



1  
00:00:03,510 --> 00:00:02,230  
hi everybody josh byerly here inside

2  
00:00:04,950 --> 00:00:03,520  
mission control houston we want to

3  
00:00:06,070 --> 00:00:04,960  
welcome you we want to say hello to our

4  
00:00:07,510 --> 00:00:06,080  
friends up there at the murphy

5  
00:00:08,950 --> 00:00:07,520  
elementary school in grand rapids

6  
00:00:11,190 --> 00:00:08,960  
minnesota i'm sitting beside karen

7  
00:00:12,709 --> 00:00:11,200  
nyberg astronaut and friend of mine who

8  
00:00:14,789 --> 00:00:12,719  
has lived not only on the bottom of the

9  
00:00:16,150 --> 00:00:14,799  
sea but also here on earth and also in

10  
00:00:18,230 --> 00:00:16,160  
space she lived aboard the international

11  
00:00:20,550 --> 00:00:18,240  
space station last year so she's here to

12  
00:00:22,870 --> 00:00:20,560  
take your questions she also is a native

13  
00:00:28,830 --> 00:00:22,880

of your home state so let's go ahead and

14

00:00:33,190 --> 00:00:31,349

hi what inspired you to become an

15

00:00:34,630 --> 00:00:33,200

astronaut

16

00:00:37,350 --> 00:00:34,640

good morning first of all good morning

17

00:00:38,630 --> 00:00:37,360

to everybody in minnesota um i decided

18

00:00:40,389 --> 00:00:38,640

that i wanted to be an astronaut when i

19

00:00:42,549 --> 00:00:40,399

was really young probably about your age

20

00:00:45,190 --> 00:00:42,559

and honestly i don't know where that

21

00:00:46,950 --> 00:00:45,200

inspiration first came from

22

00:00:48,389 --> 00:00:46,960

you know potentially i saw the beginning

23

00:00:50,549 --> 00:00:48,399

of the space shuttle program and got

24

00:00:51,910 --> 00:00:50,559

excited about that i remember looking up

25

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

at the moon and thinking how cool it

26

00:00:55,029 --> 00:00:53,440

would be to go there so i think there's

27

00:01:01,670 --> 00:00:55,039

a number of things that all work

28

00:01:07,830 --> 00:01:04,310

okay my name's steve lottie and when you

29

00:01:12,950 --> 00:01:10,550

did you want to be an astronaut if not

30

00:01:15,109 --> 00:01:12,960

when did you want to be an astronaut

31

00:01:17,990 --> 00:01:15,119

i did want to be an astronaut again like

32

00:01:20,310 --> 00:01:18,000

i said from when i was about um about

33

00:01:22,070 --> 00:01:20,320

your age that's what i decided i wanted

34

00:01:23,270 --> 00:01:22,080

to do and and all my friends knew that

35

00:01:25,030 --> 00:01:23,280

that's what i wanted to do and that's

36

00:01:32,149 --> 00:01:25,040

what i worked really hard for all the

37

00:01:37,109 --> 00:01:35,109

um what sacrifices have you had to make

38

00:01:39,190 --> 00:01:37,119

and what goals did you have to conquer

39

00:01:40,710 --> 00:01:39,200

to get where you are today

40

00:01:42,550 --> 00:01:40,720

there certainly were sacrifices

41

00:01:43,990 --> 00:01:42,560

especially as i was going through school

42

00:01:45,990 --> 00:01:44,000

there were times when my friends would

43

00:01:48,389 --> 00:01:46,000

be doing things especially when i got to

44

00:01:50,630 --> 00:01:48,399

college and i would have to study

45

00:01:52,710 --> 00:01:50,640

because i knew that to reach the goals

46

00:01:54,469 --> 00:01:52,720

that i had they were pretty lofty to be

47

00:01:55,990 --> 00:01:54,479

an astronaut and i knew that i'd have to

48

00:01:58,069 --> 00:01:56,000

get really good grades and so there were

49

00:01:59,990 --> 00:01:58,079

times when i would sacrifice my friends

50

00:02:01,910 --> 00:02:00,000

would be doing something on a friday

51  
00:02:03,670 --> 00:02:01,920  
afternoon or evening and i would stay

52  
00:02:11,190 --> 00:02:03,680  
home and study but i tried to balance it

53  
00:02:15,190 --> 00:02:12,710  
what kind of training have you went

54  
00:02:18,630 --> 00:02:16,070  
and

55  
00:02:20,470 --> 00:02:18,640  
have it did it prepare you for going

56  
00:02:22,630 --> 00:02:20,480  
from space

57  
00:02:24,790 --> 00:02:22,640  
we do a lot of training actually uh when

58  
00:02:27,110 --> 00:02:24,800  
we're training to to go into space we do

59  
00:02:28,390 --> 00:02:27,120  
everything from studying the systems i

60  
00:02:30,070 --> 00:02:28,400  
flew on the space shuttle so i learned

61  
00:02:31,430 --> 00:02:30,080  
all the systems of the space shuttle and

62  
00:02:33,270 --> 00:02:31,440  
then also the space station we have to

63  
00:02:35,270 --> 00:02:33,280

know how it works so that if something

64

00:02:37,509 --> 00:02:35,280

goes wrong we can fix it

65

00:02:39,589 --> 00:02:37,519

we also train to do space walks we train

66

00:02:41,750 --> 00:02:39,599

to work on the robotic arm we train to

67

00:02:43,430 --> 00:02:41,760

work different science and a lot of the

68

00:02:45,509 --> 00:02:43,440

science that we work we don't train in

69

00:02:47,509 --> 00:02:45,519

depth on what the science means

70

00:02:49,110 --> 00:02:47,519

and how but we learn how to work the

71

00:02:50,949 --> 00:02:49,120

equipment

72

00:02:53,430 --> 00:02:50,959

and there's other training as well like

73

00:02:55,190 --> 00:02:53,440

learning to be a follower learning to be

74

00:02:57,430 --> 00:02:55,200

a leader and learning to be a member of

75

00:02:59,750 --> 00:02:57,440

a team and so a lot of the training that

76  
00:03:03,110 --> 00:02:59,760  
i did was just part of my life when i

77  
00:03:05,589 --> 00:03:03,120  
was on sports teams growing up and um

78  
00:03:07,030 --> 00:03:05,599  
and going i would i'd like to do some

79  
00:03:09,670 --> 00:03:07,040  
backpacking and that's good training

80  
00:03:12,550 --> 00:03:09,680  
because you learn how to to um have

81  
00:03:14,070 --> 00:03:12,560  
survival skills and to work as a team

82  
00:03:23,589 --> 00:03:14,080  
and so there's there's a lot of ways you

83  
00:03:28,309 --> 00:03:26,309  
what missions have you done what are you

84  
00:03:31,350 --> 00:03:28,319  
researching during those missions and

85  
00:03:33,190 --> 00:03:31,360  
what do you do with what you learn from

86  
00:03:35,589 --> 00:03:33,200  
the research

87  
00:03:37,910 --> 00:03:35,599  
in 2008 i had my first mission and that

88  
00:03:39,509 --> 00:03:37,920

was on the space shuttle and we flew to

89

00:03:41,430 --> 00:03:39,519

the international space station and we

90

00:03:43,110 --> 00:03:41,440

installed the japanese laboratory so

91

00:03:44,869 --> 00:03:43,120

there wasn't a lot of research on that

92

00:03:46,550 --> 00:03:44,879

flight that one was mostly getting the

93

00:03:48,550 --> 00:03:46,560

space station built but we did do some

94

00:03:50,390 --> 00:03:48,560

research and a lot of that research was

95

00:03:52,789 --> 00:03:50,400

on our bodies and how our bodies react

96

00:03:54,630 --> 00:03:52,799

in space but just recently i flew a

97

00:03:56,309 --> 00:03:54,640

six-month mission on the international

98

00:03:57,830 --> 00:03:56,319

space station and that mission was a

99

00:04:00,229 --> 00:03:57,840

little different because i was living

100

00:04:02,229 --> 00:04:00,239

there and the goal was doing science and

101  
00:04:04,309 --> 00:04:02,239  
we do science for a lot of investigators

102  
00:04:06,470 --> 00:04:04,319  
around the world and so it's not

103  
00:04:09,990 --> 00:04:06,480  
specifically research that i'm doing for

104  
00:04:11,509 --> 00:04:10,000  
me i'm we do it on board for

105  
00:04:14,390 --> 00:04:11,519  
scientists all over who are trying to

106  
00:04:16,390 --> 00:04:14,400  
discover all sorts of things about about

107  
00:04:18,870 --> 00:04:16,400  
everything about how the bodies react in

108  
00:04:20,949 --> 00:04:18,880  
in microgravity and how materials react

109  
00:04:23,670 --> 00:04:20,959  
and how fluids react and how they can

110  
00:04:25,830 --> 00:04:23,680  
improve things for traveling into space

111  
00:04:33,670 --> 00:04:25,840  
in the future and also improve things on

112  
00:04:38,550 --> 00:04:36,070  
um what is the most difficult space

113  
00:04:41,510 --> 00:04:38,560

mission that you have had

114

00:04:43,510 --> 00:04:41,520

can you say that one more time

115

00:04:44,950 --> 00:04:43,520

what is the most difficult space mission

116

00:04:46,629 --> 00:04:44,960

that you have had

117

00:04:48,550 --> 00:04:46,639

well the two missions that i've had like

118

00:04:49,990 --> 00:04:48,560

i said one was on the space shuttle and

119

00:04:52,070 --> 00:04:50,000

one was on the space station they were

120

00:04:54,870 --> 00:04:52,080

both difficult for different reasons the

121

00:04:57,510 --> 00:04:54,880

space shuttle mission was very busy we

122

00:05:00,310 --> 00:04:57,520

had only 14 days to do a lot of work and

123

00:05:02,469 --> 00:05:00,320

so that was a challenge in that regard

124

00:05:03,909 --> 00:05:02,479

the space station mission the difficulty

125

00:05:06,230 --> 00:05:03,919

in there was that you had to live away

126  
00:05:07,749 --> 00:05:06,240  
from home for almost six months and that

127  
00:05:08,950 --> 00:05:07,759  
can be hard because you're leaving

128  
00:05:12,310 --> 00:05:08,960  
you're leaving your home you're leaving

129  
00:05:13,909 --> 00:05:12,320  
your family for a long period of time so

130  
00:05:15,350 --> 00:05:13,919  
i wouldn't say one was more difficult

131  
00:05:18,629 --> 00:05:15,360  
than the other but they were difficult

132  
00:05:21,430 --> 00:05:19,909  
all right and thank you for these

133  
00:05:23,749 --> 00:05:21,440  
questions this is michael hair at the

134  
00:05:24,550 --> 00:05:23,759  
digital learning network a quick message

135  
00:05:26,469 --> 00:05:24,560  
for

136  
00:05:28,950 --> 00:05:26,479  
murphy elementary school if you could

137  
00:05:31,189 --> 00:05:28,960  
please have the children speak up loudly

138  
00:05:32,870 --> 00:05:31,199

loud and proud we'd love to really hear

139

00:05:35,029 --> 00:05:32,880

your questions a little bit difficult

140

00:05:36,310 --> 00:05:35,039

with all the noise and mission control

141

00:05:38,710 --> 00:05:36,320

so definitely speak up when you're

142

00:05:49,909 --> 00:05:38,720

asking your questions thanks

143

00:05:55,830 --> 00:05:52,950

and you go ahead

144

00:05:57,909 --> 00:05:55,840

when in space what unusual or

145

00:05:59,670 --> 00:05:57,919

extraordinary things have you seen or

146

00:06:01,830 --> 00:05:59,680

experienced

147

00:06:04,390 --> 00:06:01,840

in space there's a lot of things that i

148

00:06:06,309 --> 00:06:04,400

would call extraordinary

149

00:06:09,670 --> 00:06:06,319

extraordinary in the fact that that you

150

00:06:12,710 --> 00:06:09,680

can float and it really is it really is

151  
00:06:13,590 --> 00:06:12,720  
an a unique and fun feeling to be able

152  
00:06:15,670 --> 00:06:13,600  
to

153  
00:06:18,150 --> 00:06:15,680  
stand on the wall put your feet on the

154  
00:06:20,390 --> 00:06:18,160  
wall flip upside down and also when you

155  
00:06:22,309 --> 00:06:20,400  
look outside it's it's very

156  
00:06:24,309 --> 00:06:22,319  
extraordinary i don't know if i'd call

157  
00:06:26,070 --> 00:06:24,319  
it unusual but but definitely

158  
00:06:29,670 --> 00:06:26,080  
extraordinary when you look out at the

159  
00:06:32,070 --> 00:06:29,680  
stars it's so dark and so black and the

160  
00:06:34,469 --> 00:06:32,080  
stars almost have colors it's just

161  
00:06:35,670 --> 00:06:34,479  
beautiful and watching sunrises and

162  
00:06:37,270 --> 00:06:35,680  
sunsets

163  
00:06:39,430 --> 00:06:37,280

it's something that you can't put in a

164

00:06:40,870 --> 00:06:39,440

video or in pictures to really describe

165

00:06:43,510 --> 00:06:40,880

what it's like so i would definitely

166

00:06:45,590 --> 00:06:43,520

call that extraordinary about the aurora

167

00:06:47,189 --> 00:06:45,600

and the aurora is amazing i don't know

168

00:06:49,350 --> 00:06:47,199

if any of you you live far enough north

169

00:06:52,230 --> 00:06:49,360

you've probably seen the northern lights

170

00:06:53,990 --> 00:06:52,240

in minnesota and the green kind of

171

00:06:55,350 --> 00:06:54,000

dancing on the horizon and when you see

172

00:06:57,110 --> 00:06:55,360

it from space you see it over the

173

00:07:02,309 --> 00:06:57,120

surface of the earth and it is so

174

00:07:06,390 --> 00:07:04,390

what is your day-to-day life like on the

175

00:07:08,710 --> 00:07:06,400

space station for example how do you

176

00:07:10,390 --> 00:07:08,720

stay clean how do you sleep when and how

177

00:07:12,629 --> 00:07:10,400

do you eat

178

00:07:14,790 --> 00:07:12,639

day-to-day life is not a lot different

179

00:07:16,629 --> 00:07:14,800

actually than it is here and what you do

180

00:07:19,510 --> 00:07:16,639

i wake up to an alarm clock every

181

00:07:21,029 --> 00:07:19,520

morning and about six o'clock and i

182

00:07:23,110 --> 00:07:21,039

would go and

183

00:07:25,270 --> 00:07:23,120

have some coffee and have a little

184

00:07:27,510 --> 00:07:25,280

breakfast and then

185

00:07:30,950 --> 00:07:27,520

use the bathroom

186

00:07:32,390 --> 00:07:30,960

brush my teeth get ready uh for for like

187

00:07:34,710 --> 00:07:32,400

you the way you guys get ready for

188

00:07:37,189 --> 00:07:34,720

school and then then we work all day

189

00:07:38,629 --> 00:07:37,199

long um we communicate with the folks

190

00:07:40,230 --> 00:07:38,639

here in the mission control center and

191

00:07:41,830 --> 00:07:40,240

do the science that we're doing for all

192

00:07:44,469 --> 00:07:41,840

those people around the world and we

193

00:07:46,390 --> 00:07:44,479

also exercise a couple hours every day

194

00:07:48,869 --> 00:07:46,400

and then in the evening after we're done

195

00:07:51,430 --> 00:07:48,879

with all of our work we have dinner

196

00:07:55,189 --> 00:07:51,440

together usually as a crew and then a

197

00:07:57,589 --> 00:07:55,199

lot of times call home talk to my family

198

00:07:59,430 --> 00:07:57,599

and by that time the day is done and you

199

00:08:06,390 --> 00:07:59,440

set your alarm clock and go to bed and

200

00:08:10,830 --> 00:08:08,869

what are your hobbies in the spaceship

201  
00:08:13,589 --> 00:08:10,840  
or what do you do to pass

202  
00:08:14,950 --> 00:08:13,599  
time there you know the the weekdays go

203  
00:08:16,790 --> 00:08:14,960  
pretty fast and there's not a lot of

204  
00:08:17,589 --> 00:08:16,800  
time for hobbies but on the weekends we

205  
00:08:19,670 --> 00:08:17,599  
have

206  
00:08:20,790 --> 00:08:19,680  
saturdays we kind of do housekeeping for

207  
00:08:22,710 --> 00:08:20,800  
half the day and then the rest of the

208  
00:08:25,670 --> 00:08:22,720  
day is our own time and sunday is mostly

209  
00:08:27,830 --> 00:08:25,680  
our own time and i actually really

210  
00:08:29,430 --> 00:08:27,840  
enjoyed taking pictures and i'm not a

211  
00:08:31,029 --> 00:08:29,440  
photographer but when i was on space

212  
00:08:33,190 --> 00:08:31,039  
station i had so much fun playing with

213  
00:08:35,190 --> 00:08:33,200

the cameras and the subject matter is

214

00:08:36,630 --> 00:08:35,200

fantastic in the earth and so i would

215

00:08:38,790 --> 00:08:36,640

play with the cameras and try different

216

00:08:40,790 --> 00:08:38,800

settings to get beautiful pictures to

217

00:08:43,110 --> 00:08:40,800

send to you guys on earth

218

00:08:44,550 --> 00:08:43,120

but also i i took up some sewing you may

219

00:08:45,829 --> 00:08:44,560

have heard and tried that a little bit i

220

00:08:47,350 --> 00:08:45,839

thought it would be interesting to see

221

00:08:48,470 --> 00:08:47,360

the differences of sewing because i like

222

00:08:51,269 --> 00:08:48,480

to do that it's one of my favorite

223

00:08:53,430 --> 00:08:51,279

hobbies on earth and so i took up some

224

00:08:55,030 --> 00:08:53,440

supplies and and tried tried my hand at

225

00:09:01,509 --> 00:08:55,040

that on a couple sunday afternoons when

226

00:09:05,269 --> 00:09:03,670

does zero gravity get frustrating while

227

00:09:06,470 --> 00:09:05,279

trying to eat sleep and do other

228

00:09:08,150 --> 00:09:06,480

activities

229

00:09:10,389 --> 00:09:08,160

that's a keen observation yes it

230

00:09:12,389 --> 00:09:10,399

actually does um eating what can happen

231

00:09:14,470 --> 00:09:12,399

sometimes depending on the food you have

232

00:09:16,230 --> 00:09:14,480

your food in a bag

233

00:09:18,550 --> 00:09:16,240

a lot of it and the things that were

234

00:09:20,710 --> 00:09:18,560

challenging were rice was one you put

235

00:09:22,470 --> 00:09:20,720

your spoon in and if it's not really

236

00:09:23,590 --> 00:09:22,480

sticky when you pull your spoon out

237

00:09:25,590 --> 00:09:23,600

little rice

238

00:09:27,030 --> 00:09:25,600

pieces of rice go floating all over and

239

00:09:28,550 --> 00:09:27,040

the same thing happened with scrambled

240

00:09:30,310 --> 00:09:28,560

eggs and some other things that we that

241

00:09:32,150 --> 00:09:30,320

would get frustrating and so you learn

242

00:09:34,150 --> 00:09:32,160

how to how to eat it after a while i

243

00:09:36,389 --> 00:09:34,160

would put my my spoon in the bag and

244

00:09:38,310 --> 00:09:36,399

kind of squish it together so i squish

245

00:09:40,150 --> 00:09:38,320

it into a big tight ball of rice before

246

00:09:43,350 --> 00:09:40,160

i took my spoon out of the bag so that

247

00:09:45,509 --> 00:09:43,360

could get frustrating and for sleeping

248

00:09:46,870 --> 00:09:45,519

i liked the feeling of something on my

249

00:09:48,710 --> 00:09:46,880

back when i sleep like you're laying in

250

00:09:50,630 --> 00:09:48,720

a bed so it would be a little

251  
00:09:52,389 --> 00:09:50,640  
uncomfortable for me to just hang there

252  
00:09:54,790 --> 00:09:52,399  
like you see pictures of a lot of people

253  
00:09:56,870 --> 00:09:54,800  
doing so i would sleep sideways

254  
00:09:59,190 --> 00:09:56,880  
sideways in my sleeping bag so that it

255  
00:10:01,350 --> 00:09:59,200  
pushed up against my knees and my back

256  
00:10:03,030 --> 00:10:01,360  
and i wanted to roll over and you can't

257  
00:10:05,190 --> 00:10:03,040  
roll over because you're not really

258  
00:10:06,790 --> 00:10:05,200  
laying down and so i just i felt this

259  
00:10:07,829 --> 00:10:06,800  
need to roll over in my bed and i

260  
00:10:15,590 --> 00:10:07,839  
couldn't so that got a little

261  
00:10:19,990 --> 00:10:17,750  
what are the physical effects of being

262  
00:10:21,670 --> 00:10:20,000  
in space and then coming back

263  
00:10:24,069 --> 00:10:21,680

to earth

264

00:10:26,150 --> 00:10:24,079

well when we when we go to space our

265

00:10:29,430 --> 00:10:26,160

bodies are amazing they really try to

266

00:10:31,750 --> 00:10:29,440

adapt to to to the condition or whatever

267

00:10:33,509 --> 00:10:31,760

situation they're in and because there's

268

00:10:35,750 --> 00:10:33,519

no gravity there they don't we don't

269

00:10:37,670 --> 00:10:35,760

need bones to stand up we don't need the

270

00:10:40,069 --> 00:10:37,680

muscles that we need to move around so

271

00:10:41,829 --> 00:10:40,079

our bodies are really trying to adjust

272

00:10:43,350 --> 00:10:41,839

so we need to counteract that with a lot

273

00:10:45,110 --> 00:10:43,360

of exercise

274

00:10:46,790 --> 00:10:45,120

we notice that the fluids in our body

275

00:10:48,389 --> 00:10:46,800

kind of shift up gravity is not pulling

276

00:10:50,630 --> 00:10:48,399

them to our feet and some people end up

277

00:10:52,389 --> 00:10:50,640

looking a little puffy in the face and

278

00:10:53,750 --> 00:10:52,399

and you can definitely feel that in your

279

00:10:55,910 --> 00:10:53,760

head

280

00:10:57,990 --> 00:10:55,920

but when we come back to earth then it's

281

00:11:01,350 --> 00:10:58,000

especially bad if you haven't exercised

282

00:11:03,190 --> 00:11:01,360

but if you um your body then is trying

283

00:11:04,870 --> 00:11:03,200

to because of the fluid shifts your body

284

00:11:06,949 --> 00:11:04,880

actually has gotten rid of some of its

285

00:11:08,870 --> 00:11:06,959

its blood volume and when you come back

286

00:11:10,870 --> 00:11:08,880

to earth your body's trying to rebuild

287

00:11:12,949 --> 00:11:10,880

that blood and it makes you really tired

288

00:11:14,550 --> 00:11:12,959

that's one thing i noticed i was very

289

00:11:16,310 --> 00:11:14,560

tired when i came back and i think it's

290

00:11:19,269 --> 00:11:16,320

because my body was trying to get back

291

00:11:29,350 --> 00:11:19,279

to the normal normal blood levels that

292

00:11:33,910 --> 00:11:31,190

what kind of forces do you feel when

293

00:11:35,430 --> 00:11:33,920

taking off and landing

294

00:11:37,430 --> 00:11:35,440

well taking off when the when the

295

00:11:38,949 --> 00:11:37,440

engine's first light on the rocket it's

296

00:11:41,110 --> 00:11:38,959

kind of a rumble and you can feel the

297

00:11:43,509 --> 00:11:41,120

whole vehicle vibrating and then it

298

00:11:44,870 --> 00:11:43,519

starts to lift and you feel the gravity

299

00:11:46,389 --> 00:11:44,880

forces building and building and

300

00:11:48,710 --> 00:11:46,399

building you're feeling heavier in your

301  
00:11:50,389 --> 00:11:48,720  
seat and then once the engine's cut off

302  
00:11:52,710 --> 00:11:50,399  
and you're in space about eight minutes

303  
00:11:53,990 --> 00:11:52,720  
after you launch all of a sudden

304  
00:11:56,069 --> 00:11:54,000  
you notice everything's floating you

305  
00:11:58,310 --> 00:11:56,079  
feel very light we're pushed down in our

306  
00:12:00,550 --> 00:11:58,320  
seats but we could still our hands could

307  
00:12:03,110 --> 00:12:00,560  
would lift and everything

308  
00:12:05,269 --> 00:12:03,120  
coming back is is a lot different and

309  
00:12:07,670 --> 00:12:05,279  
i've come back now on the space shuttle

310  
00:12:09,509 --> 00:12:07,680  
and the soyuz capsule which the space

311  
00:12:11,430 --> 00:12:09,519  
shuttle lands like an airplane and it's

312  
00:12:12,470 --> 00:12:11,440  
pretty it's pretty

313  
00:12:15,670 --> 00:12:12,480

calm

314

00:12:17,430 --> 00:12:15,680

you glide in and the the g-load so you

315

00:12:18,949 --> 00:12:17,440

start to feel about two and a half times

316

00:12:21,509 --> 00:12:18,959

your body weight as you come in but it's

317

00:12:22,550 --> 00:12:21,519

not so bad well in the soyuz it's just a

318

00:12:25,910 --> 00:12:22,560

capsule

319

00:12:28,069 --> 00:12:25,920

and it comes in and we reached a weight

320

00:12:30,310 --> 00:12:28,079

or a g load of almost five times our

321

00:12:32,870 --> 00:12:30,320

body weight so you felt pretty pretty

322

00:12:35,269 --> 00:12:32,880

heavy and then a parachute opens and

323

00:12:38,230 --> 00:12:35,279

your the capsule lands under a parachute

324

00:12:39,829 --> 00:12:38,240

and when that parachute opens it's very

325

00:12:41,750 --> 00:12:39,839

you're the capsule swaying around like

326

00:12:44,550 --> 00:12:41,760

this and it's it's like like a bad

327

00:12:46,949 --> 00:12:44,560

amusement park right i think

328

00:12:47,910 --> 00:12:46,959

it was fun but it was very very very

329

00:12:50,470 --> 00:12:47,920

rough

330

00:12:52,790 --> 00:12:50,480

and and then you land on the land and so

331

00:12:54,949 --> 00:12:52,800

it's almost like a small car crash on

332

00:12:57,269 --> 00:12:54,959

the ground and so you feel that too

333

00:12:59,030 --> 00:12:57,279

so um there there's a lot of a lot of

334

00:13:01,110 --> 00:12:59,040

feelings that your body get during both

335

00:13:09,829 --> 00:13:01,120

the space shuttle and and soyuz landing

336

00:13:19,190 --> 00:13:11,670

what kind of emotions do you go through

337

00:13:20,629 --> 00:13:19,200

um

338

00:13:21,990 --> 00:13:20,639

well i think

339

00:13:24,150 --> 00:13:22,000

the main thing

340

00:13:25,430 --> 00:13:24,160

leaving especially this last time when i

341

00:13:28,790 --> 00:13:25,440

knew i was going to be leaving for

342

00:13:30,949 --> 00:13:28,800

almost six months um

343

00:13:32,790 --> 00:13:30,959

the day of the day you're leaving is a

344

00:13:34,710 --> 00:13:32,800

little strange and you feel sad you know

345

00:13:37,590 --> 00:13:34,720

you're leaving your family but also

346

00:13:40,389 --> 00:13:37,600

we're trained to really um concentrate

347

00:13:42,230 --> 00:13:40,399

on the on the job that we're doing and

348

00:13:45,110 --> 00:13:42,240

try not to let the distractions of other

349

00:13:47,350 --> 00:13:45,120

things get in the way and so

350

00:13:49,509 --> 00:13:47,360

it's a lot of excitement in that case

351

00:13:51,269 --> 00:13:49,519

then it's almost like the anticipation

352

00:13:52,949 --> 00:13:51,279

when christmas is coming

353

00:13:55,030 --> 00:13:52,959

you're not nervous necessarily but

354

00:13:58,629 --> 00:13:55,040

there's this anxious anxious feeling

355

00:14:00,230 --> 00:13:58,639

that you have you're very excited

356

00:14:01,590 --> 00:14:00,240

to get going and when you're sitting in

357

00:14:03,750 --> 00:14:01,600

the rocket it almost feels like a

358

00:14:05,670 --> 00:14:03,760

simulation like you've been training but

359

00:14:08,629 --> 00:14:05,680

this time you know that it's for real

360

00:14:17,189 --> 00:14:08,639

and it's uh it's pretty neat i would say

361

00:14:21,189 --> 00:14:19,269

we read about you in time for kids and

362

00:14:23,430 --> 00:14:21,199

we want to know why you picked sally

363

00:14:25,910 --> 00:14:23,440

ride to be your hero

364

00:14:28,389 --> 00:14:25,920

yeah sally ride she's definitely a space

365

00:14:30,949 --> 00:14:28,399

hero and actually i think everybody all

366

00:14:33,350 --> 00:14:30,959

of the women that were selected when she

367

00:14:35,030 --> 00:14:33,360

was as an astronaut she was in the class

368

00:14:36,629 --> 00:14:35,040

the first time they selected female

369

00:14:38,470 --> 00:14:36,639

astronauts and i think all those women

370

00:14:39,990 --> 00:14:38,480

really inspired me

371

00:14:41,509 --> 00:14:40,000

and she happened to be the first one

372

00:14:45,189 --> 00:14:41,519

from the united states that flew into

373

00:14:46,790 --> 00:14:45,199

space and so i know that um you know

374

00:14:49,670 --> 00:14:46,800

being the being the first of something

375

00:14:52,150 --> 00:14:49,680

always takes a little bit extra work and

376

00:14:53,990 --> 00:14:52,160

and so i know she worked really hard and

377

00:14:56,069 --> 00:14:54,000

it just really was an inspiration and it

378

00:14:58,069 --> 00:14:56,079

was when i was a child that she was she

379

00:15:00,310 --> 00:14:58,079

was doing that and so i know i

380

00:15:02,790 --> 00:15:00,320

definitely read about her also when i

381

00:15:11,110 --> 00:15:02,800

was in school and and just was really

382

00:15:14,470 --> 00:15:12,870

what kind of emergencies do you have to

383

00:15:16,870 --> 00:15:14,480

prepare for and how do you prepare for

384

00:15:19,110 --> 00:15:16,880

them we do have to train for emergencies

385

00:15:20,949 --> 00:15:19,120

that's for sure there are three big ones

386

00:15:23,269 --> 00:15:20,959

that we train for

387

00:15:25,430 --> 00:15:23,279

imagine if we were on the space station

388

00:15:27,509 --> 00:15:25,440

you can't just go outside if you have a

389

00:15:31,030 --> 00:15:27,519

fire in your house so we train we train

390

00:15:33,670 --> 00:15:31,040

for a fire we train for if the um you

391

00:15:36,150 --> 00:15:33,680

know there's a vacuum in space outside

392

00:15:38,069 --> 00:15:36,160

of of the space station and humans can't

393

00:15:39,590 --> 00:15:38,079

survive there so if we got a hole in the

394

00:15:41,590 --> 00:15:39,600

space station and it leaked all of the

395

00:15:44,629 --> 00:15:41,600

air out we would be in trouble so we

396

00:15:47,350 --> 00:15:44,639

also train for a depressurization it's

397

00:15:49,350 --> 00:15:47,360

called we also train for

398

00:15:52,629 --> 00:15:49,360

if there's a some kind of a toxic

399

00:15:54,230 --> 00:15:52,639

chemical like ammonia our cooling system

400

00:15:56,870 --> 00:15:54,240

that is outside of the space station

401  
00:15:58,949 --> 00:15:56,880  
that cools all of our electronics and us

402  
00:16:01,030 --> 00:15:58,959  
has ammonia in it and that is that's a

403  
00:16:03,269 --> 00:16:01,040  
deadly toxin and so if we were to get

404  
00:16:05,590 --> 00:16:03,279  
some of that in the air in the space

405  
00:16:07,430 --> 00:16:05,600  
station we would have to we'd have to

406  
00:16:08,629 --> 00:16:07,440  
take some action so we trained very hard

407  
00:16:10,949 --> 00:16:08,639  
here

408  
00:16:13,069 --> 00:16:10,959  
on the earth with our crewmates we learn

409  
00:16:16,949 --> 00:16:13,079  
what to do if there's a fire or a

410  
00:16:18,870 --> 00:16:16,959  
depressurization or some toxic spill and

411  
00:16:20,790 --> 00:16:18,880  
if it gets too bad what we would do is

412  
00:16:27,749 --> 00:16:20,800  
get into our soyuz capsule and come back

413  
00:16:31,189 --> 00:16:29,350

when in space

414

00:16:33,189 --> 00:16:31,199

how can you tell if

415

00:16:36,230 --> 00:16:33,199

when it's day or night and when do you

416

00:16:37,910 --> 00:16:36,240

depend on to know the time

417

00:16:39,990 --> 00:16:37,920

that's that's a good question because

418

00:16:41,910 --> 00:16:40,000

obviously you know we're we're orbiting

419

00:16:44,870 --> 00:16:41,920

the earth every 90 minutes since we see

420

00:16:45,749 --> 00:16:44,880

a sunrise and sunset 16 times a day and

421

00:16:49,269 --> 00:16:45,759

so

422

00:16:52,230 --> 00:16:49,279

always looking out the window but what

423

00:16:55,269 --> 00:16:52,240

we do is we use the greenwich mean time

424

00:16:57,509 --> 00:16:55,279

which is um in in europe

425

00:16:59,110 --> 00:16:57,519

and we have we set our clocks like i

426

00:17:00,790 --> 00:16:59,120

said i set my alarm to get up at six

427

00:17:02,470 --> 00:17:00,800

o'clock in the morning and then we turn

428

00:17:04,069 --> 00:17:02,480

all the lights on and so all the lights

429

00:17:06,549 --> 00:17:04,079

are on in the space station just like

430

00:17:09,110 --> 00:17:06,559

it's daytime and then when it gets to be

431

00:17:11,029 --> 00:17:09,120

bedtime we just we look at our clocks we

432

00:17:12,549 --> 00:17:11,039

know we know what time it is that it's

433

00:17:14,549 --> 00:17:12,559

close to bedtime and we turn all the

434

00:17:16,630 --> 00:17:14,559

lights off in the space station so even

435

00:17:18,390 --> 00:17:16,640

though there might be light outside we

436

00:17:19,909 --> 00:17:18,400

don't have the windows we're not in the

437

00:17:21,990 --> 00:17:19,919

middle of the night we're in our sleep

438

00:17:24,390 --> 00:17:22,000

stations and it's very dark in there and

439

00:17:25,829 --> 00:17:24,400

so so we don't really get that confused

440

00:17:32,150 --> 00:17:25,839

in the middle of the night by what time

441

00:17:36,150 --> 00:17:33,990

okay in the future what would you want

442

00:17:37,750 --> 00:17:36,160

to discover and why

443

00:17:39,270 --> 00:17:37,760

that's a really good question discover

444

00:17:41,029 --> 00:17:39,280

what would you like to discover you know

445

00:17:43,190 --> 00:17:41,039

what i think the best thing about

446

00:17:45,110 --> 00:17:43,200

discoveries is or the neatest thing

447

00:17:46,710 --> 00:17:45,120

about discoveries is

448

00:17:48,630 --> 00:17:46,720

oftentimes we don't know what they are

449

00:17:50,230 --> 00:17:48,640

we can't predict i can't really say i

450

00:17:52,070 --> 00:17:50,240

want to discover this

451  
00:17:54,310 --> 00:17:52,080  
because what you discover just happens

452  
00:17:55,350 --> 00:17:54,320  
and that's kind of why it's a discovery

453  
00:17:56,710 --> 00:17:55,360  
but i think

454  
00:17:58,390 --> 00:17:56,720  
something that we can help with for

455  
00:18:00,549 --> 00:17:58,400  
space station is to help people that

456  
00:18:02,470 --> 00:18:00,559  
have problems and illnesses

457  
00:18:04,710 --> 00:18:02,480  
and we can play a part with the science

458  
00:18:06,950 --> 00:18:04,720  
that we're doing on on space station to

459  
00:18:08,789 --> 00:18:06,960  
help discover some cures for various

460  
00:18:10,390 --> 00:18:08,799  
diseases that people are having or come

461  
00:18:12,549 --> 00:18:10,400  
up with medicines to help people that

462  
00:18:22,230 --> 00:18:12,559  
need help and if i can play a part in

463  
00:18:25,990 --> 00:18:24,150

how did newton's laws of motion apply to

464

00:18:28,549 --> 00:18:26,000

space

465

00:18:30,789 --> 00:18:28,559

newton's laws yes they apply a lot

466

00:18:33,430 --> 00:18:30,799

there's a lot of instances um

467

00:18:35,750 --> 00:18:33,440

like if you take an object and put it in

468

00:18:37,669 --> 00:18:35,760

the middle of the space station

469

00:18:39,430 --> 00:18:37,679

and have it so it's not moving relative

470

00:18:41,909 --> 00:18:39,440

to the rest of space station it will

471

00:18:44,470 --> 00:18:41,919

just stay right there until it's acted

472

00:18:47,110 --> 00:18:44,480

on by something else and usually that

473

00:18:49,270 --> 00:18:47,120

something else is ventilation there's a

474

00:18:50,870 --> 00:18:49,280

fan blowing air and that air will push

475

00:18:53,190 --> 00:18:50,880

that thing so things usually will start

476  
00:18:55,590 --> 00:18:53,200  
to drift but if the ventilation was

477  
00:18:57,430 --> 00:18:55,600  
turned off and if nobody touched it that

478  
00:18:58,950 --> 00:18:57,440  
object would just stay right there and

479  
00:19:00,630 --> 00:18:58,960  
would not move

480  
00:19:02,470 --> 00:19:00,640  
another thing we deal with when you're

481  
00:19:03,909 --> 00:19:02,480  
working on something like let's say

482  
00:19:05,669 --> 00:19:03,919  
you're screwing in a screw with a

483  
00:19:07,430 --> 00:19:05,679  
screwdriver here on earth your feet are

484  
00:19:08,950 --> 00:19:07,440  
planted on the ground and you're staying

485  
00:19:11,270 --> 00:19:08,960  
there from gravity and it's pretty easy

486  
00:19:13,830 --> 00:19:11,280  
to turn it well in space if you don't

487  
00:19:16,470 --> 00:19:13,840  
hold on to something as you start

488  
00:19:19,270 --> 00:19:16,480

turning that screwdriver you're gonna go

489

00:19:21,270 --> 00:19:19,280

right along with it so so newton's laws

490

00:19:22,710 --> 00:19:21,280

definitely apply and you can see it in a

491

00:19:23,990 --> 00:19:22,720

lot of instances

492

00:19:30,390 --> 00:19:24,000

smart question

493

00:19:33,909 --> 00:19:32,870

where does all the garbage go

494

00:19:36,070 --> 00:19:33,919

on the

495

00:19:37,909 --> 00:19:36,080

international space station

496

00:19:39,990 --> 00:19:37,919

there certainly is a lot of garbage

497

00:19:42,230 --> 00:19:40,000

generated i think we as a human species

498

00:19:44,070 --> 00:19:42,240

generate a lot of trash and we have

499

00:19:47,350 --> 00:19:44,080

vehicles that come up we call them cargo

500

00:19:49,669 --> 00:19:47,360

vehicles and they bring up supplies for

501  
00:19:51,350 --> 00:19:49,679  
us and then after we unload all the

502  
00:19:53,590 --> 00:19:51,360  
supplies and the equipment and the food

503  
00:19:55,590 --> 00:19:53,600  
that it brought for us we've loaded up

504  
00:19:57,350 --> 00:19:55,600  
with all the trash that we have

505  
00:20:00,150 --> 00:19:57,360  
and there are a number of these vehicles

506  
00:20:02,630 --> 00:20:00,160  
and most of them once we load it up with

507  
00:20:04,390 --> 00:20:02,640  
trash and close the hatches and it goes

508  
00:20:06,230 --> 00:20:04,400  
away from space station that burns up in

509  
00:20:13,750 --> 00:20:06,240  
the atmosphere so all of our trash is

510  
00:20:19,029 --> 00:20:16,789  
have you ever been outside of the iss

511  
00:20:21,510 --> 00:20:19,039  
i have not i have not had that unique

512  
00:20:23,830 --> 00:20:21,520  
opportunity but when i was when i was on

513  
00:20:25,350 --> 00:20:23,840

space station my colleagues chris and

514

00:20:27,110 --> 00:20:25,360

luca and a couple of my russian

515

00:20:28,390 --> 00:20:27,120

colleagues as well were able to do space

516

00:20:30,470 --> 00:20:28,400

walks

517

00:20:32,870 --> 00:20:30,480

and from what they've told me it's just

518

00:20:35,510 --> 00:20:32,880

it's such an incredible feeling

519

00:20:37,510 --> 00:20:35,520

to go out there where it's just you and

520

00:20:39,990 --> 00:20:37,520

the spacesuit and you're looking through

521

00:20:41,430 --> 00:20:40,000

your visor and

522

00:20:50,549 --> 00:20:41,440

just an incredible feeling i would love

523

00:20:53,590 --> 00:20:52,390

what do the stars and planets look like

524

00:20:55,830 --> 00:20:53,600

in space

525

00:20:57,909 --> 00:20:55,840

the stars and planets are very they look

526  
00:20:59,270 --> 00:20:57,919  
actually very similar to they to the way

527  
00:21:00,789 --> 00:20:59,280  
they do when you're on earth but they

528  
00:21:02,950 --> 00:21:00,799  
seem a little brighter and a little

529  
00:21:05,270 --> 00:21:02,960  
crisper they don't twinkle the way that

530  
00:21:06,870 --> 00:21:05,280  
they do on on the earth because on earth

531  
00:21:08,470 --> 00:21:06,880  
we're looking through our atmosphere and

532  
00:21:10,789 --> 00:21:08,480  
it just kind of makes everything twinkle

533  
00:21:12,789 --> 00:21:10,799  
a little bit but from space station

534  
00:21:14,230 --> 00:21:12,799  
they're very solid and you see a lot of

535  
00:21:16,070 --> 00:21:14,240  
the colors

536  
00:21:17,590 --> 00:21:16,080  
in fact i took some pictures of stars

537  
00:21:19,510 --> 00:21:17,600  
and it really wasn't until i looked at

538  
00:21:21,350 --> 00:21:19,520

the pictures that i realized i was

539

00:21:23,270 --> 00:21:21,360

seeing these different colors i saw some

540

00:21:25,110 --> 00:21:23,280

that looked more blue some that looked

541

00:21:26,789 --> 00:21:25,120

more yellow and that just says a lot

542

00:21:28,549 --> 00:21:26,799

about the stars and what they're made of

543

00:21:31,029 --> 00:21:28,559

and where they are in their in their

544

00:21:33,590 --> 00:21:31,039

history and their lifespan

545

00:21:35,190 --> 00:21:33,600

um and there's almost like a depth to it

546

00:21:37,350 --> 00:21:35,200

as well that you can see

547

00:21:38,950 --> 00:21:37,360

um but other than being just a little

548

00:21:40,710 --> 00:21:38,960

brighter and a little more distinct in

549

00:21:42,149 --> 00:21:40,720

their colors they look very similar to

550

00:21:43,830 --> 00:21:42,159

the way you see them and the moon does

551  
00:21:46,630 --> 00:21:43,840  
too right it kind of looks a little the

552  
00:21:48,230 --> 00:21:46,640  
moon is the moon is very crisp um i

553  
00:21:50,070 --> 00:21:48,240  
noticed um

554  
00:21:52,310 --> 00:21:50,080  
in particular that the moon to me looked

555  
00:21:54,310 --> 00:21:52,320  
smaller from the space station than it

556  
00:21:56,070 --> 00:21:54,320  
does from on earth and i didn't i didn't

557  
00:21:57,590 --> 00:21:56,080  
really pick that out until i came back

558  
00:21:59,909 --> 00:21:57,600  
to earth and i saw the moon i was like

559  
00:22:01,270 --> 00:21:59,919  
wow it looks so big

560  
00:22:04,149 --> 00:22:01,280  
and it really looked a little bigger and

561  
00:22:05,830 --> 00:22:04,159  
i'm not sure exactly why that is but but

562  
00:22:07,190 --> 00:22:05,840  
it's definitely crisper

563  
00:22:14,710 --> 00:22:07,200

from space station but it looks a little

564

00:22:17,510 --> 00:22:16,070

what do you guys do to recycle the

565

00:22:19,590 --> 00:22:17,520

oxygen

566

00:22:20,950 --> 00:22:19,600

how do you do it and what is it called

567

00:22:22,390 --> 00:22:20,960

well that's definitely a very important

568

00:22:24,230 --> 00:22:22,400

thing when we're living in a closed

569

00:22:25,590 --> 00:22:24,240

system like the space station and we

570

00:22:27,669 --> 00:22:25,600

have something we call it the

571

00:22:29,029 --> 00:22:27,679

regenerative life support system and it

572

00:22:31,110 --> 00:22:29,039

doesn't just work with the oxygen it

573

00:22:32,870 --> 00:22:31,120

works with a lot of things and so

574

00:22:35,029 --> 00:22:32,880

basically if you start with the human

575

00:22:37,029 --> 00:22:35,039

being we need a couple definitely need a

576  
00:22:38,789 --> 00:22:37,039  
couple things we need oxygen to breathe

577  
00:22:41,190 --> 00:22:38,799  
and we need water to drink as well as

578  
00:22:42,789 --> 00:22:41,200  
food and other things but

579  
00:22:45,110 --> 00:22:42,799  
and then we'll also give off some things

580  
00:22:46,710 --> 00:22:45,120  
we give off carbon dioxide and we give

581  
00:22:48,870 --> 00:22:46,720  
off a little bit of water vapor water in

582  
00:22:50,470 --> 00:22:48,880  
our sweat and then also urine well what

583  
00:22:53,110 --> 00:22:50,480  
they do in this regenerative life

584  
00:22:55,510 --> 00:22:53,120  
support system is they they take the air

585  
00:22:57,669 --> 00:22:55,520  
that we breathe they can clean out the

586  
00:22:58,870 --> 00:22:57,679  
carbon dioxide so it's fresh because we

587  
00:23:01,350 --> 00:22:58,880  
don't want to breathe in that carbon

588  
00:23:03,190 --> 00:23:01,360

dioxide and they can they can clean out

589

00:23:05,270 --> 00:23:03,200

the water vapor and then they can

590

00:23:06,710 --> 00:23:05,280

collect that water vapor and our urine

591

00:23:08,870 --> 00:23:06,720

and they can put it through the system

592

00:23:10,149 --> 00:23:08,880

that cleans the water and then we can

593

00:23:11,990 --> 00:23:10,159

drink that water

594

00:23:13,750 --> 00:23:12,000

and we can also feed that water to use

595

00:23:15,270 --> 00:23:13,760

for other things and one thing they'll

596

00:23:17,990 --> 00:23:15,280

do with that water is separate the

597

00:23:19,510 --> 00:23:18,000

hydrogen and the oxygen and

598

00:23:21,430 --> 00:23:19,520

basically get rid of the hydrogen and

599

00:23:23,590 --> 00:23:21,440

now we have oxygen and then they can

600

00:23:25,190 --> 00:23:23,600

feed that oxygen back into the fresh air

601  
00:23:27,350 --> 00:23:25,200  
that we've taken the carbon dioxide out

602  
00:23:29,350 --> 00:23:27,360  
of and use it all over again so it's a

603  
00:23:31,029 --> 00:23:29,360  
pretty neat system and it's important

604  
00:23:32,710 --> 00:23:31,039  
for space station because we can't bring

605  
00:23:35,510 --> 00:23:32,720  
up fresh water all the time and we can't

606  
00:23:36,710 --> 00:23:35,520  
bring up fresh oxygen to breed so that's

607  
00:23:38,070 --> 00:23:36,720  
the that's the way we do it on space

608  
00:23:45,510 --> 00:23:38,080  
station and it's it's a pretty neat

609  
00:23:49,750 --> 00:23:47,350  
you need a special type of clothing

610  
00:23:51,750 --> 00:23:49,760  
while going into space we do wear

611  
00:23:53,350 --> 00:23:51,760  
special clothing when we launch we're in

612  
00:23:55,110 --> 00:23:53,360  
a spacesuit and the reason we wear a

613  
00:23:56,909 --> 00:23:55,120

spacesuit is because

614

00:23:59,590 --> 00:23:56,919

we can just in case there's a

615

00:24:00,950 --> 00:23:59,600

depressurization of our space capsule we

616

00:24:03,269 --> 00:24:00,960

have a spacesuit that can hold the

617

00:24:04,789 --> 00:24:03,279

pressure and keep us alive and so when

618

00:24:06,950 --> 00:24:04,799

we're launching and then again when we

619

00:24:08,870 --> 00:24:06,960

land we wear a spacesuit but when we're

620

00:24:11,830 --> 00:24:08,880

in the space station we just dress like

621

00:24:14,149 --> 00:24:11,840

this we can dress in a polo shirt and

622

00:24:15,269 --> 00:24:14,159

shorts or a t-shirt or just like you do

623

00:24:16,390 --> 00:24:15,279

at home

624

00:24:17,510 --> 00:24:16,400

well they're giving us a signal that

625

00:24:18,870 --> 00:24:17,520

that's going to wrap it up for us we

626

00:24:20,390 --> 00:24:18,880

want to thank you guys thank you karen

627

00:24:21,990 --> 00:24:20,400

very much and we'll hope you guys have a

628

00:24:23,269 --> 00:24:22,000

great day there in minnesota thanks for

629

00:24:26,470 --> 00:24:23,279

joining us