movies where astronauts are floating um

427
00:16:12,710 --> 00:16:11,279
it's an incredible thing it's hard to

428
00:16:14,389 --> 00:16:12,720
describe you just

429
00:16:16,870 --> 00:16:14,399
you just you're hanging there in the

430
00:16:18,150 --> 00:16:16,880
middle of the the module

431
00:16:19,910 --> 00:16:18,160
and it's not something that you've ever

432
00:16:21,749 --> 00:16:19,920
really had the opportunity to experience

433
00:16:23,430 --> 00:16:21,759
before but that

434
00:16:24,550 --> 00:16:23,440
is what it's like for the entire time

435
00:16:26,389 --> 00:16:24,560
that you're up there so it takes a

436
00:16:27,910 --> 00:16:26,399
little bit of time to get used to but

437
00:16:29,990 --> 00:16:27,920
it's lots of fun to be able to float

438
00:16:32,710 --> 00:16:30,000

around to get from one place to another

439

00:16:34,470 --> 00:16:32,720

to pretend like you're a superman and uh

440

00:16:35,910 --> 00:16:34,480

and to be able to move huge pieces of

441

00:16:38,710 --> 00:16:35,920

equipment around

442

00:16:38,720 --> 00:16:41,110

yeah

443

00:16:44,710 --> 00:16:42,870

thank you so much for that question play

444

00:16:46,870 --> 00:16:44,720

a little bit when there is we do we do

445

00:16:48,629 --> 00:16:46,880

goof around a little bit um

446

00:16:50,949 --> 00:16:48,639

and and actually i'm going to show you

447

00:16:52,949 --> 00:16:50,959

all my post flight uh video here in a

448

00:16:54,550 --> 00:16:52,959

little while and okay so we

449

00:16:59,430 --> 00:16:54,560

i'll show you a little bit of that yeah

450

00:17:02,870 --> 00:17:01,670

how long have i been with nasa well i've

451
00:17:06,309 --> 00:17:02,880
been

452
00:17:07,909 --> 00:17:06,319
working for nasa for about nine years

453
00:17:09,829 --> 00:17:07,919
i started

454
00:17:11,510 --> 00:17:09,839
as a flight surgeon so as a physician

455
00:17:13,350 --> 00:17:11,520
that takes care of the astronauts it

456
00:17:15,110 --> 00:17:13,360
takes care of the crew

457
00:17:16,390 --> 00:17:15,120
and most of that time was actually spent

458
00:17:17,750 --> 00:17:16,400
in russia

459
00:17:20,949 --> 00:17:17,760
supporting the astronauts that are out

460
00:17:23,110 --> 00:17:20,959
there training um in star city and then

461
00:17:24,630 --> 00:17:23,120
after two years i i applied when we had

462
00:17:26,390 --> 00:17:24,640
an astronaut selection and and got

463
00:17:28,789 --> 00:17:26,400

selected into the astronaut office and

464

00:17:31,590 --> 00:17:28,799

that was in 2009 so i've been an

465

00:17:36,630 --> 00:17:31,600

astronaut for about seven years

466

00:17:40,310 --> 00:17:38,710

absolutely

467

00:17:41,669 --> 00:17:40,320

they keep us busy on the space station

468

00:17:43,110 --> 00:17:41,679

so the question had to do with what's a

469

00:17:44,789 --> 00:17:43,120

typical day like

470

00:17:47,270 --> 00:17:44,799

well

471

00:17:49,750 --> 00:17:47,280

our first scheduled activity is at seven

472

00:17:51,510 --> 00:17:49,760

about 7 30. so most of us will get up at

473

00:17:54,070 --> 00:17:51,520

about 6 or 6 30.

474

00:17:55,350 --> 00:17:54,080

i just set a watch alarm to wake me up

475

00:17:56,950 --> 00:17:55,360

and i only slept through it one time

476

00:17:59,750 --> 00:17:56,960

while i was up there much to the

477

00:18:00,710 --> 00:17:59,760

enjoyment of my crewmates um

478

00:18:02,310 --> 00:18:00,720

but

479

00:18:04,070 --> 00:18:02,320

when we get up we do all of the morning

480

00:18:07,350 --> 00:18:04,080

hygiene things that you do down here use

481

00:18:09,750 --> 00:18:07,360

the bathroom shave brush my teeth

482

00:18:12,470 --> 00:18:09,760

and then we'll make i'll make my first

483

00:18:14,150 --> 00:18:12,480

bag of morning coffee and then look at

484

00:18:16,710 --> 00:18:14,160

the day's schedule to see if there's

485

00:18:18,390 --> 00:18:16,720

anything i need to be prepared for i'll

486

00:18:19,510 --> 00:18:18,400

eat breakfast and then we'll get ready

487

00:18:21,510 --> 00:18:19,520

for

488

00:18:22,950 --> 00:18:21,520

our morning conference at about 7 30

489

00:18:25,830 --> 00:18:22,960

where we talk with the ground about the

490

00:18:27,190 --> 00:18:25,840

day's activities after that we we hit

491

00:18:29,750 --> 00:18:27,200

the ground running or hit the ground

492

00:18:31,270 --> 00:18:29,760

floating i guess

493

00:18:33,270 --> 00:18:31,280

and that's doing science doing

494

00:18:34,870 --> 00:18:33,280

maintenance on the space station we do

495

00:18:36,470 --> 00:18:34,880

two and a half hours of exercise every

496

00:18:38,230 --> 00:18:36,480

day so we put that in there we get an

497

00:18:39,750 --> 00:18:38,240

hour off for lunch and then it's back to

498

00:18:41,590 --> 00:18:39,760

work until seven o'clock at night when

499

00:18:43,430 --> 00:18:41,600

we have our evening conference we talk

500

00:18:45,029 --> 00:18:43,440

with the ground again to kind of sum up

501
00:18:47,590 --> 00:18:45,039
the day talk about the next day's

502
00:18:49,590 --> 00:18:47,600
activities and then

503
00:18:51,110 --> 00:18:49,600
and then the the time after that is our

504
00:18:52,230 --> 00:18:51,120
own so i'll spend that

505
00:18:54,150 --> 00:18:52,240
eating dinner

506
00:18:55,590 --> 00:18:54,160
responding to email

507
00:18:57,510 --> 00:18:55,600
talking with friends and family on the

508
00:18:58,549 --> 00:18:57,520
phone and then going to bed around 10 or

509
00:19:00,630 --> 00:18:58,559
11.

510
00:19:02,470 --> 00:19:00,640
so you're welcome thank you

511
00:19:04,230 --> 00:19:02,480
and that's an amazing thing you can now

512
00:19:05,990 --> 00:19:04,240
pick up the phone and call your friends

513
00:19:08,070 --> 00:19:06,000

and family it's uh it's incredible and

514

00:19:09,430 --> 00:19:08,080

it's fun to call down to earth and

515

00:19:11,430 --> 00:19:09,440

surprise people

516

00:19:13,669 --> 00:19:11,440

the connection is even better than

517

00:19:15,110 --> 00:19:13,679

my cell phone connection so it freaks

518

00:19:16,150 --> 00:19:15,120

people out a little bit because they're

519

00:19:18,549 --> 00:19:16,160

like i thought you were on the space

520

00:19:20,950 --> 00:19:18,559

station but that's a lot of fun well

521

00:19:23,190 --> 00:19:20,960

speaking of that i'd like to transition

522

00:19:24,950 --> 00:19:23,200

to the next segment we'll have some more

523

00:19:26,870 --> 00:19:24,960

q a in a few minutes but i'd like to

524

00:19:29,669 --> 00:19:26,880

transition to the next segment by

525

00:19:32,230 --> 00:19:29,679

playing a voicemail message that i had

526
00:19:34,070 --> 00:19:32,240
on my office telephone here a few months

527
00:19:35,909 --> 00:19:34,080
ago

528
00:19:37,750 --> 00:19:35,919
a message

529
00:19:40,070 --> 00:19:37,760
hey dr neil it's joe lingard calling

530
00:19:41,669 --> 00:19:40,080
from the international space station

531
00:19:44,630 --> 00:19:41,679
i was uh

532
00:19:47,430 --> 00:19:44,640
just going through um my

533
00:19:50,549 --> 00:19:47,440
personal stowage and i have both the

534
00:19:51,990 --> 00:19:50,559
gemini 4 patch and the aerospace museum

535
00:19:53,909 --> 00:19:52,000
flag i took pictures of those in the

536
00:19:55,750 --> 00:19:53,919
cupola for you all and look forward

537
00:19:57,350 --> 00:19:55,760
looking forward to bringing those back

538
00:19:59,430 --> 00:19:57,360

to you uh once i get back from my

539

00:20:01,270 --> 00:19:59,440

session thanks for going great up here a

540

00:20:03,350 --> 00:20:01,280

little over halfway done we got some

541

00:20:09,110 --> 00:20:03,360

exciting stuff on the horizon still a

542

00:20:14,070 --> 00:20:11,590

sickness capture and greeting new crew

543

00:20:16,070 --> 00:20:14,080

coming up in december so things are

544

00:20:19,029 --> 00:20:16,080

going great hope you are doing well and

545

00:20:21,510 --> 00:20:19,039

enjoying fall on the dc area and look

546

00:20:23,830 --> 00:20:21,520

forward to catching up with you and try

547

00:20:25,750 --> 00:20:23,840

and call back soon bye-bye

548

00:20:27,270 --> 00:20:25,760

that's kind of a mundane message for

549

00:20:29,350 --> 00:20:27,280

calling from the space station that is

550

00:20:30,950 --> 00:20:29,360

the first call from space i have ever

551
00:20:33,190 --> 00:20:30,960
received

552
00:20:34,710 --> 00:20:33,200
that was not faked we didn't record that

553
00:20:38,390 --> 00:20:34,720
that was actually

554
00:20:39,350 --> 00:20:38,400
on my voicemail and about three hours

555
00:20:41,510 --> 00:20:39,360
later

556
00:20:43,909 --> 00:20:41,520
the phone rang again and this time i was

557
00:20:46,149 --> 00:20:43,919
at my desk and i picked it up and it

558
00:20:47,669 --> 00:20:46,159
started the same way dr neal this is

559
00:20:50,070 --> 00:20:47,679
chill lundgren calling from the

560
00:20:51,350 --> 00:20:50,080
international space station uh that was

561
00:20:53,909 --> 00:20:51,360
one of those

562
00:20:56,230 --> 00:20:53,919
it only happens once kind of days i

563
00:20:58,710 --> 00:20:56,240

marked that in my calendar but i think

564

00:21:00,870 --> 00:20:58,720

that's a good intro

565

00:21:03,430 --> 00:21:00,880

to turning the program over to chell

566

00:21:05,909 --> 00:21:03,440

letting him show us uh his highlights

567

00:21:07,029 --> 00:21:05,919

video from his time on the space station

568

00:21:08,390 --> 00:21:07,039

are you going to be making some

569

00:21:10,390 --> 00:21:08,400

commentaries yeah i'll talk to you i'll

570

00:21:12,149 --> 00:21:10,400

talk us through the video and then we'll

571

00:21:14,870 --> 00:21:12,159

do some more questions and answer after

572

00:21:16,630 --> 00:21:14,880

that wonderful so get comfortable

573

00:21:18,470 --> 00:21:16,640

watch the movie

574

00:21:21,110 --> 00:21:18,480

we can even take the lights down here in

575

00:21:23,350 --> 00:21:21,120

the middle if we want

576
00:21:27,270 --> 00:21:23,360
so if you're looking at the screen

577
00:21:28,789 --> 00:21:27,280
you know our journey to space starts

578
00:21:31,190 --> 00:21:28,799
much earlier than just arriving at the

579
00:21:32,630 --> 00:21:31,200
launch pad it requires

580
00:21:33,750 --> 00:21:32,640
several years of training two and a half

581
00:21:35,830 --> 00:21:33,760
years of training just to become

582
00:21:37,909 --> 00:21:35,840
eligible to fly in space and then

583
00:21:39,110 --> 00:21:37,919
two years of mission specific training

584
00:21:42,070 --> 00:21:39,120
that training

585
00:21:44,070 --> 00:21:42,080
starts at jsc but

586
00:21:46,470 --> 00:21:44,080
ends up out in star city russia where we

587
00:21:50,870 --> 00:21:46,480
do our final exams in preparation for

588
00:21:54,470 --> 00:21:52,789

and then two weeks later uh well two

589

00:21:56,310 --> 00:21:54,480

weeks prior to launch we make our way

590

00:21:58,789 --> 00:21:56,320

out to baikonur

591

00:22:01,750 --> 00:21:58,799

we don our spacesuits and march out to

592

00:22:01,760 --> 00:22:06,230

that spacesuit make my butt look big

593

00:22:10,549 --> 00:22:08,950

i know you guys are thinking that

594

00:22:11,510 --> 00:22:10,559

expedition to the international space

595

00:22:13,510 --> 00:22:11,520

station

596

00:22:15,750 --> 00:22:13,520

we have the opportunity to uh for one

597

00:22:17,029 --> 00:22:15,760

last uh wave goodbye to our friends and

598

00:22:19,270 --> 00:22:17,039

family

599

00:22:21,669 --> 00:22:19,280

and then we climb up into the

600

00:22:23,270 --> 00:22:21,679

the capsule of the at the top of that

601
00:22:25,350 --> 00:22:23,280
soyuz rocket

602
00:22:34,630 --> 00:22:25,360
we make our final preparations

603
00:22:39,270 --> 00:22:36,710
now this is the way to go to space since

604
00:22:41,350 --> 00:22:39,280
the shuttle retired right that's right

605
00:22:43,909 --> 00:22:41,360
so this we're only flying in the the

606
00:22:45,750 --> 00:22:43,919
soyuz rocket now um it's interesting the

607
00:22:47,590 --> 00:22:45,760
shuttle leaps off of the

608
00:22:49,990 --> 00:22:47,600
the launch game entry once the solid

609
00:22:51,590 --> 00:22:50,000
rocket boosters light

610
00:22:53,510 --> 00:22:51,600
for the soyuz we actually don't know

611
00:22:55,590 --> 00:22:53,520
that we've lifted off unless we see the

612
00:22:56,950 --> 00:22:55,600
the clock counting up and that's because

613
00:22:59,350 --> 00:22:56,960

it takes a while to build up enough

614

00:23:01,350 --> 00:22:59,360

thrust to to lift the rocket off of the

615

00:23:02,950 --> 00:23:01,360

launch gantry and into the air but those

616

00:23:04,870 --> 00:23:02,960

g's build up very quickly up to about

617

00:23:07,110 --> 00:23:04,880

three and a half g's and then after

618

00:23:09,430 --> 00:23:07,120

about eight and a half minutes

619

00:23:13,590 --> 00:23:09,440

the third stage will shut down

620

00:23:16,630 --> 00:23:15,190

and that's when we know that we've made

621

00:23:17,990 --> 00:23:16,640

it into orbit

622

00:23:19,990 --> 00:23:18,000

now you see that bright white light

623

00:23:23,750 --> 00:23:20,000

coming through the window

624

00:23:26,310 --> 00:23:23,760

that was my first uh first view of the

625

00:23:29,190 --> 00:23:26,320

earth of the beautiful blue and white

626
00:23:30,870 --> 00:23:29,200
crescent of the earth shining um below

627
00:23:32,310 --> 00:23:30,880
us and it's a memory that i will never

628
00:23:34,310 --> 00:23:32,320
forget

629
00:23:37,590 --> 00:23:34,320
now it takes us eight and a half minutes

630
00:23:39,270 --> 00:23:37,600
to get into orbit but an additional

631
00:23:41,029 --> 00:23:39,280
six hours to catch up with the space

632
00:23:43,029 --> 00:23:41,039
station

633
00:23:44,950 --> 00:23:43,039
and so during that time we're making

634
00:23:47,510 --> 00:23:44,960
sure that the vehicle is performing

635
00:23:48,549 --> 00:23:47,520
correctly we're speaking with the ground

636
00:23:50,630 --> 00:23:48,559
but we're

637
00:23:51,990 --> 00:23:50,640
strapped down in the fetal position in

638
00:23:54,870 --> 00:23:52,000

the capsule

639

00:23:57,029 --> 00:23:54,880

and it's pretty uncomfortable so we are

640

00:23:58,630 --> 00:23:57,039

greatly anticipating getting to be get

641

00:24:00,950 --> 00:23:58,640

out of our seats and to get into the

642

00:24:03,110 --> 00:24:00,960

wider volume of the space station and

643

00:24:05,190 --> 00:24:03,120

it's a it's an amazing view to see the

644

00:24:07,110 --> 00:24:05,200

space station hanging there above the

645

00:24:08,789 --> 00:24:07,120

earth

646

00:24:10,710 --> 00:24:08,799

and this slow dance where we are

647

00:24:12,310 --> 00:24:10,720

approaching the space station and our

648

00:24:15,190 --> 00:24:12,320

capsule are both flying

649

00:24:16,789 --> 00:24:15,200

17 500 miles per hour and yet we are

650

00:24:18,390 --> 00:24:16,799

able to

651
00:24:24,549 --> 00:24:18,400
slowly approach

652
00:24:27,990 --> 00:24:26,149
another memory that i will never forget

653
00:24:30,230 --> 00:24:28,000
is the first time that uh

654
00:24:32,390 --> 00:24:30,240
that we open that hatch and see our

655
00:24:33,909 --> 00:24:32,400
colleagues our friends our crewmates

656
00:24:35,590 --> 00:24:33,919
floating there in the space station

657
00:24:47,430 --> 00:24:35,600
welcoming and welcoming us to our new

658
00:24:51,269 --> 00:24:49,269
so that's oleg kononenko my soyuz

659
00:24:53,029 --> 00:24:51,279
commander they're there i am and i'm

660
00:24:54,070 --> 00:24:53,039
followed by kimia yui my japanese

661
00:24:55,990 --> 00:24:54,080
crewmate

662
00:24:58,950 --> 00:24:56,000
and the first thing that we do is we fly

663
00:25:01,269 --> 00:24:58,960

float into uh the service module for

664

00:25:02,789 --> 00:25:01,279

for a brief uh conversation with our

665

00:25:04,149 --> 00:25:02,799

family and friends that are still down

666

00:25:06,549 --> 00:25:04,159

in baikonur

667

00:25:25,110 --> 00:25:06,559

in an auditorium so we can chat with

668

00:25:28,789 --> 00:25:27,110

you look happy that's a it's a good

669

00:25:30,149 --> 00:25:28,799

thing and in the background there

670

00:25:32,149 --> 00:25:30,159

there's uh

671

00:25:34,149 --> 00:25:32,159

my my youngest is asking me if that was

672

00:25:35,590 --> 00:25:34,159

the right of my life and it certainly

673

00:25:37,110 --> 00:25:35,600

was

674

00:25:38,630 --> 00:25:37,120

but this is the reason that we fly to

675

00:25:40,470 --> 00:25:38,640

space this is the reason that we do

676
00:25:42,549 --> 00:25:40,480
these long duration missions is to

677
00:25:44,070 --> 00:25:42,559
conduct science and research

678
00:25:45,029 --> 00:25:44,080
to extend our presence in the solar

679
00:25:47,750 --> 00:25:45,039
system

680
00:25:49,669 --> 00:25:47,760
and to improve life back here on earth

681
00:25:51,750 --> 00:25:49,679
we do that in the us laboratory we do

682
00:25:54,390 --> 00:25:51,760
that here in the european space agency's

683
00:25:58,390 --> 00:25:54,400
columbus module and here in the japanese

684
00:26:03,350 --> 00:26:00,549
this is a multi-purpose laboratory we're

685
00:26:04,149 --> 00:26:03,360
doing not just one type of science but a

686
00:26:08,149 --> 00:26:04,159
whole

687
00:26:10,390 --> 00:26:08,159
combustion

688
00:26:11,430 --> 00:26:10,400

investigations because in the absence of

689

00:26:12,830 --> 00:26:11,440

gravity

690

00:26:15,029 --> 00:26:12,840

there's no

691

00:26:17,430 --> 00:26:15,039

gravity-driven convection that is hot

692

00:26:19,669 --> 00:26:17,440

air doesn't rise and so flames will

693

00:26:20,789 --> 00:26:19,679

typically consume all of the oxygen in

694

00:26:22,470 --> 00:26:20,799

their local environment and then

695

00:26:23,990 --> 00:26:22,480

extinguish themselves

696

00:26:25,430 --> 00:26:24,000

and so we study flames to better

697

00:26:27,350 --> 00:26:25,440

understand how to harness that energy

698

00:26:30,230 --> 00:26:27,360

and also to prevent uh of course

699

00:26:32,710 --> 00:26:30,240

unwanted fires in the crew cabin

700

00:26:34,310 --> 00:26:32,720

another area of research is fluid

701
00:26:36,310 --> 00:26:34,320
dynamics

702
00:26:39,669 --> 00:26:36,320
in the absence of gravity the weaker

703
00:26:42,470 --> 00:26:39,679
forces of capillary

704
00:26:44,710 --> 00:26:42,480
motion and surface tension take over now

705
00:26:46,630 --> 00:26:44,720
this is an experiment called slosh now

706
00:26:48,870 --> 00:26:46,640
it's very pretty but it helps us to

707
00:26:51,190 --> 00:26:48,880
understand how liquids move in vessels

708
00:26:53,990 --> 00:26:51,200
like this and will help us understand

709
00:26:56,390 --> 00:26:54,000
how fuel moves in fuel tanks during

710
00:26:59,029 --> 00:26:56,400
vehicle maneuvers to better inform us on

711
00:27:00,950 --> 00:26:59,039
how to to build our fuel tanks this

712
00:27:02,630 --> 00:27:00,960
experiment is called capillary beverage

713
00:27:05,110 --> 00:27:02,640

and you can see that i'm drinking from a

714

00:27:07,750 --> 00:27:05,120

cup but in the absence of gravity and so

715

00:27:09,510 --> 00:27:07,760

here just the geometry and the materials

716

00:27:11,590 --> 00:27:09,520

used in that cup are helping to use

717

00:27:14,149 --> 00:27:11,600

capillary motion to deliver that fluid

718

00:27:16,630 --> 00:27:14,159

to my mouth and this will help us move

719

00:27:20,950 --> 00:27:16,640

fluids like fuel and fuel tanks

720

00:27:23,350 --> 00:27:20,960

without having to use power or or pumps

721

00:27:25,590 --> 00:27:23,360

this experiment is veggie our crew got

722

00:27:27,750 --> 00:27:25,600

to grow lettuce in space um and we were

723

00:27:31,909 --> 00:27:27,760

the first u.s crew to get to grow and

724

00:27:37,990 --> 00:27:35,669

and it tasted just like lettuce

725

00:27:39,110 --> 00:27:38,000

and not and and folks would ask me like

726

00:27:40,710 --> 00:27:39,120

what else are you growing or what else

727

00:27:45,430 --> 00:27:40,720

do you want to grow and so i'm i'm very

728

00:27:49,350 --> 00:27:47,510

this uh this is that slosh experiment

729

00:27:51,830 --> 00:27:49,360

again that green

730

00:27:54,470 --> 00:27:51,840

tank of fluid is now encapsulated in

731

00:27:56,230 --> 00:27:54,480

this this orange illuminated box and

732

00:27:58,549 --> 00:27:56,240

instead of moving it around manually

733

00:28:01,029 --> 00:27:58,559

we're using these small satellites

734

00:28:03,190 --> 00:28:01,039

powered by carbon dioxide jets cold gas

735

00:28:05,750 --> 00:28:03,200

jets to move this around and replicate

736

00:28:08,950 --> 00:28:05,760

those maneuvers

737

00:28:11,190 --> 00:28:08,960

here i'm installing a satellite launcher

738

00:28:13,350 --> 00:28:11,200

uh to be taken outside of the airlock

739

00:28:16,549 --> 00:28:13,360
and mounted on our robotic arm

740

00:28:18,470 --> 00:28:16,559
so we can actually launch satellites

741

00:28:19,669 --> 00:28:18,480
from the space station

742

00:28:21,350 --> 00:28:19,679
you can see one of those satellites

743

00:28:23,350 --> 00:28:21,360
there these satellites are built by

744

00:28:25,510 --> 00:28:23,360
universities and small companies to do

745

00:28:29,190 --> 00:28:25,520
research

746

00:28:31,269 --> 00:28:29,200
that we're on the space station to come

747

00:28:33,190 --> 00:28:31,279
to conduct this research

748

00:28:35,110 --> 00:28:33,200
to make life better for us all back here

749

00:28:36,870 --> 00:28:35,120
on earth now in order to do that

750

00:28:38,549 --> 00:28:36,880
research we have to stay healthy and

751
00:28:40,710 --> 00:28:38,559
weightlessness is incredibly hard on the

752
00:28:43,909 --> 00:28:40,720
human body it's like instead of spending

753
00:28:45,430 --> 00:28:43,919
141 days in space i spent 141 days

754
00:28:46,870 --> 00:28:45,440
laying in bed

755
00:28:48,950 --> 00:28:46,880
and so you can imagine if you laid in

756
00:28:50,630 --> 00:28:48,960
bed for that long period of time your

757
00:28:52,870 --> 00:28:50,640
muscles would become weak your bones

758
00:28:54,789 --> 00:28:52,880
would lose bone mass and your hearts

759
00:28:57,029 --> 00:28:54,799
wouldn't be as good responding to

760
00:28:58,789 --> 00:28:57,039
gravity and to exercise

761
00:29:00,950 --> 00:28:58,799
and so we have three countermeasures

762
00:29:03,029 --> 00:29:00,960
three exercises to prevent those changes

763
00:29:05,990 --> 00:29:03,039

from happening to keep us healthy for

764

00:29:07,909 --> 00:29:06,000

our return back to the earth

765

00:29:09,430 --> 00:29:07,919

now those exercises include things that

766

00:29:11,430 --> 00:29:09,440

you would be very familiar with down

767

00:29:12,710 --> 00:29:11,440

here on the earth one is we do weight

768

00:29:14,070 --> 00:29:12,720

lifting there's no weight in space

769

00:29:16,870 --> 00:29:14,080

though so we have a special machine

770

00:29:18,549 --> 00:29:16,880

called the a-red the advanced resistive

771

00:29:21,110 --> 00:29:18,559

exercise device

772

00:29:24,149 --> 00:29:21,120

and it uses evacuated cylinders to

773

00:29:26,149 --> 00:29:24,159

provide up to 600 pounds of resistance

774

00:29:27,269 --> 00:29:26,159

so that we can do tricep extensions

775

00:29:30,710 --> 00:29:27,279

sit-ups

776

00:29:31,430 --> 00:29:30,720

squats deadlifts exercises to load up

777

00:29:41,430 --> 00:29:31,440

our

778

00:29:44,149 --> 00:29:41,440

strength

779

00:29:45,510 --> 00:29:44,159

um to maintain cardiovascular or aerobic

780

00:29:46,870 --> 00:29:45,520

fitness we have a treadmill and you can

781

00:29:48,870 --> 00:29:46,880

see i'm wearing a harness that's holding

782

00:29:50,310 --> 00:29:48,880

me down to that treadmill if we didn't

783

00:29:52,710 --> 00:29:50,320

have that with that first step i would

784

00:29:54,549 --> 00:29:52,720

go flying off the treadmill and these uh

785

00:29:56,389 --> 00:29:54,559

these harnesses hold us down about 70

786

00:29:58,789 --> 00:29:56,399

percent of our body weight and provide a

787

00:30:00,470 --> 00:29:58,799

tremendous workout

788

00:30:02,149 --> 00:30:00,480

in addition we have a cycle ergometer an

789

00:30:03,990 --> 00:30:02,159

exercise bike and you can see kimia here

790

00:30:06,230 --> 00:30:04,000

exercising on that the one major

791

00:30:08,230 --> 00:30:06,240

difference is that there's no seat

792

00:30:11,590 --> 00:30:08,240

we don't have to sit down to exercise on

793

00:30:15,510 --> 00:30:13,350

now those are counter measures those

794

00:30:17,269 --> 00:30:15,520

exercises help keep us healthy

795

00:30:19,750 --> 00:30:17,279

um if there were a medical issue in

796

00:30:21,750 --> 00:30:19,760

space we have a medical kit also to

797

00:30:23,909 --> 00:30:21,760

address minor medical problems and you

798

00:30:25,990 --> 00:30:23,919

could see the diagnostic kit there

799

00:30:27,669 --> 00:30:26,000

if something serious did happen in space

800

00:30:29,510 --> 00:30:27,679

our first priority would be to evacuate

801
00:30:31,590 --> 00:30:29,520
that crew member back down to earth but

802
00:30:33,990 --> 00:30:31,600
for instance if i had to do cpr in space

803
00:30:35,750 --> 00:30:34,000
this is how you do cpr in weightlessness

804
00:30:36,710 --> 00:30:35,760
you actually flip out upside down and do

805
00:30:39,430 --> 00:30:36,720
it

806
00:30:41,830 --> 00:30:39,440
we can measure body mass in space using

807
00:30:43,350 --> 00:30:41,840
the spring constant a physics equation

808
00:30:45,110 --> 00:30:43,360
to figure out

809
00:30:47,350 --> 00:30:45,120
the mass at the end of a pendulum a

810
00:30:48,870 --> 00:30:47,360
spring

811
00:30:50,470 --> 00:30:48,880
and because of some of the changes that

812
00:30:52,389 --> 00:30:50,480
we experience in space

813
00:30:53,430 --> 00:30:52,399

in weightlessness we experience a fluid

814

00:30:55,029 --> 00:30:53,440

shift of

815

00:30:56,870 --> 00:30:55,039

blood and fluid up into our chest and

816

00:30:58,389 --> 00:30:56,880

head which we think increases the

817

00:31:00,230 --> 00:30:58,399

pressure around the brain that's

818

00:31:02,310 --> 00:31:00,240

transmitted along the optic nerve to the

819

00:31:04,149 --> 00:31:02,320

eye and actually changes the structure

820

00:31:06,630 --> 00:31:04,159

of the eye we have a number of tests a

821

00:31:09,029 --> 00:31:06,640

diagnostic test that we do on the on our

822

00:31:11,990 --> 00:31:09,039

eyes to make sure to follow the changes

823

00:31:14,149 --> 00:31:12,000

in structure and to track our eye health

824

00:31:16,070 --> 00:31:14,159

it includes funduscopy taking a picture

825

00:31:18,950 --> 00:31:16,080

of the back of the eye before that was

826

00:31:21,029 --> 00:31:18,960

ocular coherence tomography amazing d

827

00:31:24,310 --> 00:31:21,039

amazingly detailed cross sections of the

828

00:31:26,149 --> 00:31:24,320

the the globe this is tonometry um where

829

00:31:28,070 --> 00:31:26,159

we're testing the intraocular pressure

830

00:31:30,470 --> 00:31:28,080

the pressure inside the eye we use

831

00:31:34,630 --> 00:31:30,480

ultrasound to look at our eyes to look

832

00:31:37,830 --> 00:31:34,640

at our hearts and also our blood vessels

833

00:31:39,830 --> 00:31:37,840

we even draw our own blood in space

834

00:31:42,310 --> 00:31:39,840

and some of that blood comes down with

835

00:31:44,549 --> 00:31:42,320

us in our space vehicles and some of it

836

00:31:46,230 --> 00:31:44,559

we'll put into our centrifuge spun at

837

00:31:49,509 --> 00:31:46,240

tens of thousands of revolutions per

838

00:31:50,630 --> 00:31:49,519

minute and then placed into our freezer

839

00:31:53,110 --> 00:31:50,640

on board

840

00:31:57,909 --> 00:31:53,120

for storage until it's brought down by a

841

00:32:04,710 --> 00:32:00,070

and you can see our minus 80 degree

842

00:32:08,389 --> 00:32:06,310

so that's the science that we do in

843

00:32:09,190 --> 00:32:08,399

space but we do other things up there as

844

00:32:11,909 --> 00:32:09,200

well

845

00:32:13,190 --> 00:32:11,919

um the cargo the the uh the time that i

846

00:32:14,870 --> 00:32:13,200

was up with there was during the

847

00:32:16,789 --> 00:32:14,880

one-year mission when scott kelly was up

848

00:32:18,870 --> 00:32:16,799

there and misha kornyenko were up there

849

00:32:20,470 --> 00:32:18,880

for an entire year now the soyuz

850

00:32:22,870 --> 00:32:20,480

spacecraft is only good to be in space

851
00:32:24,710 --> 00:32:22,880
for 200 days so we actually had a crew

852
00:32:26,389 --> 00:32:24,720
come up to bring up a new spacecraft for

853
00:32:28,470 --> 00:32:26,399
misha and scott

854
00:32:31,190 --> 00:32:28,480
and so about halfway through our mission

855
00:32:33,669 --> 00:32:31,200
we had sergey a russian cosmonaut the

856
00:32:37,509 --> 00:32:33,679
first danish astronaut andy mogensen and

857
00:32:39,350 --> 00:32:37,519
then a kazakh cosmonaut id ambatov

858
00:32:41,269 --> 00:32:39,360
come up to the space station for just 10

859
00:32:43,190 --> 00:32:41,279
days and bring that new spacecraft up

860
00:32:44,710 --> 00:32:43,200
there and so that was a phenomenal

861
00:32:47,190 --> 00:32:44,720
experience having this crew up there

862
00:32:48,950 --> 00:32:47,200
having a a crew on the space station of

863
00:32:51,590 --> 00:32:48,960

nine people instead of just the usual

864

00:32:53,269 --> 00:32:51,600

six um it gave us an opportunity to to

865

00:32:55,029 --> 00:32:53,279

hang out together

866

00:32:58,389 --> 00:32:55,039

to do some good science

867

00:33:00,230 --> 00:32:58,399

and to celebrate our cultures

868

00:33:01,590 --> 00:33:00,240

but after 10 days it was time to say

869

00:33:03,029 --> 00:33:01,600

goodbye and for all of you that have

870

00:33:05,590 --> 00:33:03,039

guests at your house it's always fun to

871

00:33:07,750 --> 00:33:05,600

say hello but it's always good to wave

872

00:33:09,830 --> 00:33:07,760

goodbye as well here's scott's trying to

873

00:33:15,509 --> 00:33:09,840

sneak a ride home early we had to call

874

00:33:19,590 --> 00:33:17,269

in addition to these vehicles that come

875

00:33:21,509 --> 00:33:19,600

up with crew on board we also have cargo

876

00:33:24,389 --> 00:33:21,519

vehicles constantly visiting the space

877

00:33:26,389 --> 00:33:24,399

station bringing food equipment

878

00:33:29,029 --> 00:33:26,399

scientific experiments and other

879

00:33:31,669 --> 00:33:29,039

supplies and so just a day before the

880

00:33:34,549 --> 00:33:31,679

end of my mission we had the the orbital

881

00:33:35,990 --> 00:33:34,559

atk cygnus vehicle cargo vehicle visit

882

00:33:38,870 --> 00:33:36,000

and i actually got to use the robotic

883

00:33:41,830 --> 00:33:38,880

arm there to grab it so video games do

884

00:33:46,950 --> 00:33:43,590

and

885

00:33:48,389 --> 00:33:46,960

exciting but also a very busy time

886

00:33:51,029 --> 00:33:48,399

because it

887

00:33:53,269 --> 00:33:51,039

it requires takes about 30 days to

888

00:33:55,110 --> 00:33:53,279

unload all that cargo off of the the

889

00:33:57,350 --> 00:33:55,120

cargo vehicle to find a place for it in

890

00:33:59,350 --> 00:33:57,360

the space station and then to pack that

891

00:34:01,110 --> 00:33:59,360

cargo vehicle back up with all the trash

892

00:34:03,350 --> 00:34:01,120

that we have on the space station for it

893

00:34:04,789 --> 00:34:03,360

to ultimately burn up in the atmosphere

894

00:34:06,470 --> 00:34:04,799

on re-entry

895

00:34:12,230 --> 00:34:06,480

and we can actually turn the music up

896

00:34:15,669 --> 00:34:13,510

um so

897

00:34:18,629 --> 00:34:15,679

in addition to that orbital atk vehicle

898

00:34:20,629 --> 00:34:18,639

we had a japanese htv cargo vehicle

899

00:34:22,389 --> 00:34:20,639

visit and kimia actually got to capture

900

00:34:25,430 --> 00:34:22,399

that one which was terrific he was the

901
00:34:28,629 --> 00:34:25,440
first japanese crew member to capture a

902
00:34:30,950 --> 00:34:28,639
japanese cargo vehicle

903
00:34:32,629 --> 00:34:30,960
and for any of those of you who do a lot

904
00:34:33,829 --> 00:34:32,639
of packing and unpacking you can you

905
00:34:35,510 --> 00:34:33,839
probably do this too i made a little

906
00:34:36,710 --> 00:34:35,520
tape ball you can see it flying by there

907
00:34:37,589 --> 00:34:36,720
in the background

908
00:34:39,589 --> 00:34:37,599
um

909
00:34:42,230 --> 00:34:39,599
but like i said at the end of uh at the

910
00:34:43,909 --> 00:34:42,240
end of the cargo mission we

911
00:34:45,909 --> 00:34:43,919
we pull that cargo vehicle back off the

912
00:34:47,589 --> 00:34:45,919
space station and send it back to earth

913
00:34:50,389 --> 00:34:47,599

to burn up in the earth's atmosphere and

914

00:34:52,869 --> 00:34:50,399

my youngest boy likes to say that one

915

00:34:54,869 --> 00:34:52,879

man's dirty underwear is another man's

916

00:34:56,149 --> 00:34:54,879

shooting star

917

00:35:12,790 --> 00:34:56,159

so

918

00:35:15,349 --> 00:35:12,800

cargo vehicle ops one of the most

919

00:35:16,390 --> 00:35:15,359

amazing experiences that i had during my

920

00:35:18,630 --> 00:35:16,400

expedition

921

00:35:21,030 --> 00:35:18,640

uh was the opportunity to do a space

922

00:35:23,990 --> 00:35:21,040

walk in fact two space walks with scott

923

00:35:25,910 --> 00:35:24,000

kelly we spend hundreds of hours in the

924

00:35:27,430 --> 00:35:25,920

neutral buoyancy laboratory the six

925

00:35:29,510 --> 00:35:27,440

million gallon pool that we have at

926
00:35:31,589 --> 00:35:29,520
johnson space center with a mock-up of

927
00:35:33,829 --> 00:35:31,599
the space station in it practicing how

928
00:35:36,390 --> 00:35:33,839
to use the suit how to use the equipment

929
00:35:37,829 --> 00:35:36,400
and how to stay safe during a spacewalk

930
00:35:39,910 --> 00:35:37,839
it takes two weeks to get all the

931
00:35:42,390 --> 00:35:39,920
equipment ready inside the space station

932
00:35:44,390 --> 00:35:42,400
and then ultimately the day that of suit

933
00:35:46,790 --> 00:35:44,400
up comes where we suit up

934
00:35:48,630 --> 00:35:46,800
and kimia puts us into the crew lock and

935
00:35:52,230 --> 00:35:48,640
locks us inside

936
00:35:55,829 --> 00:35:53,990
another one of those profound memories

937
00:35:57,510 --> 00:35:55,839
that i have of my mission

938
00:35:58,790 --> 00:35:57,520

was that first time when i opened the

939

00:36:01,910 --> 00:35:58,800

hatch

940

00:36:03,910 --> 00:36:01,920

and looked down at the earth

941

00:36:06,069 --> 00:36:03,920

rotating slowly below

942

00:36:07,030 --> 00:36:06,079

um and getting to see that full face of

943

00:36:09,829 --> 00:36:07,040

the earth

944

00:36:11,670 --> 00:36:09,839

uh in my ho in my full in my full vision

945

00:36:12,630 --> 00:36:11,680

and separated from that cold void of

946

00:36:15,510 --> 00:36:12,640

space

947

00:36:17,829 --> 00:36:15,520

by just a thin piece of plastic

948

00:36:19,430 --> 00:36:17,839

it is an amazing opportunity to get to

949

00:36:20,870 --> 00:36:19,440

to do a space walk

950

00:36:24,710 --> 00:36:20,880

and it's an experience that i will never

951
00:36:26,069 --> 00:36:24,720
forget but it is also uh the hardest

952
00:36:28,790 --> 00:36:26,079
thing that i've ever done mentally and

953
00:36:31,190 --> 00:36:28,800
physically um and so

954
00:36:32,790 --> 00:36:31,200
there's a great sense of satisfaction

955
00:36:35,190 --> 00:36:32,800
going outside

956
00:36:42,150 --> 00:36:35,200
successfully and safely uh performing

957
00:36:45,910 --> 00:36:44,470
it is uh

958
00:36:47,270 --> 00:36:45,920
it really drives home when you're

959
00:36:50,710 --> 00:36:47,280
outside

960
00:36:52,550 --> 00:36:50,720
that if there is an emergency if you get

961
00:36:54,710 --> 00:36:52,560
tied up in your safety harness or in

962
00:36:56,710 --> 00:36:54,720
your in your safety tether

963
00:36:58,710 --> 00:36:56,720

um if you get struck by a micro

964

00:37:01,270 --> 00:36:58,720

meteorite and develop a hole in your

965

00:37:03,349 --> 00:37:01,280

suit and start to lose pressure

966

00:37:04,550 --> 00:37:03,359

that uh that you have an amazing team on

967

00:37:07,349 --> 00:37:04,560

the ground

968

00:37:10,150 --> 00:37:07,359

that will feed you procedures until you

969

00:37:11,750 --> 00:37:10,160

uh what what's what's next we have an

970

00:37:13,109 --> 00:37:11,760

amazing crew inside the space station

971

00:37:14,069 --> 00:37:13,119

that are keeping track of what we're

972

00:37:15,829 --> 00:37:14,079

doing

973

00:37:16,950 --> 00:37:15,839

but if there is an issue outside it's

974

00:37:19,750 --> 00:37:16,960

just you

975

00:37:23,430 --> 00:37:19,760

and your spacewalking partner out there

976
00:37:24,390 --> 00:37:23,440
uh to get out of that bind um and and so

977
00:37:26,550 --> 00:37:24,400
we are

978
00:37:28,550 --> 00:37:26,560
amazingly grateful for the incredible

979
00:37:30,790 --> 00:37:28,560
training that we receive on the ground

980
00:37:40,870 --> 00:37:30,800
uh and the support we receive from our

981
00:37:44,470 --> 00:37:42,390
and of course at the end of your

982
00:37:46,150 --> 00:37:44,480
spacewalk

983
00:37:51,190 --> 00:37:46,160
you take a selfie

984
00:37:55,589 --> 00:37:53,589
so that's the work of space that's the

985
00:37:57,750 --> 00:37:55,599
cargo ops that's the maintenance that's

986
00:38:00,710 --> 00:37:57,760
the science that we do on the space

987
00:38:02,710 --> 00:38:00,720
station my favorite part of being in

988
00:38:05,829 --> 00:38:02,720

this a part of this long duration

989

00:38:07,670 --> 00:38:05,839

mission was getting to really learn what

990

00:38:12,230 --> 00:38:07,680

it's like to live and work in that

991

00:38:15,750 --> 00:38:13,910

to be in in this environment so

992

00:38:18,790 --> 00:38:15,760

completely different than what we grew

993

00:38:20,310 --> 00:38:18,800

up in uh in gravity all the time and so

994

00:38:23,270 --> 00:38:20,320

we have to do all the things that we do

995

00:38:24,550 --> 00:38:23,280

on earth uh in the morning i shave and

996

00:38:25,990 --> 00:38:24,560

so you don't need to use shaving cream

997

00:38:32,470 --> 00:38:26,000

in space you just squirt water in your

998

00:38:36,310 --> 00:38:35,030

this is how you get rid of uh bed head

999

00:38:38,790 --> 00:38:36,320

in the morning

1000

00:38:40,630 --> 00:38:38,800

or sleeping bag head

1001
00:38:43,510 --> 00:38:40,640
this is how you wash your hair in space

1002
00:38:45,270 --> 00:38:43,520
we have a no rinse shampoo squirt it on

1003
00:38:47,109 --> 00:38:45,280
lather it up

1004
00:38:50,390 --> 00:38:47,119
and then at the end you just dry it off

1005
00:38:54,870 --> 00:38:52,550
now i cut my own hair on the ground so i

1006
00:38:57,829 --> 00:38:54,880
cut my own hair in space and ended up

1007
00:38:59,109 --> 00:38:57,839
cutting everybody else's hair too

1008
00:39:01,030 --> 00:38:59,119
what they didn't know is that i only

1009
00:39:03,270 --> 00:39:01,040
know one haircut so

1010
00:39:04,630 --> 00:39:03,280
they all ended up with my haircut

1011
00:39:06,870 --> 00:39:04,640
there's our crew quarters that's where

1012
00:39:08,790 --> 00:39:06,880
we sleep and and spend our our private

1013
00:39:10,710 --> 00:39:08,800

time

1014

00:39:12,950 --> 00:39:10,720

i tested the patient of my crewmates by

1015

00:39:15,030 --> 00:39:12,960

playing the bagpipes in space and

1016

00:39:16,950 --> 00:39:15,040

and here i'm doing a little demo of the

1017

00:39:19,349 --> 00:39:16,960

sleeping bag scott thought i looked like

1018

00:39:21,589 --> 00:39:19,359

a great tackling dummy so he took

1019

00:39:28,390 --> 00:39:21,599

advantage of me there

1020

00:39:32,870 --> 00:39:30,950

now i love coffee our coffee in space is

1021

00:39:35,430 --> 00:39:32,880

pretty good i actually miss it but we

1022

00:39:37,270 --> 00:39:35,440

it's dehydrated and it's in a pouch like

1023

00:39:38,630 --> 00:39:37,280

a capri sun pouch and so

1024

00:39:40,150 --> 00:39:38,640

you don't get half of the experience you

1025

00:39:41,270 --> 00:39:40,160

don't have to smell the aroma of the

1026

00:39:44,069 --> 00:39:41,280

coffee so

1027

00:39:45,910 --> 00:39:44,079

uh and in addition is this

1028

00:39:47,349 --> 00:39:45,920

the air space museum is well aware of

1029

00:39:50,310 --> 00:39:47,359

all the first all the great firsts have

1030

00:39:52,390 --> 00:39:50,320

been taken first man or woman in space

1031

00:39:54,150 --> 00:39:52,400

first person on the moon so i decided i

1032

00:39:56,630 --> 00:39:54,160

would brew the first cup of coffee in

1033

00:39:58,630 --> 00:39:56,640

space um and so i took these pods of

1034

00:40:00,310 --> 00:39:58,640

coffee up with me draw took some hot

1035

00:40:01,109 --> 00:40:00,320

water off of our galley and pushed that

1036

00:40:01,990 --> 00:40:01,119

through

1037

00:40:03,670 --> 00:40:02,000

uh

1038

00:40:06,550 --> 00:40:03,680

into a cup and brewed the first

1039

00:40:13,910 --> 00:40:06,560

handcrafted pour over in space and it

1040

00:40:17,910 --> 00:40:15,990

we like it's fun to play with

1041

00:40:20,309 --> 00:40:17,920

stuff in space and so here this is a

1042

00:40:23,349 --> 00:40:20,319

ball of water that's got an alka-seltzer

1043

00:40:25,510 --> 00:40:23,359

and some food coloring in it um

1044

00:40:27,270 --> 00:40:25,520

here we just you just let water go and

1045

00:40:28,870 --> 00:40:27,280

float around a little bit

1046

00:40:30,390 --> 00:40:28,880

it's absolutely amazing and this is what

1047

00:40:32,069 --> 00:40:30,400

you might do if you're

1048

00:40:35,510 --> 00:40:32,079

adventurous and want to wash your face

1049

00:40:38,710 --> 00:40:37,190

and you can see over time how surface

1050

00:40:41,510 --> 00:40:38,720

tension is just going to carry this

1051
00:40:43,750 --> 00:40:41,520
across my face

1052
00:40:49,670 --> 00:40:43,760
this is also how you can drown in just

1053
00:40:49,680 --> 00:40:54,870
or blow bubbles

1054
00:40:57,750 --> 00:40:56,470
this is our dinner table so you can see

1055
00:41:00,630 --> 00:40:57,760
all the condiments there but you can see

1056
00:41:02,710 --> 00:41:00,640
that everything is velcroed or taped or

1057
00:41:04,309 --> 00:41:02,720
tucked under a bungee because you do not

1058
00:41:06,790 --> 00:41:04,319
want to be the guy that loses the hot

1059
00:41:08,470 --> 00:41:06,800
sauce you were in big trouble

1060
00:41:10,069 --> 00:41:08,480
um i'm making breakfast that was

1061
00:41:11,510 --> 00:41:10,079
scrambled eggs here's some sausage

1062
00:41:15,109 --> 00:41:11,520
patties

1063
00:41:16,230 --> 00:41:15,119

for a breakfast burrito

1064

00:41:18,550 --> 00:41:16,240

you can see i'm trying to lose the

1065

00:41:20,390 --> 00:41:18,560

mustard there but meal times were a

1066

00:41:22,309 --> 00:41:20,400

unique time to gather together with our

1067

00:41:23,589 --> 00:41:22,319

crew we would get together on friday

1068

00:41:24,710 --> 00:41:23,599

nights with our russian colleagues to

1069

00:41:25,829 --> 00:41:24,720

share dinner

1070

00:41:37,349 --> 00:41:25,839

and then

1071

00:41:39,109 --> 00:41:37,359

we talked a little bit about what do we

1072

00:41:41,349 --> 00:41:39,119

do to goof around a little bit so

1073

00:41:43,190 --> 00:41:41,359

definitely in our free time um we would

1074

00:41:48,550 --> 00:41:43,200

have little competitions this is called

1075

00:41:52,309 --> 00:41:50,150

threw the hatch into node two without

1076
00:41:55,030 --> 00:41:52,319
hitting anything it's a really long name

1077
00:42:00,790 --> 00:41:55,040
for a game but uh

1078
00:42:03,990 --> 00:42:02,390
and i know i made it there

1079
00:42:06,069 --> 00:42:04,000
i was pretty excited that was the first

1080
00:42:11,109 --> 00:42:06,079
time i ever pulled it off i was glad i

1081
00:42:15,430 --> 00:42:13,349
and we like to kind of recreate things

1082
00:42:18,069 --> 00:42:15,440
also from the movies that have inspired

1083
00:42:21,510 --> 00:42:18,079
us here i'm doing a little 2001 trying

1084
00:42:23,670 --> 00:42:21,520
to run around the spacecraft

1085
00:42:26,630 --> 00:42:23,680
turns out running is pretty hard so i go

1086
00:42:27,829 --> 00:42:26,640
to bicycling instead

1087
00:42:29,990 --> 00:42:27,839
and of course you can do those two

1088
00:42:31,430 --> 00:42:30,000

things on earth

1089

00:42:33,589 --> 00:42:31,440

this is pretty cool as soon as i stopped

1090

00:42:37,990 --> 00:42:33,599

bicycling i stopped moving but can you

1091

00:42:41,750 --> 00:42:39,670

so running and bicycling are hard work

1092

00:42:47,430 --> 00:42:41,760

so i just go to doing somersaults

1093

00:42:50,950 --> 00:42:49,670

but the thing that i think most of us

1094

00:42:52,470 --> 00:42:50,960

truly enjoy

1095

00:42:54,630 --> 00:42:52,480

um is

1096

00:42:56,790 --> 00:42:54,640

taking advantage of this amazing orbital

1097

00:42:58,630 --> 00:42:56,800

platform and enjoying the perspective

1098

00:43:01,829 --> 00:42:58,640

that we have from the space station

1099

00:43:03,670 --> 00:43:01,839

looking down at our absolutely gorgeous

1100

00:43:06,309 --> 00:43:03,680

blue and white

1101

00:43:09,349 --> 00:43:06,319

uh home our planet the earth

1102

00:43:11,510 --> 00:43:09,359

and so we have a beautiful window in the

1103

00:43:14,550 --> 00:43:11,520

in the lab a scientific window where we

1104

00:43:15,990 --> 00:43:14,560

can take video and pictures of forest

1105

00:43:17,349 --> 00:43:16,000

fires

1106

00:43:19,589 --> 00:43:17,359

of the

1107

00:43:20,630 --> 00:43:19,599

constantly changing uh tapestry of

1108

00:43:22,630 --> 00:43:20,640

clouds

1109

00:43:26,309 --> 00:43:22,640

of the the earth at night

1110

00:43:27,750 --> 00:43:26,319

storms in aurora

1111

00:43:29,349 --> 00:43:27,760

we have another window called the cupola

1112

00:43:31,190 --> 00:43:29,359

this is a seven bay window that kind of

1113

00:43:33,190 --> 00:43:31,200

bubbles out from the space station and

1114

00:43:36,309 --> 00:43:33,200

you can stick your head in that window

1115

00:43:38,069 --> 00:43:36,319

and see the entire face of the earth

1116

00:43:40,470 --> 00:43:38,079

and so it's an amazing place to take

1117

00:43:43,750 --> 00:43:40,480

photos and video but also an amazing

1118

00:43:45,430 --> 00:43:43,760

place to just float and reflect on this

1119

00:43:47,270 --> 00:43:45,440

once in a lifetime opportunity of

1120

00:43:48,870 --> 00:43:47,280

getting to live and work

1121

00:43:50,470 --> 00:43:48,880

on this modern

1122

00:43:54,470 --> 00:43:50,480

marvel of engineering that we have the

1123

00:43:58,150 --> 00:43:56,309

an opportunity to look back at the earth

1124

00:44:00,790 --> 00:43:58,160

again whether you're flying over the

1125

00:44:02,069 --> 00:44:00,800

same place twice it's always different

1126

00:44:05,190 --> 00:44:02,079

different weather different lighting

1127

00:44:06,950 --> 00:44:05,200

different seasons it's always gorgeous

1128

00:44:09,109 --> 00:44:06,960

to see the contrast between the deep

1129

00:44:11,430 --> 00:44:09,119

blues of the ocean and the tans of the

1130

00:44:14,790 --> 00:44:11,440

continents to fly over africa and the

1131

00:44:16,390 --> 00:44:14,800

deep browns and uh and in tans of that

1132

00:44:18,069 --> 00:44:16,400

continent

1133

00:44:21,750 --> 00:44:18,079

unfortunately we can see forest fires

1134

00:44:23,109 --> 00:44:21,760

and deforestation we can see pollution

1135

00:44:25,750 --> 00:44:23,119

and the effect that humanity's had on

1136

00:44:27,589 --> 00:44:25,760

the earth but we also get to see uh

1137

00:44:30,390 --> 00:44:27,599

gorgeous sites like the turquoise blue

1138

00:44:32,950 --> 00:44:30,400

of the caribbean and the dazzling whites

1139

00:44:35,349 --> 00:44:32,960

of the glaciers and snow on the

1140

00:44:37,190 --> 00:44:35,359

mountains of the south america you can

1141

00:44:38,630 --> 00:44:37,200

see amazing views like

1142

00:44:41,190 --> 00:44:38,640

storm systems like hurricanes and

1143

00:44:43,589 --> 00:44:41,200

typhoons you can watch the moon set and

1144

00:44:45,670 --> 00:44:43,599

if you stayed awake for 24 hours you

1145

00:44:47,910 --> 00:44:45,680

would be able to see 16 sunrises and

1146

00:44:50,550 --> 00:44:47,920

sunsets as we go around the earth every

1147

00:44:53,109 --> 00:44:50,560

92 minutes

1148

00:44:55,190 --> 00:44:53,119

but my easily my favorite view was to

1149

00:44:57,510 --> 00:44:55,200

look at the earth at night especially

1150

00:44:59,190 --> 00:44:57,520

flying over aurora it's the only time

1151
00:45:00,150 --> 00:44:59,200
that i got goosebumps on the space

1152
00:45:03,589 --> 00:45:00,160
station

1153
00:45:07,030 --> 00:45:03,599
flying over this dazzling neon cloud of

1154
00:45:09,349 --> 00:45:07,040
green purple and uh and reds

1155
00:45:12,069 --> 00:45:09,359
um and occasionally the lighting is is

1156
00:45:14,870 --> 00:45:12,079
perfect to see uh this beautiful milky

1157
00:45:18,390 --> 00:45:14,880
way that we are a part of

1158
00:45:20,950 --> 00:45:18,400
but for our crew at the end of 141 days

1159
00:45:23,030 --> 00:45:20,960
and for scott 340 days in space it meant

1160
00:45:25,990 --> 00:45:23,040
that our expedition came to an end now

1161
00:45:27,670 --> 00:45:26,000
that's a bittersweet time because uh it

1162
00:45:29,430 --> 00:45:27,680
means that

1163
00:45:31,270 --> 00:45:29,440

our time on the space station with our

1164

00:45:32,790 --> 00:45:31,280

friends our crewmates our colleagues is

1165

00:45:35,030 --> 00:45:32,800

coming to an end

1166

00:45:37,349 --> 00:45:35,040

that this experience to get to view the

1167

00:45:39,910 --> 00:45:37,359

earth from that perspective to be a part

1168

00:45:41,910 --> 00:45:39,920

of this incredible space station team

1169

00:45:44,470 --> 00:45:41,920

both on orbit and on the ground is

1170

00:45:46,550 --> 00:45:44,480

coming to an end but that day comes and

1171

00:45:48,470 --> 00:45:46,560

of course we are eager to return back to

1172

00:45:50,870 --> 00:45:48,480

the earth uh to see our family and

1173

00:45:53,190 --> 00:45:50,880

friends um so that when that day comes

1174

00:45:55,589 --> 00:45:53,200

we bid farewell to our our friends to

1175

00:45:57,670 --> 00:45:55,599

our crewmates but we get into our soyuz

1176

00:45:59,589 --> 00:45:57,680

spacecraft and we close the hatch

1177

00:46:01,030 --> 00:45:59,599

and after about an hour and a half two

1178

00:46:03,109 --> 00:46:01,040

hours after we've checked to make sure

1179

00:46:04,550 --> 00:46:03,119

that all the seals are holding that our

1180

00:46:06,550 --> 00:46:04,560

spacecraft and our spacesuits are

1181

00:46:08,950 --> 00:46:06,560

working properly we'll undock from the

1182

00:46:10,390 --> 00:46:08,960

space station and spend about an hour

1183

00:46:12,309 --> 00:46:10,400

and a half to two hours orbiting the

1184

00:46:14,550 --> 00:46:12,319

earth until we do our deorbit burn and

1185

00:46:17,030 --> 00:46:14,560

that deorbit burn slows the spacecraft's

1186

00:46:19,030 --> 00:46:17,040

orbit enough to dip our trajectory into

1187

00:46:20,309 --> 00:46:19,040

the atmosphere to slow us down to

1188

00:46:21,190 --> 00:46:20,319

decelerate

1189

00:46:22,630 --> 00:46:21,200

um

1190

00:46:24,230 --> 00:46:22,640

and when you look outside during that

1191

00:46:27,109 --> 00:46:24,240

deceleration as we're plummeting through

1192

00:46:30,230 --> 00:46:27,119

the atmosphere we are being enveloped in

1193

00:46:32,309 --> 00:46:30,240

a sheet of superheated air of plasma and

1194

00:46:34,230 --> 00:46:32,319

those sparks flying by are pieces of our

1195

00:46:37,109 --> 00:46:34,240

spaceship so that of course is a little

1196

00:46:39,589 --> 00:46:37,119

disconcerting but uh but the spaceship

1197

00:46:41,270 --> 00:46:39,599

works amazingly well the parachute comes

1198

00:46:43,270 --> 00:46:41,280

out and slows us down and carries us

1199

00:46:44,390 --> 00:46:43,280

down to the earth until we impact the

1200

00:46:46,069 --> 00:46:44,400

ground

1201

00:46:47,990 --> 00:46:46,079

which represents our landing back on

1202

00:46:50,230 --> 00:46:48,000

earth then after about 20 minutes the

1203

00:46:52,950 --> 00:46:50,240

search and rescue forces were there to

1204

00:46:54,790 --> 00:46:52,960

open the hatch and to pull us out and we

1205

00:46:57,349 --> 00:46:54,800

were all feeling great

1206

00:46:59,030 --> 00:46:57,359

they pulled us out sat us out to do some

1207

00:47:01,030 --> 00:46:59,040

quick medical tests and then put us into

1208

00:47:03,510 --> 00:47:01,040

a helicopter took us to a regional

1209

00:47:05,750 --> 00:47:03,520

airport where a nasa jet was waiting for

1210

00:47:08,470 --> 00:47:05,760

us and within 24 hours of landing in

1211

00:47:11,190 --> 00:47:08,480

kazakhstan in late december we were back

1212

00:47:13,109 --> 00:47:11,200

in ellington uh near in houston at

1213

00:47:14,150 --> 00:47:13,119

ellington field back in the arms of our

1214

00:47:16,950 --> 00:47:14,160

family

1215

00:47:19,589 --> 00:47:16,960

so that uh that was my

1216

00:47:21,270 --> 00:47:19,599

that was my five months uh my amazing

1217

00:47:23,910 --> 00:47:21,280

five months in space that's been a part

1218

00:47:30,230 --> 00:47:23,920

of a an overall extraordinary journey

1219

00:47:36,549 --> 00:47:31,910

wow

1220

00:47:39,030 --> 00:47:36,559

and and so as just kind of a book into

1221

00:47:41,910 --> 00:47:39,040

your earlier comments uh valerie i

1222

00:47:44,710 --> 00:47:41,920

wanted to tell you that i am very happy

1223

00:47:48,230 --> 00:47:44,720

that uh to fulfill my promise from my

1224

00:47:50,630 --> 00:47:48,240

phone message i am happy to return um

1225

00:47:53,990 --> 00:47:50,640

this gemini

1226

00:47:57,030 --> 00:47:54,000

gemini 4 patch to you and also this

1227

00:47:58,470 --> 00:47:57,040

national air and space museum flag um

1228

00:48:00,470 --> 00:47:58,480

i'd like to

1229

00:48:04,390 --> 00:48:00,480

we i flew this in celebration of the

1230

00:48:07,030 --> 00:48:04,400

50th anniversary of of ed white ii very

1231

00:48:08,390 --> 00:48:07,040

first american spacewalk 50 years ago

1232

00:48:10,150 --> 00:48:08,400

and then

1233

00:48:11,990 --> 00:48:10,160

i flew this in celebration of the

1234

00:48:14,390 --> 00:48:12,000

national air and space museum's 40th

1235

00:48:16,069 --> 00:48:14,400

birthday so thank you so much

1236

00:48:19,589 --> 00:48:16,079

thank you

1237

00:48:24,870 --> 00:48:22,150

uh i think we'll move to some uh more

1238

00:48:27,270 --> 00:48:24,880

questions and uh just wanted to make the

1239

00:48:29,670 --> 00:48:27,280

point before we do that that you ended

1240

00:48:33,829 --> 00:48:29,680

with these beautiful images of our

1241

00:48:36,870 --> 00:48:33,839

beautiful planet and uh jill had the

1242

00:48:40,870 --> 00:48:36,880

task and the honor while he was in space

1243

00:48:43,910 --> 00:48:40,880

to use an imax camera to film

1244

00:48:46,549 --> 00:48:43,920

these incredible vistas of earth and

1245

00:48:47,910 --> 00:48:46,559

that new imax film opens here this

1246

00:48:50,470 --> 00:48:47,920

weekend

1247

00:48:53,030 --> 00:48:50,480

it's called a beautiful planet

1248

00:48:55,109 --> 00:48:53,040

jill is in the film so if you come back

1249

00:48:57,270 --> 00:48:55,119

any time in the next few months to see

1250

00:49:00,069 --> 00:48:57,280

the movie you'll get to

1251

00:49:27,750 --> 00:49:00,079

see chill again in that

1252

00:49:27,760 --> 00:49:31,270

sure

1253

00:49:35,430 --> 00:49:33,829

of course no it's a great question so we

1254

00:49:37,670 --> 00:49:35,440

do amazing things on the international

1255

00:49:39,270 --> 00:49:37,680

space station the science and research

1256

00:49:41,270 --> 00:49:39,280

um that we're doing

1257

00:49:43,109 --> 00:49:41,280

uh to make life better back here on

1258

00:49:45,510 --> 00:49:43,119

earth the operational knowledge that

1259

00:49:47,510 --> 00:49:45,520

we're gaining to extend our presence in

1260

00:49:49,829 --> 00:49:47,520

the in the solar system hopefully

1261

00:49:51,910 --> 00:49:49,839

someday to to make that journey to mars

1262

00:49:53,270 --> 00:49:51,920

is critically important but i think that

1263

00:49:55,829 --> 00:49:53,280

the greatest benefit that we have

1264

00:49:58,230 --> 00:49:55,839

derived from this project

1265

00:50:00,790 --> 00:49:58,240

is the international cooperation uh the

1266

00:50:03,829 --> 00:50:00,800

participation of countries all over the

1267

00:50:05,829 --> 00:50:03,839

world of astronauts engineers scientists

1268

00:50:07,750 --> 00:50:05,839

from all over the world in this project

1269

00:50:09,990 --> 00:50:07,760

is really a demonstration of what we're

1270

00:50:12,069 --> 00:50:10,000

able to do when as great countries we

1271

00:50:14,069 --> 00:50:12,079

come together to work on a peaceful

1272

00:50:16,150 --> 00:50:14,079

project in cooperation and in

1273

00:50:18,069 --> 00:50:16,160

collaboration rather

1274

00:50:19,910 --> 00:50:18,079

than against each other and so i think

1275

00:50:22,309 --> 00:50:19,920

that that is uh truly the greatest

1276

00:50:24,309 --> 00:50:22,319

benefit of uh um

1277

00:50:25,430 --> 00:50:24,319

of the international space station and

1278

00:50:28,069 --> 00:50:25,440

that's the way that we're going to do

1279

00:50:30,950 --> 00:50:28,079

future exploration no one company no one

1280

00:50:33,750 --> 00:50:30,960

country uh can undertake the tasks that

1281

00:50:36,710 --> 00:50:33,760

lie ahead um to go to mars it's going to

1282

00:50:38,950 --> 00:50:36,720

require the best and brightest of all of

1283

00:50:40,549 --> 00:50:38,960

our countries the contribution of all of

1284

00:50:43,270 --> 00:50:40,559

our countries working together to pull

1285

00:50:45,510 --> 00:50:43,280

off that monumental task

1286

00:50:48,710 --> 00:50:45,520

and so i i truly believe that we are the

1287

00:50:49,990 --> 00:50:48,720

best when we're working together and so

1288

00:50:51,510 --> 00:50:50,000

and that's why i'm excited to be here

1289

00:50:53,430 --> 00:50:51,520

today to have the opportunity to talk

1290

00:50:54,710 --> 00:50:53,440

with students i see a lot of kids here

1291

00:50:56,069 --> 00:50:54,720

in the audience

1292

00:50:57,990 --> 00:50:56,079

this is the generation that's going to

1293

00:50:59,990 --> 00:50:58,000

take us to mars this is the generation

1294

00:51:01,270 --> 00:51:00,000

that's going to inspire us it's the

1295

00:51:02,230 --> 00:51:01,280

generation that's going to build the

1296

00:51:03,829 --> 00:51:02,240

rockets

1297

00:51:05,750 --> 00:51:03,839

that take us out of low earth orbit

1298

00:51:08,069 --> 00:51:05,760

again the generation that is going to

1299

00:51:10,309 --> 00:51:08,079

put that first footprint on mars and so

1300

00:51:12,549 --> 00:51:10,319

uh for the young young kids in the crowd

1301

00:51:15,270 --> 00:51:12,559

i i just i can't emphasize enough how

1302

00:51:17,030 --> 00:51:15,280

important it is to read um reading is a

1303

00:51:18,950 --> 00:51:17,040

portal to the knowledge that is

1304

00:51:20,630 --> 00:51:18,960

necessary um

1305

00:51:23,109 --> 00:51:20,640

to get to the point where you're gonna

1306

00:51:24,870 --> 00:51:23,119

be competitive to become an astronaut

1307

00:51:27,589 --> 00:51:24,880

and then for for the other kids in the

1308

00:51:29,030 --> 00:51:27,599

audience uh just pursuing your passion

1309

00:51:31,430 --> 00:51:29,040

your talents

1310

00:51:33,990 --> 00:51:31,440

especially within the stem disciplines

1311

00:51:36,230 --> 00:51:34,000

science technology engineering and math

1312

00:51:38,069 --> 00:51:36,240

um that is the language of a space

1313

00:51:41,109 --> 00:51:38,079

flight and so you have to be fluent in

1314

00:51:43,030 --> 00:51:41,119

that language and uh and so pursue that

1315

00:51:45,589 --> 00:51:43,040

passion make that goal

1316

00:51:48,710 --> 00:51:45,599

commit to it do something every day to

1317

00:51:50,390 --> 00:51:48,720

advance uh to to to pursue you know to

1318

00:51:52,950 --> 00:51:50,400

to make your way on that path on that

1319

00:51:55,349 --> 00:51:52,960

journey to that destination um and i'm

1320

00:51:57,750 --> 00:51:55,359

very excited to see some of these these

1321

00:51:59,829 --> 00:51:57,760

faces exploring with us in the future

1322

00:52:01,430 --> 00:51:59,839

thanks okay i think we have an online

1323

00:52:04,470 --> 00:52:01,440

question okay great let's see what's

1324

00:52:06,549 --> 00:52:04,480

coming in from outside um now that

1325

00:52:09,750 --> 00:52:06,559

you're back what's the best piece of

1326
00:52:11,510 --> 00:52:09,760
advice that a veteran astronaut gave you

1327
00:52:13,510 --> 00:52:11,520
before you left earth

1328
00:52:15,349 --> 00:52:13,520
that's interesting yeah let's see there

1329
00:52:18,710 --> 00:52:15,359
are a couple of things one

1330
00:52:20,950 --> 00:52:18,720
i would share three things um first of

1331
00:52:23,510 --> 00:52:20,960
all is to take time for yourself to

1332
00:52:25,430 --> 00:52:23,520
enjoy the experience i think once we get

1333
00:52:26,950 --> 00:52:25,440
up there to have that amazing

1334
00:52:29,109 --> 00:52:26,960
perspective from the space station to

1335
00:52:31,190 --> 00:52:29,119
look back at the earth and to see these

1336
00:52:33,349 --> 00:52:31,200
amazing views we immediately want to

1337
00:52:35,670 --> 00:52:33,359
share them we immediately grab for a

1338
00:52:38,150 --> 00:52:35,680

camera a still camera or a video camera

1339

00:52:40,230 --> 00:52:38,160

and want to film those and so uh some

1340

00:52:42,150 --> 00:52:40,240

great advice that i got was at least

1341

00:52:43,990 --> 00:52:42,160

once a day leave the camera behind

1342

00:52:45,750 --> 00:52:44,000

regardless of what you're looking at and

1343

00:52:48,150 --> 00:52:45,760

just float there and experience it with

1344

00:52:50,790 --> 00:52:48,160

your own eyes and enjoy that experience

1345

00:52:52,710 --> 00:52:50,800

because i think we are so we are so busy

1346

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

up there and so eager to share the

1347

00:52:58,829 --> 00:52:54,480

experience that sometimes we miss some

1348

00:53:04,309 --> 00:53:01,829

um and then uh i guess a second piece of

1349

00:53:06,470 --> 00:53:04,319

advice was to to leave some reserve you

1350

00:53:08,470 --> 00:53:06,480

know again we're so busy up there and i

1351
00:53:10,950 --> 00:53:08,480
think that sometimes we will uh cheat

1352
00:53:13,190 --> 00:53:10,960
ourselves on on sleep a little bit just

1353
00:53:14,870 --> 00:53:13,200
to to fit every as much in to a day as

1354
00:53:16,549 --> 00:53:14,880
we can

1355
00:53:18,950 --> 00:53:16,559
to really protect that sleep so that we

1356
00:53:20,710 --> 00:53:18,960
don't get tired we don't get fatigued

1357
00:53:22,630 --> 00:53:20,720
so that we can do the job that we're

1358
00:53:24,790 --> 00:53:22,640
supposed to be doing up there but also

1359
00:53:26,150 --> 00:53:24,800
leaving a little bit in reserve both in

1360
00:53:28,069 --> 00:53:26,160
the space station and during our

1361
00:53:30,069 --> 00:53:28,079
spacewalks because there's always a

1362
00:53:32,790 --> 00:53:30,079
chance of an emergency

1363
00:53:34,870 --> 00:53:32,800

and uh and so

1364

00:53:36,150 --> 00:53:34,880

you have to have enough reserve to be

1365

00:53:37,990 --> 00:53:36,160

able to deal with those unexpected

1366

00:53:39,430 --> 00:53:38,000

situations coming up i think those are

1367

00:53:41,589 --> 00:53:39,440

probably the two best pieces of advice

1368

00:53:43,510 --> 00:53:41,599

that i got and with respect to sharing

1369

00:53:45,990 --> 00:53:43,520

you were very active on social media

1370

00:53:48,710 --> 00:53:46,000

weren't you twitter i think not as

1371

00:53:51,510 --> 00:53:48,720

active as some but um i tried to find

1372

00:53:54,069 --> 00:53:51,520

something at least every every day or so

1373

00:53:55,750 --> 00:53:54,079

that really stood out to me in terms of

1374

00:53:58,230 --> 00:53:55,760

the experience that we were having or

1375

00:53:59,670 --> 00:53:58,240

maybe a photo that i had taken to again

1376

00:54:01,589 --> 00:53:59,680

share that experience with friends

1377

00:54:03,430 --> 00:54:01,599

family and people interested in what we

1378

00:54:06,870 --> 00:54:03,440

were doing and that's really an amazing

1379

00:54:09,430 --> 00:54:06,880

aspect of social media you know

1380

00:54:11,510 --> 00:54:09,440

previously in previous missions

1381

00:54:12,870 --> 00:54:11,520

before social media you know of all the

1382

00:54:14,470 --> 00:54:12,880

pictures that we took there was somebody

1383

00:54:16,470 --> 00:54:14,480

on the ground at nasa that kind of

1384

00:54:18,710 --> 00:54:16,480

curated those pictures and maybe chose

1385

00:54:19,990 --> 00:54:18,720

out one and posted it to a nasa website

1386

00:54:21,670 --> 00:54:20,000

and so if you were interested in what we

1387

00:54:24,150 --> 00:54:21,680

were doing you had to go to a nasa

1388

00:54:25,829 --> 00:54:24,160

website to find that picture and now we

1389

00:54:28,150 --> 00:54:25,839

get to choose those photos we get to

1390

00:54:30,309 --> 00:54:28,160

choose those experiences and and really

1391

00:54:31,670 --> 00:54:30,319

share them within minutes of

1392

00:54:33,670 --> 00:54:31,680

of taking or experiencing that

1393

00:54:35,829 --> 00:54:33,680

particular view a great way to bring

1394

00:54:39,750 --> 00:54:35,839

space flight down to earth absolutely

1395

00:54:42,870 --> 00:54:41,589

what exactly was my mission that is a

1396

00:54:43,750 --> 00:54:42,880

great question

1397

00:54:45,510 --> 00:54:43,760

so

1398

00:54:47,990 --> 00:54:45,520

we are all trained

1399

00:54:50,150 --> 00:54:48,000

so whether you're a doctor an engineer

1400

00:54:52,309 --> 00:54:50,160

or a pilot we all get trained to do the

1401
00:54:54,630 --> 00:54:52,319
same stuff so we get trained to do the

1402
00:54:56,950 --> 00:54:54,640
science on the space station to do

1403
00:54:58,710 --> 00:54:56,960
maintenance to do space walks to use the

1404
00:55:00,309 --> 00:54:58,720
robotic arm

1405
00:55:01,750 --> 00:55:00,319
to do all of those things and so we

1406
00:55:04,069 --> 00:55:01,760
aren't in charge of our schedule the

1407
00:55:05,990 --> 00:55:04,079
ground spends hours and hours figuring

1408
00:55:08,069 --> 00:55:06,000
out the what the priorities are and

1409
00:55:09,589 --> 00:55:08,079
figuring out the best way to do things

1410
00:55:12,630 --> 00:55:09,599
and then basically

1411
00:55:14,390 --> 00:55:12,640
creates a schedule for us to do so it's

1412
00:55:15,910 --> 00:55:14,400
it's it's hard work

1413
00:55:17,750 --> 00:55:15,920

but we get great training we have a

1414

00:55:19,670 --> 00:55:17,760

great team it's amazing to be a part of

1415

00:55:22,150 --> 00:55:19,680

such an amazing team

1416

00:55:24,069 --> 00:55:22,160

at nasa and with our international

1417

00:55:26,069 --> 00:55:24,079

partners

1418

00:55:27,910 --> 00:55:26,079

to be successful at these very

1419

00:55:31,349 --> 00:55:27,920

challenging tasks

1420

00:55:36,710 --> 00:55:33,349

what did i eat in space well i ate

1421

00:55:39,349 --> 00:55:36,720

lettuce you probably saw that right yeah

1422

00:55:41,270 --> 00:55:39,359

and then our other food is

1423

00:55:43,829 --> 00:55:41,280

half of it is this this sounds really

1424

00:55:46,069 --> 00:55:43,839

appetizing thermostabilized and

1425

00:55:47,670 --> 00:55:46,079

irradiated so it's

1426

00:55:50,950 --> 00:55:47,680

prepared it's already prepared and it's

1427

00:55:52,870 --> 00:55:50,960

in these in these sealed bags and so you

1428

00:55:54,470 --> 00:55:52,880

basically go to the pantry and you

1429

00:55:57,190 --> 00:55:54,480

choose out well i'm gonna have i'm gonna

1430

00:55:58,069 --> 00:55:57,200

have beef stroganoff today or beefsteak

1431

00:55:59,670 --> 00:55:58,079

or

1432

00:56:02,230 --> 00:55:59,680

grilled chicken and you stick it in the

1433

00:56:03,109 --> 00:56:02,240

food warmer and then the other half is

1434

00:56:05,750 --> 00:56:03,119

uh

1435

00:56:07,030 --> 00:56:05,760

dehydrated and so a lot of our desserts

1436

00:56:08,870 --> 00:56:07,040

and snacks and those sorts of things are

1437

00:56:11,030 --> 00:56:08,880

dehydrated so we put either hot and cold

1438

00:56:12,710 --> 00:56:11,040

water in there depending on what the

1439

00:56:14,150 --> 00:56:12,720

food is supposed to be like and that's

1440

00:56:16,150 --> 00:56:14,160

what makes up our menu and they do a

1441

00:56:17,430 --> 00:56:16,160

pretty good job of variety for us but

1442

00:56:19,430 --> 00:56:17,440

unfortunately once you've been up there

1443

00:56:20,950 --> 00:56:19,440

for several weeks the menu starts to

1444

00:56:25,109 --> 00:56:20,960

repeat itself and

1445

00:56:30,230 --> 00:56:26,630

thank you for that question

1446

00:56:33,430 --> 00:56:30,240

all right thank you to our audience here

1447

00:56:35,510 --> 00:56:33,440

in the museum our audience online and

1448

00:56:36,870 --> 00:56:35,520

our audience on television for joining

1449

00:56:39,910 --> 00:56:36,880

us today

1450

00:56:41,990 --> 00:56:39,920

thank you to boeing our sponsor

1451

00:56:44,470 --> 00:56:42,000

for this program but most of all thank

1452

00:56:46,950 --> 00:56:44,480

you to astronaut joe lindgren for

1453

00:56:48,870 --> 00:56:46,960

spending this hour with us and sharing

1454

00:56:50,870 --> 00:56:48,880

your experience so well thank you so

1455

00:56:55,829 --> 00:56:50,880

much it's been a thrill who wants to go

1456

00:56:59,349 --> 00:56:57,349

well i want to i want to thank you for

1457

00:57:02,390 --> 00:56:59,359

having me today uh thank you for

1458

00:57:03,829 --> 00:57:02,400

inspiring me and uh my colleagues to to

1459

00:57:06,309 --> 00:57:03,839

chase this dream and thank you for

1460

00:57:07,910 --> 00:57:06,319

inspiring uh our future explorers thank