



1  
00:00:03,830 --> 00:00:02,629  
hi everybody this is Mission Control

2  
00:00:05,990 --> 00:00:03,840  
Houston we want to welcome you guys

3  
00:00:08,540 --> 00:00:06,000  
there at the Heritage middle school in

4  
00:00:10,430 --> 00:00:08,550  
Idaho I'm joined by dottie

5  
00:00:12,320 --> 00:00:10,440  
metcalf-lindenburger who is an astronaut

6  
00:00:13,730 --> 00:00:12,330  
I'm Josh Byerly here and Doddy is

7  
00:00:14,870 --> 00:00:13,740  
willing to take your questions she'll

8  
00:00:18,260 --> 00:00:14,880  
probably take all the hard ones I'll

9  
00:00:29,450 --> 00:00:18,270  
take the easy ones I think we're ready

10  
00:00:30,529 --> 00:00:29,460  
to go what's our first question okay you

11  
00:00:32,150 --> 00:00:30,539  
guys there we're ready to take your

12  
00:00:33,229 --> 00:00:32,160  
questions here inside Mission Control so

13  
00:00:35,000 --> 00:00:33,239

if you're all ready to go ahead go ahead

14

00:00:56,930 --> 00:00:35,010

and step up and ask whatever you want to

15

00:00:58,520 --> 00:00:56,940

ask are there any stressful or

16

00:01:01,369 --> 00:00:58,530

life-or-death situations well we do have

17

00:01:04,939 --> 00:01:01,379

emergencies arrive arise while we are

18

00:01:07,670 --> 00:01:04,949

doing spaceflight but as you can see

19

00:01:08,780 --> 00:01:07,680

probably earlier you were looking at

20

00:01:10,490 --> 00:01:08,790

Mission Control and that's where we're

21

00:01:12,710 --> 00:01:10,500

sitting we've got a whole team of people

22

00:01:14,090 --> 00:01:12,720

here on earth as well as the whole crew

23

00:01:16,880 --> 00:01:14,100

that can work through emergencies

24

00:01:19,850 --> 00:01:16,890

together so if there were a fire or a

25

00:01:22,370 --> 00:01:19,860

depressurization or any of the ammonia

26  
00:01:24,230 --> 00:01:22,380  
leak we have procedures that we would

27  
00:01:26,150 --> 00:01:24,240  
run and we practice these here on earth

28  
00:01:28,700 --> 00:01:26,160  
just like you guys probably practice

29  
00:01:31,790 --> 00:01:28,710  
fire drills maybe even some earthquake

30  
00:01:34,130 --> 00:01:31,800  
drills there in the northwest so we

31  
00:01:36,320 --> 00:01:34,140  
practice those things anytime a medical

32  
00:01:37,610 --> 00:01:36,330  
situation could arise and we have crew

33  
00:01:39,260 --> 00:01:37,620  
members who are trained as the medical

34  
00:01:41,420 --> 00:01:39,270  
officers unless they're already a doctor

35  
00:01:43,610 --> 00:01:41,430  
and then they're completely certified so

36  
00:01:45,620 --> 00:01:43,620  
we do have ways of dealing with

37  
00:02:03,890 --> 00:01:45,630  
emergencies that can arise arise on

38  
00:02:05,630 --> 00:02:03,900

station for the next question what would

39

00:02:08,119 --> 00:02:05,640

I say that is NASA's greatest

40

00:02:11,040 --> 00:02:08,129

accomplishment well I think putting

41

00:02:13,420 --> 00:02:11,050

humans in space is quite an amazed

42

00:02:16,360 --> 00:02:13,430

accomplishments oh I'm I'm very glad

43

00:02:18,490 --> 00:02:16,370

that we pursue that back in the 50s and

44

00:02:20,650 --> 00:02:18,500

60s when we finally were launching folks

45

00:02:23,290 --> 00:02:20,660

into space but it also say we've done a

46

00:02:26,640 --> 00:02:23,300

lot of amazing things in exploration

47

00:02:30,340 --> 00:02:26,650

that is also non human spaceflight so

48

00:02:32,350 --> 00:02:30,350

but putting a human in space is is quite

49

00:02:35,080 --> 00:02:32,360

a feat because of all the things we as

50

00:02:37,540 --> 00:02:35,090

humans need besides you know just food

51  
00:02:40,199 --> 00:02:37,550  
and water I mean thinking about how we

52  
00:02:42,460 --> 00:02:40,209  
have to provide air that's clean and

53  
00:02:44,830 --> 00:02:42,470  
fresh and then scrub the carbon dioxide

54  
00:02:47,740 --> 00:02:44,840  
from it and how we need to take care of

55  
00:02:49,120 --> 00:02:47,750  
our bodily needs besides just eating

56  
00:02:50,949 --> 00:02:49,130  
that we made that bathrooms and things

57  
00:02:52,780 --> 00:02:50,959  
like that so all those things need to be

58  
00:02:55,180 --> 00:02:52,790  
designed and taken care of for

59  
00:02:57,970 --> 00:02:55,190  
spaceflight and I'm really impressed how

60  
00:02:59,890 --> 00:02:57,980  
we have we had we first did that and we

61  
00:03:02,110 --> 00:02:59,900  
have continued to evolve it through time

62  
00:03:04,780 --> 00:03:02,120  
and how it's it's really working great

63  
00:03:21,390 --> 00:03:04,790

on the space station now all right next

64

00:03:27,100 --> 00:03:24,850

that's a great question there's not a

65

00:03:29,440 --> 00:03:27,110

lot of free time in space but when you

66

00:03:31,750 --> 00:03:29,450

have it there are two favorite things

67

00:03:33,550 --> 00:03:31,760

that I did and one was look out the

68

00:03:35,440 --> 00:03:33,560

window and I actually looked down on

69

00:03:37,960 --> 00:03:35,450

Idaho when I was up there because I

70

00:03:40,150 --> 00:03:37,970

thought not far away from Idaho I taught

71

00:03:42,069 --> 00:03:40,160

in Vancouver Washington and so I'm very

72

00:03:43,720 --> 00:03:42,079

familiar with the Pacific Northwest I

73

00:03:45,699 --> 00:03:43,730

love the volcanoes and have climbed a

74

00:03:47,979 --> 00:03:45,709

couple of them and so I would look out

75

00:03:49,600 --> 00:03:47,989

the window down at the United States and

76  
00:03:51,610 --> 00:03:49,610  
then places I've never been in the world

77  
00:03:53,890 --> 00:03:51,620  
never been south of the Equator and so

78  
00:03:57,009 --> 00:03:53,900  
it was amazing to look at South America

79  
00:03:59,319 --> 00:03:57,019  
Australia Africa all these places that I

80  
00:04:01,870 --> 00:03:59,329  
really want to travel to someday and

81  
00:04:05,410 --> 00:04:01,880  
there's just also looking at space the

82  
00:04:07,509 --> 00:04:05,420  
Moon stars planets I enjoy looking at

83  
00:04:09,520 --> 00:04:07,519  
the moon because it was in a crescent

84  
00:04:11,740 --> 00:04:09,530  
phase while I was there so it just it

85  
00:04:12,849 --> 00:04:11,750  
looks really neat against the dark sky

86  
00:04:14,890 --> 00:04:12,859  
it's really beautiful

87  
00:04:17,470 --> 00:04:14,900  
my other favorite pastime of course is

88  
00:04:20,140 --> 00:04:17,480

floating and doing cool tricks

89

00:04:21,400 --> 00:04:20,150

with being around in space you know

90

00:04:22,780 --> 00:04:21,410

Dottie talked about them not having a

91

00:04:24,460 --> 00:04:22,790

whole lot of free time a lot of things

92

00:04:25,570 --> 00:04:24,470

that some people don't really understand

93

00:04:27,280 --> 00:04:25,580

it's back whenever they used to fly the

94

00:04:29,530 --> 00:04:27,290

shuttle and station missions together

95

00:04:30,970 --> 00:04:29,540

these crews were actually scheduled and

96

00:04:32,260 --> 00:04:30,980

five-minute increments so they would be

97

00:04:34,300 --> 00:04:32,270

handed a schedule every day that had

98

00:04:35,860 --> 00:04:34,310

five-minute chops of time that they had

99

00:04:37,420 --> 00:04:35,870

to basically stick with throughout the

100

00:04:38,470 --> 00:04:37,430

entire day so they it kind of gives you

101  
00:04:56,350 --> 00:04:38,480  
a sense of exactly what they were doing

102  
00:04:59,310 --> 00:04:56,360  
all day how often do we have to help

103  
00:05:01,810 --> 00:04:59,320  
with extreme situations not very often

104  
00:05:03,640 --> 00:05:01,820  
we've had a couple of things in the last

105  
00:05:05,320 --> 00:05:03,650  
few years come up of sometimes we have

106  
00:05:07,930 --> 00:05:05,330  
to do debris avoidance maneuvers because

107  
00:05:10,570 --> 00:05:07,940  
their space junk and so we are tracking

108  
00:05:12,940 --> 00:05:10,580  
this junk here on earth and then we have

109  
00:05:15,250 --> 00:05:12,950  
to maybe move the space station or

110  
00:05:16,540 --> 00:05:15,260  
sometimes we just are aware of the junk

111  
00:05:19,480 --> 00:05:16,550  
and we don't have to move but crews

112  
00:05:23,160 --> 00:05:19,490  
might have to shelter for a while other

113  
00:05:26,230 --> 00:05:23,170

we did have a pump module go down almost

114

00:05:30,580 --> 00:05:26,240

to August oh yeah almost two years ago

115

00:05:32,530 --> 00:05:30,590

in August and that was is very important

116

00:05:34,330 --> 00:05:32,540

because it helps cool our space station

117

00:05:36,010 --> 00:05:34,340

it keeps all of the equipment cold and

118

00:05:38,950 --> 00:05:36,020

it moves all this fluids around so it

119

00:05:40,630 --> 00:05:38,960

keeps things cool so that was an

120

00:05:42,310 --> 00:05:40,640

emergency but it wasn't such an

121

00:05:43,810 --> 00:05:42,320

emergency that we had to like go out the

122

00:05:45,790 --> 00:05:43,820

door immediately into this spacewalk we

123

00:05:47,500 --> 00:05:45,800

had timed the planet here on earth make

124

00:05:50,050 --> 00:05:47,510

really good decisions and then go to the

125

00:05:51,880 --> 00:05:50,060

spacewalks and repair it and we worked

126

00:05:54,550 --> 00:05:51,890

as a team and repaired it and now the

127

00:05:57,850 --> 00:05:54,560

space station is back functioning 100%

128

00:05:59,860 --> 00:05:57,860

so it's just amazing what we can do but

129

00:06:00,850 --> 00:05:59,870

yeah sometimes emergencies come up but

130

00:06:02,430 --> 00:06:00,860

like I said we have a good way of

131

00:06:04,870 --> 00:06:02,440

handling them they train a lot

132

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

absolutely we the crew train but also

133

00:06:09,550 --> 00:06:06,800

the ground team trains I do they do

134

00:06:11,530 --> 00:06:09,560

simulations all the time here I mean we

135

00:06:13,090 --> 00:06:11,540

the flight controllers here there's

136

00:06:14,440 --> 00:06:13,100

there's probably 20 people in this room

137

00:06:16,270 --> 00:06:14,450

they all have different jobs but they

138

00:06:17,920 --> 00:06:16,280

practice it pretty much worst-case

139

00:06:19,840 --> 00:06:17,930

scenario is a lot of times with you know

140

00:06:22,330 --> 00:06:19,850

what's kind of the worst bad Bay you can

141

00:06:23,530 --> 00:06:22,340

have and how it react to that so so

142

00:06:24,820 --> 00:06:23,540

whenever it comes time for the actual

143

00:06:37,020 --> 00:06:24,830

flight it's it's a little bit easier

144

00:06:47,770 --> 00:06:40,029

when you found out that you are going to

145

00:06:50,559 --> 00:06:47,780

be up in the space station what oh great

146

00:06:51,790 --> 00:06:50,569

question well training for us for the

147

00:06:53,529 --> 00:06:51,800

flight that I went on which was a

148

00:06:56,110 --> 00:06:53,539

shuttle flight going to Space Station

149

00:06:58,059 --> 00:06:56,120

you find out about a year year and a

150

00:06:59,529 --> 00:06:58,069

half out and so that's the mental

151  
00:07:01,150 --> 00:06:59,539  
preparation as you start actually

152  
00:07:03,999 --> 00:07:01,160  
training as a team and there were seven

153  
00:07:05,890 --> 00:07:04,009  
of us on this team and and we were going

154  
00:07:07,900 --> 00:07:05,900  
to classes and you you start out you

155  
00:07:09,870 --> 00:07:07,910  
have your assignments so I was like the

156  
00:07:12,400 --> 00:07:09,880  
flight engineer and I was the inside

157  
00:07:13,960 --> 00:07:12,410  
coordinator of the spacewalks and so you

158  
00:07:16,510 --> 00:07:13,970  
have your job and then you start

159  
00:07:17,710 --> 00:07:16,520  
learning it and then and then you start

160  
00:07:18,700 --> 00:07:17,720  
doing these simulations like I talked

161  
00:07:20,710 --> 00:07:18,710  
about then they start throwing in

162  
00:07:22,930 --> 00:07:20,720  
failures and pretty soon you're you're

163  
00:07:25,240 --> 00:07:22,940

really working as a smooth team so that

164

00:07:28,629 --> 00:07:25,250

was again about a year and a half out

165

00:07:31,629 --> 00:07:28,639

and and then physically I mean we are

166

00:07:33,129 --> 00:07:31,639

always training we work out here on

167

00:07:35,770 --> 00:07:33,139

earth a couple times a week as

168

00:07:37,450 --> 00:07:35,780

astronauts we have a gym we wait lift we

169

00:07:39,850 --> 00:07:37,460

do a lot of things to just prepare that

170

00:07:41,320 --> 00:07:39,860

way and we also for the people that are

171

00:07:43,450 --> 00:07:41,330

going to go do a spacewalk they're in

172

00:07:45,339 --> 00:07:43,460

the neutral buoyancy lab for about six

173

00:07:47,469 --> 00:07:45,349

hours at a time and they do that

174

00:07:49,600 --> 00:07:47,479

multiple times for each spacewalk so we

175

00:07:53,770 --> 00:07:49,610

might practice a spacewalk four to seven

176

00:07:55,360 --> 00:07:53,780

times before we go do that and now with

177

00:07:57,159 --> 00:07:55,370

the international space station crews

178

00:07:59,550 --> 00:07:57,169

are preparing and starting training two

179

00:08:02,649 --> 00:07:59,560

and a half years before they fly so

180

00:08:04,360 --> 00:08:02,659

that's quite a commitment and of course

181

00:08:07,209 --> 00:08:04,370

it's not just the astronaut it's the

182

00:08:09,249 --> 00:08:07,219

whole family that is um it's kind of in

183

00:08:11,399 --> 00:08:09,259

training and so there's travel and all

184

00:08:13,749 --> 00:08:11,409

these things that are involved but

185

00:08:16,570 --> 00:08:13,759

you're just really open with your family

186

00:08:18,580 --> 00:08:16,580

you discuss what you'll do when things

187

00:08:20,709 --> 00:08:18,590

come up and how to deal with that so

188

00:08:29,850 --> 00:08:20,719

that's how we prepare mentally and

189

00:08:39,719 --> 00:08:35,819

oh I would have NASA without spacecraft

190

00:08:40,980 --> 00:08:39,729

the space station boarding how do you

191

00:08:45,569 --> 00:08:40,990

hook up spacecraft to the space station

192

00:08:48,090 --> 00:08:45,579

for boarding okay that's a great

193

00:08:49,620 --> 00:08:48,100

question we have different docking

194

00:08:51,030 --> 00:08:49,630

compartments and we also have different

195

00:08:53,310 --> 00:08:51,040

vehicles that come to the space station

196

00:08:54,720 --> 00:08:53,320

so for humans coming to the space

197

00:08:57,000 --> 00:08:54,730

station they're coming on a Soyuz right

198

00:08:58,560 --> 00:08:57,010

now and there are specific docking

199

00:09:00,720 --> 00:08:58,570

compartments for the Soyuz that are at

200

00:09:03,750 --> 00:09:00,730

the back of the station in the Russian

201  
00:09:04,769 --> 00:09:03,760  
module and then you have hatches that

202  
00:09:06,569 --> 00:09:04,779  
you go through there's all these

203  
00:09:09,750 --> 00:09:06,579  
pressurization before you open hatches

204  
00:09:11,730 --> 00:09:09,760  
and and this so that's how we get humans

205  
00:09:13,290 --> 00:09:11,740  
into space right now when we had the

206  
00:09:14,490 --> 00:09:13,300  
shuttle we also had another docking

207  
00:09:16,259 --> 00:09:14,500  
compartment and it worked a little bit

208  
00:09:17,430 --> 00:09:16,269  
differently for such a big vehicle and

209  
00:09:21,540 --> 00:09:17,440  
that was out in the front of the space

210  
00:09:23,940 --> 00:09:21,550  
station currently we have the ATV the

211  
00:09:25,170 --> 00:09:23,950  
European cargo vehicle that stocked a

212  
00:09:28,040 --> 00:09:25,180  
space station and that came up

213  
00:09:30,300 --> 00:09:28,050

robotically and so it just stocks

214

00:09:32,040 --> 00:09:30,310

without the need of humans although

215

00:09:34,290 --> 00:09:32,050

humans know how they could intervene if

216

00:09:36,000 --> 00:09:34,300

they need to and then we're going to be

217

00:09:39,990 --> 00:09:36,010

having the summer a visiting vehicle

218

00:09:44,280 --> 00:09:40,000

called htv-3 and that's from the

219

00:09:46,079 --> 00:09:44,290

Japanese space agency and that will dock

220

00:09:48,180 --> 00:09:46,089

at the front of station and that uses

221

00:09:51,810 --> 00:09:48,190

the robotic arm and so crew member

222

00:09:54,810 --> 00:09:51,820

actually is needed the last few meters

223

00:09:56,970 --> 00:09:54,820

to take the robotic arm and grapple the

224

00:09:58,699 --> 00:09:56,980

HTV three and then berth it to the space

225

00:10:01,259 --> 00:09:58,709

station so lots of different ways that

226  
00:10:02,880 --> 00:10:01,269  
people and cargo come to Space Station

227  
00:10:04,230 --> 00:10:02,890  
and if you ever watched it on TV and you

228  
00:10:05,280 --> 00:10:04,240  
see you know back where we head settle

229  
00:10:07,230 --> 00:10:05,290  
and it would docked with the station or

230  
00:10:09,389 --> 00:10:07,240  
anything rash and stuff it looks so slow

231  
00:10:11,370 --> 00:10:09,399  
on TV and you forget that they're going

232  
00:10:12,600 --> 00:10:11,380  
more than 17,000 miles an hour both of

233  
00:10:14,910 --> 00:10:12,610  
those spacecraft and they each weigh

234  
00:10:16,019 --> 00:10:14,920  
hundreds of thousands a pound so it's a

235  
00:10:17,819 --> 00:10:16,029  
little bit misleading when we see it on

236  
00:10:19,769 --> 00:10:17,829  
TV it looks so slow and cautious and

237  
00:10:22,040 --> 00:10:19,779  
it's really going pretty fast

238  
00:10:40,519 --> 00:10:22,050

right so it's right all relative

239

00:10:43,750 --> 00:10:43,500

Wow the most stressful part well you

240

00:10:45,189 --> 00:10:43,760

know

241

00:10:47,769 --> 00:10:45,199

the great thing about all the training

242

00:10:50,290 --> 00:10:47,779

was that you feel very prepared but I

243

00:10:51,610 --> 00:10:50,300

will say that I was definitely excited

244

00:10:53,980 --> 00:10:51,620

maybe had a little bit of butterflies

245

00:10:56,860 --> 00:10:53,990

when I went out to the pad on that day

246

00:10:58,600 --> 00:10:56,870

they launched because you've got so much

247

00:11:01,269 --> 00:10:58,610

propellant and you've got two solid

248

00:11:02,590 --> 00:11:01,279

rocket boosters that you know and you

249

00:11:04,629 --> 00:11:02,600

know how you get to space all this

250

00:11:05,800 --> 00:11:04,639

thrust and energy so you want that

251  
00:11:08,590 --> 00:11:05,810  
energy to be going the right direction

252  
00:11:10,509 --> 00:11:08,600  
so and that you don't have control of

253  
00:11:12,759 --> 00:11:10,519  
that has been designed by really

254  
00:11:15,069 --> 00:11:12,769  
talented engineers and that's you just

255  
00:11:16,540 --> 00:11:15,079  
have trust and you know that we have

256  
00:11:19,810 --> 00:11:16,550  
done this many times and you've seen it

257  
00:11:21,370 --> 00:11:19,820  
so I was really excited but I think that

258  
00:11:23,829 --> 00:11:21,380  
was the first time I felt a bit nervous

259  
00:11:27,610 --> 00:11:23,839  
before getting into the spaceship and

260  
00:11:29,139 --> 00:11:27,620  
then not a not a lot of stress in space

261  
00:11:30,699 --> 00:11:29,149  
because even when things went wrong like

262  
00:11:33,490 --> 00:11:30,709  
we had things go wrong on our spacewalks

263  
00:11:35,889 --> 00:11:33,500

but we had trained for what to do and we

264

00:11:37,689 --> 00:11:35,899

talked about contingency situations and

265

00:11:39,069 --> 00:11:37,699

we had plans and again like I said we

266

00:11:41,620 --> 00:11:39,079

talked to the ground a lot and they have

267

00:11:45,310 --> 00:11:41,630

really good ideas too so as we do all

268

00:11:47,019 --> 00:11:45,320

this team work I just felt like we were

269

00:11:49,240 --> 00:11:47,029

all very prepared and very calm and we

270

00:11:49,840 --> 00:11:49,250

had good rationale for why we were doing

271

00:11:52,840 --> 00:11:49,850

what we were doing

272

00:11:54,879 --> 00:11:52,850

so during flight no stressful situations

273

00:11:55,840 --> 00:11:54,889

it was awesome it's Dottie

274

00:11:57,340 --> 00:11:55,850

mentioned something very interesting

275

00:11:59,050 --> 00:11:57,350

that even whenever it's stressful it's

276

00:12:00,430 --> 00:11:59,060

it's pretty calm and it's the same way

277

00:12:02,470 --> 00:12:00,440

as somebody who's been inside Mission

278

00:12:04,150 --> 00:12:02,480

Control and kind of watched a certain

279

00:12:05,590 --> 00:12:04,160

challenges come up during flight it's

280

00:12:07,150 --> 00:12:05,600

not like the movies where you see you

281

00:12:10,540 --> 00:12:07,160

know a lot of chaos I stuff like that I

282

00:12:11,829 --> 00:12:10,550

mean the team is very focused they've

283

00:12:13,660 --> 00:12:11,839

trained for these kind of things and

284

00:12:16,059 --> 00:12:13,670

even whenever you know certain semi

285

00:12:17,800 --> 00:12:16,069

major things have happened it's just

286

00:12:19,269 --> 00:12:17,810

very calm and professional it's not like

287

00:12:29,519 --> 00:12:19,279

what you would what you would expect so

288

00:12:35,740 --> 00:12:33,250

money spent well we get a budget from

289

00:12:38,350 --> 00:12:35,750

the government and we just get a portion

290

00:12:40,840 --> 00:12:38,360

of that for human spaceflight and for

291

00:12:42,730 --> 00:12:40,850

the ISS operations so you can actually

292

00:12:45,910 --> 00:12:42,740

go look up the exact details maybe you

293

00:12:47,290 --> 00:12:45,920

want to fill in a little bit out of the

294

00:12:49,689 --> 00:12:47,300

entire federal budget you know a lot of

295

00:12:51,430 --> 00:12:49,699

people have they think that NASA gets a

296

00:12:53,380 --> 00:12:51,440

huge chunk of money and we do relatively

297

00:12:55,509 --> 00:12:53,390

speaking we get about 17 18 billion

298

00:12:57,560 --> 00:12:55,519

dollars a year but out of the entire

299

00:13:00,650 --> 00:12:57,570

federal budget that is less than

300

00:13:02,330 --> 00:13:00,660

half of 1% of all the money so so our

301  
00:13:04,850 --> 00:13:02,340  
share NASA share the entire federal

302  
00:13:06,170 --> 00:13:04,860  
budget actually not that big at all the

303  
00:13:07,610 --> 00:13:06,180  
biggest that it ever was was back during

304  
00:13:09,320 --> 00:13:07,620  
Apollo and I was only about four percent

305  
00:13:11,600 --> 00:13:09,330  
of the entire federal budget so it's

306  
00:13:14,270 --> 00:13:11,610  
it's you know it's it's a relatively

307  
00:13:15,650 --> 00:13:14,280  
small chunk of money in terms of the

308  
00:13:16,910 --> 00:13:15,660  
entire federal government spending but

309  
00:13:18,920 --> 00:13:16,920  
but you get a lot of benefits out of it

310  
00:13:20,690 --> 00:13:18,930  
in terms of spin-offs and and and what

311  
00:13:22,700 --> 00:13:20,700  
this agency is able to do yeah I think

312  
00:13:25,250 --> 00:13:22,710  
of course one of the big benefits is

313  
00:13:27,320 --> 00:13:25,260

that we learn about how we can go

314

00:13:29,330 --> 00:13:27,330

explore better and and we want to

315

00:13:31,850 --> 00:13:29,340

continue human spaceflight so we want

316

00:13:33,350 --> 00:13:31,860

you guys to be explorers to just like

317

00:13:35,780 --> 00:13:33,360

the people that came to the northwest

318

00:13:37,370 --> 00:13:35,790

when when they were exploring for the

319

00:13:49,700 --> 00:13:37,380

early United States so we want you guys

320

00:13:51,820 --> 00:13:49,710

to be explorers to something

321

00:13:55,250 --> 00:13:51,830

uncomfortable about space travel well

322

00:13:56,600 --> 00:13:55,260

this is really hot yes and that's not

323

00:13:59,780 --> 00:13:56,610

kidding and it's heavy

324

00:14:01,370 --> 00:13:59,790

a bit heavy um so for all crew members

325

00:14:02,750 --> 00:14:01,380

even though sort of launched an Soyuz

326

00:14:05,360 --> 00:14:02,760

you're going to have a specific suit

327

00:14:07,370 --> 00:14:05,370

that you launch in and you have to sit

328

00:14:09,530 --> 00:14:07,380

for a while you go out to the vehicle

329

00:14:12,350 --> 00:14:09,540

and you get loaded in and then you sit

330

00:14:13,970 --> 00:14:12,360

and you wait and in the soil you see

331

00:14:15,440 --> 00:14:13,980

wait you wait with your knees scrunched

332

00:14:17,920 --> 00:14:15,450

up against you and in the shuttle you're

333

00:14:20,750 --> 00:14:17,930

laying down on your back too and and so

334

00:14:22,070 --> 00:14:20,760

to keep us cooled off in the shuttle we

335

00:14:24,260 --> 00:14:22,080

had this long underwear with little

336

00:14:25,580 --> 00:14:24,270

hoses in it that ran cold water through

337

00:14:27,470 --> 00:14:25,590

it you could keep pretty cool

338

00:14:30,290 --> 00:14:27,480

and there was blowing air circulating

339

00:14:31,940 --> 00:14:30,300

air so that helps you and thankfully the

340

00:14:34,730 --> 00:14:31,950

April morning that we launched on two

341

00:14:37,040 --> 00:14:34,740

years ago was pretty cool for Florida

342

00:14:38,570 --> 00:14:37,050

but it could get really hot there's even

343

00:14:40,370 --> 00:14:38,580

mosquitoes sometimes a kit in the

344

00:14:41,930 --> 00:14:40,380

vehicle so that part could all be a

345

00:14:44,930 --> 00:14:41,940

little uncomfortable until you know you

346

00:14:46,250 --> 00:14:44,940

finally launch and then um returning

347

00:14:48,860 --> 00:14:46,260

same thing you have to get back into

348

00:14:50,570 --> 00:14:48,870

that suit and you know you've been in a

349

00:14:53,270 --> 00:14:50,580

normal clothes I mean I wore this shirt

350

00:14:54,050 --> 00:14:53,280

in space and you've been in these normal

351  
00:14:55,970 --> 00:14:54,060  
clothes and then you have to get back

352  
00:14:58,790 --> 00:14:55,980  
into the suit and it's not really

353  
00:15:00,710 --> 00:14:58,800  
comfortable but you would totally do it

354  
00:15:02,000 --> 00:15:00,720  
for a few moments of space light well

355  
00:15:03,260 --> 00:15:02,010  
they have to drink a lot to talk about

356  
00:15:04,610 --> 00:15:03,270  
fluid loading that's it they have to

357  
00:15:05,570 --> 00:15:04,620  
drink a lot of like sport drinks and

358  
00:15:06,980 --> 00:15:05,580  
things like that they use have to drink

359  
00:15:09,070 --> 00:15:06,990  
kind of some like basically chicken soup

360  
00:15:11,410 --> 00:15:09,080  
water right there's no chicken consommé

361  
00:15:12,940 --> 00:15:11,420  
and then also we did water and salt

362  
00:15:15,790 --> 00:15:12,950  
tablets that's what I personally chose

363  
00:15:18,400 --> 00:15:15,800

to do and you do that just before you're

364

00:15:21,850 --> 00:15:18,410

deciding to make the burn to do orbit

365

00:15:23,110 --> 00:15:21,860

and so this is maybe an hour two hours

366

00:15:26,620 --> 00:15:23,120

before you're gonna be landing you're

367

00:15:29,020 --> 00:15:26,630

drinking lots of bags of water I mean I

368

00:15:32,350 --> 00:15:29,030

think I was trying to drink six eight

369

00:15:34,030 --> 00:15:32,360

ounce bags of water and and you're still

370

00:15:35,320 --> 00:15:34,040

trying to push buttons and you know

371

00:15:38,140 --> 00:15:35,330

follow the normal checklist while

372

00:15:41,260 --> 00:15:38,150

drinking this stuff needless to say it

373

00:15:43,930 --> 00:15:41,270

is not super comfortable to drink all

374

00:15:46,120 --> 00:15:43,940

that well and then re-enter gravity yes

375

00:15:47,650 --> 00:15:46,130

before all those floors are kind of

376

00:15:48,970 --> 00:15:47,660

floating in your stomach no big deal but

377

00:15:50,320 --> 00:15:48,980

then when you start to reenter you start

378

00:15:52,860 --> 00:15:50,330

to feel it on your bladder and that's

379

00:15:59,820 --> 00:15:52,870

not super comfortable in there yeah

380

00:16:06,520 --> 00:16:03,550

like this answer you don't really take a

381

00:16:08,500 --> 00:16:06,530

shower per se it's it's kind of like

382

00:16:10,680 --> 00:16:08,510

camping a little bit cleaner since

383

00:16:15,070 --> 00:16:10,690

you're not hanging out with the dirt but

384

00:16:17,650 --> 00:16:15,080

you use baby wipes to just kind of wash

385

00:16:19,900 --> 00:16:17,660

your skin off there's also some wet

386

00:16:21,820 --> 00:16:19,910

towels and and so prints that you can

387

00:16:24,400 --> 00:16:21,830

get on your scanning and clean yourself

388

00:16:26,080 --> 00:16:24,410

with and there's a no rinse shampoo that

389

00:16:28,600 --> 00:16:26,090

you work through your hair and it

390

00:16:31,000 --> 00:16:28,610

becomes quite messy because if you think

391

00:16:32,470 --> 00:16:31,010

about it when you wash your hair you

392

00:16:34,360 --> 00:16:32,480

know you have extra hair that falls out

393

00:16:36,580 --> 00:16:34,370

or you have skin that's lufs off and

394

00:16:38,050 --> 00:16:36,590

where does that stuff go in space it

395

00:16:39,430 --> 00:16:38,060

goes floating around you so you have to

396

00:16:42,400 --> 00:16:39,440

make sure you keep your hair like we

397

00:16:43,690 --> 00:16:42,410

stick it to gray tape and we just kind

398

00:16:45,220 --> 00:16:43,700

of accumulate that way then put it in

399

00:16:47,290 --> 00:16:45,230

the trash so that's not floating around

400

00:16:49,000 --> 00:16:47,300

and getting in everyone's way especially

401  
00:16:51,520 --> 00:16:49,010  
in my hair that'd be kind of messy so

402  
00:16:53,770 --> 00:16:51,530  
that's how we keep ourselves clean in

403  
00:16:56,200 --> 00:16:53,780  
but you can do it daily or you can do it

404  
00:16:57,610 --> 00:16:56,210  
after your exercise so you do need to

405  
00:16:59,830 --> 00:16:57,620  
keep yourself clean it's definitely part

406  
00:17:01,600 --> 00:16:59,840  
of the important hygiene part in space I

407  
00:17:03,280 --> 00:17:01,610  
mean you don't want to be up there six

408  
00:17:06,040 --> 00:17:03,290  
months and not be keeping yourself clean

409  
00:17:16,390 --> 00:17:06,050  
so who wants to be an astronaut now who

410  
00:17:18,370 --> 00:17:16,400  
wants to be around the other say that

411  
00:17:20,370 --> 00:17:18,380  
what kind of education is required to go

412  
00:17:23,490 --> 00:17:20,380  
up in space is that what you're asking

413  
00:17:26,440 --> 00:17:23,500

okay oh great you have good ears

414

00:17:29,410 --> 00:17:26,450

you need to have a at least a bachelor's

415

00:17:31,900 --> 00:17:29,420

in math engineering or science and then

416

00:17:34,360 --> 00:17:31,910

of course further degrees are definitely

417

00:17:37,330 --> 00:17:34,370

encouraged and an experience in those

418

00:17:41,050 --> 00:17:37,340

degrees so doing research or teaching

419

00:17:43,300 --> 00:17:41,060

etc in those degrees and so that's why

420

00:17:45,520 --> 00:17:43,310

we really hope that you are studying

421

00:17:50,410 --> 00:17:45,530

math science technology and engineering

422

00:17:51,940 --> 00:17:50,420

those good core stem classes and also

423

00:17:54,010 --> 00:17:51,950

you know this is one thing we always try

424

00:17:55,510 --> 00:17:54,020

to tell students and even college kids

425

00:17:56,920 --> 00:17:55,520

too that if you want to come work at

426

00:17:57,940 --> 00:17:56,930

NASA and maybe you're not gonna be an

427

00:18:00,460 --> 00:17:57,950

astronaut but if you want to come work

428

00:18:01,840 --> 00:18:00,470

here we hire all kinds of backgrounds me

429

00:18:03,310 --> 00:18:01,850

I've got a degree in communications and

430

00:18:05,680 --> 00:18:03,320

there's other people in our office that

431

00:18:06,790 --> 00:18:05,690

have journalism degrees and marketing

432

00:18:09,610 --> 00:18:06,800

degrees and we've got people that have

433

00:18:11,650 --> 00:18:09,620

Human Resources degrees we've got budget

434

00:18:13,390 --> 00:18:11,660

people I mean there's all kinds so it's

435

00:18:14,950 --> 00:18:13,400

me come work at NASA and be part of this

436

00:18:17,500 --> 00:18:14,960

it's one of the coolest jobs on the

437

00:18:19,000 --> 00:18:17,510

planet and you know you can get there

438

00:18:21,220 --> 00:18:19,010

too all through all sorts of that's

439

00:18:23,560 --> 00:18:21,230

right so so be passionate about what

440

00:18:24,760 --> 00:18:23,570

you're doing right go for something that

441

00:18:26,740 --> 00:18:24,770

you really want to do and it's funny

442

00:18:42,360 --> 00:18:26,750

what doors tend to tend to open up

443

00:18:49,300 --> 00:18:45,460

actually no it's the way do we design

444

00:18:51,760 --> 00:18:49,310

the the shuttle and our vehicles is so

445

00:18:54,070 --> 00:18:51,770

that you've really have very little

446

00:18:56,650 --> 00:18:54,080

change and pressure you do get a little

447

00:18:58,060 --> 00:18:56,660

a slight change but it's minimal

448

00:19:00,250 --> 00:18:58,070

compared to what you would experience in

449

00:19:01,780 --> 00:19:00,260

an airplane or what you would experience

450

00:19:05,920 --> 00:19:01,790

driving up into the mountains

451  
00:19:09,610 --> 00:19:05,930  
so not a change because the the idea is

452  
00:19:11,980 --> 00:19:09,620  
that as you as you go up and and

453  
00:19:15,760 --> 00:19:11,990  
decrease the air pressure on the outside

454  
00:19:19,240 --> 00:19:15,770  
of the vehicle you have the vehicle has

455  
00:19:20,830 --> 00:19:19,250  
to maintain the pressure inside very

456  
00:19:23,500 --> 00:19:20,840  
well I mean you don't want any leaks out

457  
00:19:24,700 --> 00:19:23,510  
and I don't wouldn't want it to burst

458  
00:19:26,890 --> 00:19:24,710  
because it would be higher pressure

459  
00:19:28,270 --> 00:19:26,900  
inside and it would burst out so we've

460  
00:19:30,520 --> 00:19:28,280  
designed their aircraft so that it

461  
00:19:32,980 --> 00:19:30,530  
maintains about fourteen point seven psi

462  
00:19:34,720 --> 00:19:32,990  
which is roughly equal to what seed

463  
00:19:35,820 --> 00:19:34,730

pressure is so you have a little bit

464

00:19:37,920 --> 00:19:35,830

less air pressure

465

00:19:40,680 --> 00:19:37,930

and Idaho cause you're up higher and

466

00:19:42,510 --> 00:19:40,690

altitude but that is that's what we

467

00:19:44,430 --> 00:19:42,520

maintain within our spacecraft and the

468

00:19:55,640 --> 00:19:44,440

same with the space station it's roughly

469

00:20:02,340 --> 00:19:59,160

control how many different jobs are

470

00:20:04,230 --> 00:20:02,350

there oh that is a great question Mike

471

00:20:09,540 --> 00:20:04,240

Joshua see we're counting hang on

472

00:20:11,400 --> 00:20:09,550

there's there's about 20 people that we

473

00:20:14,640 --> 00:20:11,410

have all sorts of jobs from the flight

474

00:20:17,760 --> 00:20:14,650

controller and flight director who's in

475

00:20:19,440 --> 00:20:17,770

charge of everyone is overseen to the

476

00:20:21,150 --> 00:20:19,450

person who talks with the crew members

477

00:20:23,460 --> 00:20:21,160

that's the cap Capcom capsule

478

00:20:25,530 --> 00:20:23,470

communicator and then we have people who

479

00:20:28,110 --> 00:20:25,540

are looking at trajectory people that

480

00:20:31,260 --> 00:20:28,120

are maintaining the life-support systems

481

00:20:35,730 --> 00:20:31,270

the thermal systems the computers the

482

00:20:38,220 --> 00:20:35,740

daily calendar the public outreach all

483

00:20:39,990 --> 00:20:38,230

these different jobs in Mission Control

484

00:20:41,340 --> 00:20:40,000

all working as a team

485

00:20:42,690 --> 00:20:41,350

there's flight doctors there's and

486

00:20:44,250 --> 00:20:42,700

there's a there's an interesting

487

00:20:45,690 --> 00:20:44,260

position called ground control or DC

488

00:20:46,590 --> 00:20:45,700

which is here in the back of the room

489

00:20:48,630 --> 00:20:46,600

and in the shuttle room is up at the

490

00:20:50,310 --> 00:20:48,640

front but those guys run the entire

491

00:20:51,690 --> 00:20:50,320

Mission Control Center and they got more

492

00:20:53,160 --> 00:20:51,700

computer screens over there than I've

493

00:20:55,680 --> 00:20:53,170

ever seen in my life I mean these guys

494

00:20:57,720 --> 00:20:55,690

know how to run every exactly he's a

495

00:20:59,220 --> 00:20:57,730

system in this entire building every

496

00:21:00,660 --> 00:20:59,230

mile of wire that we have here so

497

00:21:02,070 --> 00:21:00,670

they've got a pretty pretty tough job

498

00:21:03,990 --> 00:21:02,080

they're also the ones that actually help

499

00:21:05,700 --> 00:21:04,000

us communicate with the space station

500

00:21:08,430 --> 00:21:05,710

and the shuttle back in a day so it's

501  
00:21:11,460 --> 00:21:08,440  
there's it takes it takes a big and wide

502  
00:21:37,020 --> 00:21:11,470  
a pretty big variety of people to help

503  
00:21:39,150 --> 00:21:37,030  
make all this work while I was up in

504  
00:21:42,330 --> 00:21:39,160  
space I was just there about 15 days and

505  
00:21:44,880 --> 00:21:42,340  
the job that I did the most was to

506  
00:21:47,070 --> 00:21:44,890  
actually be a mover we brought up six

507  
00:21:49,210 --> 00:21:47,080  
tons of equipment and we needed to move

508  
00:21:51,610 --> 00:21:49,220  
that all out of

509  
00:21:53,760 --> 00:21:51,620  
basically this big u-haul vehicle called

510  
00:21:57,010 --> 00:21:53,770  
the multi-purpose Logistics Module and

511  
00:21:58,990 --> 00:21:57,020  
get that out and get it under station

512  
00:22:02,290 --> 00:21:59,000  
and then we had to return trash and

513  
00:22:04,390 --> 00:22:02,300

equipment and so we repacked so most of

514

00:22:06,130 --> 00:22:04,400

my time was as a mover the other

515

00:22:08,950 --> 00:22:06,140

significant portion of my time is as a

516

00:22:12,220 --> 00:22:08,960

as the choreographer inside of a

517

00:22:14,500 --> 00:22:12,230

spacewalk so I talked to the two Rick

518

00:22:15,730 --> 00:22:14,510

Mastracchio and clay Anderson as they

519

00:22:17,320 --> 00:22:15,740

were doing their spacewalks the whole

520

00:22:19,420 --> 00:22:17,330

time so I was a lot of talking that was

521

00:22:21,940 --> 00:22:19,430

three days about six and a half to seven

522

00:22:23,080 --> 00:22:21,950

hours of talking telling them about the

523

00:22:26,800 --> 00:22:23,090

bolts they were going to be turning

524

00:22:28,330 --> 00:22:26,810

about where their next move was going to

525

00:22:29,740 --> 00:22:28,340

be where the robotic arm is going to

526

00:22:32,050 --> 00:22:29,750

pick up an ammonia tank where it was

527

00:22:34,540 --> 00:22:32,060

going to drop it off etc so that was my

528

00:22:37,150 --> 00:22:34,550

next job and then my final big job was

529

00:22:39,250 --> 00:22:37,160

as the flight engineer but that was just

530

00:22:41,230 --> 00:22:39,260

on launch an entry so that was just kind

531

00:22:42,370 --> 00:22:41,240

of a small job she got to set up on the

532

00:22:50,640 --> 00:22:42,380

flight deck and I helped the other one

533

00:22:54,340 --> 00:22:52,720

when you're in space how much sleep do

534

00:22:55,840 --> 00:22:54,350

you get well we can actually get just as

535

00:22:58,600 --> 00:22:55,850

much sleep here on the ground and I

536

00:23:00,730 --> 00:22:58,610

slept really well in space I didn't

537

00:23:03,190 --> 00:23:00,740

usually here on earth I try to get about

538

00:23:04,540 --> 00:23:03,200

8 hours of sleep because I exercise a

539

00:23:08,170 --> 00:23:04,550

lot I just kind of need eight hours to

540

00:23:10,150 --> 00:23:08,180

be a happy person but in space it didn't

541

00:23:11,740 --> 00:23:10,160

seem I think because you're not having

542

00:23:13,750 --> 00:23:11,750

to put as much resistance since you're

543

00:23:15,760 --> 00:23:13,760

not working with working against gravity

544

00:23:17,320 --> 00:23:15,770

the whole time I didn't need it quite as

545

00:23:19,120 --> 00:23:17,330

much asleep so I found about seven hours

546

00:23:20,770 --> 00:23:19,130

was actually really great and the funny

547

00:23:23,380 --> 00:23:20,780

thing is when we sleep in space we sort

548

00:23:28,750 --> 00:23:23,390

of look like zombies because our arms

549

00:23:31,900 --> 00:23:28,760

float out but you sleep so well because

550

00:23:33,760 --> 00:23:31,910

you're not forced onto a bed you're just

551

00:23:35,560 --> 00:23:33,770

kind of floating above it and so you

552

00:23:37,300 --> 00:23:35,570

strap yourself into your sleeping bag

553

00:23:40,300 --> 00:23:37,310

sometimes you stick yourself to the wall

554

00:23:42,550 --> 00:23:40,310

don't you have to Velcro yourself or in

555

00:23:45,490 --> 00:23:42,560

our case we do use French hooks and and

556

00:23:48,160 --> 00:23:45,500

put ourselves onto the wall and if you

557

00:23:50,080 --> 00:23:48,170

want firmness you can put bungees around

558

00:23:52,690 --> 00:23:50,090

you and like really set yourself to the

559

00:23:56,320 --> 00:23:52,700

wall but I kind of like that feeling of

560

00:24:01,720 --> 00:23:56,330

you're loading so that's how you sleep

561

00:24:02,890 --> 00:24:01,730

in space oh say it again what is going

562

00:24:05,950 --> 00:24:02,900

through your mind

563

00:24:12,640 --> 00:24:05,960

when you realize you're up in space in

564

00:24:16,270 --> 00:24:12,650

year 9 well I think you definitely

565

00:24:18,910 --> 00:24:16,280

realize kind of the precarious position

566

00:24:21,070 --> 00:24:18,920

or the the position where if something

567

00:24:22,960 --> 00:24:21,080

went wrong you would want to fix it fast

568

00:24:25,330 --> 00:24:22,970

because your vehicle is your life

569

00:24:28,540 --> 00:24:25,340

support it is your only way of staying

570

00:24:31,750 --> 00:24:28,550

alive in space and so you definitely

571

00:24:33,490 --> 00:24:31,760

take care of the vehicle and but it was

572

00:24:35,680 --> 00:24:33,500

just such a beautiful experience I mean

573

00:24:38,260 --> 00:24:35,690

looking at the earth and the floating

574

00:24:39,160 --> 00:24:38,270

and so getting used to that floating

575

00:24:41,799 --> 00:24:39,170

getting used to the fact that when you

576

00:24:43,630 --> 00:24:41,809

drop something it doesn't fall to the

577

00:24:45,850 --> 00:24:43,640

ground it floats somewhere and gets

578

00:24:48,130 --> 00:24:45,860

caught up in some fan or filter or

579

00:24:50,980 --> 00:24:48,140

wherever you have to go find it so that

580

00:24:54,040 --> 00:24:50,990

took some getting used to but just you

581

00:24:56,470 --> 00:24:54,050

really look at the beauty of the earth

582

00:24:58,570 --> 00:24:56,480

and just how amazing it is that you can

583

00:25:11,680 --> 00:24:58,580

be in space that that we designed these

584

00:25:17,680 --> 00:25:11,690

vehicles to be in space that it'd say

585

00:25:21,160 --> 00:25:17,690

one more time what was that the most

586

00:25:23,230 --> 00:25:21,170

exciting thing well looking back at

587

00:25:26,380 --> 00:25:23,240

where my family was right at the moment

588

00:25:28,390 --> 00:25:26,390

so when we could pick out there was one

589

00:25:31,030 --> 00:25:28,400

particular path I remember early on in

590

00:25:32,380 --> 00:25:31,040

the flight and Jim Dutton is from Oregon

591

00:25:36,970 --> 00:25:32,390

so the two of us were looking through

592

00:25:39,610 --> 00:25:36,980

the cupola and we found crater lake and

593

00:25:41,440 --> 00:25:39,620

then we could find all these places that

594

00:25:44,380 --> 00:25:41,450

we had either lived in or we had family

595

00:25:46,270 --> 00:25:44,390

living in and so we went from the Oregon

596

00:25:48,310 --> 00:25:46,280

Washington coast all the way across the

597

00:25:50,260 --> 00:25:48,320

United States down to Houston and that

598

00:25:52,690 --> 00:25:50,270

was it was just this neat pass and and

599

00:25:54,910 --> 00:25:52,700

all along the way we had people that we

600

00:25:56,980 --> 00:25:54,920

knew or cared about so my parents are in

601  
00:25:59,200 --> 00:25:56,990  
Colorado my husband's family's in the

602  
00:26:00,730 --> 00:25:59,210  
northwest and my family right now my

603  
00:26:03,340 --> 00:26:00,740  
husband and daughter are here in Houston

604  
00:26:06,669 --> 00:26:03,350  
so that was a really special special

605  
00:26:07,960 --> 00:26:06,679  
moment all right it looks like that's

606  
00:26:10,150 --> 00:26:07,970  
all the time that we have for questions

607  
00:26:12,100 --> 00:26:10,160  
but I would like to have you guys say

608  
00:26:14,320 --> 00:26:12,110  
goodbye to each other so let's start

609  
00:26:16,850 --> 00:26:14,330  
with a heritage middle school would you

610  
00:26:19,220 --> 00:26:16,860  
like to thank our special guests for

611  
00:26:33,670 --> 00:26:19,230  
coming to your school live virtually

612  
00:26:37,820 --> 00:26:36,200  
thank you guys - you're really good you

613  
00:26:38,930 --> 00:26:37,830

had great questions I enjoyed this thank

614

00:26:40,340 --> 00:26:38,940

you yeah I want to thank you guys for

615

00:26:41,990 --> 00:26:40,350

joining us it's always fun to talk to

616

00:26:42,890 --> 00:26:42,000

you guys so we hope to we hope to see