



1
00:00:08,310 --> 00:00:02,629
station this is houston are you ready

2
00:00:12,709 --> 00:00:10,790
houston we are ready for the event

3
00:00:14,950 --> 00:00:12,719
houston chronicle this mission control

4
00:00:28,550 --> 00:00:14,960
houston please call station for a voice

5
00:00:33,750 --> 00:00:30,070
station this is the houston chronicle

6
00:00:39,830 --> 00:00:36,950
houston chronicle space station here we

7
00:00:40,950 --> 00:00:39,840
hear you loud and clear

8
00:00:49,670 --> 00:00:40,960
well

9
00:00:51,910 --> 00:00:49,680
have you here

10
00:00:53,430 --> 00:00:51,920
thank you uh i know andre and don are

11
00:00:54,869 --> 00:00:53,440
going to be coming home

12
00:00:57,270 --> 00:00:54,879
in the not too distant future and i want

13
00:00:58,389 --> 00:00:57,280

to tell you guys it was 105 in houston

14

00:01:03,990 --> 00:00:58,399

this week how much are you looking

15

00:01:06,950 --> 00:01:04,869

well

16

00:01:09,910 --> 00:01:06,960

it's it's a nice

17

00:01:12,230 --> 00:01:09,920

21 degrees centigrade up here and it's

18

00:01:14,710 --> 00:01:12,240

been been that way ever since we showed

19

00:01:16,710 --> 00:01:14,720

up so so we're living in an isothermal

20

00:01:18,469 --> 00:01:16,720

environment

21

00:01:23,670 --> 00:01:18,479

yeah it's so it's a constant temperature

22

00:01:27,429 --> 00:01:25,429

pretty much there there are some

23

00:01:29,030 --> 00:01:27,439

locations that are hotter by a few

24

00:01:31,270 --> 00:01:29,040

degrees and some locations that are

25

00:01:34,789 --> 00:01:31,280

cooler by a few degrees but pretty much

26

00:01:36,789 --> 00:01:34,799

it's isothermal which sounds nice but

27

00:01:39,510 --> 00:01:36,799

when you're used to temperature swings

28

00:01:40,710 --> 00:01:39,520

on earth it it's interesting how much

29

00:01:43,670 --> 00:01:40,720

you miss

30

00:01:46,230 --> 00:01:43,680

having having a a bit of cold or a bit

31

00:01:48,069 --> 00:01:46,240

of hot or a bit of medium

32

00:01:51,990 --> 00:01:48,079

when the temperatures are the same every

33

00:01:55,030 --> 00:01:52,000

single day uh day in day out uh it it's

34

00:01:56,789 --> 00:01:55,040

it's a different kind of a sensation

35

00:02:06,830 --> 00:01:56,799

yeah what other things like that have

36

00:02:13,190 --> 00:02:10,070

there well what i notice is uh the fact

37

00:02:16,470 --> 00:02:13,200

that uh after a while uh microgravity

38

00:02:18,869 --> 00:02:16,480

becomes so normal that uh the the the

39

00:02:19,830 --> 00:02:18,879

special aspect is a bit lost and all of

40

00:02:20,630 --> 00:02:19,840

a sudden

41

00:02:22,390 --> 00:02:20,640

uh

42

00:02:24,390 --> 00:02:22,400

if i have a pen floating in front of me

43

00:02:27,190 --> 00:02:24,400

i think well this is strange this pen is

44

00:02:29,910 --> 00:02:27,200

floating so even after 190 days

45

00:02:32,150 --> 00:02:29,920

sometimes i still can't get surprised by

46

00:02:34,550 --> 00:02:32,160

the fact that that we float because

47

00:02:37,509 --> 00:02:34,560

we're so used to fix things

48

00:02:39,270 --> 00:02:37,519

because floating is actually uh a bit uh

49

00:02:41,270 --> 00:02:39,280

well dangerous because you can lose

50

00:02:43,910 --> 00:02:41,280

things so i'm so used to fixing things

51
00:02:45,589 --> 00:02:43,920
fixing myself that uh now and then when

52
00:02:48,390 --> 00:02:45,599
i see something floating i think well

53
00:02:50,790 --> 00:02:48,400
this is very special actually

54
00:02:51,990 --> 00:02:50,800
that's that's interesting um so down

55
00:02:54,150 --> 00:02:52,000
here on the ground there's been talk

56
00:02:55,589 --> 00:02:54,160
about possibly adding another astronaut

57
00:02:57,350 --> 00:02:55,599
to the crew

58
00:03:08,710 --> 00:02:57,360
i assume there's plenty of room up there

59
00:03:11,430 --> 00:03:10,070
yeah we're i guess we're a little bit

60
00:03:13,430 --> 00:03:11,440
out of the loop up here we've heard a

61
00:03:14,790 --> 00:03:13,440
little bit about that um

62
00:03:17,110 --> 00:03:14,800
you know the resources we'll have

63
00:03:19,670 --> 00:03:17,120

available um you know you get used to

64

00:03:22,149 --> 00:03:19,680

having the three of us here on the us os

65

00:03:23,910 --> 00:03:22,159

side and i'll be alone here shortly uh

66

00:03:25,910 --> 00:03:23,920

when these two gentlemen take off on

67

00:03:27,589 --> 00:03:25,920

saturday but uh if they want to send a

68

00:03:29,110 --> 00:03:27,599

fourth person up here to help us work

69

00:03:30,830 --> 00:03:29,120

that'd be great

70

00:03:33,509 --> 00:03:30,840

what about

71

00:03:35,270 --> 00:03:33,519

soyuz would there be would there be the

72

00:03:39,110 --> 00:03:35,280

ability to do a lot more science i would

73

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

uh it would certainly help the the more

74

00:03:46,869 --> 00:03:43,760

bodies we have up here the

75

00:03:50,309 --> 00:03:46,879

the the more we can distribute the work

76

00:03:53,670 --> 00:03:50,319

uh and and and specialize in some

77

00:03:55,429 --> 00:03:53,680

respects so that that some folks focus

78

00:03:58,789 --> 00:03:55,439

on some aspects of science and some

79

00:04:00,789 --> 00:03:58,799

folks focus on on fixing the systems and

80

00:04:04,390 --> 00:04:00,799

you can get that kind of specialization

81

00:04:07,190 --> 00:04:04,400

when the crew size gets larger and

82

00:04:10,070 --> 00:04:07,200

what's interesting is what crew size do

83

00:04:11,509 --> 00:04:10,080

you need to have a full-time cook it's

84

00:04:13,830 --> 00:04:11,519

interesting to look at scientific

85

00:04:15,750 --> 00:04:13,840

expeditions going out and and at what

86

00:04:17,590 --> 00:04:15,760

point do you need to have a full-time

87

00:04:19,349 --> 00:04:17,600

cook so that everybody else can

88

00:04:21,110 --> 00:04:19,359

concentrate on getting the

89

00:04:22,790 --> 00:04:21,120

the science mission done that's

90

00:04:25,830 --> 00:04:22,800

interesting

91

00:04:28,390 --> 00:04:25,840

so i was blown away a few weeks ago by a

92

00:04:30,790 --> 00:04:28,400

photo that andre took of the himalayas

93

00:04:32,310 --> 00:04:30,800

above the cloud layer i i wonder what

94

00:04:33,990 --> 00:04:32,320

you thought of when you when you saw

95

00:04:40,310 --> 00:04:34,000

that from space because the photo you

96

00:04:45,430 --> 00:04:42,870

well i have to say that the the earth is

97

00:04:46,950 --> 00:04:45,440

amazing every day uh that is a bit every

98

00:04:50,070 --> 00:04:46,960

time i look out the window it's

99

00:04:52,950 --> 00:04:50,080

fantastic and uh it's it's you try and

100

00:04:55,189 --> 00:04:52,960

do your best to to to capture that that

101
00:04:57,990 --> 00:04:55,199
feeling that sensation that you have

102
00:05:00,310 --> 00:04:58,000
and i'm glad that was uh

103
00:05:02,469 --> 00:05:00,320
such a nice picture but uh there are

104
00:05:04,710 --> 00:05:02,479
plenty plenty more of such great

105
00:05:06,390 --> 00:05:04,720
pictures taken by every crew here on the

106
00:05:08,550 --> 00:05:06,400
space station because

107
00:05:10,469 --> 00:05:08,560
uh every time you look at the planet

108
00:05:13,350 --> 00:05:10,479
it's awesome

109
00:05:16,310 --> 00:05:13,360
well yes uh don i saw some amazing time

110
00:05:18,070 --> 00:05:16,320
lapse photography by don um most of this

111
00:05:19,909 --> 00:05:18,080
is taken from the cupola i guess it's

112
00:05:21,350 --> 00:05:19,919
allowed these these photographs to be

113
00:05:24,629 --> 00:05:21,360

taken or do you get them from elsewhere

114

00:05:30,710 --> 00:05:28,150

uh the cupola is is the the prime place

115

00:05:32,790 --> 00:05:30,720

for doing earth observations

116

00:05:34,469 --> 00:05:32,800

other windows are available the these

117

00:05:36,550 --> 00:05:34,479

these windows right behind us here in

118

00:05:39,270 --> 00:05:36,560

the the jpm module

119

00:05:41,830 --> 00:05:39,280

are our outstanding windows to

120

00:05:42,710 --> 00:05:41,840

uh take pictures of earth

121

00:05:44,870 --> 00:05:42,720

through

122

00:05:45,510 --> 00:05:44,880

and there are pictures there are windows

123

00:05:48,469 --> 00:05:45,520

in

124

00:05:51,029 --> 00:05:48,479

the russian segment that are also uh

125

00:05:52,550 --> 00:05:51,039

excellent windows to take pictures of

126

00:05:53,990 --> 00:05:52,560

earth

127

00:06:00,710 --> 00:05:54,000

what's the most amazing thing you've

128

00:06:04,230 --> 00:06:02,550

gosh that's like asking what's your

129

00:06:05,430 --> 00:06:04,240

favorite food it kind of depends on your

130

00:06:08,070 --> 00:06:05,440

mood

131

00:06:10,070 --> 00:06:08,080

probably the transit of venus has is

132

00:06:12,070 --> 00:06:10,080

pretty high on the list

133

00:06:14,070 --> 00:06:12,080

the solar eclipse is another one this is

134

00:06:16,469 --> 00:06:14,080

my second solar eclipse i've seen both

135

00:06:18,790 --> 00:06:16,479

of them have been from space

136

00:06:21,430 --> 00:06:18,800

and and then aurora borealis aurora

137

00:06:24,309 --> 00:06:21,440

australialis is just amazing each

138

00:06:26,309 --> 00:06:24,319

display is different and and captivates

139

00:06:28,870 --> 00:06:26,319

you and then there's polar mesospheric

140

00:06:31,590 --> 00:06:28,880

clouds also known as noctilucent clouds

141

00:06:35,110 --> 00:06:31,600

these are another favorite hobby science

142

00:06:36,629 --> 00:06:35,120

area of mine and this mission i've been

143

00:06:38,950 --> 00:06:36,639

fortunate enough to see both southern

144

00:06:41,110 --> 00:06:38,960

hemisphere clouds which are only visible

145

00:06:44,469 --> 00:06:41,120

during the winter time and now we're

146

00:06:46,710 --> 00:06:44,479

into the summertime northern hemisphere

147

00:06:49,670 --> 00:06:46,720

noctilucent cloud season so to be able

148

00:06:52,950 --> 00:06:49,680

to see both of these clouds in in one

149

00:06:55,110 --> 00:06:52,960

mission i think is a real treat

150

00:06:57,430 --> 00:06:55,120

so there was a lot of attention uh with

151
00:06:58,870 --> 00:06:57,440
the spacex docking uh from your

152
00:07:02,070 --> 00:06:58,880
perspective

153
00:07:03,430 --> 00:07:02,080
uh did everything go okay and and

154
00:07:08,790 --> 00:07:03,440
excited to see more missions from them

155
00:07:13,909 --> 00:07:11,749
yeah it was a great moment and uh as you

156
00:07:17,189 --> 00:07:13,919
as you know we train for all kind of

157
00:07:19,990 --> 00:07:17,199
difficult situations and in reality it

158
00:07:23,350 --> 00:07:20,000
went very smooth so that was a

159
00:07:25,749 --> 00:07:23,360
very very great moment for for everybody

160
00:07:27,670 --> 00:07:25,759
everybody was of course tense first time

161
00:07:28,710 --> 00:07:27,680
how will it behave

162
00:07:31,029 --> 00:07:28,720
so

163
00:07:32,950 --> 00:07:31,039

yeah it was we realized that it was a

164

00:07:34,790 --> 00:07:32,960

special moment and uh

165

00:07:36,550 --> 00:07:34,800

this will be the future of spaceflight

166

00:07:38,950 --> 00:07:36,560

there will be commercial companies uh

167

00:07:41,510 --> 00:07:38,960

taking over and that's the idea the

168

00:07:44,070 --> 00:07:41,520

agencies will continue to explore and go

169

00:07:46,950 --> 00:07:44,080

further and then commercial uh an

170

00:07:50,309 --> 00:07:46,960

industry on on the ground will take over

171

00:07:52,790 --> 00:07:50,319

uh uh yeah the use of a low earth orbit

172

00:07:55,189 --> 00:07:52,800

so i think this was uh a great moment

173

00:07:57,670 --> 00:07:55,199

the first step of a new era

174

00:07:59,990 --> 00:07:57,680

any do any of you think i'd like to

175

00:08:01,189 --> 00:08:00,000

i hope in the future

176

00:08:03,830 --> 00:08:01,199

i'd like to add that i hope in the

177

00:08:07,589 --> 00:08:03,840

future that these things become so

178

00:08:10,230 --> 00:08:07,599

routine that uh that journalists just go

179

00:08:12,710 --> 00:08:10,240

ho-hum another visiting commercial

180

00:08:15,029 --> 00:08:12,720

vehicles docking the space station and

181

00:08:18,070 --> 00:08:15,039

and they'll hardly take note and and

182

00:08:21,430 --> 00:08:18,080

that i think would be the sign of of the

183

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

technology moving in the right direction

184

00:08:24,950 --> 00:08:23,520

did any of you uh think that wow one day

185

00:08:32,310 --> 00:08:24,960

i'll probably be flying on one of these

186

00:08:36,469 --> 00:08:34,550

i think we've all thought about that and

187

00:08:38,310 --> 00:08:36,479

of course we all want to come back to

188

00:08:40,550 --> 00:08:38,320

the space station it's a wonderful place

189

00:08:42,310 --> 00:08:40,560

to to live and to work

190

00:08:44,630 --> 00:08:42,320

and to see dragon come up here and it

191

00:08:46,310 --> 00:08:44,640

performed flawlessly and it was a you

192

00:08:48,630 --> 00:08:46,320

know great success

193

00:08:51,269 --> 00:08:48,640

if we can utilize that service to get uh

194

00:08:53,110 --> 00:08:51,279

astronauts up here to continue the work

195

00:08:54,470 --> 00:08:53,120

and maybe someday we can even you know

196

00:08:56,470 --> 00:08:54,480

get more people up here we've talked

197

00:08:58,630 --> 00:08:56,480

about that also that we're very

198

00:09:01,590 --> 00:08:58,640

fortunate to be here and if more people

199

00:09:03,509 --> 00:09:01,600

can experience that you know the better

200

00:09:06,470 --> 00:09:03,519

so so finally don i wanted to ask you i

201
00:09:07,590 --> 00:09:06,480
saw your diary of a space zucchini and i

202
00:09:09,430 --> 00:09:07,600
was just wondering if the the

203
00:09:14,870 --> 00:09:09,440
personification of vegetables is a

204
00:09:18,310 --> 00:09:17,430
you know it may very well be that among

205
00:09:20,790 --> 00:09:18,320
other

206
00:09:22,790 --> 00:09:20,800
various disorders uh

207
00:09:24,710 --> 00:09:22,800
uh

208
00:09:27,750 --> 00:09:24,720
that's an interesting thought probably

209
00:09:29,430 --> 00:09:27,760
it's probably space dementia

210
00:09:34,630 --> 00:09:29,440
hey guys thanks very much have a great

211
00:09:38,389 --> 00:09:36,630
station this is houston acr that

212
00:09:40,470 --> 00:09:38,399
concludes the houston chronicle portion

213
00:09:44,310 --> 00:09:40,480

of the event please stand by for a voice

214

00:09:50,310 --> 00:09:46,230

station this is national public radio

215

00:09:56,070 --> 00:09:54,230

npr we hear you loud and clear

216

00:10:00,790 --> 00:09:56,080

i hear you guys loud and clear too it's

217

00:10:05,590 --> 00:10:03,190

so expedition 31 flight engineers joe

218

00:10:07,750 --> 00:10:05,600

acaba andre kuipers and don pettit

219

00:10:10,230 --> 00:10:07,760

thanks for talking to us from space

220

00:10:11,990 --> 00:10:10,240

today don pettit and andre kuipers

221

00:10:14,550 --> 00:10:12,000

you've been there i think about six

222

00:10:16,310 --> 00:10:14,560

months now are you ready to come home or

223

00:10:20,870 --> 00:10:16,320

does it feel like you've just just

224

00:10:26,230 --> 00:10:24,150

well actually i i think i'm i'm ready

225

00:10:29,509 --> 00:10:26,240

because i like to see the family again

226

00:10:31,350 --> 00:10:29,519

so that's a long period but there's so

227

00:10:32,550 --> 00:10:31,360

much things to see so much things to do

228

00:10:35,990 --> 00:10:32,560

that

229

00:10:38,470 --> 00:10:36,000

to stay longer or better to come back

230

00:10:40,310 --> 00:10:38,480

here it would be great to be up here uh

231

00:10:43,430 --> 00:10:40,320

to serve two three weeks a year as a

232

00:10:44,870 --> 00:10:43,440

holiday after this so it's a fantastic

233

00:10:47,430 --> 00:10:44,880

place and

234

00:10:50,630 --> 00:10:47,440

yeah i have to go back but

235

00:10:54,389 --> 00:10:52,630

and i just ran out of vitamin

236

00:10:56,790 --> 00:10:54,399

supplements so i figured it's time for

237

00:10:59,350 --> 00:10:56,800

me to go home

238

00:11:05,190 --> 00:10:59,360

don better walk us through uh how you'll

239

00:11:12,870 --> 00:11:09,110

we we will get in our soyuz spacecraft

240

00:11:15,430 --> 00:11:12,880

and under the command of oleg kononenko

241

00:11:18,069 --> 00:11:15,440

and andre kuipers will be flight

242

00:11:20,150 --> 00:11:18,079

engineer one and or board engineer one

243

00:11:22,230 --> 00:11:20,160

and i'm board engineer two

244

00:11:24,389 --> 00:11:22,240

and uh we work

245

00:11:26,949 --> 00:11:24,399

together to

246

00:11:29,110 --> 00:11:26,959

get this spacecraft back home

247

00:11:31,269 --> 00:11:29,120

starting off with undocking well we we

248

00:11:33,110 --> 00:11:31,279

start off we we get inside we close the

249

00:11:35,190 --> 00:11:33,120

hatch we have to do a leak check make

250

00:11:36,790 --> 00:11:35,200

sure the hatches don't leak

251
00:11:39,190 --> 00:11:36,800
and then we

252
00:11:42,470 --> 00:11:39,200
we strap in and undock

253
00:11:43,750 --> 00:11:42,480
and then we do a deorbit burn

254
00:11:46,310 --> 00:11:43,760
and then

255
00:11:48,790 --> 00:11:46,320
as we hit the atmosphere the spacecraft

256
00:11:51,030 --> 00:11:48,800
separates so that only the the descent

257
00:11:53,110 --> 00:11:51,040
module comes comes through the

258
00:11:56,870 --> 00:11:53,120
atmosphere in one piece and then our

259
00:11:58,870 --> 00:11:56,880
parachute comes out and we go

260
00:12:01,190 --> 00:11:58,880
thump roll roll on the steps of

261
00:12:03,030 --> 00:12:01,200
kazakhstan

262
00:12:05,990 --> 00:12:03,040
that is amazing

263
00:12:11,430 --> 00:12:06,000

um what is this centaur garment that i

264

00:12:15,110 --> 00:12:13,590

oh the cantavr

265

00:12:16,550 --> 00:12:15,120

uh

266

00:12:18,310 --> 00:12:16,560

the catawba

267

00:12:21,269 --> 00:12:18,320

think of it as a

268

00:12:25,030 --> 00:12:21,279

spandex on steroids

269

00:12:27,030 --> 00:12:25,040

and and it's uh and it it's this tight

270

00:12:30,389 --> 00:12:27,040

garment that just goes around uh it's

271

00:12:33,509 --> 00:12:30,399

like a a pair of boxer shorts uh uh for

272

00:12:35,829 --> 00:12:33,519

for your your uh waist area and then you

273

00:12:37,430 --> 00:12:35,839

have another spandex thing that goes

274

00:12:39,190 --> 00:12:37,440

around your calf

275

00:12:41,590 --> 00:12:39,200

and then when you wear this medical

276
00:12:43,750 --> 00:12:41,600
harness you kind of look like you walk

277
00:12:44,949 --> 00:12:43,760
from the scene of gladiator

278
00:12:47,750 --> 00:12:44,959
and then

279
00:12:49,350 --> 00:12:47,760
and and what this does is it keeps the

280
00:12:51,350 --> 00:12:49,360
lower part of your body from getting

281
00:12:52,710 --> 00:12:51,360
bloated with all the water running

282
00:12:53,509 --> 00:12:52,720
downhill

283
00:12:55,670 --> 00:12:53,519
uh

284
00:12:59,670 --> 00:12:55,680
after after we've returned to earth so

285
00:13:02,550 --> 00:12:59,680
so it has a medical purpose to it

286
00:13:05,350 --> 00:13:02,560
not your everyday spanx i guess

287
00:13:07,910 --> 00:13:05,360
um joe acaba andre kuipers you've been

288
00:13:09,750 --> 00:13:07,920

studying the human condition in space

289

00:13:17,190 --> 00:13:09,760

have you found any differences in how

290

00:13:20,389 --> 00:13:19,110

well i think there's a lot of different

291

00:13:21,750 --> 00:13:20,399

things that happened to us while we're

292

00:13:24,230 --> 00:13:21,760

up here of course you're all familiar

293

00:13:25,750 --> 00:13:24,240

with the the fluid shift and when you

294

00:13:28,230 --> 00:13:25,760

say astronauts have big heads it's

295

00:13:30,150 --> 00:13:28,240

really uh it's a physical uh feature

296

00:13:31,110 --> 00:13:30,160

that we have while we're up here

297

00:13:32,870 --> 00:13:31,120

um

298

00:13:34,230 --> 00:13:32,880

but the body it's amazing to me i've

299

00:13:36,629 --> 00:13:34,240

been here for about a month now how

300

00:13:38,790 --> 00:13:36,639

quickly you do adapt to being up in

301

00:13:41,750 --> 00:13:38,800

space and after just a few days it's

302

00:13:44,470 --> 00:13:41,760

just a natural environment to be in

303

00:13:46,150 --> 00:13:44,480

really what about your senses do you do

304

00:13:48,310 --> 00:13:46,160

you find that when you drop things you

305

00:13:52,949 --> 00:13:48,320

still look down or do you acclimate to

306

00:13:56,870 --> 00:13:55,509

well we get used to it but it's still

307

00:13:58,949 --> 00:13:56,880

it's still uh

308

00:14:01,590 --> 00:13:58,959

sometimes troublesome if if you lose

309

00:14:04,230 --> 00:14:01,600

something how to to to find it back also

310

00:14:06,550 --> 00:14:04,240

because you you tend to focus on on the

311

00:14:08,870 --> 00:14:06,560

walls and the floors and it might it may

312

00:14:11,269 --> 00:14:08,880

just be floating just in front of it and

313

00:14:12,790 --> 00:14:11,279

you might just miss it it's amazing how

314

00:14:15,189 --> 00:14:12,800

you can look around for something which

315

00:14:17,430 --> 00:14:15,199

is right in front of you so that's still

316

00:14:20,310 --> 00:14:17,440

going on and i think our brain has a

317

00:14:22,949 --> 00:14:20,320

hard time uh to deal with uh with

318

00:14:25,110 --> 00:14:22,959

the the three dimensions uh but we are

319

00:14:28,470 --> 00:14:25,120

uh we are careful to prevent it so

320

00:14:31,189 --> 00:14:28,480

everything we have we fix it with velcro

321

00:14:34,790 --> 00:14:31,199

with tape with bungee cords

322

00:14:37,350 --> 00:14:34,800

so we we are pretty good in preventing

323

00:14:38,949 --> 00:14:37,360

to uh to lose something

324

00:14:40,949 --> 00:14:38,959

you know one of our favorite topics on

325

00:14:43,110 --> 00:14:40,959

science friday are the microbes that

326

00:14:44,230 --> 00:14:43,120

live in and on us i wonder have you guys

327

00:14:47,269 --> 00:14:44,240

looked at

328

00:14:49,670 --> 00:14:47,279

how how microbes respond to space or if

329

00:14:52,069 --> 00:14:49,680

the same microorganisms live with us

330

00:14:56,389 --> 00:14:52,079

when we're in when you're on space

331

00:15:00,790 --> 00:14:58,470

you know i think the microbes are with

332

00:15:03,829 --> 00:15:00,800

us whether we like it or not

333

00:15:04,550 --> 00:15:03,839

and uh and as far as i know

334

00:15:09,269 --> 00:15:04,560

the

335

00:15:12,310 --> 00:15:09,279

behavior of a single microbe in

336

00:15:14,550 --> 00:15:12,320

weightlessness is is probably close to

337

00:15:17,430 --> 00:15:14,560

what it is in gravity what may be

338

00:15:20,150 --> 00:15:17,440

different would be cultures if you had a

339

00:15:22,870 --> 00:15:20,160

tank of fluid filled with some kind of

340

00:15:24,949 --> 00:15:22,880

microbes they may clump

341

00:15:26,870 --> 00:15:24,959

in the absence of gravitational driven

342

00:15:28,550 --> 00:15:26,880

buoyancy forces

343

00:15:30,389 --> 00:15:28,560

they may clump in a manner that's

344

00:15:32,790 --> 00:15:30,399

different than uh the same culture

345

00:15:35,590 --> 00:15:32,800

growing on earth so there may be some

346

00:15:38,949 --> 00:15:35,600

interesting three-dimensional structure

347

00:15:42,230 --> 00:15:38,959

in colonies of microorganisms and that

348

00:15:45,430 --> 00:15:42,240

in in itself may uh affect the way the

349

00:15:47,269 --> 00:15:45,440

colony grows as a whole so you bring up

350

00:15:48,949 --> 00:15:47,279

an interesting question maybe maybe that

351

00:15:50,310 --> 00:15:48,959

could be a future saturday morning

352

00:15:52,550 --> 00:15:50,320

science

353

00:15:54,629 --> 00:15:52,560

i hope so so about a month ago we

354

00:15:56,470 --> 00:15:54,639

watched you guys capture the dragon and

355

00:15:57,990 --> 00:15:56,480

actually we literally watched you

356

00:15:59,749 --> 00:15:58,000

capture the dragon we huddled around

357

00:16:02,069 --> 00:15:59,759

this computer in the science friday

358

00:16:03,829 --> 00:16:02,079

office and you made it look just

359

00:16:05,749 --> 00:16:03,839

effortless but

360

00:16:11,829 --> 00:16:05,759

how was it for you was it was it a

361

00:16:15,110 --> 00:16:13,189

yeah i i think you could call it a

362

00:16:16,949 --> 00:16:15,120

stressful day in the office uh it's

363

00:16:19,749 --> 00:16:16,959

something that we'd practiced for

364

00:16:21,990 --> 00:16:19,759

and uh we practiced

365

00:16:24,710 --> 00:16:22,000

27 different ways with

366

00:16:27,030 --> 00:16:24,720

27 different kinds of malfunctions and

367

00:16:29,670 --> 00:16:27,040

what happens if a happens that we do b

368

00:16:32,470 --> 00:16:29,680

and and if b doesn't work we do c and

369

00:16:33,910 --> 00:16:32,480

and so on and so forth and

370

00:16:35,910 --> 00:16:33,920

and

371

00:16:38,069 --> 00:16:35,920

personally i was happy everything was

372

00:16:40,230 --> 00:16:38,079

nominal when you're working in a

373

00:16:42,629 --> 00:16:40,240

frontier like this you don't want to be

374

00:16:44,629 --> 00:16:42,639

a hero where where you jump up and save

375

00:16:47,829 --> 00:16:44,639

the day you'd rather have everything be

376

00:16:50,790 --> 00:16:47,839

nominal so that nobody has to be

377

00:16:53,509 --> 00:16:50,800

a hero and save the day and fortunately

378

00:16:56,069 --> 00:16:53,519

that's the way dragon turned out and it

379

00:16:57,990 --> 00:16:56,079

turned out that way primarily because of

380

00:16:59,590 --> 00:16:58,000

all the hard-working folks on the ground

381

00:17:05,110 --> 00:16:59,600

that had sharpened their pencils and

382

00:17:08,390 --> 00:17:06,710

we heard a lot about dragon but were

383

00:17:10,470 --> 00:17:08,400

there other events that happened in

384

00:17:12,710 --> 00:17:10,480

space station another top event that you

385

00:17:15,110 --> 00:17:12,720

think should have gotten gotten more

386

00:17:20,069 --> 00:17:15,120

more due that we haven't heard about as

387

00:17:25,189 --> 00:17:21,829

well uh

388

00:17:26,549 --> 00:17:25,199

we're doing a lot of fascinating science

389

00:17:28,950 --> 00:17:26,559

and

390

00:17:32,470 --> 00:17:28,960

sometimes that doesn't get as much uh

391

00:17:35,110 --> 00:17:32,480

headline news as these single events and

392

00:17:37,990 --> 00:17:35,120

i think one of the reasons why

393

00:17:41,190 --> 00:17:38,000

is that science in the process

394

00:17:43,590 --> 00:17:41,200

of being made isn't necessarily exciting

395

00:17:45,990 --> 00:17:43,600

in fact some people might call it boring

396

00:17:48,230 --> 00:17:46,000

if if you're sitting in front of a piece

397

00:17:50,230 --> 00:17:48,240

of scientific equipment maybe a glove

398

00:17:51,990 --> 00:17:50,240

box and you know your hands are poking

399

00:17:54,230 --> 00:17:52,000

in there and maybe you scratch your nose

400

00:17:55,430 --> 00:17:54,240

every so often with your shoulder

401
00:17:57,669 --> 00:17:55,440
because you can't because your hands are

402
00:17:59,750 --> 00:17:57,679
in the glove box and and you know

403
00:18:02,150 --> 00:17:59,760
someone watching you do that

404
00:18:03,990 --> 00:18:02,160
is just going to be bored but the

405
00:18:06,710 --> 00:18:04,000
science that's going on in the glove box

406
00:18:08,150 --> 00:18:06,720
may be really really exciting and

407
00:18:11,350 --> 00:18:08,160
and and so

408
00:18:13,990 --> 00:18:11,360
when the documentary is made in 10 years

409
00:18:16,230 --> 00:18:14,000
the professional journalists and actors

410
00:18:18,230 --> 00:18:16,240
will be able to make it exciting but but

411
00:18:20,710 --> 00:18:18,240
the the course of a real scientist doing

412
00:18:22,789 --> 00:18:20,720
real science it's i think it's pretty

413
00:18:24,870 --> 00:18:22,799

dry

414

00:18:27,590 --> 00:18:24,880

oh john i think you do you do a pretty

415

00:18:29,110 --> 00:18:27,600

good job to my mind so i i wondered are

416

00:18:31,270 --> 00:18:29,120

there um

417

00:18:33,430 --> 00:18:31,280

are there were there challenges to

418

00:18:35,669 --> 00:18:33,440

living in space station that you you

419

00:18:36,789 --> 00:18:35,679

hadn't foreseen or did this experience

420

00:18:43,669 --> 00:18:36,799

test you

421

00:18:47,750 --> 00:18:45,350

yeah i think there's a lot of challenges

422

00:18:49,190 --> 00:18:47,760

up here and i think you really notice it

423

00:18:51,190 --> 00:18:49,200

at the end of the day

424

00:18:52,950 --> 00:18:51,200

when you're really really tired like

425

00:18:54,630 --> 00:18:52,960

andre was saying before

426

00:18:56,710 --> 00:18:54,640

you always have to be aware of things

427

00:18:57,909 --> 00:18:56,720

that might float away if you're working

428

00:18:59,270 --> 00:18:57,919

a procedure

429

00:19:00,549 --> 00:18:59,280

you don't want to miss a step that could

430

00:19:01,669 --> 00:19:00,559

be critical that could break some

431

00:19:04,230 --> 00:19:01,679

equipment

432

00:19:05,590 --> 00:19:04,240

and so everything you do from when you

433

00:19:08,070 --> 00:19:05,600

wake up in the morning and you have

434

00:19:10,549 --> 00:19:08,080

breakfast using the bathroom

435

00:19:12,150 --> 00:19:10,559

to the procedures you do use all day

436

00:19:13,350 --> 00:19:12,160

it is really really tiring and i think

437

00:19:16,070 --> 00:19:13,360

that's the one of the biggest things

438

00:19:17,990 --> 00:19:16,080

that i noticed since i've been up here

439

00:19:21,110 --> 00:19:18,000

i think we have just a little under a

440

00:19:23,830 --> 00:19:21,120

minute left so maybe as a quick quick

441

00:19:26,070 --> 00:19:23,840

ender are there qualities that you would

442

00:19:27,750 --> 00:19:26,080

identify for a long-term mission now

443

00:19:31,270 --> 00:19:27,760

that you've spent so much time up in

444

00:19:36,950 --> 00:19:34,310

yes what i would do is any prospective

445

00:19:39,909 --> 00:19:36,960

crew member i would go and look in their

446

00:19:41,430 --> 00:19:39,919

garage and if their garage is a mass

447

00:19:43,990 --> 00:19:41,440

hodgepodge then that would be an

448

00:19:46,230 --> 00:19:44,000

automatic disqualifier if their garage

449

00:19:47,909 --> 00:19:46,240

is nice and neat then you know that they

450

00:19:49,669 --> 00:19:47,919

are going to be able to take care of all

451
00:19:52,710 --> 00:19:49,679
the equipment on space station and put

452
00:19:55,510 --> 00:19:52,720
everything away in its proper place

453
00:19:57,909 --> 00:19:55,520
thank you so much expedition 31 flight

454
00:20:00,150 --> 00:19:57,919
engineers joe acaba andre kuipers and

455
00:20:01,830 --> 00:20:00,160
don pettit thank you for talking to us

456
00:20:08,070 --> 00:20:01,840
on science friday from the international

457
00:20:13,190 --> 00:20:10,549
it's been a pleasure uh by now science

458
00:20:14,710 --> 00:20:13,200
fry is one of my favorite uh npr

459
00:20:16,870 --> 00:20:14,720
stations

460
00:20:21,110 --> 00:20:16,880
uh thank you don and safe trip back to

461
00:20:29,909 --> 00:20:23,750
station this is houston acr thank you

462
00:20:33,909 --> 00:20:31,590
thank you houston chronicle and national

463
00:20:36,470 --> 00:20:33,919

public radio station we're now resuming