



1  
00:00:05,990 --> 00:00:04,190  
good morning welcome to NASA's Johnson

2  
00:00:08,750 --> 00:00:06,000  
Space Center where we're joined today by

3  
00:00:11,240 --> 00:00:08,760  
astronauts Peggy Whitson and Jeff Jack

4  
00:00:13,580 --> 00:00:11,250  
Fisher who are just recently returned a

5  
00:00:15,379 --> 00:00:13,590  
little over a week ago from a long stay

6  
00:00:18,230 --> 00:00:15,389  
at the International Space Station they

7  
00:00:19,310 --> 00:00:18,240  
landed on September 2nd and are here to

8  
00:00:21,800 --> 00:00:19,320  
tell us a little bit about their time

9  
00:00:23,300 --> 00:00:21,810  
there Peggy spent about mine and half

10  
00:00:25,160 --> 00:00:23,310  
months in space and set several records

11  
00:00:27,109 --> 00:00:25,170  
along the way including the most

12  
00:00:29,200 --> 00:00:27,119  
cumulative time for a u.s. astronaut in

13  
00:00:31,250 --> 00:00:29,210

space six hundred and sixty-five days

14

00:00:33,200 --> 00:00:31,260

over three missions and the most

15

00:00:36,770 --> 00:00:33,210

consecutive time in space for a female

16

00:00:39,020 --> 00:00:36,780

astronaut 288 days on this mission and

17

00:00:40,549 --> 00:00:39,030

Jack joined the space station in April

18

00:00:43,459 --> 00:00:40,559

for his first trip to space and spend

19

00:00:48,590 --> 00:00:43,469

136 days there having the two of them

20

00:00:50,060 --> 00:00:48,600

his face together and the two of them in

21

00:00:51,950 --> 00:00:50,070

space together along with several other

22

00:00:53,869 --> 00:00:51,960

crew members he rotated in out in and

23

00:00:55,549 --> 00:00:53,879

out along the way let us get a lot of

24

00:00:57,770 --> 00:00:55,559

extra science done while they were there

25

00:00:59,510 --> 00:00:57,780

and now we're gonna let them tell us

26

00:01:01,660 --> 00:00:59,520

each a little bit about their their

27

00:01:04,399 --> 00:01:01,670

mission and then we'll take questions

28

00:01:06,590 --> 00:01:04,409

well we had a fantastic time working

29

00:01:09,289 --> 00:01:06,600

together onboard the space station we

30

00:01:12,710 --> 00:01:09,299

had lots of visiting vehicles over the

31

00:01:15,320 --> 00:01:12,720

time frame we had SpaceX's I think I

32

00:01:18,590 --> 00:01:15,330

were three when I was there and Cygnus

33

00:01:21,560 --> 00:01:18,600

which was great cargo vehicle I was

34

00:01:23,630 --> 00:01:21,570

really surprised by the size of that we

35

00:01:26,780 --> 00:01:23,640

were able to get a lot of trash in there

36

00:01:28,160 --> 00:01:26,790

we needed I'm thinking the the next guys

37

00:01:29,690 --> 00:01:28,170

are gonna be wishing they had their

38

00:01:30,920 --> 00:01:29,700

Cygnus a little sooner because I'm

39

00:01:34,880 --> 00:01:30,930

thinking they're gonna have a lot o

40

00:01:37,819 --> 00:01:34,890

trash but the time that erectus but we

41

00:01:39,859 --> 00:01:37,829

the you know we had opportunity to do

42

00:01:43,940 --> 00:01:39,869

some spacewalks which were always a

43

00:01:46,039 --> 00:01:43,950

blast and you know it was fun in

44

00:01:48,859 --> 00:01:46,049

addition to you know being one of those

45

00:01:50,960 --> 00:01:48,869

very challenging things to do physically

46

00:01:54,950 --> 00:01:50,970

mentally challenging things but it was a

47

00:01:57,830 --> 00:01:54,960

blast but I think this time the thing

48

00:01:59,660 --> 00:01:57,840

that impressed me the most was the

49

00:02:02,359 --> 00:01:59,670

quality and caliber of science that

50

00:02:06,050 --> 00:02:02,369

we're doing now I'm really was excited

51  
00:02:09,020 --> 00:02:06,060  
by it so I had a great time yeah it was

52  
00:02:12,360 --> 00:02:09,030  
great and and since Peggy already said

53  
00:02:15,180 --> 00:02:12,370  
everything we did I'm done no

54  
00:02:16,949 --> 00:02:15,190  
it's it was great to see and you know I

55  
00:02:19,680 --> 00:02:16,959  
don't have a lot of experience in space

56  
00:02:23,039 --> 00:02:19,690  
obviously but working as a Capcom for a

57  
00:02:26,039 --> 00:02:23,049  
long time I was able to see the the

58  
00:02:29,160 --> 00:02:26,049  
evolution of how we do operations on the

59  
00:02:31,949 --> 00:02:29,170  
space station and the team now is just

60  
00:02:34,500 --> 00:02:31,959  
so much more efficient I think we ended

61  
00:02:36,809 --> 00:02:34,510  
up a virgin like 60 hours of science a

62  
00:02:38,819 --> 00:02:36,819  
week with just the two of us which you

63  
00:02:41,009 --> 00:02:38,829

know back in the day 30 hours of science

64

00:02:43,170 --> 00:02:41,019

for a whole crew was really amazing but

65

00:02:45,720 --> 00:02:43,180

you're able to do that because they're

66

00:02:49,050 --> 00:02:45,730

leveraging so much of the operations

67

00:02:50,550 --> 00:02:49,060

that you can do from the ground you know

68

00:02:53,130 --> 00:02:50,560

we're doing things with a robotic arm

69

00:02:55,940 --> 00:02:53,140

now that are just amazing and almost

70

00:03:00,149 --> 00:02:55,950

incomprehensible you know five years ago

71

00:03:03,539 --> 00:03:00,159

so we're able to catch a vehicle for

72

00:03:05,220 --> 00:03:03,549

instance and as soon as you've caught it

73

00:03:06,720 --> 00:03:05,230

you put the brakes on you walk away you

74

00:03:08,880 --> 00:03:06,730

go back to work you get another five

75

00:03:10,470 --> 00:03:08,890

hours of science done you come back five

76

00:03:12,780 --> 00:03:10,480

hours later it's time to open hatch

77

00:03:16,170 --> 00:03:12,790

because they've done everything else

78

00:03:18,390 --> 00:03:16,180

from the ground moved it over with the

79

00:03:22,349 --> 00:03:18,400

robotic arm put it on the hatch run the

80

00:03:25,819 --> 00:03:22,359

bolts and they've just become so much

81

00:03:28,710 --> 00:03:25,829

more efficient that this this fine oiled

82

00:03:31,050 --> 00:03:28,720

fine-tuned machine is able to crank out

83

00:03:34,050 --> 00:03:31,060

a lot more science so it was great to be

84

00:03:36,449 --> 00:03:34,060

a part of that obviously to be on orbit

85

00:03:39,330 --> 00:03:36,459

with with the space ninja and and fueler

86

00:03:41,780 --> 00:03:39,340

was was fantastic because she you know I

87

00:03:44,640 --> 00:03:41,790

got to learn from from the best so

88

00:03:47,309 --> 00:03:44,650

overall it's just a fantastic mission

89

00:03:49,589 --> 00:03:47,319

and and it was great to represent this

90

00:03:52,800 --> 00:03:49,599

incredible team this worldwide team that

91

00:03:54,569 --> 00:03:52,810

is rocking the science every day well

92

00:03:55,800 --> 00:03:54,579

we're glad to have you back we're gonna

93

00:03:57,390 --> 00:03:55,810

switch things up a little bit today and

94

00:03:59,699 --> 00:03:57,400

start with some questions from people

95

00:04:01,289 --> 00:03:59,709

who are following along online we've got

96

00:04:02,580 --> 00:04:01,299

a Facebook live going on right now and

97

00:04:04,860 --> 00:04:02,590

you can send in your questions in the

98

00:04:07,589 --> 00:04:04,870

comment section there or on twitter or

99

00:04:08,550 --> 00:04:07,599

instagram using the hashtag ask nasa but

100

00:04:09,569 --> 00:04:08,560

we're gonna start with some of those

101  
00:04:10,890 --> 00:04:09,579  
questions and then come take questions

102  
00:04:13,170 --> 00:04:10,900  
in the room

103  
00:04:15,089 --> 00:04:13,180  
so first of all for Peggy Gregory

104  
00:04:17,520 --> 00:04:15,099  
Edwards on Facebook asked if you feel

105  
00:04:19,439 --> 00:04:17,530  
homesick for the space station now well

106  
00:04:21,180 --> 00:04:19,449  
actually a little bit there are parts of

107  
00:04:23,120 --> 00:04:21,190  
it that I really miss but I've been

108  
00:04:26,150 --> 00:04:23,130  
there long enough I think

109  
00:04:37,970 --> 00:04:26,160  
I was ready to come home especially to a

110  
00:04:39,800 --> 00:04:37,980  
toilet be able to flush so I was ready I

111  
00:04:41,360 --> 00:04:39,810  
think that point but it's funny because

112  
00:04:44,200 --> 00:04:41,370  
I could have stayed longer I think

113  
00:04:46,700 --> 00:04:44,210

wouldn't have been a problem but once

114

00:04:48,650 --> 00:04:46,710

like a couple weeks before landing I

115

00:04:50,270 --> 00:04:48,660

made that switch in my head in it and

116

00:04:51,800 --> 00:04:50,280

then it was like okay that was the two

117

00:04:53,570 --> 00:04:51,810

longest weeks of the mission was because

118

00:04:59,480 --> 00:04:53,580

once I decided I was ready to come home

119

00:05:01,040 --> 00:04:59,490

then it was a long time to get here same

120

00:05:03,130 --> 00:05:01,050

for you jacquard was a little different

121

00:05:06,290 --> 00:05:03,140

since you not there you know I

122

00:05:07,730 --> 00:05:06,300

definitely loved being up there and you

123

00:05:08,840 --> 00:05:07,740

know floating around and playing with

124

00:05:12,080 --> 00:05:08,850

your food and looking out the window

125

00:05:14,150 --> 00:05:12,090

just that's a whole lot of fun and and

126

00:05:16,190 --> 00:05:14,160

feeling like every day you're you're

127

00:05:18,530 --> 00:05:16,200

able to be part of this team and make a

128

00:05:19,850 --> 00:05:18,540

difference but it's totally true once

129

00:05:21,950 --> 00:05:19,860

you shift gears

130

00:05:24,560 --> 00:05:21,960

it was the same every time you know I

131

00:05:27,260 --> 00:05:24,570

deployed once you shift gears in and

132

00:05:29,030 --> 00:05:27,270

you're thinking about coming home then

133

00:05:32,930 --> 00:05:29,040

it it's it's a different mental state

134

00:05:34,880 --> 00:05:32,940

and you know we you have to play with

135

00:05:37,250 --> 00:05:34,890

your mind a bit to make sure that you

136

00:05:39,020 --> 00:05:37,260

keep your motivation up over a long

137

00:05:41,720 --> 00:05:39,030

mission obviously Peggy was there a lot

138

00:05:44,900 --> 00:05:41,730

longer but then once you make that that

139

00:05:47,760 --> 00:05:44,910

final shift in the gear you're ready

140

00:05:50,560 --> 00:05:47,770

yeah and besides my wife is super odd

141

00:05:52,550 --> 00:05:50,570

[Laughter]

142

00:05:54,710 --> 00:05:52,560

when we have another one for you this

143

00:05:56,420 --> 00:05:54,720

one is from Stacy Hutchins on Facebook

144

00:05:59,000 --> 00:05:56,430

and she asked if you have any tips or

145

00:05:59,720 --> 00:05:59,010

advice for her son Jack who also wants

146

00:06:02,240 --> 00:05:59,730

to be a great name

147

00:06:03,380 --> 00:06:02,250

well it's good it's kind of tough when

148

00:06:06,020 --> 00:06:03,390

you're younger cuz there's lots of ways

149

00:06:10,430 --> 00:06:06,030

to make fun of Jack Jack in the Box Jack

150

00:06:13,040 --> 00:06:10,440

I I think that that it's important for

151  
00:06:16,250 --> 00:06:13,050  
for everybody to just keep your eyes

152  
00:06:18,050 --> 00:06:16,260  
open as you're going through life and

153  
00:06:21,500 --> 00:06:18,060  
try new things so that you can find that

154  
00:06:23,660 --> 00:06:21,510  
passion you know we talked a lot the one

155  
00:06:25,340 --> 00:06:23,670  
piece of advice and you know I boiled it

156  
00:06:26,960 --> 00:06:25,350  
down to the last thing my dad said to me

157  
00:06:29,210 --> 00:06:26,970  
which was I dare you to dream because

158  
00:06:31,670 --> 00:06:29,220  
you need to find your passion that thing

159  
00:06:34,180 --> 00:06:31,680  
that really ignites your soul and then

160  
00:06:36,650 --> 00:06:34,190  
you need to you know dare to do it

161  
00:06:39,020 --> 00:06:36,660  
nobody's going to hand it to you there

162  
00:06:40,940 --> 00:06:39,030  
a lot of a lot of that in our world

163  
00:06:42,200 --> 00:06:40,950

today that oh I deserve this and I

164

00:06:45,230 --> 00:06:42,210

deserve that you don't deserve anything

165

00:06:47,810 --> 00:06:45,240

if you don't take what you were given

166

00:06:49,970 --> 00:06:47,820

and make something of it and work really

167

00:06:53,090 --> 00:06:49,980

hard at it you're not going to

168

00:06:55,130 --> 00:06:53,100

accomplish anything so that's kind of

169

00:06:56,330 --> 00:06:55,140

the advice to get keep your eyes open

170

00:06:58,520 --> 00:06:56,340

and find that passion and then work

171

00:06:59,570 --> 00:06:58,530

really hard at it help you a lot of

172

00:07:01,400 --> 00:06:59,580

different ways I'm sure

173

00:07:03,770 --> 00:07:01,410

alright we're actually gonna wrap up the

174

00:07:05,660 --> 00:07:03,780

Facebook live online now but if you want

175

00:07:07,940 --> 00:07:05,670

to keep tuning in you can go to [nasa.gov](http://nasa.gov)

176

00:07:09,440 --> 00:07:07,950

slash live meanwhile we're gonna start

177

00:07:11,030 --> 00:07:09,450

taking questions here on their room but

178

00:07:12,860 --> 00:07:11,040

if you have a question on the phone

179

00:07:14,330 --> 00:07:12,870

bridge you can press star 1 to get that

180

00:07:16,220 --> 00:07:14,340

question registered and if it gets

181

00:07:18,500 --> 00:07:16,230

answered you can press star 2 to dismiss

182

00:07:20,630 --> 00:07:18,510

it alright we'll start over here with

183

00:07:23,180 --> 00:07:20,640

Mark crow and if you can let us know who

184

00:07:28,480 --> 00:07:23,190

your questions for well we'll try and

185

00:07:32,270 --> 00:07:28,490

get it answered you can space technology

186

00:07:36,190 --> 00:07:32,280

minds for Peggy Whitson I wonder how you

187

00:07:39,560 --> 00:07:36,200

think your extended mission will help

188

00:07:42,560 --> 00:07:39,570

contribute most to the goals of research

189

00:07:46,280 --> 00:07:42,570

that Scott and Mikkel we're doing on

190

00:07:49,550 --> 00:07:46,290

their 340 days is there is there data

191

00:07:52,490 --> 00:07:49,560

that will come from your experience that

192

00:07:55,270 --> 00:07:52,500

will push that sort of knowledge set of

193

00:07:57,409 --> 00:07:55,280

what happens after six months and

194

00:08:00,950 --> 00:07:57,419

towards a year that you think is

195

00:08:02,750 --> 00:08:00,960

extremely valuable I think we hadn't

196

00:08:05,090 --> 00:08:02,760

originally planned for me to be up there

197

00:08:07,190 --> 00:08:05,100

that long so there was no you know

198

00:08:10,159 --> 00:08:07,200

proactive science selection based on

199

00:08:12,050 --> 00:08:10,169

that however I was participating in one

200

00:08:13,970 --> 00:08:12,060

of the big studies that were was

201  
00:08:16,580 --> 00:08:13,980  
accomplished during that one year which

202  
00:08:20,390 --> 00:08:16,590  
was the fluid shift study looking at how

203  
00:08:23,210 --> 00:08:20,400  
fluid shift and changes in the eyes and

204  
00:08:26,060 --> 00:08:23,220  
trying to better understand that process

205  
00:08:29,450 --> 00:08:26,070  
over a more extended period of time and

206  
00:08:32,060 --> 00:08:29,460  
so with the exhibition extension we

207  
00:08:34,459 --> 00:08:32,070  
added additional data takes so that we

208  
00:08:37,310 --> 00:08:34,469  
could gather that additional data and be

209  
00:08:38,920 --> 00:08:37,320  
another another n in the subject count

210  
00:08:42,740 --> 00:08:38,930  
for that many of the other

211  
00:08:45,670 --> 00:08:42,750  
investigations also were able to expand

212  
00:08:47,980 --> 00:08:45,680  
their day to say data sets because

213  
00:08:50,710 --> 00:08:47,990

I got to do additional data collections

214

00:08:52,780 --> 00:08:50,720

for them as well so I do think there

215

00:08:57,280 --> 00:08:52,790

were some contributions it's still very

216

00:09:00,150 --> 00:08:57,290

small and and human human studies have a

217

00:09:02,920 --> 00:09:00,160

huge variation in individual reactions

218

00:09:05,170 --> 00:09:02,930

so it's it's good to have the additional

219

00:09:07,389 --> 00:09:05,180

data points I'm sure it contributes in

220

00:09:09,730 --> 00:09:07,399

that sense it wasn't quite as long as

221

00:09:11,680 --> 00:09:09,740

they were up there but I think it

222

00:09:17,310 --> 00:09:11,690

probably helps the scientists understand

223

00:09:23,650 --> 00:09:19,690

when the discussion of the one-year

224

00:09:25,000 --> 00:09:23,660

missions first came up I think I was a

225

00:09:27,280 --> 00:09:25,010

little before we were kind of getting

226

00:09:29,500 --> 00:09:27,290

into the deep space gateway and the

227

00:09:31,690 --> 00:09:29,510

potential there and I'm sort of drawing

228

00:09:34,480 --> 00:09:31,700

on your experience as a researcher and

229

00:09:38,410 --> 00:09:34,490

biochemistry and so forth but I'm

230

00:09:40,810 --> 00:09:38,420

wondering do you think doing more of

231

00:09:43,570 --> 00:09:40,820

these long term missions on the space

232

00:09:45,280 --> 00:09:43,580

station would be a good thing or it

233

00:09:48,250 --> 00:09:45,290

would be good to do them when you can

234

00:09:51,040 --> 00:09:48,260

and fold in the deep skate deep space

235

00:09:53,079 --> 00:09:51,050

gateway long do you make to get the

236

00:09:56,890 --> 00:09:53,089

information you're seeking about whether

237

00:09:59,019 --> 00:09:56,900

humans can truck to Mars yeah I think we

238

00:10:02,680 --> 00:09:59,029

do need additional information in

239

00:10:07,300 --> 00:10:02,690

heading to Mars just about the human

240

00:10:09,510 --> 00:10:07,310

body and it's going to take some subject

241

00:10:12,460 --> 00:10:09,520

numbers to in order to make the

242

00:10:14,680 --> 00:10:12,470

investigations have any significance to

243

00:10:16,840 --> 00:10:14,690

determine you know is this just a and

244

00:10:19,269 --> 00:10:16,850

just because this person has this

245

00:10:21,910 --> 00:10:19,279

unusual reaction or is this a common

246

00:10:23,860 --> 00:10:21,920

common result and so I do think we need

247

00:10:26,800 --> 00:10:23,870

additional subject numbers for that

248

00:10:30,340 --> 00:10:26,810

there are a lot of things that I think

249

00:10:31,569 --> 00:10:30,350

we will find change and Plateau but

250

00:10:33,340 --> 00:10:31,579

there are going to be some things that

251  
00:10:35,800 --> 00:10:33,350  
continue to change and we need to better

252  
00:10:38,079 --> 00:10:35,810  
understand those those physiologic

253  
00:10:40,449 --> 00:10:38,089  
things that continue to change in order

254  
00:10:43,090 --> 00:10:40,459  
to understand how it affects the human

255  
00:10:44,949 --> 00:10:43,100  
body and make us better prepared when we

256  
00:10:48,730 --> 00:10:44,959  
do do those long-duration missions to

257  
00:10:51,940 --> 00:10:48,740  
Mars okay and I think we've got Robert

258  
00:10:54,340 --> 00:10:51,950  
Perlman here hi Robert Perlman with

259  
00:10:57,940 --> 00:10:54,350  
collec space.com with a question for

260  
00:10:59,350 --> 00:10:57,950  
Peggy your first Soyuz landing was

261  
00:11:01,809 --> 00:10:59,360  
rougher than most

262  
00:11:03,819 --> 00:11:01,819  
being a ballistic reentry but you were

263  
00:11:06,220 --> 00:11:03,829

coming back from fewer days in space and

264

00:11:08,949 --> 00:11:06,230

this time was a normal landing but with

265

00:11:12,549 --> 00:11:08,959

longer days can you compare or you were

266

00:11:15,220 --> 00:11:12,559

able to determine which was more hiring

267

00:11:18,200 --> 00:11:15,230

on the body maybe even bringing in your

268

00:11:23,579 --> 00:11:18,210

shuttle landing from your first flight

269

00:11:26,079 --> 00:11:23,589

[Laughter]

270

00:11:28,509 --> 00:11:26,089

once you're under the parachutes you're

271

00:11:30,549 --> 00:11:28,519

falling at the same rate so you hit the

272

00:11:32,109 --> 00:11:30,559

ground at the same as long as the soft

273

00:11:34,929 --> 00:11:32,119

landing engines fire you hit the ground

274

00:11:36,819 --> 00:11:34,939

at the same approximate speed we had a

275

00:11:39,569 --> 00:11:36,829

windier day when I had the ballistic

276

00:11:42,879 --> 00:11:39,579

landing after expedition 16 and so we

277

00:11:45,040 --> 00:11:42,889

bounced and rolled more than we did this

278

00:11:49,359 --> 00:11:45,050

time it still feels pretty much like a

279

00:12:00,970 --> 00:11:49,369

pretty good car crash it was you know

280

00:12:05,049 --> 00:12:00,980

it's definitely a jolting experience so

281

00:12:08,679 --> 00:12:05,059

no I think it's still pretty jolting

282

00:12:10,569 --> 00:12:08,689

experience a landing on the ground after

283

00:12:12,429 --> 00:12:10,579

a long-duration mission I don't know

284

00:12:14,530 --> 00:12:12,439

that there was any particular difference

285

00:12:17,639 --> 00:12:14,540

I think because we had gone through the

286

00:12:20,710 --> 00:12:17,649

ballistic reentry after expedition 16

287

00:12:24,249 --> 00:12:20,720

you know by the time we got to that it

288

00:12:26,859 --> 00:12:24,259

didn't seem as dramatic because we had

289

00:12:31,449 --> 00:12:26,869

been basically shaking up quite a bit

290

00:12:33,759 --> 00:12:31,459

beforehand in in this case you know when

291

00:12:36,069 --> 00:12:33,769

we the parachute opened it was very

292

00:12:38,289 --> 00:12:36,079

dramatic then because we hadn't been

293

00:12:40,470 --> 00:12:38,299

shaken up in advance and so our body was

294

00:12:43,689 --> 00:12:40,480

just that was our first exposure to

295

00:12:46,150 --> 00:12:43,699

gravity and being moved around like that

296

00:12:49,419 --> 00:12:46,160

and so it seemed more dramatic this time

297

00:12:51,939 --> 00:12:49,429

so I think it just has to do with you

298

00:12:54,100 --> 00:12:51,949

know your body adapts very quickly to be

299

00:12:59,069 --> 00:12:54,110

those feelings again but the initial

300

00:13:08,620 --> 00:13:03,850

stimulating provocative is provocative

301  
00:13:15,430 --> 00:13:12,819  
know what how are you supposed to know

302  
00:13:17,350 --> 00:13:15,440  
what its gonna be like every day I for

303  
00:13:19,720 --> 00:13:17,360  
me that under the shoot was was kind of

304  
00:13:22,080 --> 00:13:19,730  
fun because it was continuous motion but

305  
00:13:26,139 --> 00:13:22,090  
boy the good car crash

306  
00:13:33,309 --> 00:13:30,449  
I was pretty exciting provocative

307  
00:13:36,300 --> 00:13:33,319  
alright go ahead I can ask a follow-up

308  
00:13:40,360 --> 00:13:36,310  
for Jack this was your first flight and

309  
00:13:42,090 --> 00:13:40,370  
the space station has in in recent years

310  
00:13:45,639 --> 00:13:42,100  
gained a lot of creature comforts

311  
00:13:48,689 --> 00:13:45,649  
projection screen having the IP Phone to

312  
00:13:51,100 --> 00:13:48,699  
be able to talk to family every weekend

313  
00:13:53,019 --> 00:13:51,110

but as we look out going further out

314

00:13:55,079 --> 00:13:53,029

into space those creature comforts are

315

00:13:58,749 --> 00:13:55,089

probably going to fall away how

316

00:14:01,319 --> 00:13:58,759

important psychologically to making it

317

00:14:05,590 --> 00:14:01,329

through a 136 day mission or even longer

318

00:14:07,509 --> 00:14:05,600

are those those nice connections to home

319

00:14:10,030 --> 00:14:07,519

or could you see going through the same

320

00:14:11,579 --> 00:14:10,040

flight without having any of those or

321

00:14:13,900 --> 00:14:11,589

even connection back to earth

322

00:14:15,069 --> 00:14:13,910

you know you'll you'll have some form of

323

00:14:16,990 --> 00:14:15,079

connection back to earth and we've

324

00:14:19,030 --> 00:14:17,000

gotten very good at that I would say

325

00:14:22,210 --> 00:14:19,040

comparing this to my deployments in the

326

00:14:25,509 --> 00:14:22,220

military this was way better way better

327

00:14:27,400 --> 00:14:25,519

connectivity you know I was able to talk

328

00:14:30,670 --> 00:14:27,410

with my wife almost every almost every

329

00:14:33,639 --> 00:14:30,680

day so it's amazingly good on the space

330

00:14:36,730 --> 00:14:33,649

station first time I deployed couldn't

331

00:14:40,860 --> 00:14:36,740

talk to anybody for about a month and

332

00:14:43,929 --> 00:14:40,870

then one five-minute phone call a week

333

00:14:46,150 --> 00:14:43,939

yeah it's it's it's important to

334

00:14:49,240 --> 00:14:46,160

maintain that connectivity but I think

335

00:14:50,949 --> 00:14:49,250

doing video messages you know obviously

336

00:14:53,019 --> 00:14:50,959

there's going to be a delay is is

337

00:14:56,170 --> 00:14:53,029

sufficient so I don't think it's it's

338

00:14:57,939 --> 00:14:56,180

something that you can't adapt to we

339

00:15:01,389 --> 00:14:57,949

were spoiled on the space station it's

340

00:15:04,569 --> 00:15:01,399

it's fantastic but we can do with less

341

00:15:07,350 --> 00:15:04,579

so I don't think it's gonna be a big

342

00:15:09,309 --> 00:15:07,360

showstopper for long-duration flights

343

00:15:11,920 --> 00:15:09,319

all right I think we've got another

344

00:15:13,449 --> 00:15:11,930

question here from Sophia Sanchez but

345

00:15:15,189 --> 00:15:13,459

just a reminder that if you are on the

346

00:15:18,670 --> 00:15:15,199

phone bridge you can press star 1 to get

347

00:15:21,160 --> 00:15:18,680

your question answered Sophia Sanchez

348

00:15:22,689 --> 00:15:21,170

Kosmic Chicago with Chicago now I had a

349

00:15:25,150 --> 00:15:22,699

question for Peggy

350

00:15:26,860 --> 00:15:25,160

did you have any long-term spaceflight

351

00:15:28,329 --> 00:15:26,870

challenges that you could use as

352

00:15:33,249 --> 00:15:28,339

teaching moments for our new astronauts

353

00:15:35,110 --> 00:15:33,259

I think every day is kind of a challenge

354

00:15:39,460 --> 00:15:35,120

you know we are living and working with

355

00:15:41,590 --> 00:15:39,470

people and in a very close proximity we

356

00:15:43,900 --> 00:15:41,600

talk about our expeditionary crew skills

357

00:15:47,259 --> 00:15:43,910

which I think are really important being

358

00:15:49,509 --> 00:15:47,269

able to help your crewmates knowing when

359

00:15:51,629 --> 00:15:49,519

you know you're being a little crankier

360

00:15:53,769 --> 00:15:51,639

than you should be and you know

361

00:15:56,499 --> 00:15:53,779

apologizing in advance and all that

362

00:15:58,540 --> 00:15:56,509

being able to get along is extremely

363

00:16:00,819 --> 00:15:58,550

important in those situations so every

364

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

day I think is something that you

365

00:16:05,650 --> 00:16:02,839

work together as a team you know some

366

00:16:08,619 --> 00:16:05,660

days we talked about you know hey we did

367

00:16:10,119 --> 00:16:08,629

the sleep shift for an undocking and you

368

00:16:11,230 --> 00:16:10,129

know we need to do we need to work

369

00:16:13,749 --> 00:16:11,240

together because we don't trust

370

00:16:15,280 --> 00:16:13,759

ourselves to do it the job you know by

371

00:16:18,429 --> 00:16:15,290

yourself but being able to acknowledge

372

00:16:21,400 --> 00:16:18,439

that and accommodate that makes you a

373

00:16:25,540 --> 00:16:21,410

much better team and so I think the

374

00:16:27,100 --> 00:16:25,550

experience those experiences translate

375

00:16:30,069 --> 00:16:27,110

very well and it's something that we

376

00:16:34,470 --> 00:16:30,079

actually do teach our new astronauts is

377

00:16:37,090 --> 00:16:34,480

you know how to use these techniques to

378

00:16:38,860 --> 00:16:37,100

work well with people and to work more

379

00:16:42,220 --> 00:16:38,870

efficiently and to work more

380

00:16:44,379 --> 00:16:42,230

productively together and I think Jack

381

00:16:48,160 --> 00:16:44,389

and I demonstrate a lot of those those

382

00:16:52,919 --> 00:16:48,170

capabilities that I think are very

383

00:16:58,210 --> 00:16:57,249

we drop little bit all right I do you

384

00:17:00,449 --> 00:16:58,220

think we have some questions on the

385

00:17:10,910 --> 00:17:00,459

phone now so we're going to go to

386

00:17:22,069 --> 00:17:17,590

smart gaucho on the line okay go ahead

387

00:17:24,289 --> 00:17:22,079

hello yes yes this question first off

388

00:17:26,329 --> 00:17:24,299

I'd like to congratulate you both on

389

00:17:29,180 --> 00:17:26,339

this record-setting mission it was

390

00:17:32,419 --> 00:17:29,190

absolutely incredible Peggy could you

391

00:17:35,360 --> 00:17:32,429

tell me what was the hardest part of

392

00:17:39,230 --> 00:17:35,370

this long extended mission for you and

393

00:17:42,440 --> 00:17:39,240

on the flip side of that question can

394

00:17:44,690 --> 00:17:42,450

you tell me what was the absolute high

395

00:17:51,020 --> 00:17:44,700

point of this mission that you will

396

00:17:55,220 --> 00:17:51,030

never ever forget hi the hardest part I

397

00:17:58,370 --> 00:17:55,230

think would probably be just I get bored

398

00:18:00,650 --> 00:17:58,380

with the food I like to cook and make

399

00:18:02,630 --> 00:18:00,660

things and you know what you only have a

400

00:18:05,360 --> 00:18:02,640

certain number of meals that you can

401  
00:18:07,970 --> 00:18:05,370  
play with or change or try you know

402  
00:18:10,700 --> 00:18:07,980  
figure out how to change things up and

403  
00:18:11,720 --> 00:18:10,710  
so I get bored with with the food and so

404  
00:18:15,380 --> 00:18:11,730  
that's I think something very

405  
00:18:17,539 --> 00:18:15,390  
challenging I told Jack when he first

406  
00:18:19,460 --> 00:18:17,549  
arrived it's all about the sauce you

407  
00:18:21,380 --> 00:18:19,470  
just have to figure out which sauce you

408  
00:18:24,860 --> 00:18:21,390  
want to try today and you'll eat

409  
00:18:27,409 --> 00:18:24,870  
whatever with it but it's all about the

410  
00:18:30,380 --> 00:18:27,419  
sauce and so I think that's that's

411  
00:18:33,470 --> 00:18:30,390  
probably the biggest challenge for me in

412  
00:18:36,080 --> 00:18:33,480  
terms of the single most highlight gosh

413  
00:18:41,690 --> 00:18:36,090

it would be hard to pick a single most

414

00:18:46,730 --> 00:18:41,700

the point you know the EVs are always a

415

00:18:50,120 --> 00:18:46,740

highlight I think I think one specific

416

00:18:52,159 --> 00:18:50,130

example would be during the battery

417

00:18:55,030 --> 00:18:52,169

aren't our EVs we were taking the

418

00:18:58,610 --> 00:18:55,040

batteries off of this large pallet and

419

00:19:01,520 --> 00:18:58,620

the first one we had taken off and it

420

00:19:04,039 --> 00:19:01,530

had been dark and Shane and I had taken

421

00:19:06,500 --> 00:19:04,049

each of us taken an adapter plate and

422

00:19:08,960 --> 00:19:06,510

gone and we installed it and we came

423

00:19:12,799 --> 00:19:08,970

back and then it was lit lit then the

424

00:19:16,549 --> 00:19:12,809

pallet was lit in the the pallet was

425

00:19:18,890 --> 00:19:16,559

this mirror shiny metal and so you could

426

00:19:21,450 --> 00:19:18,900

see yourself which is like look I'm an

427

00:19:26,470 --> 00:19:24,100

and then you can see the reflection of

428

00:19:29,110 --> 00:19:26,480

beautiful earth behind you you know and

429

00:19:33,640 --> 00:19:29,120

it was just like wow what an amazing job

430

00:19:36,070 --> 00:19:33,650

I have space walks we actually have a

431

00:19:37,840 --> 00:19:36,080

question on Twitter from akia who asked

432

00:19:41,800 --> 00:19:37,850

how do you practice for an unplanned

433

00:19:43,570 --> 00:19:41,810

spacewalk same way you practice for a

434

00:19:45,730 --> 00:19:43,580

planned spacewalk it's all about

435

00:19:47,530 --> 00:19:45,740

building the skills so we we spend a lot

436

00:19:50,380 --> 00:19:47,540

of time we have just a world-class

437

00:19:52,930 --> 00:19:50,390

facility down the road with the neutral

438

00:19:55,300 --> 00:19:52,940

buoyancy laboratory and we get in the

439

00:19:57,070 --> 00:19:55,310

suit and you know practice using all the

440

00:20:00,220 --> 00:19:57,080

tools and getting used to the suit

441

00:20:03,760 --> 00:20:00,230

itself I didn't I didn't find a whole

442

00:20:06,100 --> 00:20:03,770

lot of differences and and spacewalking

443

00:20:08,500 --> 00:20:06,110

is is kind of intensely personal because

444

00:20:11,110 --> 00:20:08,510

our suit as you can see this poor fella

445

00:20:13,900 --> 00:20:11,120

back here has got as arms go in the

446

00:20:17,080 --> 00:20:13,910

wrong direction so it it can be hard to

447

00:20:19,420 --> 00:20:17,090

work it in and depending on your body

448

00:20:22,900 --> 00:20:19,430

anatomy you either fit it or don't and

449

00:20:26,740 --> 00:20:22,910

so the differences between the pool and

450

00:20:31,030 --> 00:20:26,750

space are also personal for me it wasn't

451  
00:20:33,430 --> 00:20:31,040  
very different and all the training that

452  
00:20:35,710 --> 00:20:33,440  
we had in the neutral buoyancy

453  
00:20:38,110 --> 00:20:35,720  
laboratory of working with the tools and

454  
00:20:40,420 --> 00:20:38,120  
the suit and and and the tasks and

455  
00:20:42,820 --> 00:20:40,430  
having kind of situational awareness of

456  
00:20:46,510 --> 00:20:42,830  
the station and and not getting lost

457  
00:20:50,890 --> 00:20:46,520  
going to where you need to go it allows

458  
00:20:54,420 --> 00:20:50,900  
you to really do whatever you need to do

459  
00:20:58,930 --> 00:20:54,430  
outside we're not we don't have the

460  
00:21:01,090 --> 00:20:58,940  
ability to get perfect on space locks

461  
00:21:04,090 --> 00:21:01,100  
like they used to with the shuttle where

462  
00:21:07,330 --> 00:21:04,100  
you'd have a crew completely totally

463  
00:21:08,890 --> 00:21:07,340

perfectly trained for a spacewalk we

464

00:21:11,920 --> 00:21:08,900

have to be able to go out there and do

465

00:21:14,440 --> 00:21:11,930

whatever because we're going up you know

466

00:21:16,120 --> 00:21:14,450

months in advance and maybe we're in

467

00:21:17,680 --> 00:21:16,130

Russia for training all the time so you

468

00:21:20,680 --> 00:21:17,690

have to just be able to go outside and

469

00:21:23,230 --> 00:21:20,690

do it and then you know being able to go

470

00:21:25,510 --> 00:21:23,240

outside with with miss ninja herself as

471

00:21:29,010 --> 00:21:25,520

is is nice because she has so much

472

00:21:31,019 --> 00:21:29,020

experience that that you're able to

473

00:21:36,950 --> 00:21:31,029

really adapt to whatever the situation

474

00:21:38,820 --> 00:21:36,960

is and yeah it's it's also so much fun

475

00:21:40,080 --> 00:21:38,830

alright let's go back to the phone

476  
00:21:44,700 --> 00:21:40,090  
bridge I think we have a question now

477  
00:21:47,700 --> 00:21:44,710  
from Creston news advertiser yeah my

478  
00:21:50,399 --> 00:21:47,710  
questions for Peggy after spending so

479  
00:21:52,860 --> 00:21:50,409  
much time in training in space how do

480  
00:21:54,720 --> 00:21:52,870  
you draw on what you've learned what you

481  
00:21:58,950 --> 00:21:54,730  
learned growing up in Beaconsfield Mount

482  
00:22:01,110 --> 00:21:58,960  
Ayr to to practice there well I think

483  
00:22:04,230 --> 00:22:01,120  
you know being raised on a farm you

484  
00:22:07,740 --> 00:22:04,240  
learn a lot about dedication and work

485  
00:22:09,690 --> 00:22:07,750  
ethic and and you get a healthy dose too

486  
00:22:12,659 --> 00:22:09,700  
stubborn to go along with it and that

487  
00:22:15,960 --> 00:22:12,669  
gets a lot of jobs done than otherwise

488  
00:22:19,440 --> 00:22:15,970

you might consider impossible and I

489

00:22:22,320 --> 00:22:19,450

think watching watching my parents do

490

00:22:24,750 --> 00:22:22,330

things that you know you had you just

491

00:22:25,950 --> 00:22:24,760

had to figure out a way to fix it work

492

00:22:29,310 --> 00:22:25,960

around it

493

00:22:30,750 --> 00:22:29,320

make it happen that that was part of you

494

00:22:35,399 --> 00:22:30,760

know how I grew up and I think that

495

00:22:40,320 --> 00:22:35,409

applies on space station - all right and

496

00:22:43,590 --> 00:22:40,330

how about now from space calm hi

497

00:22:46,980 --> 00:22:43,600

I was curious what the most amazing

498

00:22:54,029 --> 00:22:46,990

thing was each of you saw out the window

499

00:22:57,510 --> 00:22:54,039

wall in space boy we saw an incredible

500

00:23:00,029 --> 00:22:57,520

roar I've seen Aurora's before and one

501  
00:23:02,220 --> 00:23:00,039  
night I was on the IP phone talking to

502  
00:23:04,260 --> 00:23:02,230  
my husband and I'm like you got to hang

503  
00:23:06,090 --> 00:23:04,270  
on I got to go get Jack this is amazing

504  
00:23:08,519 --> 00:23:06,100  
and they just kept getting better and

505  
00:23:12,950 --> 00:23:08,529  
better and it was an amazing aurora and

506  
00:23:16,680 --> 00:23:12,960  
I was awesome that that was impressive

507  
00:23:18,810 --> 00:23:16,690  
the colors are the direct depth this

508  
00:23:21,210 --> 00:23:18,820  
scale on this particular one it was just

509  
00:23:22,830 --> 00:23:21,220  
huge it was you know usually you see an

510  
00:23:25,169 --> 00:23:22,840  
aurora and it's kind of on the edge of

511  
00:23:26,789 --> 00:23:25,179  
the horizon and sometimes it'll dance

512  
00:23:28,950 --> 00:23:26,799  
out a little bit toward you and this one

513  
00:23:30,900 --> 00:23:28,960

looks like overhead and all the way to

514

00:23:34,950 --> 00:23:30,910

the horizon it was just amazing

515

00:23:37,820 --> 00:23:34,960

was hey I mean that and I hadn't taken a

516

00:23:40,170 --> 00:23:37,830

single picture at night and so I'm just

517

00:23:43,380 --> 00:23:40,180

fumbling around trying to capture this

518

00:23:47,550 --> 00:23:43,390

and sucking at it and I think that same

519

00:23:50,280 --> 00:23:47,560

night we saw that the Andromeda oh my

520

00:23:52,140 --> 00:23:50,290

gosh so I got better at taking pictures

521

00:23:54,450 --> 00:23:52,150

but we never saw an Aurora like that

522

00:23:56,730 --> 00:23:54,460

again that was that was truly

523

00:23:59,190 --> 00:23:56,740

breathhtaking so the view was as good as

524

00:24:01,710 --> 00:23:59,200

promised oh you can't imagine the view

525

00:24:04,400 --> 00:24:01,720

it's it's way better than than anything

526  
00:24:06,140 --> 00:24:04,410  
I could ever imagine being up there was

527  
00:24:11,510 --> 00:24:06,150  
amazing

528  
00:24:17,670 --> 00:24:14,880  
have a question for Peggy our readers

529  
00:24:19,470 --> 00:24:17,680  
that Kazu are young girls ages 5 to 10

530  
00:24:21,810 --> 00:24:19,480  
and you are such an amazing role model

531  
00:24:23,580 --> 00:24:21,820  
to them especially having a glides batch

532  
00:24:27,990 --> 00:24:23,590  
in our program for 10 years in a row

533  
00:24:29,880 --> 00:24:28,000  
before being accepted so you never gave

534  
00:24:32,060 --> 00:24:29,890  
up if a young girl in particular wants

535  
00:24:35,160 --> 00:24:32,070  
to become an astronaut or if she has any

536  
00:24:37,140 --> 00:24:35,170  
seemingly impossible dream like you once

537  
00:24:40,770 --> 00:24:37,150  
did as a child what advice would you

538  
00:24:43,290 --> 00:24:40,780

give to her well I think Jack was right

539

00:24:44,850 --> 00:24:43,300

on in terms of choosing something that

540

00:24:47,340 --> 00:24:44,860

you have a passion about I think that's

541

00:24:49,350 --> 00:24:47,350

probably the most important key to being

542

00:24:50,700 --> 00:24:49,360

successful in whatever it is that you

543

00:24:54,360 --> 00:24:50,710

want to be you have to have a passion

544

00:24:57,900 --> 00:24:54,370

for it but I also think for me in

545

00:24:59,870 --> 00:24:57,910

particular it was trying to do things a

546

00:25:02,760 --> 00:24:59,880

little bit more than I thought I could

547

00:25:04,410 --> 00:25:02,770

living outside of that comfort zone you

548

00:25:06,840 --> 00:25:04,420

know pushing myself challenging myself

549

00:25:09,630 --> 00:25:06,850

to do a little bit more I think is also

550

00:25:12,120 --> 00:25:09,640

a very important lesson in life you you

551

00:25:16,290 --> 00:25:12,130

really have to push yourself to really

552

00:25:17,670 --> 00:25:16,300

find out how far you really can go okay

553

00:25:22,920 --> 00:25:17,680

I think we had another question here in

554

00:25:24,590 --> 00:25:22,930

the room earlier hi my name is param EDA

555

00:25:26,970 --> 00:25:24,600

and I'm an intern here at NASA Johnson

556

00:25:28,800 --> 00:25:26,980

working with the spacesuit group on the

557

00:25:30,090 --> 00:25:28,810

informatics system and so I asked this

558

00:25:33,270 --> 00:25:30,100

question to the some of the ask hands

559

00:25:35,700 --> 00:25:33,280

last week or a few weeks ago but as

560

00:25:38,810 --> 00:25:35,710

experience TVA crewmembers I would like

561

00:25:42,810 --> 00:25:38,820

to know if you had any sort of I guess

562

00:25:44,760 --> 00:25:42,820

dream additional technologies to the EMU

563

00:25:52,409 --> 00:25:44,770

suit what would they be

564

00:25:58,049 --> 00:25:52,419

and that would you think Woodhouse would

565

00:26:01,039 --> 00:25:58,059

be great yeah I I did my first two

566

00:26:04,440 --> 00:26:01,049

spacewalks on this mission in the large

567

00:26:08,070 --> 00:26:04,450

which is larger than the one I usually

568

00:26:09,840 --> 00:26:08,080

do did spacewalks in and you know I have

569

00:26:12,330 --> 00:26:09,850

to admit I was I got done with those

570

00:26:14,760 --> 00:26:12,340

spacewalks and I thought you know I'm

571

00:26:17,130 --> 00:26:14,770

getting a little old to be doing this

572

00:26:18,480 --> 00:26:17,140

then I got to do two with Jack and he

573

00:26:22,620 --> 00:26:18,490

was wearing the large so I have to wear

574

00:26:24,600 --> 00:26:22,630

the medium and that helped a lot I've

575

00:26:26,970 --> 00:26:24,610

ended up so I'm like okay I'm not as

576

00:26:28,110 --> 00:26:26,980

worthless as I thought I was I can move

577

00:26:30,330 --> 00:26:28,120

around them and get around a little

578

00:26:32,909 --> 00:26:30,340

better but I think jumping me down to a

579

00:26:34,680 --> 00:26:32,919

small would be just that much more of an

580

00:26:37,680 --> 00:26:34,690

increase in what you think you could do

581

00:26:40,409 --> 00:26:37,690

your capabilities would be so I really

582

00:26:45,960 --> 00:26:40,419

think having a suit that fits is is very

583

00:26:49,799 --> 00:26:45,970

important to your capabilities so Oh for

584

00:26:51,389 --> 00:26:49,809

me the the reason that a small would be

585

00:26:54,269 --> 00:26:51,399

better is is because we reach so

586

00:26:56,970 --> 00:26:54,279

everything is your arms outside I'm kind

587

00:27:00,870 --> 00:26:56,980

of built like a monkey so it works out

588

00:27:05,549 --> 00:27:00,880

for me but you have to be able to have a

589

00:27:08,250 --> 00:27:05,559

larger anthropometric group of usability

590

00:27:10,620 --> 00:27:08,260

for for a spacesuit to be truly

591

00:27:12,870 --> 00:27:10,630

effective because not everybody has

592

00:27:15,149 --> 00:27:12,880

monkey arms but they might have much

593

00:27:18,120 --> 00:27:15,159

better si so they can be better outside

594

00:27:20,970 --> 00:27:18,130

so if you if you build it where it's not

595

00:27:24,180 --> 00:27:20,980

this huge reach around of all these

596

00:27:26,730 --> 00:27:24,190

controls and everything right here then

597

00:27:28,860 --> 00:27:26,740

it would increase everybody's efficiency

598

00:27:30,840 --> 00:27:28,870

and allow more people to be efficient

599

00:27:32,970 --> 00:27:30,850

outside and and that would be the

600

00:27:36,419 --> 00:27:32,980

biggest improvement I think you could

601  
00:27:37,889 --> 00:27:36,429  
make on a spacesuit all right I think we

602  
00:27:38,850 --> 00:27:37,899  
have some more questions I'm online

603  
00:27:41,100 --> 00:27:38,860  
right now and remember that you can

604  
00:27:45,389 --> 00:27:41,110  
submit yours on twitter or instagram

605  
00:27:47,220 --> 00:27:45,399  
using the hashtag ask NASA for Justin on

606  
00:27:48,690 --> 00:27:47,230  
Twitter and want to know what were some

607  
00:27:51,269 --> 00:27:48,700  
of your favorite experiments you did

608  
00:27:54,720 --> 00:27:51,279  
while you were on the space station well

609  
00:27:55,830 --> 00:27:54,730  
I I liked really like the tissue culture

610  
00:27:58,469 --> 00:27:55,840  
experiments

611  
00:28:00,479 --> 00:27:58,479  
after I finished graduate school I did a

612  
00:28:02,580 --> 00:28:00,489  
lot of research in tissue culture

613  
00:28:05,279 --> 00:28:02,590

different types of tissue culture and

614

00:28:10,580 --> 00:28:05,289

I've got to culture heart cells bone

615

00:28:13,320 --> 00:28:10,590

cells lung cells and lung cancer cells

616

00:28:15,779 --> 00:28:13,330

but probably the neatest investigation

617

00:28:18,570 --> 00:28:15,789

was looking at one was growing these

618

00:28:20,999 --> 00:28:18,580

lung cancer cells using these magnetic

619

00:28:23,969 --> 00:28:21,009

attachment points that were attached to

620

00:28:25,950 --> 00:28:23,979

the cells so they could clump more like

621

00:28:28,560 --> 00:28:25,960

a tumor would and grow three

622

00:28:33,389 --> 00:28:28,570

dimensionally like a tumor would in your

623

00:28:37,560 --> 00:28:33,399

body or you know on the earth but the

624

00:28:40,829 --> 00:28:37,570

neat one was they took a new drug that

625

00:28:43,109 --> 00:28:40,839

had an antibody to the cancer cells and

626  
00:28:46,680 --> 00:28:43,119  
so then we were grown these little mini

627  
00:28:48,570 --> 00:28:46,690  
tumors and we added the drug the

628  
00:28:51,180 --> 00:28:48,580  
antibody directed drug which would be

629  
00:28:52,799 --> 00:28:51,190  
great for chemotherapy type studies you

630  
00:28:54,659 --> 00:28:52,809  
know because chemotherapy the reason

631  
00:28:57,239 --> 00:28:54,669  
it's so hazardous to you is because it's

632  
00:28:59,159 --> 00:28:57,249  
killing so many other good cells while

633  
00:29:01,889 --> 00:28:59,169  
it's trying to kill the cancer cells and

634  
00:29:04,979 --> 00:29:01,899  
this would be a targeted way to kill the

635  
00:29:06,539 --> 00:29:04,989  
cancer cells and subjectively looking

636  
00:29:09,359 --> 00:29:06,549  
under the microscope it looked like it

637  
00:29:11,369 --> 00:29:09,369  
was working so that was very cool do you

638  
00:29:13,229 --> 00:29:11,379

do you notice that like the science

639

00:29:16,829 --> 00:29:13,239

onboard space station has evolved over

640

00:29:19,200 --> 00:29:16,839

the years as you well the the quantity

641

00:29:21,329 --> 00:29:19,210

is definitely evolved we're doing much

642

00:29:26,070 --> 00:29:21,339

much more many different types of

643

00:29:29,669 --> 00:29:26,080

experiments and that's exciting but I

644

00:29:31,379 --> 00:29:29,679

think the quality the complexity is

645

00:29:35,459 --> 00:29:31,389

probably a better word the complexity of

646

00:29:37,709 --> 00:29:35,469

the science we're doing is that greatly

647

00:29:39,539 --> 00:29:37,719

improved and I think it's going to lead

648

00:29:40,919 --> 00:29:39,549

to some really exciting results just

649

00:29:43,499 --> 00:29:40,929

like research here on the ground though

650

00:29:46,349 --> 00:29:43,509

it takes years to find out some of those

651  
00:29:48,119 --> 00:29:46,359  
things I know from for instance one of

652  
00:29:51,570 --> 00:29:48,129  
the things from my first flight on

653  
00:29:54,419 --> 00:29:51,580  
expedition five that's now used nowadays

654  
00:29:56,899 --> 00:29:54,429  
it's a filtration system and the study

655  
00:30:00,659 --> 00:29:56,909  
was looking at plants growing soybeans

656  
00:30:02,969 --> 00:30:00,669  
in this little plant culture system but

657  
00:30:05,609 --> 00:30:02,979  
because it had to have a special

658  
00:30:07,890 --> 00:30:05,619  
filtration air filtration system that

659  
00:30:11,790 --> 00:30:07,900  
elf air filtration system is now you

660  
00:30:14,940 --> 00:30:11,800  
used in surgical rooms and also used in

661  
00:30:17,700 --> 00:30:14,950  
wineries to prevent infections and molds

662  
00:30:19,680 --> 00:30:17,710  
in your wines and and you know how would

663  
00:30:22,500 --> 00:30:19,690

you know that growing these soybeans

664

00:30:25,170 --> 00:30:22,510

would have led to those things you don't

665

00:30:26,490 --> 00:30:25,180

know but I think that's kind of the neat

666

00:30:27,210 --> 00:30:26,500

part of doing the research yeah

667

00:30:28,770 --> 00:30:27,220

absolutely

668

00:30:30,690 --> 00:30:28,780

and you should have some great

669

00:30:32,220 --> 00:30:30,700

behind-the-scenes videos on your speedy

670

00:30:35,840 --> 00:30:32,230

time videos of experiments and even

671

00:30:38,130 --> 00:30:35,850

easily like well I love the the I

672

00:30:39,900 --> 00:30:38,140

nicknamed it the cancer seeking missiles

673

00:30:42,780 --> 00:30:39,910

so as a cancer dad that one was was

674

00:30:45,300 --> 00:30:42,790

special to me and in the battle against

675

00:30:48,450 --> 00:30:45,310

that terrible disease but I think

676  
00:30:49,890 --> 00:30:48,460  
another great advantage of of the

677  
00:30:52,500 --> 00:30:49,900  
science now is that it's so much more

678  
00:30:55,920 --> 00:30:52,510  
flexible so we have you know an example

679  
00:30:58,140 --> 00:30:55,930  
is this nanorack system that we put we

680  
00:31:00,390 --> 00:30:58,150  
put in the gym air like the Japanese

681  
00:31:02,160 --> 00:31:00,400  
module airlock and then we can put all

682  
00:31:05,490 --> 00:31:02,170  
these different satellites and what was

683  
00:31:08,820 --> 00:31:05,500  
it like 30-something satellites we in

684  
00:31:11,610 --> 00:31:08,830  
two weeks so it it's a capability where

685  
00:31:14,370 --> 00:31:11,620  
the Japanese robotic arm grabs this

686  
00:31:16,110 --> 00:31:14,380  
launcher from the airlock puts it

687  
00:31:20,580 --> 00:31:16,120  
outside pukes off these satellites and

688  
00:31:22,800 --> 00:31:20,590

and they're they're a a great capability

689

00:31:26,010 --> 00:31:22,810

to have a lower-cost

690

00:31:27,900 --> 00:31:26,020

rapid turnaround of technology and then

691

00:31:31,650 --> 00:31:27,910

we can investigate so many more things

692

00:31:34,860 --> 00:31:31,660

and NanoRacks and there's a lot of

693

00:31:38,460 --> 00:31:34,870

examples with our cases partners that

694

00:31:41,520 --> 00:31:38,470

that were we're able to get more science

695

00:31:43,530 --> 00:31:41,530

quicker onto the station at a lower cost

696

00:31:46,500 --> 00:31:43,540

kind of build the infrastructure so that

697

00:31:48,480 --> 00:31:46,510

we can investigate more things and I

698

00:31:50,370 --> 00:31:48,490

think that flexibility is going to lead

699

00:31:52,740 --> 00:31:50,380

to a lot more of these type of

700

00:31:54,570 --> 00:31:52,750

discoveries as opposed to the you know

701  
00:31:56,970 --> 00:31:54,580  
10 years to get it on the space station

702  
00:31:59,280 --> 00:31:56,980  
it's a it's a rapid cycle now and I

703  
00:32:02,190 --> 00:31:59,290  
think it's exciting to see how much more

704  
00:32:05,310 --> 00:32:02,200  
we're gonna be able to do we have a lot

705  
00:32:07,170 --> 00:32:05,320  
of different school experiments so

706  
00:32:09,780 --> 00:32:07,180  
elementary school experiments were in

707  
00:32:12,000 --> 00:32:09,790  
these small little things and you know

708  
00:32:13,890 --> 00:32:12,010  
very simple but it's really neat I think

709  
00:32:15,600 --> 00:32:13,900  
that they they actually got to have

710  
00:32:17,580 --> 00:32:15,610  
their science on the space station yeah

711  
00:32:20,110 --> 00:32:17,590  
I actually got to work on one from my

712  
00:32:23,080 --> 00:32:20,120  
high school so how cool was that that is

713  
00:32:25,659 --> 00:32:23,090

oh cars High School in Colorado and boom

714

00:32:27,279 --> 00:32:25,669

how did it go it worked great so they're

715

00:32:28,659 --> 00:32:27,289

very smart they're they're much smarter

716

00:32:32,830 --> 00:32:28,669

than me I can't remember what it does

717

00:32:37,090 --> 00:32:32,840

but it was also I think we have another

718

00:32:40,590 --> 00:32:37,100

question here in the room thank you

719

00:32:42,669 --> 00:32:40,600

Steve Titus from Iowa's Iain University

720

00:32:44,919 --> 00:32:42,679

you know I think about the intellectual

721

00:32:46,240 --> 00:32:44,929

horsepower that is up on the space

722

00:32:48,789 --> 00:32:46,250

station and certainly you've talked

723

00:32:51,610 --> 00:32:48,799

about the complex science that is going

724

00:32:53,320 --> 00:32:51,620

on what's the experience like for the

725

00:32:57,690 --> 00:32:53,330

both of you and your own experiences

726

00:33:01,450 --> 00:32:57,700

spiritually being up there well I think

727

00:33:06,549 --> 00:33:01,460

being there provides a perspective that

728

00:33:11,649 --> 00:33:06,559

makes you at peace it's too bad we can't

729

00:33:13,210 --> 00:33:11,659

translate that too well I think you look

730

00:33:16,000 --> 00:33:13,220

out the window and you can't help but

731

00:33:19,720 --> 00:33:16,010

feel that we're just one small part of a

732

00:33:22,450 --> 00:33:19,730

bigger whole you know the the people I

733

00:33:24,450 --> 00:33:22,460

invited to to Ellington to meet us was

734

00:33:29,710 --> 00:33:24,460

my wife my daughter and my priest

735

00:33:31,740 --> 00:33:29,720

because father Howard is was I think

736

00:33:33,850 --> 00:33:31,750

it's important we talked about

737

00:33:37,000 --> 00:33:33,860

expeditionary behavior yay

738

00:33:40,810 --> 00:33:37,010

it takes a lot to keep keep the light

739

00:33:44,260 --> 00:33:40,820

shining and to be a good teammate and

740

00:33:46,230 --> 00:33:44,270

and crew member and and you got to have

741

00:33:50,710 --> 00:33:46,240

a way to recharge the battery and for me

742

00:33:53,529 --> 00:33:50,720

that was it and so father Howard was

743

00:33:56,350 --> 00:33:53,539

very important to me and I think that

744

00:33:59,889 --> 00:33:56,360

experience and just seeing just this

745

00:34:02,070 --> 00:33:59,899

mind-blowing beauty of the universe you

746

00:34:05,830 --> 00:34:02,080

just

747

00:34:10,180 --> 00:34:05,840

it grows your faith in ways that it's

748

00:34:11,440 --> 00:34:10,190

hard to even describe all right I think

749

00:34:13,899 --> 00:34:11,450

we have a couple of follow-up questions

750

00:34:15,940 --> 00:34:13,909

on the phone bridge here let's go back

751  
00:34:19,930 --> 00:34:15,950  
to the history historical aerospace news

752  
00:34:22,810 --> 00:34:19,940  
media yes could you tell me you had

753  
00:34:26,470 --> 00:34:22,820  
mentioned your slightly rough landing

754  
00:34:27,880 --> 00:34:26,480  
coming back from your mission did you do

755  
00:34:30,880 --> 00:34:27,890  
any

756  
00:34:33,270 --> 00:34:30,890  
Uber's or tests involving the future

757  
00:34:36,820 --> 00:34:33,280  
where astronauts will be sent and

758  
00:34:39,490 --> 00:34:36,830  
launched from Cape Canaveral in SpaceX

759  
00:34:41,680 --> 00:34:39,500  
dragon capsules or Boeing Starliner

760  
00:34:46,360 --> 00:34:41,690  
capsules in the future did you do

761  
00:34:48,670 --> 00:34:46,370  
anything on that we did one experiment

762  
00:34:51,100 --> 00:34:48,680  
looking at a new piece of exercise

763  
00:34:53,230 --> 00:34:51,110

hardware it's much much smaller much

764

00:34:55,360 --> 00:34:53,240

more miniaturized it's more I think not

765

00:34:59,100 --> 00:34:55,370

necessarily for the commercial providers

766

00:35:01,780 --> 00:34:59,110

but for Orion or other distant

767

00:35:05,340 --> 00:35:01,790

exploration vehicles trying to get

768

00:35:09,070 --> 00:35:05,350

our exercise device in a much smaller

769

00:35:11,020 --> 00:35:09,080

volume the one we have now our resistive

770

00:35:12,850 --> 00:35:11,030

exercise device is phenomenal and it

771

00:35:15,460 --> 00:35:12,860

works great but it takes up a large

772

00:35:17,740 --> 00:35:15,470

volume and so this was trying to use

773

00:35:20,170 --> 00:35:17,750

something smaller so we did some of the

774

00:35:22,120 --> 00:35:20,180

initial testing on that you know

775

00:35:24,310 --> 00:35:22,130

obviously with most things it's got a

776  
00:35:26,350 --> 00:35:24,320  
little ways to go but we were excited to

777  
00:35:28,330 --> 00:35:26,360  
be able to try out something that you

778  
00:35:32,500 --> 00:35:28,340  
know is going to be directly applied to

779  
00:35:34,180 --> 00:35:32,510  
our lessons for exploration we actually

780  
00:35:36,130 --> 00:35:34,190  
have a facebook question on exercise

781  
00:35:37,390 --> 00:35:36,140  
they want to know how often you have to

782  
00:35:42,460 --> 00:35:37,400  
exercise in order to keep your bones

783  
00:35:46,270 --> 00:35:42,470  
healthy go ahead we did about an hour of

784  
00:35:50,380 --> 00:35:46,280  
resistive exercise a day and then we had

785  
00:35:53,190 --> 00:35:50,390  
options to do treadmill or bike us our

786  
00:35:56,530 --> 00:35:53,200  
gamma tree as our cardiovascular

787  
00:35:58,770 --> 00:35:56,540  
conditioning system so as in each day it

788  
00:36:03,040 --> 00:35:58,780

ended up being about two hours a day of

789

00:36:05,770 --> 00:36:03,050

exercise so it was it's pretty intense

790

00:36:08,590 --> 00:36:05,780

but I enjoyed it I think it's a good for

791

00:36:11,320 --> 00:36:08,600

me it's a good you know psychological

792

00:36:13,420 --> 00:36:11,330

you know mellows me out and makes me

793

00:36:15,940 --> 00:36:13,430

happy jack knows I get stressed on those

794

00:36:19,300 --> 00:36:15,950

days when when I can't exercise because

795

00:36:22,060 --> 00:36:19,310

of this excellent experiment or that for

796

00:36:23,620 --> 00:36:22,070

me it was coffee when the experiment you

797

00:36:25,150 --> 00:36:23,630

couldn't have coffee then I got a little

798

00:36:27,460 --> 00:36:25,160

got a little antsy when she couldn't

799

00:36:33,010 --> 00:36:27,470

have exercise she's kind of steer around

800

00:36:35,110 --> 00:36:33,020

her well speaking of exercise I I know

801  
00:36:37,430 --> 00:36:35,120  
you did the great video

802  
00:36:38,510 --> 00:36:37,440  
sweetie time again showing off the

803  
00:36:40,819 --> 00:36:38,520  
read the advanced resistive exercise

804  
00:36:43,609 --> 00:36:40,829  
device it looks like you pretty much

805  
00:36:45,980 --> 00:36:43,619  
mastered it yeah now it's it's a lot of

806  
00:36:47,630 --> 00:36:45,990  
fun and previously in my previous two

807  
00:36:49,880 --> 00:36:47,640  
missions we were using an interim device

808  
00:36:51,500 --> 00:36:49,890  
and it wasn't vibration isolated so this

809  
00:36:54,920 --> 00:36:51,510  
one's much better because it can go much

810  
00:36:58,160 --> 00:36:54,930  
higher resistance so lifting more weight

811  
00:37:00,020 --> 00:36:58,170  
but it also isolates the vibrations and

812  
00:37:01,910 --> 00:37:00,030  
protects the scientific experiments that

813  
00:37:04,609 --> 00:37:01,920

we're doing as well so that that was

814

00:37:08,270 --> 00:37:04,619

even better all right I think we have

815

00:37:11,240 --> 00:37:08,280

another question Michael Galindo for

816

00:37:13,339 --> 00:37:11,250

America space comm for Peggy when did

817

00:37:14,930 --> 00:37:13,349

you find out that your mission was gonna

818

00:37:18,500 --> 00:37:14,940

be extended did you have any previous

819

00:37:20,420 --> 00:37:18,510

idea and it was they talked to me about

820

00:37:22,910 --> 00:37:20,430

it the day before my launch that it

821

00:37:27,380 --> 00:37:22,920

might be a possibility and it wasn't

822

00:37:30,440 --> 00:37:27,390

confirmed until probably within a month

823

00:37:33,050 --> 00:37:30,450

of when I was supposed to be landing and

824

00:37:35,660 --> 00:37:33,060

maybe even a little less and than that

825

00:37:40,430 --> 00:37:35,670

maybe a couple of weeks so it was out

826

00:37:42,200 --> 00:37:40,440

there as a maybe so psychologically I

827

00:37:44,329 --> 00:37:42,210

told my husband we're gonna have a

828

00:37:45,980 --> 00:37:44,339

flexible plan for happiness we're gonna

829

00:37:47,300 --> 00:37:45,990

be happy if I come home in June and

830

00:37:53,990 --> 00:37:47,310

we're gonna be happy if I come home and

831

00:37:55,640 --> 00:37:54,000

so it worked out we were happy all right

832

00:38:02,569 --> 00:37:55,650

another one from the phone bridge now

833

00:38:04,190 --> 00:38:02,579

from Creston news advertiser you said in

834

00:38:06,290 --> 00:38:04,200

the interview that you think training

835

00:38:07,940 --> 00:38:06,300

and space travel gets easier as you get

836

00:38:10,609 --> 00:38:07,950

older do you still stand by that

837

00:38:14,599 --> 00:38:10,619

well definitely sleeping in space is way

838

00:38:16,550 --> 00:38:14,609

easier yeah I think the aches and pains

839

00:38:20,630 --> 00:38:16,560

that you feel down here you don't feel

840

00:38:24,109 --> 00:38:20,640

them up there and in general much fewer

841

00:38:25,760 --> 00:38:24,119

aches and pains up in space and

842

00:38:30,109 --> 00:38:25,770

zero-gravity just because it takes so

843

00:38:32,960 --> 00:38:30,119

little to move around so yeah I still

844

00:38:34,609 --> 00:38:32,970

stand by that anything you feel like you

845

00:38:35,750 --> 00:38:34,619

didn't know going in that you you've

846

00:38:39,109 --> 00:38:35,760

learned and you'll take in to your next

847

00:38:44,849 --> 00:38:39,119

mission oh boy it's so much a there's

848

00:38:47,830 --> 00:38:44,859

more sauce sriracha more coffee no

849

00:38:49,870 --> 00:38:47,840

there's so much yeah and that and that's

850

00:38:52,420 --> 00:38:49,880

why I think that the space station is

851

00:38:54,849 --> 00:38:52,430

getting so much better every single

852

00:38:56,520 --> 00:38:54,859

expedition because we are learning and

853

00:38:59,589 --> 00:38:56,530

we're growing and we're evolving and

854

00:39:03,250 --> 00:38:59,599

there's you know it was interesting

855

00:39:05,970 --> 00:39:03,260

every time I'd grab a we call them CTB I

856

00:39:09,160 --> 00:39:05,980

don't even know what CT B stands for bag

857

00:39:12,339 --> 00:39:09,170

maybe you sit and cargo transfer bag so

858

00:39:13,990 --> 00:39:12,349

you'd pick it and there's velcro in

859

00:39:16,990 --> 00:39:14,000

different places and straps in different

860

00:39:18,460 --> 00:39:17,000

places like that this is crazy why why

861

00:39:21,070 --> 00:39:18,470

are they there and then you'd stick it

862

00:39:24,550 --> 00:39:21,080

someplace you'd be like that's why and

863

00:39:27,870 --> 00:39:24,560

so so many parts of the station are

864

00:39:30,609 --> 00:39:27,880

better and more refined than they were

865

00:39:34,000 --> 00:39:30,619

that you can't help but grow and get

866

00:39:35,740 --> 00:39:34,010

better and there's too many to list we

867

00:39:37,810 --> 00:39:35,750

have a question from Twitter for you

868

00:39:39,910 --> 00:39:37,820

from Stacy Smith he wants to know what's

869

00:39:43,330 --> 00:39:39,920

been the most difficult or a comical

870

00:39:48,849 --> 00:39:43,340

adjustment for back to gravity uh Stacy

871

00:39:51,370 --> 00:39:48,859

I know Stacy it's comical you know it's

872

00:39:55,570 --> 00:39:51,380

interesting your brain adapts so quickly

873

00:40:00,070 --> 00:39:55,580

so when I got up to orbit the brain has

874

00:40:02,020 --> 00:40:00,080

to go vestibular you are lying to me I'm

875

00:40:04,150 --> 00:40:02,030

not spinning I'm not doing this I'm

876

00:40:07,780 --> 00:40:04,160

turning you off and so after about a

877

00:40:10,359 --> 00:40:07,790

week or so it just shuts it down and you

878

00:40:12,670 --> 00:40:10,369

use your vision and kind of map out the

879

00:40:16,089 --> 00:40:12,680

environment and you you maneuver that

880

00:40:18,880 --> 00:40:16,099

way coming home you know I was lucky

881

00:40:20,470 --> 00:40:18,890

enough had kind of adapted quickly as

882

00:40:22,420 --> 00:40:20,480

long as my eyes were open and I was

883

00:40:25,120 --> 00:40:22,430

doing good and I was walking and you

884

00:40:27,579 --> 00:40:25,130

close your eyes and Wow

885

00:40:30,460 --> 00:40:27,589

we have this platform test that we stand

886

00:40:33,670 --> 00:40:30,470

there and there's a reason you wear a

887

00:40:35,349 --> 00:40:33,680

harness because you close your eyes and

888

00:40:38,290 --> 00:40:35,359

I could feel my legs

889

00:40:40,390 --> 00:40:38,300

you know just kind of going the brain

890

00:40:42,640 --> 00:40:40,400

trying to control it it's like dude

891

00:40:44,260 --> 00:40:42,650

you've told me to ignore vestibular for

892

00:40:47,349 --> 00:40:44,270

all these months and now you want me to

893

00:40:50,020 --> 00:40:47,359

use it away and so you just fall over

894

00:40:52,540 --> 00:40:50,030

you know into the into the wall or

895

00:40:56,360 --> 00:40:52,550

whatever it's it's the

896

00:40:57,860 --> 00:40:56,370

getting to use your vestibular again and

897

00:41:00,770 --> 00:40:57,870

and that balance when your eyes are

898

00:41:01,970 --> 00:41:00,780

closed was you can you can ask the

899

00:41:05,930 --> 00:41:01,980

people that were around me that was

900

00:41:07,430 --> 00:41:05,940

definitely comical alright I think we've

901  
00:41:11,030 --> 00:41:07,440  
got a couple of follow-up questions here

902  
00:41:12,520 --> 00:41:11,040  
in the room from Robert first I Robert

903  
00:41:15,710 --> 00:41:12,530  
problem with collects paste come again

904  
00:41:20,480 --> 00:41:15,720  
we're just under a month from the 60th

905  
00:41:22,160 --> 00:41:20,490  
anniversary of Sputnik and you went and

906  
00:41:23,960 --> 00:41:22,170  
so we went from having one satellite in

907  
00:41:26,090 --> 00:41:23,970  
orbit to both of you actually becoming

908  
00:41:28,790 --> 00:41:26,100  
more or less tethered satellites during

909  
00:41:31,700 --> 00:41:28,800  
spacewalks I wonder if there was any

910  
00:41:34,670 --> 00:41:31,710  
point during your mission that that that

911  
00:41:37,400 --> 00:41:34,680  
legacy of advancement in space sort of

912  
00:41:39,890 --> 00:41:37,410  
struck you or just in reflecting back on

913  
00:41:41,600 --> 00:41:39,900

your mission what it means this past 60

914

00:41:45,500 --> 00:41:41,610

years how far we've come and where we're

915

00:41:48,200 --> 00:41:45,510

going I think for me kind of the one

916

00:41:52,100 --> 00:41:48,210

moment was realizing we did the 200

917

00:41:54,350 --> 00:41:52,110

spacewalk I remember when I first joined

918

00:41:56,420 --> 00:41:54,360

the astronaut office everyone talked

919

00:41:58,160 --> 00:41:56,430

about the wall of EVs it was gonna be

920

00:41:59,930 --> 00:41:58,170

impossible to build the space station

921

00:42:01,880 --> 00:41:59,940

because of the wall of EVs

922

00:42:03,890 --> 00:42:01,890

there were just too many and it just

923

00:42:07,010 --> 00:42:03,900

wasn't going to physically be able to be

924

00:42:09,710 --> 00:42:07,020

done you know we did it mm-hmm it's

925

00:42:12,290 --> 00:42:09,720

pretty awesome I I think for me it was

926

00:42:15,400 --> 00:42:12,300

you know we launched our launch was the

927

00:42:18,620 --> 00:42:15,410

first April launch and Yuri Gagarin and

928

00:42:20,570 --> 00:42:18,630

we even have wherever our batch is we

929

00:42:25,430 --> 00:42:20,580

have little Sputnik on the patch because

930

00:42:28,480 --> 00:42:25,440

of the 60 years but I think he and what

931

00:42:31,280 --> 00:42:28,490

he represented was was this amazing

932

00:42:33,260 --> 00:42:31,290

legacy that we were proud to be a part

933

00:42:36,890 --> 00:42:33,270

of there's a little picture of him with

934

00:42:40,670 --> 00:42:36,900

the Dove with a big old smile and and I

935

00:42:44,420 --> 00:42:40,680

think that that opening of space for

936

00:42:47,360 --> 00:42:44,430

everyone and and being a part of an

937

00:42:52,070 --> 00:42:47,370

international space station where we

938

00:42:55,670 --> 00:42:52,080

depended on each other every day for all

939

00:42:58,190 --> 00:42:55,680

the systems for help for everything and

940

00:43:00,860 --> 00:42:58,200

what we're able to accomplish every day

941

00:43:05,450 --> 00:43:00,870

on that space station is just amazing so

942

00:43:05,850 --> 00:43:05,460

I think for both of us to be a part of

943

00:43:09,120 --> 00:43:05,860

that

944

00:43:10,980 --> 00:43:09,130

and to show the world as you know

945

00:43:14,910 --> 00:43:10,990

probably the best example of

946

00:43:18,950 --> 00:43:14,920

international cooperation in history we

947

00:43:26,610 --> 00:43:24,660

let's go back to Sophie now Sophie with

948

00:43:29,220 --> 00:43:26,620

cosmic Chicago again I'm a question for

949

00:43:30,690 --> 00:43:29,230

both Jack and Peggy I'm gonna paraphrase

950

00:43:33,660 --> 00:43:30,700

a question that one of my former Girl

951  
00:43:35,580 --> 00:43:33,670  
Scouts posed most of us aspire to be

952  
00:43:38,820 --> 00:43:35,590  
astronauts and go to space

953  
00:43:45,740 --> 00:43:38,830  
now that you've lived the dream and been

954  
00:43:52,560 --> 00:43:45,750  
to space what's your next dream go ahead

955  
00:43:55,080 --> 00:43:52,570  
I'm gonna do when I grow up you know I I

956  
00:43:57,920 --> 00:43:55,090  
think being a part of exploration any

957  
00:44:02,790 --> 00:43:57,930  
part of exploration is is really

958  
00:44:06,630 --> 00:44:02,800  
interesting satisfying gratifying those

959  
00:44:10,860 --> 00:44:06,640  
are the things that keep me going and so

960  
00:44:13,620 --> 00:44:10,870  
I something in space exploration I don't

961  
00:44:17,610 --> 00:44:13,630  
know what exactly yeah haven't had time

962  
00:44:19,290 --> 00:44:17,620  
to think about it boy I I don't know

963  
00:44:22,560 --> 00:44:19,300

either what what I'm going to do when I

964

00:44:24,630 --> 00:44:22,570

grow up there's there's a little plaque

965

00:44:26,130 --> 00:44:24,640

that my mom had in my bathroom growing

966

00:44:27,720 --> 00:44:26,140

up and it said what you are is God's

967

00:44:31,110 --> 00:44:27,730

gift to you what you become is your gift

968

00:44:35,640 --> 00:44:31,120

to him and I think that spaceflight is a

969

00:44:38,520 --> 00:44:35,650

gift we were given by the US taxpayer to

970

00:44:41,490 --> 00:44:38,530

get up there and and get infected with

971

00:44:43,670 --> 00:44:41,500

this just passion for space I think it's

972

00:44:46,860 --> 00:44:43,680

our job to do everything in our power to

973

00:44:49,770 --> 00:44:46,870

spread that and to infect as many people

974

00:44:52,200 --> 00:44:49,780

as we can help build the infrastructure

975

00:44:56,450 --> 00:44:52,210

to to make sure that we have a permanent

976  
00:44:59,910 --> 00:44:56,460  
foothold in space and I don't know how

977  
00:45:02,460 --> 00:44:59,920  
to do that best yet but that's what my

978  
00:45:04,830 --> 00:45:02,470  
eyes are open to find it's a good

979  
00:45:08,760 --> 00:45:04,840  
infection good infection it's a good

980  
00:45:10,350 --> 00:45:08,770  
infection you want this one well getting

981  
00:45:11,640 --> 00:45:10,360  
back to some of the science questions

982  
00:45:13,770 --> 00:45:11,650  
that we talked about earlier we have

983  
00:45:16,020 --> 00:45:13,780  
code designs on Twitter

984  
00:45:17,520 --> 00:45:16,030  
excuse me stick Katie on Twitter wants

985  
00:45:19,559 --> 00:45:17,530  
to know what's the advantage of doing an

986  
00:45:22,079 --> 00:45:19,569  
experiment on space versus on

987  
00:45:24,209 --> 00:45:22,089  
the earth well the International Space

988  
00:45:26,279 --> 00:45:24,219

Station is a unique laboratory in a lot

989

00:45:29,209 --> 00:45:26,289

of ways it's the only one that can give

990

00:45:33,660 --> 00:45:29,219

you long duration zero gravity and

991

00:45:35,519 --> 00:45:33,670

having microgravity as a variable allows

992

00:45:37,439 --> 00:45:35,529

investigators to look at things in a

993

00:45:38,519 --> 00:45:37,449

different way that they can down here on

994

00:45:40,890 --> 00:45:38,529

earth there's a lot of physical

995

00:45:43,229 --> 00:45:40,900

properties like the combustion

996

00:45:45,630 --> 00:45:43,239

experiments that we were doing the

997

00:45:47,969 --> 00:45:45,640

flames just don't burn the same way and

998

00:45:49,949 --> 00:45:47,979

they had what's called cool flames so

999

00:45:53,660 --> 00:45:49,959

something would burn you know they'd

1000

00:45:56,630 --> 00:45:53,670

inject these fuels and ignite them and

1001  
00:45:59,430 --> 00:45:56,640  
they would appear to burn out and then

1002  
00:46:01,289 --> 00:45:59,440  
using special cameras they could see

1003  
00:46:03,900 --> 00:46:01,299  
that these flames were actually still

1004  
00:46:06,719 --> 00:46:03,910  
burning but at a cool level that they

1005  
00:46:08,699 --> 00:46:06,729  
can't see on earth because you know you

1006  
00:46:11,789 --> 00:46:08,709  
have too many convective forces working

1007  
00:46:14,849 --> 00:46:11,799  
gravity gravitational forces that that

1008  
00:46:16,680 --> 00:46:14,859  
don't allow it to happen and it helps us

1009  
00:46:19,140 --> 00:46:16,690  
understand how things work on the ground

1010  
00:46:21,569 --> 00:46:19,150  
how burning and different combustion

1011  
00:46:23,489 --> 00:46:21,579  
things work on the ground as well but

1012  
00:46:26,189 --> 00:46:23,499  
it's also important for our exploration

1013  
00:46:29,180 --> 00:46:26,199

missions because if we better understand

1014

00:46:32,219 --> 00:46:29,190

how to take advantage of this

1015

00:46:35,099 --> 00:46:32,229

microgravity environment and maybe burn

1016

00:46:37,109 --> 00:46:35,109

more efficiently it could be a huge

1017

00:46:41,039 --> 00:46:37,119

advantage in our future exploration as

1018

00:46:44,809 --> 00:46:41,049

well so there's just all kinds of ways

1019

00:46:48,959 --> 00:46:44,819

that the lack of gravity can provide a

1020

00:46:51,209 --> 00:46:48,969

different twist on their understanding

1021

00:46:53,039 --> 00:46:51,219

of a basic principle so that we have

1022

00:46:54,029 --> 00:46:53,049

here on the ground it's kind of like

1023

00:46:55,799 --> 00:46:54,039

you're referring to earlier we don't

1024

00:46:59,039 --> 00:46:55,809

even always know what we're gonna learn

1025

00:47:00,930 --> 00:46:59,049

can be used in the future I have one

1026  
00:47:02,910 --> 00:47:00,940  
here from Co designs on Twitter for you

1027  
00:47:05,189 --> 00:47:02,920  
they want to know was Garth Brooks the

1028  
00:47:08,549 --> 00:47:05,199  
highlight of this space mission well I

1029  
00:47:11,370 --> 00:47:08,559  
was sure cool you know my favorite

1030  
00:47:15,239 --> 00:47:11,380  
artist and my favorite song so heaven

1031  
00:47:18,299 --> 00:47:15,249  
Garth sing the river was was amazing I

1032  
00:47:19,890 --> 00:47:18,309  
think I it was my 20th anniversary on

1033  
00:47:22,229 --> 00:47:19,900  
orbit so I got to marry my wife again

1034  
00:47:24,809 --> 00:47:22,239  
and that was kind of the highlight and

1035  
00:47:26,819 --> 00:47:24,819  
then the spacewalks were great but Garth

1036  
00:47:30,040 --> 00:47:26,829  
doesn't beat my wife but he's pretty

1037  
00:47:35,120 --> 00:47:32,720  
alright and I think that we also have

1038  
00:47:39,349 --> 00:47:35,130

another follow-up on the phone bridge

1039

00:47:42,170 --> 00:47:39,359

from historical aerospace news media yes

1040

00:47:43,130 --> 00:47:42,180

this question is for Peggy Peggy can you

1041

00:47:45,920 --> 00:47:43,140

tell me

1042

00:47:48,589 --> 00:47:45,930

you look fantastic returning from the

1043

00:47:51,320 --> 00:47:48,599

extended stay on a long mission that you

1044

00:47:54,079 --> 00:47:51,330

were on you look very well very good

1045

00:47:57,079 --> 00:47:54,089

physically you look strong and sound can

1046

00:48:01,220 --> 00:47:57,089

you tell me did you notice physically

1047

00:48:04,820 --> 00:48:01,230

any any pain in your joints your knees

1048

00:48:08,660 --> 00:48:04,830

your shoulders etc did you feel more

1049

00:48:12,500 --> 00:48:08,670

strain on your eyes etc on the extended

1050

00:48:16,550 --> 00:48:12,510

length of this mission oh well if you're

1051  
00:48:18,770 --> 00:48:16,560  
asking compared to pre-flight now I had

1052  
00:48:20,599 --> 00:48:18,780  
a lot of pain in my joints pre-flight so

1053  
00:48:23,390 --> 00:48:20,609  
I don't know that I noticed any more

1054  
00:48:25,849 --> 00:48:23,400  
pain I think my back felt stiffer this

1055  
00:48:28,220 --> 00:48:25,859  
time than before the neurovestibular

1056  
00:48:30,710 --> 00:48:28,230  
part seemed to come back a little

1057  
00:48:33,740 --> 00:48:30,720  
quicker than it did on previous flights

1058  
00:48:36,380 --> 00:48:33,750  
so I think that's a learned thing I

1059  
00:48:38,540 --> 00:48:36,390  
think that even though I'd been eight

1060  
00:48:42,079 --> 00:48:38,550  
years I think there is some learning

1061  
00:48:44,440 --> 00:48:42,089  
that your brain remembers how to switch

1062  
00:48:49,160 --> 00:48:44,450  
back to earth earth mode versus

1063  
00:48:50,599 --> 00:48:49,170

microgravity mode and what was the rest

1064

00:48:55,760 --> 00:48:50,609

of the question I forgot all right maybe

1065

00:48:58,010 --> 00:48:55,770

memory might be a problem you know more

1066

00:49:00,920 --> 00:48:58,020

strained on this extended length of your

1067

00:49:03,589 --> 00:49:00,930

vision oh yeah no I don't really think

1068

00:49:05,480 --> 00:49:03,599

it made any difference my eyes actually

1069

00:49:07,370 --> 00:49:05,490

right now are better than they were when

1070

00:49:09,400 --> 00:49:07,380

I launched which is a little unusual it

1071

00:49:12,050 --> 00:49:09,410

didn't happen on previous flights I

1072

00:49:14,300 --> 00:49:12,060

think that has to do with old age and

1073

00:49:17,150 --> 00:49:14,310

how your eyes have changed and then how

1074

00:49:19,760 --> 00:49:17,160

being in zero gravity kind of reshapes

1075

00:49:22,910 --> 00:49:19,770

them so it probably not gonna last more

1076

00:49:24,740 --> 00:49:22,920

than 30 days they're giving me so but

1077

00:49:30,140 --> 00:49:24,750

I'm like I'll take advantage of it while

1078

00:49:33,589 --> 00:49:30,150

I can we have another question from

1079

00:49:35,900 --> 00:49:33,599

Facebook this is a four from a teacher

1080

00:49:37,490 --> 00:49:35,910

social sciences teacher for K through 12

1081

00:49:39,230 --> 00:49:37,500

who wants to know if you have any advice

1082

00:49:41,640 --> 00:49:39,240

for her girl students to become curious

1083

00:49:45,509 --> 00:49:41,650

like you

1084

00:49:47,759 --> 00:49:45,519

well I think I think that historically

1085

00:49:51,569 --> 00:49:47,769

if you look at studies they say that

1086

00:49:53,880 --> 00:49:51,579

that girls you know 50/50 are in the

1087

00:49:56,870 --> 00:49:53,890

sign interested in the sciences and then

1088

00:50:01,019 --> 00:49:56,880

somewhere along the way our girls are

1089

00:50:03,660 --> 00:50:01,029

either being persuaded or dissuaded

1090

00:50:05,940 --> 00:50:03,670

somehow into thinking that's not a good

1091

00:50:08,549 --> 00:50:05,950

career choice for them or that's not a

1092

00:50:11,390 --> 00:50:08,559

life choice for them and so we need to

1093

00:50:12,980 --> 00:50:11,400

figure out a way to to overcome that and

1094

00:50:16,920 --> 00:50:12,990

[Music]

1095

00:50:19,200 --> 00:50:16,930

keep everybody interested from your

1096

00:50:21,630 --> 00:50:19,210

childhood that you really kind of felt

1097

00:50:24,420 --> 00:50:21,640

the spider was always there I I always

1098

00:50:27,150 --> 00:50:24,430

had an interest in science from when I

1099

00:50:30,599 --> 00:50:27,160

was very young and so luckily nobody

1100

00:50:36,000 --> 00:50:30,609

ever told me I I couldn't yeah I had

1101  
00:50:37,950 --> 00:50:36,010  
great role models all right one more

1102  
00:50:39,990 --> 00:50:37,960  
question from Facebook from Linda

1103  
00:50:41,579 --> 00:50:40,000  
O'Connor she wants to know what do you

1104  
00:50:45,450 --> 00:50:41,589  
miss most about living on the space

1105  
00:50:47,549 --> 00:50:45,460  
station floating floating floating it's

1106  
00:50:49,710 --> 00:50:47,559  
awesome like I'm kind of a big good guy

1107  
00:50:51,839 --> 00:50:49,720  
but on the space station you kind of

1108  
00:50:53,549 --> 00:50:51,849  
feel like a ballerina you don't wait

1109  
00:50:56,279 --> 00:50:53,559  
anything so you feel like you're

1110  
00:50:57,450 --> 00:50:56,289  
flexible and you can do spins and

1111  
00:51:02,609 --> 00:50:57,460  
everything and then you come back and

1112  
00:51:05,220 --> 00:51:02,619  
you're like I'm not a ballerina but it's

1113  
00:51:08,130 --> 00:51:05,230

awesome it's a lot of fun floating is

1114

00:51:09,660 --> 00:51:08,140

you don't get tired of it do get tired

1115

00:51:20,609 --> 00:51:09,670

of sometimes losing the tools but you

1116

00:51:24,089 --> 00:51:20,619

don't think we have a question kind of

1117

00:51:25,980 --> 00:51:24,099

back in the back here Rockaways with

1118

00:51:28,529 --> 00:51:25,990

mappy I was just wondering there's such

1119

00:51:31,109 --> 00:51:28,539

a diverse spectrum or breadth of

1120

00:51:33,660 --> 00:51:31,119

facilities and capabilities for research

1121

00:51:36,509 --> 00:51:33,670

up on station and I was just wondering

1122

00:51:39,029 --> 00:51:36,519

for each of you were you partial to any

1123

00:51:40,759 --> 00:51:39,039

particular facility or capability I know

1124

00:51:42,990 --> 00:51:40,769

you mentioned some conversation just

1125

00:51:45,499 --> 00:51:43,000

randomly but was there anyone that you

1126

00:51:48,960 --> 00:51:45,509

were per a partial to for its

1127

00:51:51,599 --> 00:51:48,970

multidisciplinary capabilities and for

1128

00:51:53,849 --> 00:51:51,609

the reason it gave you pause or that

1129

00:51:54,930 --> 00:51:53,859

there was a great unexpected result that

1130

00:51:56,460 --> 00:51:54,940

you got at any given

1131

00:51:59,220 --> 00:51:56,470

time and that you couldn't wait to

1132

00:52:02,000 --> 00:51:59,230

return to to doing or utilizing that

1133

00:52:03,960 --> 00:52:02,010

particular capability from a facility

1134

00:52:06,900 --> 00:52:03,970

perspective I think that microgravity

1135

00:52:11,819 --> 00:52:06,910

Sciences glovebox is probably has the

1136

00:52:16,349 --> 00:52:11,829

most diverse experiment types in it we

1137

00:52:20,339 --> 00:52:16,359

did everything from studies looking at

1138

00:52:24,030 --> 00:52:20,349

how fluid and guests liquid air mixtures

1139

00:52:26,550 --> 00:52:24,040

through wetted and non wetted substances

1140

00:52:27,960 --> 00:52:26,560

I've done superconductor crystals in

1141

00:52:32,099 --> 00:52:27,970

there and then get heat him up to over

1142

00:52:34,170 --> 00:52:32,109

800 degrees did the tissue culture in

1143

00:52:36,829 --> 00:52:34,180

there and we do rodent research in there

1144

00:52:39,660 --> 00:52:36,839

there's so many different types of

1145

00:52:41,670 --> 00:52:39,670

investigations that can happen inside

1146

00:52:45,089 --> 00:52:41,680

the MSG I like it because of that

1147

00:52:48,780 --> 00:52:45,099

flexibility but I still think there's

1148

00:52:52,339 --> 00:52:48,790

some really unique capabilities and many

1149

00:52:55,290 --> 00:52:52,349

of the other facilities that that we

1150

00:52:59,069 --> 00:52:55,300

really working in all of them we did

1151  
00:53:01,770 --> 00:52:59,079  
specialize a little bit yeah but you

1152  
00:53:05,069 --> 00:53:01,780  
know it it it just helped for efficiency

1153  
00:53:07,260 --> 00:53:05,079  
to specialize a little bit but it was

1154  
00:53:09,300 --> 00:53:07,270  
fun working on all of them it was yeah

1155  
00:53:13,020 --> 00:53:09,310  
we we specialize because there's only

1156  
00:53:15,540 --> 00:53:13,030  
two of us for so long and to be able to

1157  
00:53:19,380 --> 00:53:15,550  
get all the science especially space x11

1158  
00:53:22,920 --> 00:53:19,390  
we kind of encompassed that alone and we

1159  
00:53:25,200 --> 00:53:22,930  
we specialized in different parts of the

1160  
00:53:28,319 --> 00:53:25,210  
large science so that we could get more

1161  
00:53:30,930 --> 00:53:28,329  
and more efficient I did a lot in the

1162  
00:53:32,940 --> 00:53:30,940  
the Japanese module and there's a lot of

1163  
00:53:35,130 --> 00:53:32,950

great capabilities in there one of them

1164

00:53:37,290 --> 00:53:35,140

is called elf it levitates little pieces

1165

00:53:40,460 --> 00:53:37,300

little balls of metal and then melts

1166

00:53:44,309 --> 00:53:40,470

them with the laser that's just awesome

1167

00:53:47,220 --> 00:53:44,319

there's just and every single rack in

1168

00:53:49,170 --> 00:53:47,230

the space station you can reconfigure as

1169

00:53:51,690 --> 00:53:49,180

a as a kid growing up on a construction

1170

00:53:54,359 --> 00:53:51,700

site I I loved tinkering and and and

1171

00:53:56,900 --> 00:53:54,369

doing that and and working with the the

1172

00:54:00,059 --> 00:53:56,910

racks to to repurpose them so I think in

1173

00:54:01,980 --> 00:54:00,069

general we've just gotten obviously the

1174

00:54:04,740 --> 00:54:01,990

MSG is a specialized piece of equipment

1175

00:54:07,290 --> 00:54:04,750

that's amazing but I think the entire

1176

00:54:08,710 --> 00:54:07,300

space station is full of that stuff that

1177

00:54:11,170 --> 00:54:08,720

you can repurpose

1178

00:54:14,410 --> 00:54:11,180

and really adapt to whatever the science

1179

00:54:16,780 --> 00:54:14,420

is so it's a it's an exciting place and

1180

00:54:19,839 --> 00:54:16,790

I think the quantity of science that we

1181

00:54:23,079 --> 00:54:19,849

were doing now between between SpaceX's

1182

00:54:25,540 --> 00:54:23,089

or cargo different cargo vehicles coming

1183

00:54:27,970 --> 00:54:25,550

and arriving we would reconfigure

1184

00:54:30,579 --> 00:54:27,980

Express racks we just take and move you

1185

00:54:33,130 --> 00:54:30,589

know five six different lockers put them

1186

00:54:35,710 --> 00:54:33,140

somewhere else bring out new sets of

1187

00:54:37,120 --> 00:54:35,720

hardware for the new investigations that

1188

00:54:38,680 --> 00:54:37,130

were coming up on the next one that was

1189

00:54:41,740 --> 00:54:38,690

actually really cool that we could

1190

00:54:43,569 --> 00:54:41,750

specialize the racks for the science

1191

00:54:46,240 --> 00:54:43,579

that we were doing I thought that was

1192

00:54:48,010 --> 00:54:46,250

neat comer and Paulo were like dude

1193

00:54:50,650 --> 00:54:48,020

we're out all these holes in the racks

1194

00:54:52,780 --> 00:54:50,660

it's like wait till SpaceX twelve and

1195

00:54:54,880 --> 00:54:52,790

within a week everything's full and

1196

00:54:57,280 --> 00:54:54,890

they're just cranking the science away

1197

00:55:01,230 --> 00:54:57,290

it it was it was neat that's great I

1198

00:55:04,270 --> 00:55:01,240

think we have a follow up here from mark

1199

00:55:08,740 --> 00:55:04,280

thank you Mark Cairo from Aviation Week

1200

00:55:10,690 --> 00:55:08,750

I like to ask both of you both expect to

1201

00:55:13,210 --> 00:55:10,700

launch again and I am honestly

1202

00:55:15,010 --> 00:55:13,220

especially asking Peggy but I think it's

1203

00:55:16,420 --> 00:55:15,020

a good question always to ask everyone

1204

00:55:19,500 --> 00:55:16,430

who's just come back what they're

1205

00:55:23,020 --> 00:55:19,510

thinking about as far as flying again

1206

00:55:26,490 --> 00:55:23,030

I'd love to fly again I don't know that

1207

00:55:29,440 --> 00:55:26,500

that's probably practical at this point

1208

00:55:31,150 --> 00:55:29,450

but I don't know you know if we keep

1209

00:55:32,920 --> 00:55:31,160

doing commercial things maybe there will

1210

00:55:34,750 --> 00:55:32,930

be an option out there somewhere maybe

1211

00:55:37,380 --> 00:55:34,760

somebody will want to hire a scientist

1212

00:55:40,990 --> 00:55:37,390

to go do their experiments farm in space

1213

00:55:44,589 --> 00:55:41,000

eid for for me yeah we talked about it

1214

00:55:47,859 --> 00:55:44,599

it's a gift and I don't ever expect that

1215

00:55:51,550 --> 00:55:47,869

gift again you can't expect it I'd love

1216

00:55:55,540 --> 00:55:51,560

to fly but I'm gonna do as much as I can

1217

00:55:57,160 --> 00:55:55,550

with what I've been given so far and I

1218

00:55:59,710 --> 00:55:57,170

and I think it's important for us to

1219

00:56:04,059 --> 00:55:59,720

spread the wealth and get as many people

1220

00:56:07,660 --> 00:56:04,069

to experience that amazing place as

1221

00:56:09,609 --> 00:56:07,670

possible I think we'd all love to see

1222

00:56:11,440 --> 00:56:09,619

both of you back in space um so we'll

1223

00:56:13,030 --> 00:56:11,450

we'll hope for the best but I think

1224

00:56:15,339 --> 00:56:13,040

that's about all we have time for today

1225

00:56:16,540 --> 00:56:15,349

here in our news conference if you want

1226  
00:56:17,950 --> 00:56:16,550  
to keep up with what's going on on the

1227  
00:56:22,450 --> 00:56:17,960  
international space station you can do

1228  
00:56:27,359 --> 00:56:24,520  
slash station and of course both of

1229  
00:56:29,920 --> 00:56:27,369  
these folks are on social media you can

1230  
00:56:33,670 --> 00:56:29,930  
follow along with what they're doing on

1231  
00:56:36,640 --> 00:56:33,680  
Twitter at Astro Peggy and Astro to fish

1232  
00:56:40,089 --> 00:56:36,650  
also Facebook NASA astronaut Peggy

1233  
00:56:41,339 --> 00:56:40,099  
Whitson and Instagram for four Jack as

1234  
00:56:43,900 --> 00:56:41,349  
well so a lots of different