1
00:00:16,310 --> 00:00:14,230
good afternoon and welcome to the

2
00:00:19,349 --> 00:00:16,320
johnson space center for the expedition

3
00:00:20,630 --> 00:00:19,359
48 49 crew news briefing before we get

4
00:00:22,950 --> 00:00:20,640
started we did have one kind of

5
00:00:24,710 --> 00:00:22,960
technical note for you all we may be

6
00:00:26,710 --> 00:00:24,720
experiencing some interference in the

7
00:00:28,070 --> 00:00:26,720
television signal today

8
00:00:29,990 --> 00:00:28,080
but we'll be recording the briefing and

9
00:00:31,750 --> 00:00:30,000
we'll be replaying it on nasa tv

10
00:00:34,709 --> 00:00:31,760
throughout the day so if you miss any of

11
00:00:36,389 --> 00:00:34,719
it you can tune back in a little later

12
00:00:38,310 --> 00:00:36,399
so now we're going to introduce the crew

13
00:00:41,110 --> 00:00:38,320

who's here with us today we have um the

14
00:00:43,830 --> 00:00:41,120
expedition 48 49 crew members and we're

15
00:00:45,270 --> 00:00:43,840
going to start with nasa's kate rubins

16
00:00:46,630 --> 00:00:45,280
this is her first mission to the

17
00:00:48,630 --> 00:00:46,640
international space station her first

18
00:00:50,709 --> 00:00:48,640
trip to space at all and so kate maybe

19
00:00:52,229 --> 00:00:50,719
you can start a little bit by telling us

20
00:00:53,670 --> 00:00:52,239
what you're looking forward to as a

21
00:00:55,430 --> 00:00:53,680
science since you have such a scientific

22
00:00:57,430 --> 00:00:55,440
background yeah we actually have an

23
00:00:59,990 --> 00:00:57,440
amazing complement of science on

24
00:01:01,990 --> 00:01:00,000
expedition 48 and 49 there's going to be

25
00:01:03,270 --> 00:01:02,000
over 250 different science experiments

26
00:01:04,469 --> 00:01:03,280
so it's a little difficult to choose

27
00:01:05,910 --> 00:01:04,479
which one

28
00:01:07,510 --> 00:01:05,920
there's definitely a lot of life science

29
00:01:09,590 --> 00:01:07,520
experiments that i'm pretty excited

30
00:01:11,350 --> 00:01:09,600
about there's going to be some dna

31
00:01:13,830 --> 00:01:11,360
sequencing experiments a lot of

32
00:01:17,990 --> 00:01:13,840
experiments to look at the behavior of

33
00:01:19,590 --> 00:01:18,000
cells in space as well as bone loss and

34
00:01:21,350 --> 00:01:19,600
muscle loss that we can actually

35
00:01:22,950 --> 00:01:21,360
correlate with some diseases on earth so

36
00:01:26,550 --> 00:01:22,960
i'm looking forward to a pretty hefty

37
00:01:29,030 --> 00:01:26,560
research component on 4849

38
00:01:31,510 --> 00:01:29,040

okay well next up we have anatoly

39
00:01:33,510 --> 00:01:31,520
ivanishin who is the russian cosmonaut

40
00:01:34,870 --> 00:01:33,520
on the crew and he is actually

41
00:01:36,550 --> 00:01:34,880
the experienced member of the crew he's

42
00:01:38,069 --> 00:01:36,560
been to the space station before so

43
00:01:40,710 --> 00:01:38,079
anatoly maybe you can tell us a little

44
00:01:42,550 --> 00:01:40,720
bit about what you've been able to give

45
00:01:45,429 --> 00:01:42,560
your crewmates in terms of tips for

46
00:01:47,270 --> 00:01:45,439
ready for for going to the space station

47
00:01:49,109 --> 00:01:47,280
i think that my roommates are ready for

48
00:01:51,910 --> 00:01:49,119
going to the space station

49
00:01:54,950 --> 00:01:51,920
and the the better advice i can give to

50
00:01:57,510 --> 00:01:54,960
them is to keep their eyes open

51
00:01:59,510 --> 00:01:57,520
have fun and enjoy the time you

52
00:02:00,630 --> 00:01:59,520
spend in space because the time is going

53
00:02:03,429 --> 00:02:00,640
to pass

54
00:02:07,910 --> 00:02:05,429
okay

55
00:02:10,469 --> 00:02:07,920
and finally we have takuya onishi who is

56
00:02:12,869 --> 00:02:10,479
the japanese aerospace exploration

57
00:02:16,070 --> 00:02:12,879
agency member here he'll be a flight

58
00:02:17,589 --> 00:02:16,080
engineer on 48 and 49 as well and takuyu

59
00:02:19,510 --> 00:02:17,599
maybe you can tell us a little bit about

60
00:02:20,630 --> 00:02:19,520
the the training you've been involved in

61
00:02:23,350 --> 00:02:20,640
so far

62
00:02:26,390 --> 00:02:23,360
yeah i'm the left seater of soyuz space

63
00:02:29,270 --> 00:02:26,400

vehicle so i spend almost half of my

64
00:02:31,830 --> 00:02:29,280
time in russia and the other half time

65
00:02:34,309 --> 00:02:31,840
half of my time in

66
00:02:38,070 --> 00:02:34,319
here at houston so

67
00:02:39,830 --> 00:02:38,080
i was i've been very busy for this these

68
00:02:40,790 --> 00:02:39,840
two and a half years

69
00:02:43,430 --> 00:02:40,800
since

70
00:02:44,150 --> 00:02:43,440
my appointment assignment

71
00:02:47,750 --> 00:02:44,160
and

72
00:02:51,270 --> 00:02:47,760
the training for soyuz vehicle was

73
00:02:53,910 --> 00:02:51,280
quite tough because i needed to study

74
00:02:55,830 --> 00:02:53,920
like like a student college student i

75
00:02:58,949 --> 00:02:55,840
stayed stayed up late

76
00:03:01,750 --> 00:02:58,959
uh almost every day like up to

77
00:03:04,949 --> 00:03:01,760
2 a.m studying solid assistance and

78
00:03:07,990 --> 00:03:04,959
doing club going going to classes

79
00:03:10,790 --> 00:03:08,000
on a daytime and come back and study

80
00:03:14,550 --> 00:03:10,800
again so it was very challenging for me

81
00:03:15,670 --> 00:03:14,560
but i enjoyed the training itself

82
00:03:16,869 --> 00:03:15,680
all right well with that kind of

83
00:03:19,430 --> 00:03:16,879
schedule we really appreciate y'all

84
00:03:20,630 --> 00:03:19,440
making time to talk with us today

85
00:03:22,070 --> 00:03:20,640
we've got just a little bit of time

86
00:03:23,430 --> 00:03:22,080
today and we've got a number of media

87
00:03:25,830 --> 00:03:23,440
here on the room so we're going to start

88
00:03:27,750 --> 00:03:25,840

by taking questions here but we also

89
00:03:29,430 --> 00:03:27,760
have reporters on the phone on the phone

90
00:03:31,589 --> 00:03:29,440
bridge you will be joining us for those

91
00:03:34,309 --> 00:03:31,599
of you who are joining by phone you can

92
00:03:35,589 --> 00:03:34,319
press star 1 to ask a question and if

93
00:03:38,070 --> 00:03:35,599
your question is answered you can press

94
00:03:39,589 --> 00:03:38,080
star 2 to withdraw it and then finally

95
00:03:42,070 --> 00:03:39,599
if you are watching

96
00:03:43,670 --> 00:03:42,080
and and participating remotely you are

97
00:03:45,430 --> 00:03:43,680
welcome to ask questions via social

98
00:03:47,030 --> 00:03:45,440
media you can use the

99
00:03:49,190 --> 00:03:47,040
asknasa and we'll have someone in here

100
00:03:51,030 --> 00:03:49,200
in the room to ask it on your behalf

101
00:03:52,390 --> 00:03:51,040
all right let's start though with our

102
00:03:53,990 --> 00:03:52,400
media questions if you can make your way

103
00:04:05,270 --> 00:03:54,000
to the microphone we'll get started on

104
00:04:09,350 --> 00:04:06,869
hi eric berger with arts technica a

105
00:04:11,350 --> 00:04:09,360
question for kate uh

106
00:04:13,990 --> 00:04:11,360
i remember you know five years ago you

107
00:04:15,830 --> 00:04:14,000
were following the crew of sts-135

108
00:04:20,229 --> 00:04:15,840
around and now

109
00:04:21,749 --> 00:04:20,239
you finally made it um maybe talk about

110
00:04:24,390 --> 00:04:21,759
a little bit about kind of the

111
00:04:25,749 --> 00:04:24,400
expectations um that you have for space

112
00:04:27,909 --> 00:04:25,759
and kind of

113
00:04:29,990 --> 00:04:27,919

you know how long you've been sort of

114
00:04:30,950 --> 00:04:30,000
training and waiting and to get to this

115
00:04:33,030 --> 00:04:30,960
point

116
00:04:34,390 --> 00:04:33,040
well i thought i made it when i was

117
00:04:36,710 --> 00:04:34,400
finished ask can training i had to hang

118
00:04:38,710 --> 00:04:36,720
out with the crew 135 that was pretty

119
00:04:40,230 --> 00:04:38,720
that was pretty amazing um but we have

120
00:04:42,469 --> 00:04:40,240
been training for quite some time so we

121
00:04:45,030 --> 00:04:42,479
trained for two years after we're

122
00:04:46,870 --> 00:04:45,040
initially accepted as as as astronaut

123
00:04:48,870 --> 00:04:46,880
candidates at nasa and then we spent a

124
00:04:51,030 --> 00:04:48,880
few more years just understanding all

125
00:04:52,870 --> 00:04:51,040
the technical parts of the job once more

126
00:04:54,629 --> 00:04:52,880
mission assigned it's about a two to two

127
00:04:57,110 --> 00:04:54,639
and a half year flow so it has been

128
00:04:59,030 --> 00:04:57,120
quite some time it passes by really

129
00:05:02,230 --> 00:04:59,040
quickly i think space flight's going to

130
00:05:03,270 --> 00:05:02,240
pass by at a similar speed so i'm i'm

131
00:05:04,550 --> 00:05:03,280
looking forward to the mission there's a

132
00:05:05,749 --> 00:05:04,560
lot of things i'm looking forward to i

133
00:05:06,950 --> 00:05:05,759
think the science is going to be really

134
00:05:09,270 --> 00:05:06,960
exciting we're going to have some

135
00:05:11,430 --> 00:05:09,280
opportunities to have visiting vehicles

136
00:05:12,790 --> 00:05:11,440
a lot of our commercial

137
00:05:15,350 --> 00:05:12,800
partners are going to be sending

138
00:05:17,670 --> 00:05:15,360

different cargo vehicles up and

139
00:05:19,350 --> 00:05:17,680
i think there's probably not too many

140
00:05:21,189 --> 00:05:19,360
things on a day in the life of space

141
00:05:22,870 --> 00:05:21,199
station that aren't absolutely amazing

142
00:05:25,029 --> 00:05:22,880
because the fact that you are in free

143
00:05:26,550 --> 00:05:25,039
fall the entire time and the laws of

144
00:05:29,270 --> 00:05:26,560
physics have changed so i'm looking

145
00:05:30,950 --> 00:05:29,280
forward to seeing all that

146
00:05:32,070 --> 00:05:30,960
all right reminder to the media here in

147
00:05:33,990 --> 00:05:32,080
the room that you can make your way up

148
00:05:35,830 --> 00:05:34,000
to the microphone for more questions

149
00:05:37,590 --> 00:05:35,840
while we're waiting um kate i know

150
00:05:39,590 --> 00:05:37,600
you've been to a number of kind of

151
00:05:41,430 --> 00:05:39,600
extreme environments in the course of

152
00:05:42,710 --> 00:05:41,440
your career before nasa

153
00:05:44,790 --> 00:05:42,720
do you feel like those have prepared you

154
00:05:46,230 --> 00:05:44,800
for for space or is it going to be very

155
00:05:48,390 --> 00:05:46,240
different well i think each

156
00:05:51,110 --> 00:05:48,400
environment's pretty unique but it is

157
00:05:53,350 --> 00:05:51,120
right we do a lot of training during our

158
00:05:55,189 --> 00:05:53,360
assigned crew flow and also before we're

159
00:05:57,189 --> 00:05:55,199
assigned to survive in an extreme

160
00:05:59,430 --> 00:05:57,199
environment and so the kinds of things

161
00:06:01,110 --> 00:05:59,440
that you do to take care of yourself and

162
00:06:02,790 --> 00:06:01,120
take care of your crew mates is really

163
00:06:04,550 --> 00:06:02,800

important we got an opportunity to do

164
00:06:06,550 --> 00:06:04,560
water survival and winter survival

165
00:06:08,230 --> 00:06:06,560
together and you learn a lot about

166
00:06:10,150 --> 00:06:08,240
yourself and you learn how

167
00:06:12,150 --> 00:06:10,160
you can be part of a team and and work

168
00:06:14,150 --> 00:06:12,160
together in an expedition so that's

169
00:06:15,430 --> 00:06:14,160
actually sometimes one of the really fun

170
00:06:16,710 --> 00:06:15,440
parts of training

171
00:06:19,110 --> 00:06:16,720
and i think it's going to be incredibly

172
00:06:23,029 --> 00:06:19,120
fun for us as a crew on orbit as well

173
00:06:28,950 --> 00:06:25,749
hi robert perlman with collectspace.com

174
00:06:31,590 --> 00:06:28,960
um you'll be launching on a new class of

175
00:06:33,670 --> 00:06:31,600
soyuz the ms can you talk a little bit

176
00:06:35,670 --> 00:06:33,680
about what that's done to your training

177
00:06:37,870 --> 00:06:35,680
load um and

178
00:06:41,110 --> 00:06:37,880
you were originally assigned to the

179
00:06:42,950 --> 00:06:41,120
tma20m so what was the differences in

180
00:06:45,189 --> 00:06:42,960
stepping up from the older soyuz to the

181
00:06:48,469 --> 00:06:45,199
newer one

182
00:06:50,790 --> 00:06:48,479
yes why news i use ms

183
00:06:54,710 --> 00:06:50,800
and you know that the history of

184
00:06:56,870 --> 00:06:54,720
say youth space craft has i think

185
00:06:59,510 --> 00:06:56,880
almost 50 years

186
00:07:03,350 --> 00:06:59,520
it's made in flight sioux spacecraft

187
00:07:05,589 --> 00:07:03,360
performed in 1696

188
00:07:09,350 --> 00:07:05,599

that was unmanned flight

189
00:07:12,870 --> 00:07:09,360
and since that since then we have four g

190
00:07:15,029 --> 00:07:12,880
four generations of ceo spacecrafts

191
00:07:18,230 --> 00:07:15,039
uh actually we are flying

192
00:07:19,029 --> 00:07:18,240
the default generation

193
00:07:22,070 --> 00:07:19,039
and

194
00:07:25,430 --> 00:07:22,080
yes we were to fly uh the the last

195
00:07:26,230 --> 00:07:25,440
vehicle in the previous series

196
00:07:30,309 --> 00:07:26,240
but

197
00:07:33,189 --> 00:07:30,319
due to some changes uh actually

198
00:07:36,710 --> 00:07:33,199
alexis and alex kirkpatrick and jeff

199
00:07:37,430 --> 00:07:36,720
williams to fly our vehicle and we kind

200
00:07:40,550 --> 00:07:37,440
of

201
00:07:44,869 --> 00:07:42,710
you know that we have

202
00:07:47,589 --> 00:07:44,879
mend and cargo ships are used in

203
00:07:50,390 --> 00:07:47,599
progress which share the general design

204
00:07:51,909 --> 00:07:50,400
idea general architecture and most of

205
00:07:54,230 --> 00:07:51,919
the equipment

206
00:07:57,589 --> 00:07:54,240
and there is a rule that all the

207
00:08:00,309 --> 00:07:57,599
equipment before it is flown onsite use

208
00:08:03,830 --> 00:08:00,319
should be tested on progress first

209
00:08:05,990 --> 00:08:03,840
as well we need to have two successful

210
00:08:07,029 --> 00:08:06,000
progress flights in the new series

211
00:08:09,510 --> 00:08:07,039
before

212
00:08:13,189 --> 00:08:09,520
we have a goal for new satisfied

213
00:08:16,309 --> 00:08:13,199

so we have a progress ms-01

214
00:08:17,909 --> 00:08:16,319
in space it was locked successfully

215
00:08:22,710 --> 00:08:17,919
and we expect

216
00:08:24,550 --> 00:08:22,720
the second progress ms ms02

217
00:08:27,909 --> 00:08:24,560
to start

218
00:08:31,029 --> 00:08:27,919
on the 31st of this month

219
00:08:33,430 --> 00:08:31,039
and with its successful launch our road

220
00:08:34,630 --> 00:08:33,440
to spacewise

221
00:08:35,909 --> 00:08:34,640
will be

222
00:08:38,870 --> 00:08:35,919
open

223
00:08:40,709 --> 00:08:38,880
so what are the differences

224
00:08:42,709 --> 00:08:40,719
the new vehicles

225
00:08:44,389 --> 00:08:42,719
new vehicle uh

226
00:08:47,110 --> 00:08:44,399
exposes

227
00:08:50,389 --> 00:08:47,120
uh there have been some changes

228
00:08:53,670 --> 00:08:50,399
we have new engine arrangement

229
00:08:56,630 --> 00:08:53,680
now we have two many folds of attitude

230
00:09:00,230 --> 00:08:56,640
control engines and should

231
00:09:03,509 --> 00:09:00,240
have failure in one of the manifolds

232
00:09:06,310 --> 00:09:03,519
we have a backup so

233
00:09:09,030 --> 00:09:06,320
we have good redundancy we can

234
00:09:10,949 --> 00:09:09,040
perform any operations on the second

235
00:09:14,389 --> 00:09:10,959
manifold

236
00:09:16,389 --> 00:09:14,399
we have new system which allows the

237
00:09:19,030 --> 00:09:16,399
vehicle to

238
00:09:21,430 --> 00:09:19,040

be commanded from the ground

239
00:09:23,829 --> 00:09:21,440
to send telemetry

240
00:09:26,310 --> 00:09:23,839
to have voice exchange

241
00:09:29,269 --> 00:09:26,320
and even to transfer files

242
00:09:30,870 --> 00:09:29,279
using satellite constellation which

243
00:09:32,870 --> 00:09:30,880
flight launchpad

244
00:09:33,829 --> 00:09:32,880
which kind of cheaters

245
00:09:36,870 --> 00:09:33,839
and

246
00:09:39,190 --> 00:09:36,880
i think that 70 percent of the orbit

247
00:09:41,269 --> 00:09:39,200
the vehicle

248
00:09:45,030 --> 00:09:41,279
will have the ability to talk with the

249
00:09:47,590 --> 00:09:45,040
ground to be controlled by the ground

250
00:09:49,990 --> 00:09:47,600
we have new radar

251
00:09:51,829 --> 00:09:50,000
uh it has become

252
00:09:54,150 --> 00:09:51,839
more reliable

253
00:09:56,550 --> 00:09:54,160
less weight

254
00:10:00,070 --> 00:09:56,560
and as a result

255
00:10:02,069 --> 00:10:00,080
we have changes in the

256
00:10:03,590 --> 00:10:02,079
render profile

257
00:10:05,269 --> 00:10:03,600
now we will

258
00:10:07,910 --> 00:10:05,279
turn it on

259
00:10:10,710 --> 00:10:07,920
later on

260
00:10:12,230 --> 00:10:10,720
less distance than we used to

261
00:10:15,670 --> 00:10:12,240
because we kind of have enough

262
00:10:19,030 --> 00:10:15,680
statistics we can rely on the

263
00:10:19,910 --> 00:10:19,040

flying without the radar for for some

264
00:10:23,030 --> 00:10:19,920
time

265
00:10:26,150 --> 00:10:23,040
and this reader allows to allow to

266
00:10:28,150 --> 00:10:26,160
reduce the number of antennas

267
00:10:30,630 --> 00:10:28,160
now we have just one half we used to

268
00:10:34,790 --> 00:10:32,550
uh what else

269
00:10:37,269 --> 00:10:34,800
we have new

270
00:10:40,550 --> 00:10:37,279
backup

271
00:10:44,829 --> 00:10:40,560
manual control system

272
00:10:44,839 --> 00:10:54,470
and what do they miss

273
00:10:58,790 --> 00:10:56,550
from my point of view

274
00:11:01,509 --> 00:10:58,800
i'm hearing that

275
00:11:03,190 --> 00:11:01,519
differences between the old vehicle and

276
00:11:04,949 --> 00:11:03,200
the new vehicle

277
00:11:08,870 --> 00:11:04,959
those are not so

278
00:11:11,269 --> 00:11:08,880
big and not so many from a cruise bus

279
00:11:13,990 --> 00:11:11,279
perspective so

280
00:11:16,389 --> 00:11:14,000
i think we have enough time to get ready

281
00:11:19,990 --> 00:11:16,399
for that new vehicle

282
00:11:21,710 --> 00:11:20,000
until the to the launch and

283
00:11:24,310 --> 00:11:21,720
since

284
00:11:27,190 --> 00:11:24,320
2014 we've been

285
00:11:30,790 --> 00:11:27,200
going through many simulations as a crew

286
00:11:34,630 --> 00:11:30,800
so we already know that how to work as a

287
00:11:36,710 --> 00:11:34,640
team and we know each other very well so

288
00:11:39,269 --> 00:11:36,720

it's a just difference

289
00:11:42,790 --> 00:11:39,279
in procedures from my point of view so

290
00:11:44,069 --> 00:11:42,800
i'm not worried about anything

291
00:11:45,910 --> 00:11:44,079
all right well i think we've got another

292
00:11:48,389 --> 00:11:45,920
question here in the room now

293
00:11:51,030 --> 00:11:48,399
um my name is marco tomitsui from the

294
00:11:54,150 --> 00:11:51,040
japanese newspaper the um

295
00:11:55,910 --> 00:11:54,160
and my question goes to miss kate

296
00:11:58,230 --> 00:11:55,920
robins and

297
00:12:00,710 --> 00:11:58,240
question is about what kind of message

298
00:12:03,829 --> 00:12:00,720
do you have for young women who are

299
00:12:06,550 --> 00:12:03,839
considering who are in the stem field

300
00:12:09,190 --> 00:12:06,560
and another question is what are some of

301
00:12:12,710 --> 00:12:09,200
challenges women must face to be

302
00:12:14,870 --> 00:12:12,720
successful in stem field

303
00:12:15,829 --> 00:12:14,880
that's a great question and we do a lot

304
00:12:20,629 --> 00:12:15,839
to

305
00:12:22,710 --> 00:12:20,639
interested in science and engineering

306
00:12:24,550 --> 00:12:22,720
fields and my advice was if you're

307
00:12:26,230 --> 00:12:24,560
thinking about it that's great

308
00:12:29,110 --> 00:12:26,240
go with that you know

309
00:12:30,710 --> 00:12:29,120
pursue that and if that's your passion

310
00:12:32,069 --> 00:12:30,720
i think there's a lot of opportunities

311
00:12:33,430 --> 00:12:32,079
there's certainly a lot of opportunities

312
00:12:36,710 --> 00:12:33,440
at nasa there's opportunities in

313
00:12:38,629 --> 00:12:36,720

engineering and science and if you find

314
00:12:40,870 --> 00:12:38,639
something that you're excited about and

315
00:12:42,790 --> 00:12:40,880
you're interested in uh you know my my

316
00:12:44,389 --> 00:12:42,800
advice to to young women and young men

317
00:12:45,910 --> 00:12:44,399
would be do what you're really

318
00:12:48,150 --> 00:12:45,920
interested in and what really drives and

319
00:12:49,910 --> 00:12:48,160
motivates you um and in terms of

320
00:12:52,790 --> 00:12:49,920
barriers uh you know i think there are

321
00:12:54,870 --> 00:12:52,800
barriers sometimes there are

322
00:12:56,790 --> 00:12:54,880
lower numbers of of women that are in

323
00:12:59,030 --> 00:12:56,800
the senior faculty range

324
00:13:01,269 --> 00:12:59,040
so finding finding folks that can mentor

325
00:13:02,870 --> 00:13:01,279
you is extremely important but i think

326
00:13:04,949 --> 00:13:02,880
that we've got increasingly more and

327
00:13:06,949 --> 00:13:04,959
more opportunities and we are seeing a

328
00:13:09,190 --> 00:13:06,959
lot of young people that are really

329
00:13:10,790 --> 00:13:09,200
captivated by science and are interested

330
00:13:12,710 --> 00:13:10,800
in space science and the kind of

331
00:13:13,990 --> 00:13:12,720
engineering that we do at nasa so that's

332
00:13:15,590 --> 00:13:14,000
one of the great part of our jobs is

333
00:13:16,629 --> 00:13:15,600
that we get to see this and meet some of

334
00:13:19,269 --> 00:13:16,639
these young folks that are really

335
00:13:21,269 --> 00:13:19,279
excited about science and space

336
00:13:22,550 --> 00:13:21,279
okay thanks

337
00:13:23,910 --> 00:13:22,560
uh just a reminder if you're on the

338
00:13:26,069 --> 00:13:23,920

phone and you have a question please

339
00:13:27,350 --> 00:13:26,079
press star one to let us know and if

340
00:13:29,910 --> 00:13:27,360
your question is answered you can press

341
00:13:31,190 --> 00:13:29,920
star two to withdraw it uh and another

342
00:13:32,870 --> 00:13:31,200
reminder also that we're taking

343
00:13:35,110 --> 00:13:32,880
questions via social media so you can

344
00:13:36,710 --> 00:13:35,120
use the hashtag ask nasa to get your

345
00:13:38,629 --> 00:13:36,720
question in and we'll voice it here in

346
00:13:40,710 --> 00:13:38,639
the room for you

347
00:13:42,069 --> 00:13:40,720
we can still have

348
00:13:43,829 --> 00:13:42,079
questions from here in the room if

349
00:13:46,550 --> 00:13:43,839
anybody is

350
00:13:47,829 --> 00:13:46,560
has one ready but in the meantime takuya

351
00:13:51,110 --> 00:13:47,839
maybe you can tell us a little bit about

352
00:13:52,230 --> 00:13:51,120
your um experience with nemo

353
00:13:54,790 --> 00:13:52,240
so

354
00:13:57,590 --> 00:13:54,800
i was a part of a nemo mission

355
00:13:59,030 --> 00:13:57,600
for those who don't know about nemo

356
00:14:00,870 --> 00:13:59,040
mission that's

357
00:14:03,750 --> 00:14:00,880
one of the nasa

358
00:14:05,030 --> 00:14:03,760
analog mission for space flight and

359
00:14:06,949 --> 00:14:05,040
we've done it

360
00:14:10,550 --> 00:14:06,959
underwater and

361
00:14:12,470 --> 00:14:10,560
we were supposed to spend two weeks

362
00:14:13,189 --> 00:14:12,480
in research lab

363
00:14:14,310 --> 00:14:13,199

of

364
00:14:15,269 --> 00:14:14,320
underwater

365
00:14:18,310 --> 00:14:15,279
like

366
00:14:20,790 --> 00:14:18,320
offshore the florida but unfortunately

367
00:14:22,629 --> 00:14:20,800
my our mission was shortened by a week

368
00:14:23,990 --> 00:14:22,639
because of uh

369
00:14:25,990 --> 00:14:24,000
becoming a

370
00:14:29,509 --> 00:14:26,000
typhoon

371
00:14:31,509 --> 00:14:29,519
we had a great time then

372
00:14:34,949 --> 00:14:31,519
i was told by

373
00:14:36,069 --> 00:14:34,959
an ajax astronaut koichi wakata and he

374
00:14:38,550 --> 00:14:36,079
told me that

375
00:14:40,949 --> 00:14:38,560
nemo mission is one with the best

376
00:14:45,350 --> 00:14:40,959
analogy

377
00:14:47,990 --> 00:14:45,360
for space flight and i totally agree now

378
00:14:48,949 --> 00:14:48,000
and i thought it was

379
00:14:51,750 --> 00:14:48,959
so

380
00:14:55,910 --> 00:14:51,760
great experience for me to be a part of

381
00:14:59,269 --> 00:14:55,920
that mission the timeline each day was

382
00:15:03,509 --> 00:14:59,279
full we was very busy doing

383
00:15:05,509 --> 00:15:03,519
evas and preparing for next eva having

384
00:15:07,590 --> 00:15:05,519
conference with the grand team

385
00:15:09,670 --> 00:15:07,600
communicating with the

386
00:15:12,470 --> 00:15:09,680
ground team so

387
00:15:15,750 --> 00:15:12,480
all aspects of that mission was i

388
00:15:16,949 --> 00:15:15,760

thought very similar to space mission

389
00:15:18,870 --> 00:15:16,959
do you feel like that helped you get

390
00:15:21,350 --> 00:15:18,880
ready for for the experience coming up

391
00:15:23,110 --> 00:15:21,360
yeah definitely yeah great

392
00:15:24,470 --> 00:15:23,120
all right well next up i think we have

393
00:15:26,230 --> 00:15:24,480
some guests here in the room with us

394
00:15:27,590 --> 00:15:26,240
from rice university some young women

395
00:15:29,030 --> 00:15:27,600
who are going into stem fields

396
00:15:31,110 --> 00:15:29,040
themselves and i think they had a few

397
00:15:33,670 --> 00:15:31,120
questions for us go ahead

398
00:15:35,189 --> 00:15:33,680
hello ray holcomb from rice university a

399
00:15:37,030 --> 00:15:35,199
question for dr rubin you've had

400
00:15:38,629 --> 00:15:37,040
extensive experience

401
00:15:40,069 --> 00:15:38,639
with laboratory research during your

402
00:15:42,069 --> 00:15:40,079
career can you tell us about the

403
00:15:45,350 --> 00:15:42,079
scientific process and how it differs

404
00:15:49,590 --> 00:15:47,110
yeah that's a great question

405
00:15:50,790 --> 00:15:49,600
the iss is a laboratory on board one of

406
00:15:52,230 --> 00:15:50,800
the things that that differs a little

407
00:15:54,470 --> 00:15:52,240
bit is that the laboratories on earth

408
00:15:56,550 --> 00:15:54,480
are extremely specialized so you spend

409
00:15:58,629 --> 00:15:56,560
your whole career or many years doing

410
00:16:00,949 --> 00:15:58,639
one particular experiment whereas on

411
00:16:02,790 --> 00:16:00,959
board the space station we have

412
00:16:03,910 --> 00:16:02,800
hundreds of investigators from all over

413
00:16:05,910 --> 00:16:03,920

the globe that are sending their

414
00:16:07,430 --> 00:16:05,920
experiments up so you start to be a

415
00:16:08,389 --> 00:16:07,440
little bit more of a generalist than a

416
00:16:09,749 --> 00:16:08,399
specialist

417
00:16:12,230 --> 00:16:09,759
but we've had some training i just had

418
00:16:13,990 --> 00:16:12,240
training this week for example that's

419
00:16:16,710 --> 00:16:14,000
looking at how we're going to grow

420
00:16:18,550 --> 00:16:16,720
different kinds of cells on board

421
00:16:19,990 --> 00:16:18,560
and how we're going to be taking a look

422
00:16:21,990 --> 00:16:20,000
at the different kinds of cells that

423
00:16:24,389 --> 00:16:22,000
form your your bone mass and that's

424
00:16:26,150 --> 00:16:24,399
pretty similar to uh what i spent about

425
00:16:27,990 --> 00:16:26,160
a decade doing in the laboratory back on

426
00:16:29,110 --> 00:16:28,000
earth so i felt right at home i think

427
00:16:31,350 --> 00:16:29,120
the interesting thing is going to be

428
00:16:32,710 --> 00:16:31,360
when everything starts to float up and

429
00:16:34,230 --> 00:16:32,720
you need to figure out how to how to

430
00:16:37,189 --> 00:16:34,240
tape it down and how to get your bench

431
00:16:40,470 --> 00:16:37,199
work done with with the lack of of a

432
00:16:40,480 --> 00:16:43,269
go ahead

433
00:16:47,749 --> 00:16:45,829
i'm jim oberger with spectrum magazine

434
00:16:49,269 --> 00:16:47,759
your question your comment raised a

435
00:16:51,030 --> 00:16:49,279
question about the water survival

436
00:16:53,749 --> 00:16:51,040
training because it's been it's been

437
00:16:55,269 --> 00:16:53,759
winter in russia for a few months uh

438
00:16:58,550 --> 00:16:55,279

where when and where did you do your

439
00:17:03,189 --> 00:17:00,949
where did we do yeah where and where it

440
00:17:05,990 --> 00:17:03,199
was some some place

441
00:17:06,710 --> 00:17:06,000
not from moscow not far from moscow okay

442
00:17:08,789 --> 00:17:06,720
so

443
00:17:10,630 --> 00:17:08,799
you broke the ice or

444
00:17:13,350 --> 00:17:10,640
what was it in the wintertime

445
00:17:16,309 --> 00:17:13,360
no actually we have two kind of survival

446
00:17:17,829 --> 00:17:16,319
training which are mandatory for uh sayu

447
00:17:20,069 --> 00:17:17,839
space flights

448
00:17:22,309 --> 00:17:20,079
this water survival which is always done

449
00:17:23,829 --> 00:17:22,319
during the summer and

450
00:17:26,150 --> 00:17:23,839
winter

451
00:17:28,549 --> 00:17:26,160
forest viral that's good thank you very

452
00:17:30,950 --> 00:17:29,669
all right

453
00:17:32,950 --> 00:17:30,960
if you have another question you come on

454
00:17:34,549 --> 00:17:32,960
to the microphone but in the meantime

455
00:17:35,909 --> 00:17:34,559
anatoly maybe you can tell us a little

456
00:17:38,549 --> 00:17:35,919
bit about what you're looking forward to

457
00:17:41,270 --> 00:17:38,559
getting back to at the space station

458
00:17:42,150 --> 00:17:41,280
uh i'm looking forward to

459
00:17:45,110 --> 00:17:42,160
well

460
00:17:48,070 --> 00:17:45,120
entering again the space station i left

461
00:17:48,080 --> 00:17:52,950
in 2012

462
00:17:56,310 --> 00:17:54,549
it was just it looks like it was

463
00:17:59,350 --> 00:17:56,320

yesterday

464
00:18:02,150 --> 00:17:59,360
so i'm going to be a part of the crew

465
00:18:03,750 --> 00:18:02,160
and perform scientific research maintain

466
00:18:06,390 --> 00:18:03,760
the station

467
00:18:08,310 --> 00:18:06,400
and i'm pretty much sure that the time

468
00:18:10,710 --> 00:18:08,320
will fly

469
00:18:12,950 --> 00:18:10,720
and we'll do something really

470
00:18:18,310 --> 00:18:12,960
interesting and

471
00:18:18,320 --> 00:18:22,630
promote our science

472
00:18:26,470 --> 00:18:24,870
sounds like a good plan

473
00:18:28,070 --> 00:18:26,480
all right any other questions here in

474
00:18:30,150 --> 00:18:28,080
the room

475
00:18:33,990 --> 00:18:30,160
maybe we can take some from ask madison

476
00:18:37,590 --> 00:18:35,990
so this question comes to us from

477
00:18:39,430 --> 00:18:37,600
charles on twitter and it can be for

478
00:18:41,669 --> 00:18:39,440
anyone how do you

479
00:18:44,470 --> 00:18:41,679
plan to engage people on earth while in

480
00:18:49,029 --> 00:18:46,150
how do you plan to engage people on

481
00:18:51,750 --> 00:18:50,070
i wish

482
00:18:54,870 --> 00:18:51,760
the project of international space

483
00:18:56,870 --> 00:18:54,880
station could be a good example for

484
00:18:59,510 --> 00:18:56,880
people on earth

485
00:19:02,549 --> 00:18:59,520
how successfully can be different

486
00:19:04,950 --> 00:19:02,559
nations when they combine their efforts

487
00:19:05,830 --> 00:19:04,960
in order to achieve a common significant

488
00:19:07,510 --> 00:19:05,840

goal

489
00:19:10,150 --> 00:19:07,520
and we have

490
00:19:12,950 --> 00:19:10,160
some examples in this way starting from

491
00:19:14,870 --> 00:19:12,960
a serious apollo mission through

492
00:19:16,710 --> 00:19:14,880
shuttle mir program and here

493
00:19:19,029 --> 00:19:16,720
international space station

494
00:19:19,990 --> 00:19:19,039
which has been in us with us for quite a

495
00:19:23,029 --> 00:19:20,000
time

496
00:19:25,510 --> 00:19:23,039
and i'm pretty much sure

497
00:19:28,150 --> 00:19:25,520
the project will go on at least until

498
00:19:30,549 --> 00:19:28,160
2024

499
00:19:32,870 --> 00:19:30,559
and i consider this project as a solid

500
00:19:33,909 --> 00:19:32,880
foundation for our future and the worst

501
00:19:40,230 --> 00:19:33,919
in

502
00:19:41,750 --> 00:19:40,240
um

503
00:19:43,510 --> 00:19:41,760
this can also be for anyone in the crew

504
00:19:45,830 --> 00:19:43,520
that wants to answer it comes to us from

505
00:19:48,150 --> 00:19:45,840
bob o'dare jr on facebook are there any

506
00:19:49,669 --> 00:19:48,160
spacewalks planned for this mission and

507
00:19:50,549 --> 00:19:49,679
what tasks will you be completing on

508
00:19:52,390 --> 00:19:50,559
them

509
00:19:54,470 --> 00:19:52,400
great question

510
00:19:56,710 --> 00:19:54,480
that's a good question so um

511
00:19:58,870 --> 00:19:56,720
the the schedule as it is baselined

512
00:20:00,950 --> 00:19:58,880
right now does have a few space walks

513
00:20:01,830 --> 00:20:00,960

for this mission some of the things that

514
00:20:07,190 --> 00:20:01,840
are

515
00:20:09,029 --> 00:20:07,200
the international docking adapter

516
00:20:10,870 --> 00:20:09,039
and that's going to allow us to dock for

517
00:20:12,630 --> 00:20:10,880
future commercial crew vehicles to the

518
00:20:14,789 --> 00:20:12,640
space station so that's going to be

519
00:20:16,230 --> 00:20:14,799
really exciting to be able to uh to bolt

520
00:20:18,149 --> 00:20:16,240
that onto space station we hope to

521
00:20:20,149 --> 00:20:18,159
accomplish that during our mission we're

522
00:20:22,549 --> 00:20:20,159
also getting another set of batteries

523
00:20:24,149 --> 00:20:22,559
that's going to be installed uh out on

524
00:20:25,270 --> 00:20:24,159
the truss segment of the space station

525
00:20:27,669 --> 00:20:25,280
and so

526
00:20:29,750 --> 00:20:27,679
power power is everything in space it's

527
00:20:31,430 --> 00:20:29,760
solar-powered which is

528
00:20:32,950 --> 00:20:31,440
it's really neat that we have a vehicle

529
00:20:34,630 --> 00:20:32,960
that's entirely

530
00:20:36,230 --> 00:20:34,640
powered off of solar power and it's a

531
00:20:37,669 --> 00:20:36,240
huge vehicle

532
00:20:39,270 --> 00:20:37,679
and so we're going to get the

533
00:20:43,350 --> 00:20:39,280
opportunity hopefully to change out

534
00:20:46,390 --> 00:20:44,950
okay keep coming to the microphone as

535
00:20:47,830 --> 00:20:46,400
you have questions

536
00:20:49,110 --> 00:20:47,840
but kate maybe you can tell us a little

537
00:20:50,950 --> 00:20:49,120
bit about the training that's that's

538
00:20:53,990 --> 00:20:50,960

gone into the spacewalks

539
00:20:56,789 --> 00:20:54,000
yeah sure so uh uh takuya and i train uh

540
00:20:58,950 --> 00:20:56,799
in the nbl um also with the crew on

541
00:21:01,909 --> 00:20:58,960
either side of us and we get a lot of

542
00:21:03,270 --> 00:21:01,919
training when we're in our initial flow

543
00:21:05,909 --> 00:21:03,280
after that it starts to get more

544
00:21:07,590 --> 00:21:05,919
specific once we get mission assigned so

545
00:21:09,350 --> 00:21:07,600
we're trained for

546
00:21:11,669 --> 00:21:09,360
potential contingencies on board space

547
00:21:13,750 --> 00:21:11,679
station as well as any of these nominal

548
00:21:16,470 --> 00:21:13,760
tasks that might come up it's about a

549
00:21:18,149 --> 00:21:16,480
six six hour we call it a run but you're

550
00:21:19,510 --> 00:21:18,159
not running it's a six hour run

551
00:21:20,630 --> 00:21:19,520
underwater

552
00:21:23,190 --> 00:21:20,640
you're definitely not running because

553
00:21:25,430 --> 00:21:23,200
you have a 300 pound spacesuit on but we

554
00:21:27,909 --> 00:21:25,440
are able to be neutrally buoyant and

555
00:21:30,470 --> 00:21:27,919
that's how we can simulate as best we

556
00:21:32,390 --> 00:21:30,480
can microgravity here on earth and do

557
00:21:34,230 --> 00:21:32,400
all the training for spacewalks

558
00:21:35,750 --> 00:21:34,240
in six hours

559
00:21:38,230 --> 00:21:35,760
sounds like a long time to go without a

560
00:21:40,870 --> 00:21:38,240
break is that at all taxing it's about

561
00:21:43,029 --> 00:21:40,880
two marathons worth and when i'm on

562
00:21:45,510 --> 00:21:43,039
earth i i run one marathon and call that

563
00:21:46,710 --> 00:21:45,520

good so yeah it's a challenge but i

564
00:21:49,510 --> 00:21:46,720
guess it gets you ready for the real

565
00:21:51,990 --> 00:21:49,520
thing and it does yep okay all right

566
00:21:53,430 --> 00:21:52,000
eric hi eric berger again uh kate with

567
00:21:54,870 --> 00:21:53,440
your background in infectious diseases

568
00:21:55,750 --> 00:21:54,880
maybe you could talk i don't i'm not

569
00:21:57,110 --> 00:21:55,760
gonna ask you to pick a favorite

570
00:21:59,669 --> 00:21:57,120
experiment but maybe talk a little bit

571
00:22:01,830 --> 00:21:59,679
about some of the work you're doing and

572
00:22:03,510 --> 00:22:01,840
and how that advances the study of you

573
00:22:05,430 --> 00:22:03,520
know biological science back here on

574
00:22:06,789 --> 00:22:05,440
earth

575
00:22:08,149 --> 00:22:06,799
yeah that's a great question i can't

576
00:22:10,870 --> 00:22:08,159
pick a favorite experiment there's too

577
00:22:13,350 --> 00:22:10,880
many of them um but i did mention we've

578
00:22:16,149 --> 00:22:13,360
got a cell culture experiment that's

579
00:22:18,070 --> 00:22:16,159
looking at bone cells and so everybody

580
00:22:19,669 --> 00:22:18,080
thinks of bone as this

581
00:22:21,110 --> 00:22:19,679
your bones are just there and and

582
00:22:23,029 --> 00:22:21,120
they're kind of this solid material but

583
00:22:25,110 --> 00:22:23,039
they're actually a living tissue so

584
00:22:27,190 --> 00:22:25,120
we're constantly breaking our bone down

585
00:22:29,430 --> 00:22:27,200
and we're adding to it

586
00:22:31,750 --> 00:22:29,440
and when you lose that stimulus of

587
00:22:33,990 --> 00:22:31,760
gravity we are going to break down more

588
00:22:36,549 --> 00:22:34,000

bone than we're going to add so that's

589
00:22:39,350 --> 00:22:36,559
why you hear about potential bone loss

590
00:22:41,270 --> 00:22:39,360
on orbit this is really interesting for

591
00:22:43,029 --> 00:22:41,280
earth-based diseases as well we've got

592
00:22:45,510 --> 00:22:43,039
things like osteoporosis where you've

593
00:22:47,430 --> 00:22:45,520
got this accumulation of bone loss and

594
00:22:50,149 --> 00:22:47,440
so the experiment on space station is

595
00:22:52,549 --> 00:22:50,159
designed to specifically look at cells

596
00:22:55,110 --> 00:22:52,559
that build up bone and how they behave

597
00:22:57,029 --> 00:22:55,120
in microgravity and how the the

598
00:22:59,110 --> 00:22:57,039
the differences due to lack of gravity

599
00:23:00,230 --> 00:22:59,120
stimulus might alter their function so

600
00:23:03,430 --> 00:23:00,240
we think we might be able to learn

601
00:23:04,870 --> 00:23:03,440
something about earth diseases as well

602
00:23:06,950 --> 00:23:04,880
you talked a little bit already about

603
00:23:08,710 --> 00:23:06,960
how it'll it'll be a little different

604
00:23:10,390 --> 00:23:08,720
doing scientific work in this in

605
00:23:11,909 --> 00:23:10,400
microgravity than on earth but maybe you

606
00:23:13,190 --> 00:23:11,919
can talk a little bit more about that

607
00:23:15,029 --> 00:23:13,200
and

608
00:23:16,870 --> 00:23:15,039
guess what the attraction of the space

609
00:23:18,789 --> 00:23:16,880
station as a laboratory is to somebody

610
00:23:20,310 --> 00:23:18,799
with your scientific background

611
00:23:22,310 --> 00:23:20,320
yeah it's a really neat laboratory

612
00:23:24,950 --> 00:23:22,320
because it's the only place that we can

613
00:23:27,830 --> 00:23:24,960

actually study gravity as a variable so

614
00:23:29,669 --> 00:23:27,840
scientists across all disciplines

615
00:23:31,990 --> 00:23:29,679
throughout the hundreds of years that

616
00:23:33,430 --> 00:23:32,000
we've been doing science have always had

617
00:23:35,590 --> 00:23:33,440
gravity as a constant in their

618
00:23:37,270 --> 00:23:35,600
experiments and this is really the one

619
00:23:38,470 --> 00:23:37,280
lab where we can actually use it as a

620
00:23:39,909 --> 00:23:38,480
variable

621
00:23:41,830 --> 00:23:39,919
we can even

622
00:23:44,230 --> 00:23:41,840
alter the amount of gravity so we could

623
00:23:46,710 --> 00:23:44,240
put lunar gravity or martian gravity we

624
00:23:49,110 --> 00:23:46,720
can centrifuge things and so it's really

625
00:23:50,630 --> 00:23:49,120
a way to investigate what happens to

626
00:23:52,549 --> 00:23:50,640
physiological

627
00:23:54,149 --> 00:23:52,559
beings to their to their individual

628
00:23:55,830 --> 00:23:54,159
cells and their tissues when you don't

629
00:23:58,310 --> 00:23:55,840
have gravity and it's a lot of basic

630
00:24:00,630 --> 00:23:58,320
research but we can understand things

631
00:24:03,269 --> 00:24:00,640
about physiological processes because

632
00:24:04,950 --> 00:24:03,279
we're using the space station and and

633
00:24:06,710 --> 00:24:04,960
microgravity there

634
00:24:08,870 --> 00:24:06,720
that we could we can discover processes

635
00:24:10,870 --> 00:24:08,880
we've never been able to before on earth

636
00:24:12,310 --> 00:24:10,880
uh and that we just can't test on the

637
00:24:14,470 --> 00:24:12,320
ground sure

638
00:24:16,230 --> 00:24:14,480

and i guess takuya i think you have a

639
00:24:17,909 --> 00:24:16,240
bit more of an engineering background

640
00:24:19,990 --> 00:24:17,919
maybe can you talk a little bit about

641
00:24:21,750 --> 00:24:20,000
how you gear up for all the science that

642
00:24:22,870 --> 00:24:21,760
you'll be doing as well

643
00:24:26,310 --> 00:24:22,880
so

644
00:24:29,029 --> 00:24:26,320
i studied a material science in my

645
00:24:31,590 --> 00:24:29,039
university so i'm especially

646
00:24:33,190 --> 00:24:31,600
interested in the materials science

647
00:24:34,630 --> 00:24:33,200
experiments and

648
00:24:37,110 --> 00:24:34,640
those are

649
00:24:39,750 --> 00:24:37,120
being conducted in space station

650
00:24:41,750 --> 00:24:39,760
especially jax has

651
00:24:44,870 --> 00:24:41,760
just deployed a new

652
00:24:48,789 --> 00:24:44,880
piece of hardware for experiment it is

653
00:24:51,830 --> 00:24:48,799
called elf that's elf stands for

654
00:24:53,990 --> 00:24:51,840
electrostatic levitation furnace and

655
00:24:55,029 --> 00:24:54,000
what it does is uh

656
00:24:58,310 --> 00:24:55,039
it can

657
00:25:01,990 --> 00:24:58,320
levitate a piece of material then

658
00:25:06,390 --> 00:25:02,000
by using laser it can heat up

659
00:25:10,630 --> 00:25:06,400
material like up to 3000 degrees celsius

660
00:25:13,669 --> 00:25:10,640
to see how materials uh melt or how

661
00:25:15,750 --> 00:25:13,679
reacts to those high temperatures

662
00:25:18,549 --> 00:25:15,760
like viscosity

663
00:25:20,630 --> 00:25:18,559

density and surface tension

664
00:25:21,510 --> 00:25:20,640
and

665
00:25:23,590 --> 00:25:21,520
knowing

666
00:25:24,710 --> 00:25:23,600
those characteristics

667
00:25:27,430 --> 00:25:24,720
we can

668
00:25:28,630 --> 00:25:27,440
advance our technology on the ground for

669
00:25:31,990 --> 00:25:28,640
example

670
00:25:33,269 --> 00:25:32,000
probably maybe a new method of

671
00:25:39,669 --> 00:25:33,279
production

672
00:25:40,870 --> 00:25:39,679
material so i'm really looking for those

673
00:25:42,789 --> 00:25:40,880
kind of

674
00:25:43,909 --> 00:25:42,799
experiments

675
00:25:45,669 --> 00:25:43,919
thanks

676
00:25:47,510 --> 00:25:45,679
uh and natalie what about you i know

677
00:25:50,149 --> 00:25:47,520
that uh the russians have kind of a lot

678
00:25:51,590 --> 00:25:50,159
of scientific experience experience

679
00:25:53,669 --> 00:25:51,600
experiments that we don't even always

680
00:25:56,230 --> 00:25:53,679
hear a lot about in the u.s so any that

681
00:25:58,070 --> 00:25:56,240
you're particularly interested in there

682
00:26:00,390 --> 00:25:58,080
are many but i'd like to tell you a few

683
00:26:04,070 --> 00:26:00,400
words about join experiments we are

684
00:26:05,990 --> 00:26:04,080
going to conduct a joint russia east

685
00:26:08,710 --> 00:26:06,000
research

686
00:26:11,510 --> 00:26:08,720
in the field of complex plasmas

687
00:26:13,909 --> 00:26:11,520
it's a long-running experiment uh

688
00:26:16,230 --> 00:26:13,919

i i don't remember it it started it has

689
00:26:18,310 --> 00:26:16,240
been years and i remember it was

690
00:26:20,870 --> 00:26:18,320
conducted in russian part of the station

691
00:26:22,630 --> 00:26:20,880
now it's moved to columbus

692
00:26:26,070 --> 00:26:22,640
so

693
00:26:28,630 --> 00:26:26,080
this experiment studies complex plasmas

694
00:26:31,350 --> 00:26:28,640
complex plasmas are plasmas

695
00:26:32,549 --> 00:26:31,360
which contain

696
00:26:34,470 --> 00:26:32,559
ions

697
00:26:36,830 --> 00:26:34,480
electrons

698
00:26:40,310 --> 00:26:36,840
neutral gases and dust

699
00:26:42,549 --> 00:26:40,320
particles uh micro particles or

700
00:26:45,190 --> 00:26:42,559
dust dust greens

701
00:26:48,149 --> 00:26:45,200
and what's interesting uh

702
00:26:51,669 --> 00:26:48,159
in this type of plasmas

703
00:26:54,470 --> 00:26:51,679
there is a phenomena when the particles

704
00:26:55,990 --> 00:26:54,480
uh being highly charged and interacts

705
00:26:59,350 --> 00:26:56,000
strongly with

706
00:27:01,510 --> 00:26:59,360
each other so they can form a structure

707
00:27:03,750 --> 00:27:01,520
uh a structure

708
00:27:06,149 --> 00:27:03,760
which is a crystal like structure so

709
00:27:07,750 --> 00:27:06,159
that's why we call this experiment

710
00:27:09,750 --> 00:27:07,760
crystal plasma

711
00:27:12,549 --> 00:27:09,760
and

712
00:27:13,350 --> 00:27:12,559
what is the most in inter what is the

713
00:27:16,149 --> 00:27:13,360

the

714
00:27:18,789 --> 00:27:16,159
objective for investigation

715
00:27:22,230 --> 00:27:18,799
is the liquid phase of

716
00:27:23,669 --> 00:27:22,240
this phenomena and the scientists are

717
00:27:26,310 --> 00:27:23,679
looking in

718
00:27:27,590 --> 00:27:26,320
like three different stages of this

719
00:27:29,350 --> 00:27:27,600
experiment

720
00:27:31,590 --> 00:27:29,360
they interstate in

721
00:27:36,070 --> 00:27:31,600
micro microscopic

722
00:27:36,870 --> 00:27:36,080
particles of complex club plasmas

723
00:27:39,029 --> 00:27:36,880
like

724
00:27:40,710 --> 00:27:39,039
charging particles

725
00:27:42,870 --> 00:27:40,720
agglomeration

726
00:27:44,789 --> 00:27:42,880
and particle growth

727
00:27:47,430 --> 00:27:44,799
microscopic

728
00:27:48,870 --> 00:27:47,440
macroscopic properties of complex

729
00:27:53,110 --> 00:27:48,880
plasmas

730
00:27:54,630 --> 00:27:53,120
like hydrodynamics for example viscosity

731
00:27:55,909 --> 00:27:54,640
thermodynamics

732
00:27:57,430 --> 00:27:55,919
and

733
00:28:01,029 --> 00:27:57,440
non-equilibrium

734
00:28:04,470 --> 00:28:01,039
properties of complex plasmas

735
00:28:06,950 --> 00:28:04,480
and general generic

736
00:28:08,230 --> 00:28:06,960
uh properties of classical media body

737
00:28:10,149 --> 00:28:08,240
systems

738
00:28:11,909 --> 00:28:10,159

like melting

739
00:28:14,149 --> 00:28:11,919
crystallization

740
00:28:16,789 --> 00:28:14,159
are

741
00:28:20,070 --> 00:28:16,799
protons in

742
00:28:22,870 --> 00:28:20,080
plasma crystals and dust waves

743
00:28:25,029 --> 00:28:22,880
so plasma is found

744
00:28:27,990 --> 00:28:25,039
anywhere throughout the u.s

745
00:28:30,950 --> 00:28:28,000
and they have a

746
00:28:33,190 --> 00:28:30,960
plasma on the thermal shield of any

747
00:28:35,029 --> 00:28:33,200
spacecraft entering the

748
00:28:37,029 --> 00:28:35,039
very entering the earth's atmosphere by

749
00:28:38,710 --> 00:28:37,039
the way it is the most amazing part of

750
00:28:41,510 --> 00:28:38,720
the space flight

751
00:28:42,630 --> 00:28:41,520
but very short very soon the

752
00:28:44,389 --> 00:28:42,640
windows

753
00:28:46,389 --> 00:28:44,399
will get

754
00:28:49,590 --> 00:28:46,399
burned and you won't be able to see

755
00:28:52,549 --> 00:28:49,600
anything so that research will possibly

756
00:28:54,950 --> 00:28:52,559
allow scientists to

757
00:28:57,669 --> 00:28:54,960
shed some light so on the nature of the

758
00:29:00,630 --> 00:28:57,679
complex plasmas and it will have

759
00:29:01,909 --> 00:29:00,640
application possibly in the spacecraft

760
00:29:04,230 --> 00:29:01,919
designs

761
00:29:05,590 --> 00:29:04,240
and though it is

762
00:29:07,590 --> 00:29:05,600
more

763
00:29:09,269 --> 00:29:07,600

fundamental research i believe that

764
00:29:13,269 --> 00:29:09,279
application for the

765
00:29:14,950 --> 00:29:13,279
industries on the ground also possible

766
00:29:16,389 --> 00:29:14,960
wow it's always amazing to hear all the

767
00:29:18,149 --> 00:29:16,399
different types of research that go on

768
00:29:20,149 --> 00:29:18,159
on the space station um

769
00:29:22,950 --> 00:29:20,159
but i think we have another question

770
00:29:26,230 --> 00:29:22,960
um this time my question goes to

771
00:29:28,950 --> 00:29:26,240
kate and mr michi so it is the first

772
00:29:31,669 --> 00:29:28,960
time for both of you to go to space so

773
00:29:32,789 --> 00:29:31,679
what would you like to do in the space

774
00:29:35,190 --> 00:29:32,799
are

775
00:29:35,990 --> 00:29:35,200
international space station except for

776
00:29:39,029 --> 00:29:36,000
uh

777
00:29:40,789 --> 00:29:39,039
work or except for business experiments

778
00:29:44,470 --> 00:29:40,799
so in your space-time what do you want

779
00:29:46,389 --> 00:29:44,480
to do in the iss

780
00:29:48,149 --> 00:29:46,399
well i might end up trying to do some

781
00:29:50,789 --> 00:29:48,159
experiments in my spare time because

782
00:29:52,470 --> 00:29:50,799
that's what i'm most interested in um

783
00:29:55,029 --> 00:29:52,480
i'm i'm particularly interested in

784
00:29:57,350 --> 00:29:55,039
trying to do some sequencing of dna on

785
00:29:59,350 --> 00:29:57,360
board so that's one of the things that

786
00:30:00,789 --> 00:29:59,360
i think is going to be a very exciting

787
00:30:02,549 --> 00:30:00,799
payload that we have

788
00:30:04,470 --> 00:30:02,559

i think in general a lot of astronauts

789
00:30:06,389 --> 00:30:04,480
spend their time looking at the earth

790
00:30:09,029 --> 00:30:06,399
it's amazing you go over a different

791
00:30:12,070 --> 00:30:09,039
part of the earth um every single orbit

792
00:30:13,750 --> 00:30:12,080
and so just the opportunity to see the

793
00:30:16,070 --> 00:30:13,760
entire world and to be able to take

794
00:30:18,310 --> 00:30:16,080
photographs of that seems to be

795
00:30:20,710 --> 00:30:18,320
incredibly captivating and you can see

796
00:30:23,110 --> 00:30:20,720
from scott kelly's twitter feed for

797
00:30:25,350 --> 00:30:23,120
example just the the way that it changes

798
00:30:26,789 --> 00:30:25,360
every day and uh just the beauty of the

799
00:30:28,630 --> 00:30:26,799
earth is is

800
00:30:31,190 --> 00:30:28,640
i think uh not something that any

801
00:30:33,669 --> 00:30:31,200
astronaut would ever get sick of

802
00:30:36,630 --> 00:30:33,679
all right go ahead this is my first

803
00:30:39,430 --> 00:30:36,640
flight and so i'm really excited about

804
00:30:40,389 --> 00:30:39,440
it and i really looking for look forward

805
00:30:42,710 --> 00:30:40,399
to

806
00:30:45,029 --> 00:30:42,720
all aspects of

807
00:30:48,789 --> 00:30:45,039
our space flight

808
00:30:51,190 --> 00:30:48,799
so from the launch until our landing

809
00:30:54,070 --> 00:30:51,200
and even

810
00:30:54,950 --> 00:30:54,080
how to use a space toilet in the station

811
00:30:57,590 --> 00:30:54,960
i

812
00:30:59,830 --> 00:30:57,600
really look forward to all of them

813
00:31:01,269 --> 00:30:59,840

and hopefully i can uh

814
00:31:02,789 --> 00:31:01,279
introduce

815
00:31:05,509 --> 00:31:02,799
this kind of

816
00:31:06,950 --> 00:31:05,519
lives our lives in the station to the

817
00:31:09,750 --> 00:31:06,960
public using

818
00:31:12,070 --> 00:31:09,760
internet like twitter or google plus

819
00:31:15,750 --> 00:31:12,080
personally i'm doing a

820
00:31:16,830 --> 00:31:15,760
google plus so using it i want to

821
00:31:18,789 --> 00:31:16,840
encourage

822
00:31:23,909 --> 00:31:18,799
people what

823
00:31:26,070 --> 00:31:23,919
kids our kids to study about space

824
00:31:27,990 --> 00:31:26,080
thanks juan de la garza space flight

825
00:31:29,350 --> 00:31:28,000
insider this is for anyone that would

826
00:31:30,950 --> 00:31:29,360
like to answer it

827
00:31:33,190 --> 00:31:30,960
in collaboration with your international

828
00:31:35,750 --> 00:31:33,200
partners there's hundreds of experiments

829
00:31:37,509 --> 00:31:35,760
scheduled for your stay on board

830
00:31:41,990 --> 00:31:37,519
how are they distributed amongst every

831
00:31:47,990 --> 00:31:45,430
so we get some training on the ground

832
00:31:49,909 --> 00:31:48,000
generic set of skills training so that

833
00:31:51,590 --> 00:31:49,919
we can function as laboratory workers

834
00:31:53,110 --> 00:31:51,600
essentially on board the international

835
00:31:56,310 --> 00:31:53,120
space station

836
00:31:58,630 --> 00:31:56,320
and then each contributing agency gets

837
00:32:01,269 --> 00:31:58,640
time and resources and payload

838
00:32:03,269 --> 00:32:01,279

availability that's all that's not

839
00:32:04,950 --> 00:32:03,279
decided by the crew thank goodness

840
00:32:07,750 --> 00:32:04,960
there's some really smart people that

841
00:32:09,430 --> 00:32:07,760
that do all the allocations uh and then

842
00:32:11,110 --> 00:32:09,440
we will get some timelines and some

843
00:32:13,509 --> 00:32:11,120
schedules that says when we're

844
00:32:15,350 --> 00:32:13,519
performing which experiments and so it's

845
00:32:17,909 --> 00:32:15,360
all predetermined

846
00:32:19,590 --> 00:32:17,919
so we're able to wake up and we take a

847
00:32:21,269 --> 00:32:19,600
look at the schedule and we see what the

848
00:32:23,190 --> 00:32:21,279
various experiments and it may be

849
00:32:24,789 --> 00:32:23,200
maintenance tasks as well

850
00:32:26,789 --> 00:32:24,799
or prep for a visiting vehicle we're

851
00:32:28,470 --> 00:32:26,799
going to do that day

852
00:32:30,789 --> 00:32:28,480
and you know there's always the option

853
00:32:33,430 --> 00:32:30,799
to help your crew member out or work on

854
00:32:35,110 --> 00:32:33,440
something that that you're interested in

855
00:32:36,389 --> 00:32:35,120
but we've got a whole team of folks on

856
00:32:39,830 --> 00:32:36,399
the ground that really helped develop

857
00:32:42,710 --> 00:32:41,350
all right and if you're watching at home

858
00:32:46,310 --> 00:32:42,720
a reminder that you can send in your

859
00:32:47,830 --> 00:32:46,320
questions via the hashtag asknasa and

860
00:32:52,070 --> 00:32:47,840
for those on the phone bridge uh press

861
00:32:57,909 --> 00:32:54,870
hello i'm hr sami with kyodo news a

862
00:33:00,549 --> 00:32:57,919
japanese wire i like to ask all three of

863
00:33:06,389 --> 00:33:03,909

how do you evaluate yourself as a team i

864
00:33:09,669 --> 00:33:06,399
also like all of you to

865
00:33:10,630 --> 00:33:09,679
describe the other two as a colleague

866
00:33:12,149 --> 00:33:10,640
thank you

867
00:33:13,509 --> 00:33:12,159
i think the

868
00:33:15,669 --> 00:33:13,519
vi team

869
00:33:19,830 --> 00:33:15,679
we have been together in training for i

870
00:33:22,710 --> 00:33:19,840
think two years and in half

871
00:33:26,789 --> 00:33:25,269
very interesting experience of being in

872
00:33:30,070 --> 00:33:26,799
survival training

873
00:33:31,350 --> 00:33:30,080
uh the under circumstances when you can

874
00:33:33,430 --> 00:33:31,360
really

875
00:33:37,430 --> 00:33:33,440
see the people or with whom you're going

876
00:33:39,269 --> 00:33:37,440
to fly and i was really very happy

877
00:33:40,789 --> 00:33:39,279
to go through this training

878
00:33:43,669 --> 00:33:40,799
and

879
00:33:45,669 --> 00:33:43,679
well both of my crew mates are

880
00:33:47,909 --> 00:33:45,679
very educated

881
00:33:49,269 --> 00:33:47,919
very hard-working people way easier

882
00:33:51,430 --> 00:33:49,279
going

883
00:33:53,029 --> 00:33:51,440
and during our

884
00:33:55,669 --> 00:33:53,039
winter survival

885
00:33:57,350 --> 00:33:55,679
both of them were really helpful

886
00:33:58,070 --> 00:33:57,360
kate is a scientist

887
00:34:04,789 --> 00:33:58,080
he

888
00:34:07,509 --> 00:34:04,799

we have to spend two days in a russian

889
00:34:09,510 --> 00:34:07,519
winter forest and the temperature is

890
00:34:12,869 --> 00:34:09,520
significant

891
00:34:13,750 --> 00:34:12,879
not as warm my ass in august in houston

892
00:34:15,990 --> 00:34:13,760
and

893
00:34:18,389 --> 00:34:16,000
actually we had to build two different

894
00:34:19,270 --> 00:34:18,399
type of shelters and spend two nights

895
00:34:23,270 --> 00:34:19,280
there

896
00:34:26,629 --> 00:34:23,280
and well kate was very inventive uh she

897
00:34:29,270 --> 00:34:26,639
came up with the solution how to

898
00:34:32,149 --> 00:34:29,280
build a structure of cutting wood around

899
00:34:35,430 --> 00:34:32,159
the fireplace so we would

900
00:34:36,389 --> 00:34:35,440
be able to get them dry and better

901
00:34:41,510 --> 00:34:36,399
and

902
00:34:42,389 --> 00:34:41,520
i i really like attack as a

903
00:34:44,790 --> 00:34:42,399
my

904
00:34:49,430 --> 00:34:44,800
sius flight engineer

905
00:34:51,589 --> 00:34:49,440
i can rely absolutely on his uh

906
00:34:53,909 --> 00:34:51,599
actually he we share with him the

907
00:34:56,950 --> 00:34:53,919
responsibility to deliver our bright

908
00:34:58,950 --> 00:34:56,960
scientists to the station and i'm

909
00:35:02,710 --> 00:34:58,960
very very happy with the performance he

910
00:35:05,750 --> 00:35:02,720
has shown during our training

911
00:35:09,109 --> 00:35:05,760
kate i know that kate has two dogs

912
00:35:11,910 --> 00:35:09,119
named after first russian space dogs

913
00:35:14,230 --> 00:35:11,920

and you have to have some skills in

914
00:35:18,069 --> 00:35:14,240
russian language in order to get the

915
00:35:19,589 --> 00:35:18,079
flavor of these names and

916
00:35:21,349 --> 00:35:19,599
taksan

917
00:35:22,150 --> 00:35:21,359
have two kids

918
00:35:24,630 --> 00:35:22,160
and

919
00:35:26,390 --> 00:35:24,640
you know that

920
00:35:27,829 --> 00:35:26,400
in sayu's vehicle

921
00:35:31,349 --> 00:35:27,839
usually

922
00:35:32,870 --> 00:35:31,359
the vehicle is very reliable but

923
00:35:34,710 --> 00:35:32,880
every crew

924
00:35:36,710 --> 00:35:34,720
find that

925
00:35:39,109 --> 00:35:36,720
the equipment set is not complete

926
00:35:40,390 --> 00:35:39,119
usually one instrument is missing a very

927
00:35:42,870 --> 00:35:40,400
important one

928
00:35:45,670 --> 00:35:42,880
and this is a weightlessness indicator

929
00:35:47,589 --> 00:35:45,680
and since tucker has two

930
00:35:49,510 --> 00:35:47,599
little kids i think

931
00:35:59,109 --> 00:35:49,520
he will find

932
00:36:05,510 --> 00:36:00,950
yeah i think

933
00:36:08,230 --> 00:36:05,520
trust these two guys

934
00:36:09,510 --> 00:36:08,240
more than 100 percent two days ago we

935
00:36:12,390 --> 00:36:09,520
had a

936
00:36:15,109 --> 00:36:12,400
emergency training but we went through

937
00:36:18,470 --> 00:36:15,119
as many as five scenarios without any

938
00:36:19,910 --> 00:36:18,480

single problems so

939
00:36:23,270 --> 00:36:19,920
we've been

940
00:36:25,030 --> 00:36:23,280
trained as a team very well and

941
00:36:27,510 --> 00:36:25,040
for me anatoly

942
00:36:30,950 --> 00:36:27,520
he's very experienced and

943
00:36:32,150 --> 00:36:30,960
i like his style of work he's always

944
00:36:33,990 --> 00:36:32,160
calm

945
00:36:36,950 --> 00:36:34,000
even if we have

946
00:36:39,670 --> 00:36:36,960
fire and rapid depressurization and so

947
00:36:41,030 --> 00:36:39,680
is a vehicle at the same time so i like

948
00:36:41,910 --> 00:36:41,040
his style

949
00:36:45,270 --> 00:36:41,920
and

950
00:36:46,310 --> 00:36:45,280
he always gives us good advice to kate

951
00:36:47,750 --> 00:36:46,320
and me

952
00:36:50,230 --> 00:36:47,760
and kate

953
00:36:51,349 --> 00:36:50,240
she has totally totally

954
00:36:52,470 --> 00:36:51,359
different

955
00:36:55,270 --> 00:36:52,480
sets of

956
00:36:57,829 --> 00:36:55,280
point of view compared to anatoly and i

957
00:36:59,510 --> 00:36:57,839
because she was a researcher and

958
00:37:01,109 --> 00:36:59,520
sometimes i was

959
00:37:02,630 --> 00:37:01,119
pretty much

960
00:37:03,510 --> 00:37:02,640
impressed by

961
00:37:04,630 --> 00:37:03,520
what

962
00:37:08,230 --> 00:37:04,640
she was

963
00:37:15,109 --> 00:37:08,240

look how she looked at the experiments

964
00:37:19,910 --> 00:37:18,310
okay okay did you wanna yeah well you um

965
00:37:22,150 --> 00:37:19,920
you know you expect and you hope that

966
00:37:23,190 --> 00:37:22,160
everything goes according to plan but if

967
00:37:24,630 --> 00:37:23,200
it doesn't

968
00:37:26,710 --> 00:37:24,640
these are the two guys that you want to

969
00:37:29,109 --> 00:37:26,720
be with you in your spacecraft so i feel

970
00:37:31,829 --> 00:37:29,119
pretty lucky um you know you end up

971
00:37:33,109 --> 00:37:31,839
forming a team with your crew and it's

972
00:37:34,310 --> 00:37:33,119
really important these are these are

973
00:37:36,550 --> 00:37:34,320
people you're going to be spending a lot

974
00:37:38,069 --> 00:37:36,560
of time with and so i just feel

975
00:37:39,670 --> 00:37:38,079
incredibly fortunate to be able to fly

976
00:37:41,270 --> 00:37:39,680
with these guys and i'm really looking

977
00:37:42,790 --> 00:37:41,280
forward to it

978
00:37:44,710 --> 00:37:42,800
and i know it's not incredibly unusual

979
00:37:47,270 --> 00:37:44,720
but y'all got a very international crew

980
00:37:49,270 --> 00:37:47,280
as well were there any um

981
00:37:52,069 --> 00:37:49,280
you know barrier or cultural barriers to

982
00:37:53,030 --> 00:37:52,079
to that surprised you or that you had to

983
00:37:55,349 --> 00:37:53,040
overcome

984
00:37:56,230 --> 00:37:55,359
i haven't mentioned so far

985
00:37:57,589 --> 00:37:56,240
no

986
00:37:59,030 --> 00:37:57,599
all right

987
00:38:00,790 --> 00:37:59,040
okay i think we have one question on the

988
00:38:07,030 --> 00:38:00,800

phone bridge now so we're going to go to

989
00:38:10,870 --> 00:38:09,190
hi so for anyone who wants to answer

990
00:38:17,990 --> 00:38:10,880
what was the most challenging thing you

991
00:38:21,990 --> 00:38:19,750
yeah for me it was

992
00:38:24,230 --> 00:38:22,000
soyuz training and

993
00:38:27,829 --> 00:38:24,240
so training style in

994
00:38:30,069 --> 00:38:27,839
russia is a little bit different from uh

995
00:38:32,950 --> 00:38:30,079
training style here in system for

996
00:38:34,630 --> 00:38:32,960
example i always use this example to

997
00:38:37,670 --> 00:38:34,640
explain the difference

998
00:38:38,550 --> 00:38:37,680
and let's say we you need to

999
00:38:41,190 --> 00:38:38,560
learn

1000
00:38:42,710 --> 00:38:41,200
how to use microwave and

1001
00:38:46,470 --> 00:38:42,720
here in houston

1002
00:38:48,950 --> 00:38:46,480
they always they only teach us like we

1003
00:38:49,829 --> 00:38:48,960
need we just need to open the door then

1004
00:38:51,270 --> 00:38:49,839
put

1005
00:38:53,990 --> 00:38:51,280
a dish

1006
00:38:57,270 --> 00:38:54,000
inside the microwave and select time and

1007
00:38:59,910 --> 00:38:57,280
push hit start button that's all then if

1008
00:39:03,109 --> 00:38:59,920
we have any problem with microwave or

1009
00:39:04,310 --> 00:39:03,119
heating just let the ground team know

1010
00:39:07,510 --> 00:39:04,320
that's how

1011
00:39:09,430 --> 00:39:07,520
americans or nasa teaches us that

1012
00:39:12,069 --> 00:39:09,440
they're in russia

1013
00:39:13,430 --> 00:39:12,079

it's totally different they start

1014
00:39:16,470 --> 00:39:13,440
teaching us

1015
00:39:17,349 --> 00:39:16,480
what's the principle of physics how we

1016
00:39:21,109 --> 00:39:17,359
can

1017
00:39:22,870 --> 00:39:21,119
heat up things using a microwave so that

1018
00:39:24,069 --> 00:39:22,880
was a lot of

1019
00:39:26,230 --> 00:39:24,079
studying

1020
00:39:30,310 --> 00:39:26,240
almost every day

1021
00:39:33,190 --> 00:39:30,320
from like 8 00 a.m to 2 a.m so it was

1022
00:39:35,910 --> 00:39:33,200
quite challenging for me

1023
00:39:38,390 --> 00:39:35,920
uh as soon as we assigned to crew we

1024
00:39:41,109 --> 00:39:38,400
started traveling all around the world

1025
00:39:42,790 --> 00:39:41,119
and that was a kind of challenge because

1026
00:39:44,950 --> 00:39:42,800
you have to

1027
00:39:46,550 --> 00:39:44,960
shift time zones

1028
00:39:49,510 --> 00:39:46,560
quite frequently

1029
00:39:50,390 --> 00:39:49,520
and quite significantly we have i think

1030
00:39:52,870 --> 00:39:50,400
nine

1031
00:39:54,950 --> 00:39:52,880
time zones between russia and

1032
00:39:57,190 --> 00:39:54,960
between moscow and houston

1033
00:39:59,510 --> 00:39:57,200
and the challenge

1034
00:40:01,109 --> 00:39:59,520
language issues have always been

1035
00:40:04,069 --> 00:40:01,119
challenged for me

1036
00:40:05,270 --> 00:40:04,079
uh it's really difficult and

1037
00:40:07,750 --> 00:40:05,280
by the way

1038
00:40:09,589 --> 00:40:07,760

taksan speaks perfect russian and

1039
00:40:17,109 --> 00:40:09,599
english both languages and i really

1040
00:40:21,510 --> 00:40:18,950
well for me at the beginning the

1041
00:40:23,270 --> 00:40:21,520
challenge was integrating everything you

1042
00:40:25,190 --> 00:40:23,280
go through this two and a half year

1043
00:40:26,710 --> 00:40:25,200
training flow and

1044
00:40:28,630 --> 00:40:26,720
you see a

1045
00:40:30,630 --> 00:40:28,640
a little slice of everything so we need

1046
00:40:32,790 --> 00:40:30,640
to be able to do anything and everything

1047
00:40:33,910 --> 00:40:32,800
on board we need to understand all of

1048
00:40:36,470 --> 00:40:33,920
the equipment

1049
00:40:38,230 --> 00:40:36,480
how to fix it so you show up for work

1050
00:40:39,670 --> 00:40:38,240
and one morning you're a plumber and the

1051
00:40:41,109 --> 00:40:39,680
next morning

1052
00:40:42,470 --> 00:40:41,119
you're a dentist and then you're going

1053
00:40:45,829 --> 00:40:42,480
to be a scientist and then you're a

1054
00:40:48,309 --> 00:40:45,839
spacewalker and so you have to be

1055
00:40:50,230 --> 00:40:48,319
pretty detail-oriented and

1056
00:40:52,550 --> 00:40:50,240
be able to be a little bit of an expert

1057
00:40:53,829 --> 00:40:52,560
in each one of these areas during the

1058
00:40:55,589 --> 00:40:53,839
course of the training flow they start

1059
00:40:56,790 --> 00:40:55,599
to bring that all together

1060
00:40:59,030 --> 00:40:56,800
and by the end you definitely get

1061
00:41:01,430 --> 00:40:59,040
comfortable and you really feel prepared

1062
00:41:02,950 --> 00:41:01,440
for anything that may happen during the

1063
00:41:04,470 --> 00:41:02,960

increment so i think that's really a

1064
00:41:06,630 --> 00:41:04,480
testament to the training team and how

1065
00:41:08,630 --> 00:41:06,640
they bring all this together

1066
00:41:10,950 --> 00:41:08,640
and the key is to just let them do their

1067
00:41:14,230 --> 00:41:10,960
job and and we'll turn out trained crew

1068
00:41:17,349 --> 00:41:15,829
okay i think we're just about out of

1069
00:41:20,550 --> 00:41:17,359
time but maybe we have time for one more

1070
00:41:22,230 --> 00:41:20,560
social media question

1071
00:41:24,230 --> 00:41:22,240
definitely and this one may require a

1072
00:41:26,069 --> 00:41:24,240
little bit of explanation for people not

1073
00:41:28,390 --> 00:41:26,079
familiar with acronyms but ben evans is

1074
00:41:31,349 --> 00:41:28,400
asking on twitter will the crew do any

1075
00:41:35,270 --> 00:41:31,359
work inside beam during your expedition

1076
00:41:39,109 --> 00:41:37,349
yeah so um

1077
00:41:41,829 --> 00:41:39,119
we're hoping that that we're going to be

1078
00:41:43,670 --> 00:41:41,839
doing some work in beam and

1079
00:41:45,430 --> 00:41:43,680
it depends a little bit where it falls

1080
00:41:47,349 --> 00:41:45,440
we're actually hoping that tim copeland

1081
00:41:49,750 --> 00:41:47,359
tim peake get it all nice and outfitted

1082
00:41:51,670 --> 00:41:49,760
for us and we can just be

1083
00:41:53,750 --> 00:41:51,680
part of the experiment

1084
00:41:55,910 --> 00:41:53,760
but we will probably be doing some

1085
00:41:58,870 --> 00:41:55,920
sensor installation

1086
00:42:00,150 --> 00:41:58,880
we are going to be looking at

1087
00:42:02,790 --> 00:42:00,160
the pressure shell we are going to be

1088
00:42:04,950 --> 00:42:02,800

looking at radiation and a whole bunch

1089
00:42:07,190 --> 00:42:04,960
of different parameters to evaluate

1090
00:42:08,550 --> 00:42:07,200
these types of vessels docked to space

1091
00:42:09,990 --> 00:42:08,560
station so i think it's it's pretty

1092
00:42:11,270 --> 00:42:10,000
exciting it's something

1093
00:42:12,150 --> 00:42:11,280
really new and interesting that we're

1094
00:42:13,910 --> 00:42:12,160
doing

1095
00:42:17,190 --> 00:42:13,920
and we're definitely looking forward to

1096
00:42:18,309 --> 00:42:17,200
wherever that falls uh in our increment

1097
00:42:19,990 --> 00:42:18,319
and maybe you can explain a little bit

1098
00:42:21,670 --> 00:42:20,000
more about what beam is yeah i'm sorry

1099
00:42:23,990 --> 00:42:21,680
that was the first thing right i jumped

1100
00:42:25,510 --> 00:42:24,000
right into the nasa acronyms um so so

1101
00:42:28,150 --> 00:42:25,520
beam is actually

1102
00:42:29,990 --> 00:42:28,160
an expandable module that that bigelow

1103
00:42:32,630 --> 00:42:30,000
is going to send up and so that's going

1104
00:42:35,030 --> 00:42:32,640
to be birth to the space station

1105
00:42:36,630 --> 00:42:35,040
it's going to it's an inflatable module

1106
00:42:38,150 --> 00:42:36,640
this thing sounds very scary at the

1107
00:42:39,270 --> 00:42:38,160
beginning because you picture blowing up

1108
00:42:41,910 --> 00:42:39,280
a balloon but it's actually an

1109
00:42:44,309 --> 00:42:41,920
incredibly hard pressure shell and then

1110
00:42:45,430 --> 00:42:44,319
we'll be outfitting with sensors to

1111
00:42:47,030 --> 00:42:45,440
analyze

1112
00:42:50,150 --> 00:42:47,040
how that pressure shell is reacting in

1113
00:42:51,829 --> 00:42:50,160

the space environment over time

1114
00:42:53,589 --> 00:42:51,839
okay i think that's probably all the

1115
00:42:55,829 --> 00:42:53,599
questions we have unless there are any

1116
00:42:57,910 --> 00:42:55,839
more you don't see any so

1117
00:42:59,109 --> 00:42:57,920
the crew is going to be launching to the

1118
00:43:01,270 --> 00:42:59,119
international space station from the

1119
00:43:03,270 --> 00:43:01,280
baikonur cosmodrome in kazakhstan on

1120
00:43:04,550 --> 00:43:03,280
june 21st and then they'll be spending

1121
00:43:05,670 --> 00:43:04,560
their time there all the way through

1122
00:43:07,190 --> 00:43:05,680
october

1123
00:43:10,390 --> 00:43:07,200
so you'll want to follow along with that

1124
00:43:12,390 --> 00:43:10,400
you can catch updates at nasa.gov