1
00:05:43,879 --> 00:00:24,740
[Music]

2
00:05:44,809 --> 00:05:43,889
good afternoon thanks for joining us for

3
00:05:47,779 --> 00:05:44,819
the International Space Station

4
00:05:49,820 --> 00:05:47,789
expedition 63 and 64 crew news

5
00:05:52,550 --> 00:05:49,830
conference from NASA's Johnson Space

6
00:05:55,369 --> 00:05:52,560
Center with us is NASA astronaut Cady

7
00:05:58,309 --> 00:05:55,379
burns and cosmonaut Sergei risk Brazil

8
00:06:01,339 --> 00:05:58,319
cough and Sergei Koontz vertov of this

9
00:06:02,510 --> 00:06:01,349
Russian space agency Roscosmos to talk

10
00:06:04,790 --> 00:06:02,520
about their training and upcoming

11
00:06:06,589 --> 00:06:04,800
mission they will launch aboard a Soyuz

12
00:06:09,980 --> 00:06:06,599
spacecraft from the baikonur cosmodrome

13
00:06:11,360 --> 00:06:09,990

in kazakhstan on october 14th for a

14
00:06:13,520 --> 00:06:11,370
six-month mission aboard the space

15
00:06:15,770 --> 00:06:13,530
station within weeks after their arrival

16
00:06:18,020 --> 00:06:15,780
we'll celebrate the 20th anniversary of

17
00:06:20,360 --> 00:06:18,030
a permanent human presence on the space

18
00:06:22,459 --> 00:06:20,370
station we also anticipate the first

19
00:06:24,320 --> 00:06:22,469
operational crewed mission of the SpaceX

20
00:06:26,689 --> 00:06:24,330
Dragon spacecraft to take place during

21
00:06:29,450 --> 00:06:26,699
their mission another exciting milestone

22
00:06:31,040 --> 00:06:29,460
for human spaceflight kate has a

23
00:06:33,499 --> 00:06:31,050
background in molecular and cancer

24
00:06:35,360 --> 00:06:33,509
biology and led efforts to study viral

25
00:06:38,929 --> 00:06:35,370
diseases before being selected as an

26
00:06:40,580 --> 00:06:38,939
astronaut in 2009 she spent 115 days in

27
00:06:44,119 --> 00:06:40,590
space aboard the space station on

28
00:06:46,189 --> 00:06:44,129
expedition 48 and 49 in 2016 during

29
00:06:48,290 --> 00:06:46,199
which she conducted two spacewalks and

30
00:06:51,200 --> 00:06:48,300
many research investigations including

31
00:06:53,959 --> 00:06:51,210
the first DNA sequencing in space this

32
00:06:56,300 --> 00:06:53,969
will be her second spaceflight watching

33
00:06:58,550 --> 00:06:56,310
with Kate in the Soyuz commander as the

34
00:07:00,890 --> 00:06:58,560
rest cosmos cosmonaut Sergei Rizzo cuff

35
00:07:04,969 --> 00:07:00,900
result office was a flight engineer for

36
00:07:07,399 --> 00:07:04,979
expeditions 49 and 50 in October 2016

37
00:07:09,379 --> 00:07:07,409
through April 2017 when he was on board

38
00:07:09,920 --> 00:07:09,389

the space station with rubens for a few

39
00:07:11,809 --> 00:07:09,930
days

40
00:07:14,240 --> 00:07:11,819
that October before she returned to

41
00:07:17,269 --> 00:07:14,250
Earth this is also his second trip to

42
00:07:20,059 --> 00:07:17,279
space finally we have rose cosmos

43
00:07:21,350 --> 00:07:20,069
cosmonaut Sergei Koontz fertig of this

44
00:07:23,869 --> 00:07:21,360
will be his first spaceflight

45
00:07:25,070 --> 00:07:23,879
congratulations Sergei will give the

46
00:07:27,379 --> 00:07:25,080
crew a chance to tell us about their

47
00:07:29,029 --> 00:07:27,389
mission then we'll take questions for

48
00:07:31,760 --> 00:07:29,039
those on the phone please press star-1

49
00:07:33,260 --> 00:07:31,770
if you have a question and star 2 to

50
00:07:35,839 --> 00:07:33,270
withdraw your question if it's already

51
00:07:37,640 --> 00:07:35,849
been answered if you'd like to ask a

52
00:07:41,209 --> 00:07:37,650
question on social media please use

53
00:07:43,879 --> 00:07:41,219
hashtag ask NASA with that let me turn

54
00:07:45,800 --> 00:07:43,889
to Kate Rubin's Kate you are a scientist

55
00:07:47,180 --> 00:07:45,810
and you participated in hundreds of

56
00:07:49,010 --> 00:07:47,190
science investigations during your last

57
00:07:51,019 --> 00:07:49,020
mission what are you most looking

58
00:07:52,360 --> 00:07:51,029
forward to for this mission can you tell

59
00:07:55,300 --> 00:07:52,370
us about some of the science

60
00:07:57,820 --> 00:07:55,310
yeah absolutely I'm really excited about

61
00:08:00,280 --> 00:07:57,830
the expansion of some of the early work

62
00:08:03,070 --> 00:08:00,290
that we did growing cells for long

63
00:08:04,900 --> 00:08:03,080

duration and culture so I'm a biologist

64
00:08:06,430 --> 00:08:04,910
I tend towards getting really excited

65
00:08:08,379 --> 00:08:06,440
about things like growing cells and

66
00:08:09,879 --> 00:08:08,389
culture but the international space

67
00:08:12,300 --> 00:08:09,889
station offers us a really exciting

68
00:08:15,879 --> 00:08:12,310
opportunity to study things like

69
00:08:18,400 --> 00:08:15,889
three-dimensional culture you know

70
00:08:20,250 --> 00:08:18,410
tissues and organs in microgravity in

71
00:08:22,900 --> 00:08:20,260
ways that we can't study on earth

72
00:08:24,460 --> 00:08:22,910
because you get these delicate

73
00:08:26,830 --> 00:08:24,470
structures that will collapse under

74
00:08:29,530 --> 00:08:26,840
gravity conditions so there's a lot of

75
00:08:31,300 --> 00:08:29,540
really exciting biology going on there's

76
00:08:32,980 --> 00:08:31,310
some great physics experiments you may

77
00:08:35,950 --> 00:08:32,990
have seen some scientific press about

78
00:08:38,800 --> 00:08:35,960
cold atom lab recently that promises to

79
00:08:41,050 --> 00:08:38,810
be a really exciting investigation for

80
00:08:42,760 --> 00:08:41,060
the world of physics and of course I'm

81
00:08:44,740 --> 00:08:42,770
looking forward to expanding some of the

82
00:08:47,430 --> 00:08:44,750
sequencer efforts that we started in

83
00:08:50,110 --> 00:08:47,440
2016 with that team

84
00:08:51,790 --> 00:08:50,120
that sounds great we're so excited to

85
00:08:54,910 --> 00:08:51,800
see you up there performing all that

86
00:08:57,370 --> 00:08:54,920
important research with that let me turn

87
00:08:58,990 --> 00:08:57,380
to Sergey result Gogh this will be your

88
00:09:01,180 --> 00:08:59,000

second trip to the International Space

89
00:09:03,010 --> 00:09:01,190
Station with that experience what are

90
00:09:09,930 --> 00:09:03,020
you most looking forward to for this

91
00:09:19,300 --> 00:09:12,190
Kalpana Chawla looking polishness the

92
00:09:23,620 --> 00:09:19,310
Australian vodka - Mustafa finish we

93
00:09:25,450 --> 00:09:23,630
keep our drive is a Christian will

94
00:09:27,670 --> 00:09:25,460
fulfill all the objectives of the

95
00:09:32,920 --> 00:09:27,680
mission and that the crew will make it

96
00:09:36,100 --> 00:09:32,930
safely to nerve and stay well all right

97
00:09:38,410 --> 00:09:36,110
Thank You Sergei could switch cough this

98
00:09:40,120 --> 00:09:38,420
is your first trip to space how excited

99
00:09:45,540 --> 00:09:40,130
are you for this upcoming launch what

100
00:09:51,240 --> 00:09:48,100
canoes new Europe Atma pollutant

101
00:09:54,700 --> 00:09:51,250
messages say my missus focuses on

102
00:09:57,850 --> 00:09:54,710
restoration rescue pocket off key in

103
00:10:00,070 --> 00:09:57,860
position das DARPA of course I'm very

104
00:10:00,940 --> 00:10:00,080
excited about this upcoming trip to the

105
00:10:03,340 --> 00:10:00,950
space station

106
00:10:05,650 --> 00:10:03,350
but right now I'm intensely focused on

107
00:10:07,740 --> 00:10:05,660
the last period of training before

108
00:10:09,280 --> 00:10:07,750
launch

109
00:10:11,770 --> 00:10:09,290
alright great

110
00:10:13,210 --> 00:10:11,780
let's take some questions we'll start

111
00:10:15,340 --> 00:10:13,220
with questions on the phone and then

112
00:10:16,720 --> 00:10:15,350
take questions from social media so

113
00:10:18,790 --> 00:10:16,730

remember if you're on the phone please

114
00:10:20,650 --> 00:10:18,800
press star 1 if you have a question and

115
00:10:22,270 --> 00:10:20,660
start to to withdraw your question if

116
00:10:24,040 --> 00:10:22,280
it's been answered if you're on social

117
00:10:27,250 --> 00:10:24,050
media you can ask questions using

118
00:10:29,710 --> 00:10:27,260
hashtag ask NASA alright starting with

119
00:10:31,780 --> 00:10:29,720
the phone we have Megan Bauer from

120
00:10:35,460 --> 00:10:31,790
Pacific Rim media go ahead with your

121
00:10:42,610 --> 00:10:39,490
in previous research I've done some DNA

122
00:10:45,610 --> 00:10:42,620
analysis could you talk about how DNA

123
00:10:48,100 --> 00:10:45,620
sequencing and analysis in microgravity

124
00:10:50,680 --> 00:10:48,110
could the core or both the research

125
00:10:52,360 --> 00:10:50,690
being done back on earth yeah absolutely

126
00:10:55,330 --> 00:10:52,370
some of the things that we're really

127
00:10:57,640 --> 00:10:55,340
interested in with the DNA sequencing

128
00:10:59,440 --> 00:10:57,650
this flight is looking at the microbiome

129
00:11:01,840 --> 00:10:59,450
of the space station environment and

130
00:11:04,210 --> 00:11:01,850
that has a lot of parallels with ways

131
00:11:06,070 --> 00:11:04,220
that we study the microbiome on earth so

132
00:11:08,380 --> 00:11:06,080
there's this idea the microbiome of the

133
00:11:10,180 --> 00:11:08,390
built environment all the microbes all

134
00:11:11,800 --> 00:11:10,190
around you they're not necessarily

135
00:11:14,080 --> 00:11:11,810
harmful and a lot of cases they're

136
00:11:15,310 --> 00:11:14,090
beneficial but they really surround us

137
00:11:17,890 --> 00:11:15,320
and they're in our environment all the

138
00:11:20,140 --> 00:11:17,900

time what we're very interested in

139
00:11:21,880 --> 00:11:20,150
is how the microbiome of the space

140
00:11:24,610 --> 00:11:21,890
station might be different it's been

141
00:11:27,270 --> 00:11:24,620
separate from Earth for 20 years

142
00:11:30,340 --> 00:11:27,280
it's its own biome it's got its own

143
00:11:32,260 --> 00:11:30,350
resources and humans coming and going

144
00:11:34,810 --> 00:11:32,270
from it so we want to see what that

145
00:11:37,210 --> 00:11:34,820
microbiome looks like what these small

146
00:11:43,210 --> 00:11:37,220
closed environments do when they've been

147
00:11:49,690 --> 00:11:43,220
separate for a very long time Thanks

148
00:11:51,370 --> 00:11:49,700
now let's go to Howard eunice Kate this

149
00:12:01,020 --> 00:11:51,380
is Howard you from the Napa Valley

150
00:12:06,600 --> 00:12:03,400
this is Howard Dean for the Napa Valley

151
00:12:09,880 --> 00:12:06,610
Register yep and I've got you Howard

152
00:12:12,340 --> 00:12:09,890
yeah okay all right I guess my first

153
00:12:16,990 --> 00:12:12,350
question for you would be since I

154
00:12:20,050 --> 00:12:17,000
followed your mission in 2016 what would

155
00:12:22,450 --> 00:12:20,060
you say is the most important lesson

156
00:12:25,900 --> 00:12:22,460
from that experience that you carry it

157
00:12:28,030 --> 00:12:25,910
to this mission starting in October yeah

158
00:12:31,360 --> 00:12:28,040
I think it's not so much a lesson but

159
00:12:33,940 --> 00:12:31,370
just the ability to work in space so

160
00:12:35,860 --> 00:12:33,950
when you start out as a rookie for

161
00:12:37,750 --> 00:12:35,870
example you're not very good at flying

162
00:12:39,760 --> 00:12:37,760
and navigating through the space station

163
00:12:42,550 --> 00:12:39,770

so you tend to kind of crawl hand over

164
00:12:45,220 --> 00:12:42,560
hand on the handrails takes a little

165
00:12:48,070 --> 00:12:45,230
while to get your space legs so to speak

166
00:12:49,630 --> 00:12:48,080
so you have to learn how to transport

167
00:12:52,030 --> 00:12:49,640
yourself from one end of the station to

168
00:12:55,240 --> 00:12:52,040
the other how to carry out your

169
00:12:57,880 --> 00:12:55,250
activities the fact that everything

170
00:13:01,060 --> 00:12:57,890
floats seems trivial until you try to

171
00:13:02,590 --> 00:13:01,070
get a big payload done that has 20

172
00:13:04,060 --> 00:13:02,600
different parts and you have to figure

173
00:13:05,890 --> 00:13:04,070
out where you're gonna put all those I

174
00:13:08,680 --> 00:13:05,900
think learning all those kinds of skills

175
00:13:11,440 --> 00:13:08,690
takes a good two to four weeks and so

176
00:13:13,390 --> 00:13:11,450
I'm really excited to go back again with

177
00:13:16,150 --> 00:13:13,400
all that in my toolkit it means we can

178
00:13:18,760 --> 00:13:16,160
start doing a larger amount of science

179
00:13:20,830 --> 00:13:18,770
right out of the gate so we'll be taking

180
00:13:23,110 --> 00:13:20,840
over from Chris Cassidy who's also a

181
00:13:25,450 --> 00:13:23,120
very experienced astronaut on the US

182
00:13:26,980 --> 00:13:25,460
operating segment and I think we're

183
00:13:28,600 --> 00:13:26,990
going to get hopefully a lot done during

184
00:13:30,430 --> 00:13:28,610
our increment

185
00:13:35,470 --> 00:13:30,440
just that that familiar to his face is

186
00:13:40,360 --> 00:13:35,480
great alright let's go to bill Harwood

187
00:13:43,000 --> 00:13:40,370
with CBS bill har load up at the Kennedy

188
00:13:45,280 --> 00:13:43,010

Space Center this is probably a dumb

189
00:13:48,130 --> 00:13:45,290
question but with your expertise I'll

190
00:13:49,449 --> 00:13:48,140
ask it anyway by the time you guys take

191
00:13:51,579 --> 00:13:49,459
off in October I don't know if the

192
00:13:54,340 --> 00:13:51,589
pandemic is still going to be a pandemic

193
00:13:55,690 --> 00:13:54,350
or not could you what is your sense of

194
00:13:58,690 --> 00:13:55,700
it do you think it's still going to be a

195
00:14:00,430 --> 00:13:58,700
big deal by the time you fly and what is

196
00:14:03,040 --> 00:14:00,440
your advice to people right now who are

197
00:14:05,530 --> 00:14:03,050
facing it coming from the position of

198
00:14:08,110 --> 00:14:05,540
someone who is an expert on immunology

199
00:14:10,569 --> 00:14:08,120
and things like that right yeah thanks

200
00:14:13,889 --> 00:14:10,579
for your question bill so I did used to

201
00:14:16,240 --> 00:14:13,899
be a biologist in my previous life and

202
00:14:18,750 --> 00:14:16,250
unfortunately I do think in October we

203
00:14:20,500 --> 00:14:18,760
still will be struggling with this virus

204
00:14:23,139 --> 00:14:20,510
hopefully we're going to be able to

205
00:14:25,389 --> 00:14:23,149
contain it better but I think this is

206
00:14:27,250 --> 00:14:25,399
going to be around for a while what

207
00:14:28,660 --> 00:14:27,260
we've been doing at NASA is all the

208
00:14:32,040 --> 00:14:28,670
kinds of things that you've been hearing

209
00:14:35,139 --> 00:14:32,050
about so when we can work remotely we do

210
00:14:37,269 --> 00:14:35,149
when we have to do in-person training

211
00:14:39,880 --> 00:14:37,279
for example with the crews and some of

212
00:14:42,340 --> 00:14:39,890
the flight hardware we all wear masks we

213
00:14:44,800 --> 00:14:42,350

take social distancing measures and we

214
00:14:45,939 --> 00:14:44,810
sanitize the hardware as we're using it

215
00:14:49,000 --> 00:14:45,949
I think we're just going to continue

216
00:14:51,490 --> 00:14:49,010
that all through training so the kinds

217
00:14:53,560 --> 00:14:51,500
of things that we're advising people to

218
00:14:55,210 --> 00:14:53,570
do in their daily lives this is what the

219
00:14:58,030 --> 00:14:55,220
space station crew who's getting ready

220
00:14:59,199 --> 00:14:58,040
to launch is doing as well this is these

221
00:15:02,280 --> 00:14:59,209
are the best things that we know how to

222
00:15:04,840 --> 00:15:02,290
do right now to prevent transmission and

223
00:15:07,000 --> 00:15:04,850
I think this is this is great advice

224
00:15:09,130 --> 00:15:07,010
whether you're training to fly on the

225
00:15:10,780 --> 00:15:09,140
space station or you're just going about

226
00:15:15,030 --> 00:15:10,790
your daily life to keep you and your

227
00:15:21,420 --> 00:15:17,730
all right let's go to mark karo with

228
00:15:23,550 --> 00:15:21,430
Aviation Week thank you it is Mark crow

229
00:15:26,999 --> 00:15:23,560
with Aviation Week and my question is

230
00:15:30,780 --> 00:15:27,009
for Kate looks like a really good chance

231
00:15:34,939 --> 00:15:30,790
that you're going to have seven crew on

232
00:15:38,040 --> 00:15:34,949
the space station during your stay and

233
00:15:40,949 --> 00:15:38,050
five in the US segment and so I'm

234
00:15:44,129 --> 00:15:40,959
wondering what you think that says about

235
00:15:46,860 --> 00:15:44,139
the overall value of the space station

236
00:15:49,680 --> 00:15:46,870
and as a scientist astronaut yourself

237
00:15:52,530 --> 00:15:49,690
what does that say about its science

238
00:15:54,569 --> 00:15:52,540

mission that science focus yeah I think

239
00:15:56,490 --> 00:15:54,579
it's going to be incredible to have

240
00:15:59,009 --> 00:15:56,500
seven people on the space station you

241
00:16:01,230 --> 00:15:59,019
know it's really designed to be able to

242
00:16:02,460 --> 00:16:01,240
accommodate that many astronauts we've

243
00:16:04,590 --> 00:16:02,470
been doing a lot of things with the

244
00:16:06,090 --> 00:16:04,600
space station program in the last few

245
00:16:09,360 --> 00:16:06,100
years to get ready for this so we've

246
00:16:11,759 --> 00:16:09,370
been enhancing our abilities to scrub

247
00:16:14,040 --> 00:16:11,769
co2 from the atmosphere for example and

248
00:16:16,110 --> 00:16:14,050
we're testing a lot of new technologies

249
00:16:18,870 --> 00:16:16,120
that we're going to use for exploration

250
00:16:21,689 --> 00:16:18,880
so having seven crew aboard allows us to

251
00:16:24,750 --> 00:16:21,699
test things like new kinds of atmosphere

252
00:16:26,910 --> 00:16:24,760
revitalization we can test things like

253
00:16:28,650 --> 00:16:26,920
new spacesuit components and then

254
00:16:30,809 --> 00:16:28,660
certainly with that number of crew on

255
00:16:33,150 --> 00:16:30,819
station we can really increase our

256
00:16:35,250 --> 00:16:33,160
science output and so this is an

257
00:16:37,050 --> 00:16:35,260
incredible time for the International

258
00:16:40,350 --> 00:16:37,060
Space Station we've got the Commercial

259
00:16:42,269 --> 00:16:40,360
Crew program going we have cargo going

260
00:16:44,819 --> 00:16:42,279
through our providers and so we're able

261
00:16:47,309 --> 00:16:44,829
to both staff the station and send

262
00:16:48,809 --> 00:16:47,319
materials up to really really increase

263
00:16:51,660 --> 00:16:48,819

the throughput of science this is a

264
00:16:53,790 --> 00:16:51,670
mature program we know how to get a lot

265
00:16:56,579 --> 00:16:53,800
of work done up there and so when we get

266
00:16:58,259 --> 00:16:56,589
seven crew members we're going to see I

267
00:17:02,420 --> 00:16:58,269
think a huge scientific output and I'm

268
00:17:07,439 --> 00:17:04,980
all right let's switch over to a

269
00:17:09,569 --> 00:17:07,449
question on social media for all three

270
00:17:13,919 --> 00:17:09,579
of you how will you spend the rest of

271
00:17:16,740 --> 00:17:13,929
your days before your launch well from

272
00:17:18,990 --> 00:17:16,750
the NASA side we're almost completely

273
00:17:20,520 --> 00:17:19,000
finished with our NASA training we're

274
00:17:22,350 --> 00:17:20,530
going to do some training with our

275
00:17:23,520 --> 00:17:22,360
European Space Agency partners in

276
00:17:25,620 --> 00:17:23,530
Cologne and

277
00:17:28,020 --> 00:17:25,630
then move to Moscow to finish some

278
00:17:31,400 --> 00:17:28,030
training with our with our Russian

279
00:17:34,770 --> 00:17:31,410
partners and our specific Soyuz training

280
00:17:36,780 --> 00:17:34,780
will be in masks and we'll be enjoying

281
00:17:38,720 --> 00:17:36,790
our last few months on the planet but I

282
00:17:47,890 --> 00:17:38,730
think we'll be training pretty hard

283
00:17:59,230 --> 00:17:56,880
first Sergey came so just as allocate

284
00:18:02,710 --> 00:17:59,240
negative Kapoor yet prodigious at door

285
00:18:03,340 --> 00:18:02,720
Nia starta business turnover could be a

286
00:18:04,470 --> 00:18:03,350
spouse

287
00:18:07,570 --> 00:18:04,480
[Music]

288
00:18:11,860 --> 00:18:07,580

we are Prime's cuteness at geneseo's

289
00:18:13,450 --> 00:18:11,870
Nagar a dog he's a Trinity Lido start

290
00:18:16,770 --> 00:18:13,460
amok rhymes in the baikonur Vijay

291
00:18:22,990 --> 00:18:16,780
Prashad final nature's pocket off-key

292
00:18:27,160 --> 00:18:23,000
propeller den crantini motion we private

293
00:18:32,020 --> 00:18:27,170
miss miss Costanza but got off Abhishek

294
00:18:36,010 --> 00:18:32,030
Bachchan magician II is which in erotic

295
00:18:38,080 --> 00:18:36,020
stroke of Norma guitar captain so case

296
00:18:41,080 --> 00:18:38,090
basically has said it all already

297
00:18:44,290 --> 00:18:41,090
we still have some training to do and

298
00:18:47,290 --> 00:18:44,300
that training will will last until the

299
00:18:49,570 --> 00:18:47,300
launch date with no breaks no pauses

300
00:18:53,320 --> 00:18:49,580
from here we are going to Cologne and

301
00:18:55,240 --> 00:18:53,330
then find our 2008 and then three weeks

302
00:18:57,520 --> 00:18:55,250
out before the launch show we'll go to

303
00:18:59,020 --> 00:18:57,530
the Baikonur cosmodrome for the final

304
00:19:01,450 --> 00:18:59,030
stage of their preparation and the

305
00:19:04,630 --> 00:19:01,460
quarantine and that will Greg Irwin to

306
00:19:06,910 --> 00:19:04,640
launch to the SS so this final leg of

307
00:19:08,470 --> 00:19:06,920
preparation of training is going to be

308
00:19:10,680 --> 00:19:08,480
very intensive because we have very

309
00:19:12,630 --> 00:19:10,690
little time left

310
00:19:15,640 --> 00:19:12,640
all right thank you

311
00:19:17,610 --> 00:19:15,650
another question from social media for

312
00:19:20,710 --> 00:19:17,620
each of you or whoever wants to answer

313
00:19:22,780 --> 00:19:20,720

what comfort protocols are there for

314
00:19:24,610 --> 00:19:22,790
crew members who experience homesickness

315
00:19:28,960 --> 00:19:24,620
how do you deal with homesickness in

316
00:19:30,790 --> 00:19:28,970
space yeah from the first mission I

317
00:19:34,210 --> 00:19:30,800
learned that we actually have really

318
00:19:36,790 --> 00:19:34,220
great support from NASA so they provide

319
00:19:39,820 --> 00:19:36,800
the ability for us to email our friends

320
00:19:42,790 --> 00:19:39,830
and family members we can call using a

321
00:19:45,070 --> 00:19:42,800
voice over internet phone and we can

322
00:19:48,160 --> 00:19:45,080
even have weekly video chats so that's

323
00:19:51,700 --> 00:19:48,170
great we get some care packages with

324
00:19:54,160 --> 00:19:51,710
letters and and things from home my care

325
00:19:55,930 --> 00:19:54,170
package included some some plastic

326
00:19:57,190 --> 00:19:55,940
scientific equipment I could do

327
00:19:58,870 --> 00:19:57,200
experiments

328
00:20:01,780 --> 00:19:58,880
because that's what psychologically

329
00:20:03,820 --> 00:20:01,790
supports me in space so we we just have

330
00:20:06,940 --> 00:20:03,830
a really wonderful team of folks here

331
00:20:09,010 --> 00:20:06,950
from the US side that help us and the

332
00:20:17,670 --> 00:20:09,020
surrogates can answer from the Russian

333
00:20:23,230 --> 00:20:19,680
valerian as Eva Padilla

334
00:20:27,160 --> 00:20:23,240
robotica parcel number to dispatch

335
00:20:30,990 --> 00:20:27,170
weights machinist just to present when

336
00:20:33,280 --> 00:20:31,000
it was motionless with autism Louie

337
00:20:38,350 --> 00:20:33,290
osseous tangles always visible system

338
00:20:41,770 --> 00:20:38,360

videos vision he rebels cousin position

339
00:20:48,310 --> 00:20:41,780
the step King rusev specifically the

340
00:20:52,930 --> 00:20:48,320
slowly degenerate keep our taxes motion

341
00:20:58,090 --> 00:20:52,940
but at 690 emotional state severe anemia

342
00:21:00,400 --> 00:20:58,100
politer another one is that we do have

343
00:21:04,000 --> 00:21:00,410
excellent ground support that does

344
00:21:06,360 --> 00:21:04,010
support the crew a high percent and we

345
00:21:09,520 --> 00:21:06,370
cannot only communicate with them using

346
00:21:12,520 --> 00:21:09,530
audio assets but there are also video

347
00:21:13,870 --> 00:21:12,530
assets as well and besides as Kate has

348
00:21:17,950 --> 00:21:13,880
said with there are opportunities to

349
00:21:19,420 --> 00:21:17,960
send cargo so yes

350
00:21:22,210 --> 00:21:19,430
the crew are very happy with their

351
00:21:24,610 --> 00:21:22,220
ground support and in addition toward I

352
00:21:27,310 --> 00:21:24,620
have mentioned already we can visualize

353
00:21:30,610 --> 00:21:27,320
and try to imagine ourselves back in

354
00:21:33,900 --> 00:21:30,620
those places that we can see from up

355
00:21:36,490 --> 00:21:33,910
there when they look down on earth

356
00:21:39,910 --> 00:21:36,500
that's great we'll go back to the phone

357
00:21:43,780 --> 00:21:39,920
for a few more questions let's go to Eva

358
00:21:46,780 --> 00:21:43,790
with the California Space Center yes

359
00:21:49,300 --> 00:21:46,790
thank you for making this great meeting

360
00:21:52,330 --> 00:21:49,310
available I have two questions a

361
00:21:55,330 --> 00:21:52,340
controller at Space Center sponsors lady

362
00:22:00,000 --> 00:21:55,340
rocket media for the young audience for

363
00:22:06,300 --> 00:22:02,680

especially in the area of Lompoc but

364
00:22:09,100 --> 00:22:06,310
also France Poland Lithuania and Ukraine

365
00:22:10,160 --> 00:22:09,110
so I will have couple of questions for

366
00:22:13,320 --> 00:22:10,170
Kate

367
00:22:15,630 --> 00:22:13,330
with your experiment and focus on the

368
00:22:18,480 --> 00:22:15,640
research and the results that you

369
00:22:22,680 --> 00:22:18,490
delivered and trained to the label which

370
00:22:24,870 --> 00:22:22,690
one would you like to see being

371
00:22:28,940 --> 00:22:24,880
transformed into the startup and

372
00:22:34,770 --> 00:22:28,950
actually become an enterprise and

373
00:22:37,830 --> 00:22:34,780
question for both surveys is speaking to

374
00:22:41,460 --> 00:22:37,840
an audience of the countries that I'm

375
00:22:43,490 --> 00:22:41,470
sure you know who don't have ethanol

376
00:22:48,930 --> 00:22:43,500
programs yet

377
00:22:52,020 --> 00:22:48,940
how would you inspire young women and

378
00:22:57,510 --> 00:22:52,030
men in Poland since when were you crying

379
00:22:58,830 --> 00:22:57,520
to think about becoming astronauts yeah

380
00:23:01,920 --> 00:22:58,840
so for your first question about

381
00:23:04,740 --> 00:23:01,930
commercial enterprises there's actually

382
00:23:06,990 --> 00:23:04,750
a really wide world of commercial space

383
00:23:09,060 --> 00:23:07,000
that's opening up and a lot of the

384
00:23:11,250 --> 00:23:09,070
payloads that we're going to be looking

385
00:23:13,140 --> 00:23:11,260
at the scientific experiments are things

386
00:23:15,770 --> 00:23:13,150
like for example pharmaceutical

387
00:23:18,300 --> 00:23:15,780
companies that are trying to improve

388
00:23:23,040 --> 00:23:18,310

something about maybe the binding of

389
00:23:25,080 --> 00:23:23,050
their drugs their therapeutic agents for

390
00:23:27,240 --> 00:23:25,090
example with the receptor or with a with

391
00:23:29,580 --> 00:23:27,250
a ligand and so they can study that by

392
00:23:32,310 --> 00:23:29,590
crystallizing this and studying the

393
00:23:34,830 --> 00:23:32,320
structure in microgravity we talked a

394
00:23:38,400 --> 00:23:34,840
little bit about cells and understanding

395
00:23:40,530 --> 00:23:38,410
how cells form how tissues form that's

396
00:23:42,300 --> 00:23:40,540
got a lot of therapeutic applications

397
00:23:44,820 --> 00:23:42,310
and then there's a whole host of

398
00:23:46,680 --> 00:23:44,830
material science kinds of things that

399
00:23:48,870 --> 00:23:46,690
that startup companies may be really

400
00:23:51,060 --> 00:23:48,880
interested in where microgravity allows

401
00:23:54,600 --> 00:23:51,070
us to produce a product in a way that we

402
00:23:56,430 --> 00:23:54,610
can't on earth and I'll turn it over to

403
00:24:05,690 --> 00:23:56,440
my crewmates to answer your second

404
00:24:13,250 --> 00:24:07,409
stock asides

405
00:24:17,779 --> 00:24:13,260
Nalini melodically Jai Simha marui

406
00:24:21,690 --> 00:24:17,789
chesty Stronach Katara we open in luleå

407
00:24:26,370 --> 00:24:21,700
mushroom Turkish cottage my my movie a

408
00:24:29,640 --> 00:24:26,380
professor cosmonaut of some interest and

409
00:24:31,250 --> 00:24:29,650
some elusive professional Anita

410
00:24:34,830 --> 00:24:31,260
[Music]

411
00:24:38,820 --> 00:24:34,840
as far as inspiring the youth goes and

412
00:24:41,279 --> 00:24:38,830
the youth over the entire world and the

413
00:24:43,950 --> 00:24:41,289

Contras dimensions I for one can only

414
00:24:46,770 --> 00:24:43,960
say that the profession of an astronaut

415
00:24:50,990 --> 00:24:46,780
or cosmonaut is the best of all it's the

416
00:25:01,100 --> 00:24:53,390
that's great Sergei our did you have

417
00:25:04,700 --> 00:25:01,110
anything to add program Misner the

418
00:25:09,080 --> 00:25:04,710
cosmic estancia dog astrologer sneaky

419
00:25:12,260 --> 00:25:09,090
partner annoy naga rebuke organs at

420
00:25:16,130 --> 00:25:12,270
least run by the mall a demo mode in

421
00:25:18,380 --> 00:25:16,140
rhodium cutter interviews captivity room

422
00:25:21,020 --> 00:25:18,390
cosmological targets alone as well

423
00:25:22,549 --> 00:25:21,030
cosmic Oprah's trust oh he switched to

424
00:25:26,630 --> 00:25:22,559
delicious new model was noiseless

425
00:25:28,480 --> 00:25:26,640
tonight ECB Elizabeth especially the

426
00:25:31,370 --> 00:25:28,490
International Space Station project

427
00:25:33,770 --> 00:25:31,380
includes not only those countries that

428
00:25:36,200 --> 00:25:33,780
are part of this project but there are

429
00:25:38,270 --> 00:25:36,210
also other organizations that involve

430
00:25:40,669 --> 00:25:38,280
other countries that currently are not

431
00:25:43,850 --> 00:25:40,679
part of the ISS so there are multiple

432
00:25:46,520 --> 00:25:43,860
opportunities and lots of ways for those

433
00:25:48,080 --> 00:25:46,530
who are interested in piloted space

434
00:25:52,640 --> 00:25:48,090
flight in the space expression in

435
00:25:57,590 --> 00:25:52,650
general to involve themselves into this

436
00:26:01,600 --> 00:25:57,600
space thing thank you alright let's go

437
00:26:05,240 --> 00:26:01,610
to Jackie Goddard with The Times London

438
00:26:08,390 --> 00:26:05,250

Thank You hello my question is for Kate

439
00:26:11,120 --> 00:26:08,400
could you boil down to layman's terms

440
00:26:14,960 --> 00:26:11,130
what studying laser called atoms for

441
00:26:17,120 --> 00:26:14,970
quantum sensors means to sort of

442
00:26:19,700 --> 00:26:17,130
ordinary mortals and what applications

443
00:26:21,380 --> 00:26:19,710
or benefits that work might bring for

444
00:26:23,180 --> 00:26:21,390
life on earth or for technology

445
00:26:26,720 --> 00:26:23,190
breakthroughs for future space

446
00:26:28,970 --> 00:26:26,730
exploration thank you sure absolutely

447
00:26:31,520 --> 00:26:28,980
so we have those kinds of experiments

448
00:26:32,419 --> 00:26:31,530
like the cold atom lab on earth people

449
00:26:35,480 --> 00:26:32,429
have been using bose-einstein

450
00:26:38,149 --> 00:26:35,490
condensates for a long time and they've

451
00:26:41,149 --> 00:26:38,159
been using these atom traps

452
00:26:43,279 --> 00:26:41,159
what microgravity allows us to do is put

453
00:26:45,560 --> 00:26:43,289
all of that in freefall essentially and

454
00:26:48,980 --> 00:26:45,570
so that really helps the instrument

455
00:26:51,110 --> 00:26:48,990
stakeholder that allows us to look at

456
00:26:53,960 --> 00:26:51,120
the experiment over a longer period of

457
00:26:56,750 --> 00:26:53,970
time we can see phenomenon that we

458
00:26:58,940 --> 00:26:56,760
weren't able to see before and really

459
00:27:00,680 --> 00:26:58,950
the the first cold atom lab results have

460
00:27:02,779 --> 00:27:00,690
demonstrated that we were able to

461
00:27:04,350 --> 00:27:02,789
install it on station and we can get

462
00:27:07,470 --> 00:27:04,360
these first results and so this

463
00:27:10,380 --> 00:27:07,480

is really the opening of this facility

464
00:27:12,650 --> 00:27:10,390
there's eventual applications for a lot

465
00:27:15,780 --> 00:27:12,660
of different things with atom

466
00:27:17,850 --> 00:27:15,790
interferometry so we can we can it's a

467
00:27:19,470 --> 00:27:17,860
little hard to explain exactly what

468
00:27:21,120 --> 00:27:19,480
we're going to get out of this in terms

469
00:27:24,060 --> 00:27:21,130
of things that you're going to use every

470
00:27:26,880 --> 00:27:24,070
day but certainly we know that very high

471
00:27:29,610 --> 00:27:26,890
precision timing atomic clocks are

472
00:27:32,789 --> 00:27:29,620
important things like navigation you can

473
00:27:34,260 --> 00:27:32,799
imagine the types of opportunities that

474
00:27:37,049 --> 00:27:34,270
that's going to open up similar to

475
00:27:43,560 --> 00:27:37,059
things like GPS and small processors

476
00:27:45,810 --> 00:27:43,570
have opened a world of devices to us all

477
00:27:52,650 --> 00:27:45,820
right let's go to Robert Perlman with

478
00:27:54,500 --> 00:27:52,660
collect space hi Robert Carlin with

479
00:27:57,630 --> 00:27:54,510
collect space so the question for Kate

480
00:27:59,340 --> 00:27:57,640
given that we are coming soon after you

481
00:28:01,770 --> 00:27:59,350
arrive on space station you will arrive

482
00:28:04,350 --> 00:28:01,780
at that 20-year milestone of continuous

483
00:28:07,530 --> 00:28:04,360
human occupancy I was wondering what

484
00:28:10,140 --> 00:28:07,540
your own memories are of expedition 1 if

485
00:28:11,820 --> 00:28:10,150
you have any specific memories of the

486
00:28:14,280 --> 00:28:11,830
mission you can share and what does

487
00:28:17,970 --> 00:28:14,290
reaching this milestone as an

488
00:28:18,570 --> 00:28:17,980

international group of agencies mean to

489
00:28:20,640 --> 00:28:18,580
you

490
00:28:24,450 --> 00:28:20,650
what does it say about our advance in

491
00:28:26,039 --> 00:28:24,460
spaceflight thanks I think it's just

492
00:28:27,960 --> 00:28:26,049
incredible that we've had a space

493
00:28:31,560 --> 00:28:27,970
station with continuous human presence

494
00:28:33,419 --> 00:28:31,570
for 20 years it's truly amazing and you

495
00:28:36,870 --> 00:28:33,429
really feel it when you arrive at the

496
00:28:39,570 --> 00:28:36,880
space station and and see this hardware

497
00:28:41,130 --> 00:28:39,580
and see these modules put together and

498
00:28:43,710 --> 00:28:41,140
flying in space it's one of the most

499
00:28:45,930 --> 00:28:43,720
incredible engineering achievements I

500
00:28:47,430 --> 00:28:45,940
think that humanity has has done and the

501
00:28:49,560 --> 00:28:47,440
fact that we've done it as an

502
00:28:52,049 --> 00:28:49,570
international partnership and a

503
00:28:55,560 --> 00:28:52,059
collaboration I think that's absolutely

504
00:28:58,860 --> 00:28:55,570
the the intangible benefit of all of

505
00:29:00,780 --> 00:28:58,870
this so expedition 1 I I was not an

506
00:29:04,049 --> 00:29:00,790
astronaut at that point I was a

507
00:29:07,080 --> 00:29:04,059
scientist and I was a virologist and I

508
00:29:09,320 --> 00:29:07,090
was a space fan so I followed that along

509
00:29:11,789 --> 00:29:09,330
with the with the rest of you space fans

510
00:29:13,470 --> 00:29:11,799
you know and had some had some big

511
00:29:15,720 --> 00:29:13,480
dreams but never thought that I would

512
00:29:19,530 --> 00:29:15,730
actually be getting a chance to fly to

513
00:29:28,360 --> 00:29:22,810

all right let's go to Russell pounds

514
00:29:30,490 --> 00:29:28,370
with Pacific Rim media hello this is

515
00:29:33,280 --> 00:29:30,500
Russell pound the Pacific Rim media and

516
00:29:35,830 --> 00:29:33,290
a question for King I'm looking at

517
00:29:37,750 --> 00:29:35,840
what's going on with our pandemic across

518
00:29:40,570 --> 00:29:37,760
the world right now and I was curious

519
00:29:42,910 --> 00:29:40,580
what's your greatest hope for a silver

520
00:29:45,640 --> 00:29:42,920
lining that may come from the current

521
00:29:47,620 --> 00:29:45,650
crisis we're working through yeah I

522
00:29:50,740 --> 00:29:47,630
think you know things are really tough

523
00:29:52,570 --> 00:29:50,750
right now and it's you know this is this

524
00:29:54,730 --> 00:29:52,580
is a tough time and it's really a tough

525
00:29:56,970 --> 00:29:54,740
time for the whole world what we are

526
00:30:00,190 --> 00:29:56,980
seeing from the field of science is

527
00:30:03,670 --> 00:30:00,200
really an incredible amount of effort

528
00:30:06,640 --> 00:30:03,680
I have never as a scientist seen so many

529
00:30:08,440 --> 00:30:06,650
scientists working towards one goal and

530
00:30:10,900 --> 00:30:08,450
so you can see that with the people that

531
00:30:13,650 --> 00:30:10,910
are developing Diagnostics for the virus

532
00:30:16,090 --> 00:30:13,660
developing vaccines and therapeutics

533
00:30:18,370 --> 00:30:16,100
literally the the world's scientific

534
00:30:19,030 --> 00:30:18,380
enterprise is focused on solving this

535
00:30:20,890 --> 00:30:19,040
problem

536
00:30:23,440 --> 00:30:20,900
I think scientists are finding new ways

537
00:30:26,350 --> 00:30:23,450
to collaborate together and they're

538
00:30:28,570 --> 00:30:26,360

speeding up research the the pace of the

539
00:30:30,870 --> 00:30:28,580
discoveries is pretty incredible so I am

540
00:30:33,850 --> 00:30:30,880
heartened by what we can achieve

541
00:30:35,410 --> 00:30:33,860
together as humanity and and the

542
00:30:37,180 --> 00:30:35,420
scientific progress that we're seeing I

543
00:30:40,590 --> 00:30:37,190
think is going to bear fruit in terms of

544
00:30:47,050 --> 00:30:40,600
our ability to handle this disease and

545
00:30:48,850 --> 00:30:47,060
really ensure that we emerge from it all

546
00:30:52,420 --> 00:30:48,860
right let's go back to a couple of

547
00:30:54,760 --> 00:30:52,430
questions on social media for Sergey are

548
00:30:58,120 --> 00:30:54,770
what are the training differences

549
00:30:59,620 --> 00:30:58,130
between the Soyuz TMA M and the Soyuz M

550
00:31:07,600 --> 00:30:59,630
s if you can answer and have an

551
00:31:10,660 --> 00:31:07,610
experience on that process you've made a

552
00:31:13,200 --> 00:31:10,670
lot of kitchen a student still it almost

553
00:31:16,690 --> 00:31:13,210
is a change difficult to say user

554
00:31:20,020 --> 00:31:16,700
connects name is citizen Alicia

555
00:31:21,540 --> 00:31:20,030
miss Madonna Tuerto veneers necessarily

556
00:31:24,340 --> 00:31:21,550
a configuration

557
00:31:29,110 --> 00:31:24,350
non-skid which is level was pretty much

558
00:31:32,650 --> 00:31:29,120
a gesture was Pitonyak terribly no

559
00:31:34,540 --> 00:31:32,660
stationary repressive in exported set

560
00:31:36,700 --> 00:31:34,550
with Delia Jakarta is directly shared

561
00:31:41,230 --> 00:31:36,710
sadly the Boucher waking up to the body

562
00:31:43,330 --> 00:31:41,240
me kissing is me bald Italian Moshe boom

563
00:31:48,160 --> 00:31:43,340

but Roberto detection the your coffee

564
00:31:51,850 --> 00:31:48,170
wasn't very keen yes indeed it took me

565
00:31:53,740 --> 00:31:51,860
14 years studying different Soyuz

566
00:31:56,550 --> 00:31:53,750
modifications and now you have a

567
00:32:00,960 --> 00:31:56,560
modification number four there are

568
00:32:03,400 --> 00:32:00,970
extremely important differences very

569
00:32:07,390 --> 00:32:03,410
significant ones even though the search

570
00:32:09,310 --> 00:32:07,400
vehicle looks the same and Kate and I

571
00:32:11,230 --> 00:32:09,320
have already had the opportunity to test

572
00:32:15,150 --> 00:32:11,240
out the first two the echoes of this new

573
00:32:18,460 --> 00:32:15,160
series and now it's a service that goes

574
00:32:21,700 --> 00:32:18,470
continuously even though the each

575
00:32:26,170 --> 00:32:21,710
vehicle is still different from the

576
00:32:30,970 --> 00:32:26,180
previous one and to provide more details

577
00:32:34,180 --> 00:32:30,980
so we'll have to do some tests and to

578
00:32:39,660 --> 00:32:34,190
continue to work with this particular

579
00:32:42,070 --> 00:32:39,670
vehicle when we get on board all right

580
00:32:44,440 --> 00:32:42,080
please remember if you have a question

581
00:32:47,620 --> 00:32:44,450
on the phone bridge to press star one

582
00:32:49,270 --> 00:32:47,630
and I will call on you for now let's

583
00:32:52,420 --> 00:32:49,280
take another one from social media this

584
00:32:54,730 --> 00:32:52,430
is for Kate on YouTube its DNA

585
00:32:56,860 --> 00:32:54,740
sequencing what is DNA sequencing and

586
00:32:59,080 --> 00:32:56,870
why is it different on the International

587
00:33:01,840 --> 00:32:59,090
Space Station yeah that's a great

588
00:33:03,730 --> 00:33:01,850

question so DNA this is the building

589
00:33:06,820 --> 00:33:03,740
blocks of life this is the blueprint

590
00:33:09,030 --> 00:33:06,830
that's in your cells and in every cell

591
00:33:11,920 --> 00:33:09,040
of every living organism on earth and

592
00:33:13,780 --> 00:33:11,930
sequencing is essentially reading that

593
00:33:16,540 --> 00:33:13,790
so it's like reading a book it's

594
00:33:18,700 --> 00:33:16,550
comprised of four letters only so it's a

595
00:33:21,040 --> 00:33:18,710
strange book but we read each letter

596
00:33:23,170 --> 00:33:21,050
individually with a DNA sequencer and

597
00:33:24,670 --> 00:33:23,180
that can tell us a lot of different

598
00:33:26,410 --> 00:33:24,680
things that can tell us for example if

599
00:33:28,180 --> 00:33:26,420
we're looking at microbes which

600
00:33:30,310 --> 00:33:28,190
different species are there so we read

601
00:33:32,019 --> 00:33:30,320
their genome we match them to a database

602
00:33:35,230 --> 00:33:32,029
we can tell who's who and where they're

603
00:33:38,049 --> 00:33:35,240
living we can also tell things like how

604
00:33:40,360 --> 00:33:38,059
the environment is affecting cellular

605
00:33:42,460 --> 00:33:40,370
changes so in that case we're reading

606
00:33:45,580 --> 00:33:42,470
out the messages from the DNA this is

607
00:33:48,100 --> 00:33:45,590
called RNA and we can also tell things

608
00:33:50,100 --> 00:33:48,110
like epigenetics so how that DNA may be

609
00:33:53,830 --> 00:33:50,110
modified in a different environment

610
00:33:56,139 --> 00:33:53,840
there is a study recently about the two

611
00:33:58,690 --> 00:33:56,149
twins one on earth and one on spit and

612
00:34:01,299 --> 00:33:58,700
one on the ground and one in space and

613
00:34:02,889 --> 00:34:01,309

they looked at epigenetic modifications

614
00:34:06,279 --> 00:34:02,899
which are the changes to the DNA

615
00:34:08,500 --> 00:34:06,289
possibly due to spaceflight so the

616
00:34:11,169 --> 00:34:08,510
actual process of sequencing is not

617
00:34:13,720 --> 00:34:11,179
different in space but what we're using

618
00:34:16,359 --> 00:34:13,730
this is a tool to examine how things

619
00:34:17,800 --> 00:34:16,369
change in space so for example if you

620
00:34:20,319 --> 00:34:17,810
want to see how the microbial

621
00:34:22,659 --> 00:34:20,329
environment is different in space you

622
00:34:25,359 --> 00:34:22,669
count the microorganisms up there if you

623
00:34:27,520 --> 00:34:25,369
want to see how cells change in response

624
00:34:29,680 --> 00:34:27,530
to microgravity and different

625
00:34:31,000 --> 00:34:29,690
gravitational sensing you can look at

626
00:34:33,309 --> 00:34:31,010
the messages that are coming out of

627
00:34:35,230 --> 00:34:33,319
those cells so it's really a tool to

628
00:34:37,270 --> 00:34:35,240
look at all of these different kinds of

629
00:34:39,940 --> 00:34:37,280
things that are happening at the

630
00:34:45,369 --> 00:34:39,950
cellular and the molecular level in in

631
00:34:48,309 --> 00:34:45,379
space alright that's amazing thank you

632
00:34:51,250 --> 00:34:48,319
another question on Twitter this is for

633
00:34:53,290 --> 00:34:51,260
Kate and Sergey are what was your best

634
00:34:56,290 --> 00:34:53,300
or favorite memory from your last

635
00:34:59,579 --> 00:34:56,300
mission let's start with Kate sure I

636
00:35:02,680 --> 00:34:59,589
think probably my my favorite memory was

637
00:35:06,309 --> 00:35:02,690
on the spacewalk there's really nothing

638
00:35:07,809 --> 00:35:06,319

that compares to being a vacuum we were

639
00:35:11,290 --> 00:35:07,819
at the very front of the space station

640
00:35:13,240 --> 00:35:11,300
so the port that Bob and Doug just

641
00:35:15,160 --> 00:35:13,250
docked to with their endeavour

642
00:35:17,050 --> 00:35:15,170
spacecraft was was one of the things

643
00:35:19,000 --> 00:35:17,060
that we were installing so we got to

644
00:35:21,670 --> 00:35:19,010
turn around and look and see the entire

645
00:35:23,500 --> 00:35:21,680
space station from the outside you don't

646
00:35:25,960 --> 00:35:23,510
realize what it's like when you're

647
00:35:27,880 --> 00:35:25,970
living inside it and so to be outside it

648
00:35:30,339 --> 00:35:27,890
and looking back that was pretty

649
00:35:32,589 --> 00:35:30,349
incredible I got a chance to snap a

650
00:35:34,089 --> 00:35:32,599
photo of jeff williams who was out there

651
00:35:36,670 --> 00:35:34,099
with me on a spacewalk with the whole

652
00:35:40,380 --> 00:35:36,680
station behind him and that crystallizes

653
00:35:40,390 --> 00:35:45,840
amazing Sergey are

654
00:35:53,220 --> 00:35:50,990
Lavinia yamashina banana Staravia

655
00:35:55,230 --> 00:35:53,230
Samarkand eating a pretty onion over two

656
00:35:57,960 --> 00:35:55,240
stands he was more than a state on a

657
00:36:00,840 --> 00:35:57,970
crostini news Oh mr. Schuester gaturro

658
00:36:03,210 --> 00:36:00,850
most Australian skating the new version

659
00:36:04,950 --> 00:36:03,220
jet ski mr. Branigan estes fish swedish

660
00:36:07,380 --> 00:36:04,960
it was a fall now I was Morrison

661
00:36:11,340 --> 00:36:07,390
Virginia and not sure are doing because

662
00:36:13,620 --> 00:36:11,350
Nicole netted so for me the most vivid

663
00:36:17,240 --> 00:36:13,630

impressions were left by the mere fact

664
00:36:20,250 --> 00:36:17,250
of my long-duration stay onboard the ISS

665
00:36:23,670 --> 00:36:20,260
experiencing zero-g weightlessness which

666
00:36:27,060 --> 00:36:23,680
I can compare to like dreaming when

667
00:36:31,500 --> 00:36:27,070
you're a kid and of course observing the

668
00:36:34,110 --> 00:36:31,510
earth from afar from up there all right

669
00:36:36,570 --> 00:36:34,120
great another question on Twitter this

670
00:36:38,970 --> 00:36:36,580
one's for Kate what goals do you wish to

671
00:36:42,810 --> 00:36:38,980
accomplish in your biological studies

672
00:36:45,420 --> 00:36:42,820
towards cancer research yeah so I got I

673
00:36:47,850 --> 00:36:45,430
got my PhD in cancer biology but I

674
00:36:50,430 --> 00:36:47,860
actually did a lot of work on viral adji

675
00:36:52,470 --> 00:36:50,440
most of our work on space station is

676
00:36:54,810 --> 00:36:52,480
focused by things which microgravity

677
00:36:58,440 --> 00:36:54,820
affects so I think we are going to study

678
00:37:01,260 --> 00:36:58,450
a lot of cellular mechanisms the

679
00:37:03,540 --> 00:37:01,270
response of cells to microgravity how

680
00:37:06,870 --> 00:37:03,550
cells organize for example we can look

681
00:37:08,610 --> 00:37:06,880
at small organize and and how they might

682
00:37:10,920 --> 00:37:08,620
form structures in microgravity

683
00:37:15,780 --> 00:37:10,930
these things aren't directly related to

684
00:37:18,420 --> 00:37:15,790
understanding cancer or the process of

685
00:37:21,720 --> 00:37:18,430
mutation but we can't understand a lot

686
00:37:23,760 --> 00:37:21,730
more about human physiology and gravity

687
00:37:26,520 --> 00:37:23,770
is one of those variables that we can't

688
00:37:28,470 --> 00:37:26,530

ever check on the ground we can't assess

689
00:37:30,870 --> 00:37:28,480
our experiment with and without gravity

690
00:37:33,240 --> 00:37:30,880
that's very difficult to do here for a

691
00:37:35,700 --> 00:37:33,250
number of reasons we have some setups

692
00:37:37,230 --> 00:37:35,710
that don't quite there they're close

693
00:37:39,510 --> 00:37:37,240
approximations but they don't quite

694
00:37:41,820 --> 00:37:39,520
mimic true microgravity so I'm really

695
00:37:43,620 --> 00:37:41,830
interested in understanding cell and

696
00:37:44,670 --> 00:37:43,630
tissue architecture and when we

697
00:37:48,110 --> 00:37:44,680
understand that better

698
00:37:51,450 --> 00:37:48,120
we often get an idea about things like

699
00:37:55,510 --> 00:37:51,460
tumor biology and tumor environment and

700
00:37:58,940 --> 00:37:55,520
how tumors may move around in the body

701
00:37:59,810 --> 00:37:58,950
all right we'll go back to the phone one

702
00:38:01,460 --> 00:37:59,820
more time

703
00:38:05,570 --> 00:38:01,470
Russell pounds did you have a follow-up

704
00:38:08,720 --> 00:38:05,580
question yes thank you very much the

705
00:38:12,350 --> 00:38:08,730
follow-up is Kate for Kate in your

706
00:38:14,630 --> 00:38:12,360
experience what is the aha moment for

707
00:38:17,870 --> 00:38:14,640
everyday Americans or even the business

708
00:38:21,770 --> 00:38:17,880
community that our large investments in

709
00:38:24,170 --> 00:38:21,780
space exploration is valuable yeah I

710
00:38:26,480 --> 00:38:24,180
think you really see that when we

711
00:38:27,980 --> 00:38:26,490
increase the scientific output on the

712
00:38:30,170 --> 00:38:27,990
space station and really when we reached

713
00:38:33,080 --> 00:38:30,180

six crew members we started seeing the

714
00:38:34,970 --> 00:38:33,090
numbers of papers come out and these are

715
00:38:39,350 --> 00:38:34,980
things that are that are influencing a

716
00:38:42,290 --> 00:38:39,360
whole range of potential either products

717
00:38:43,970 --> 00:38:42,300
for people or our understanding of

718
00:38:46,970 --> 00:38:43,980
fundamental things we talked a lot about

719
00:38:48,920 --> 00:38:46,980
cells and biology but there's things

720
00:38:51,140 --> 00:38:48,930
about manufacturing that we can

721
00:38:55,280 --> 00:38:51,150
understand in microgravity materials

722
00:38:57,560 --> 00:38:55,290
science there's ways to process things

723
00:38:59,650 --> 00:38:57,570
differently and analyze them differently

724
00:39:02,960 --> 00:38:59,660
we can study things like combustion

725
00:39:05,360 --> 00:39:02,970
there's I think pretty much any area

726
00:39:07,790 --> 00:39:05,370
there's something very interesting to

727
00:39:09,590 --> 00:39:07,800
study with microgravity and it may have

728
00:39:11,510 --> 00:39:09,600
a direct commercial application or it

729
00:39:14,810 --> 00:39:11,520
may be something that leads us along the

730
00:39:16,460 --> 00:39:14,820
road to a commercial product but I think

731
00:39:19,670 --> 00:39:16,470
it's it's hard to find an area that

732
00:39:21,200 --> 00:39:19,680
doesn't have some kind of influence from

733
00:39:23,210 --> 00:39:21,210
the effect of gravity and really the

734
00:39:27,830 --> 00:39:23,220
only way to study that is in this

735
00:39:32,290 --> 00:39:27,840
incredible orbiting laboratory all right

736
00:39:39,080 --> 00:39:36,320
okay I wanted to ask you this you during

737
00:39:40,910 --> 00:39:39,090
your first mission you read a 20 minute

738
00:39:43,790 --> 00:39:40,920

video conference from the space station

739
00:39:46,670 --> 00:39:43,800
back to vintage high school here in Napa

740
00:39:48,380 --> 00:39:46,680
now obviously the schools here have been

741
00:39:50,180 --> 00:39:48,390
closed for three and a half months and

742
00:39:53,780 --> 00:39:50,190
there's considerable debate as to

743
00:39:57,110 --> 00:39:53,790
whether when I should say the safe to

744
00:40:00,230 --> 00:39:57,120
reopen live classes again but I would

745
00:40:02,990 --> 00:40:00,240
like to know what plans NASA is making

746
00:40:05,510 --> 00:40:03,000
to possibly have you reach out to

747
00:40:08,500 --> 00:40:05,520
students again even at even if it has to

748
00:40:10,210 --> 00:40:08,510
be done by alternative means yeah that's

749
00:40:12,870 --> 00:40:10,220
great question and that's one of the

750
00:40:15,160 --> 00:40:12,880
great things about stage station

751
00:40:18,190 --> 00:40:15,170
educational opportunities is we do them

752
00:40:20,010 --> 00:40:18,200
remotely by video and so we're working

753
00:40:22,840 --> 00:40:20,020
on a number of different opportunities

754
00:40:26,080 --> 00:40:22,850
to be able to have students tie-in

755
00:40:27,730 --> 00:40:26,090
remotely and ask questions and be able

756
00:40:30,430 --> 00:40:27,740
to have astronauts answer those

757
00:40:32,890 --> 00:40:30,440
questions so you know versus having

758
00:40:35,530 --> 00:40:32,900
everybody sit in an auditorium we still

759
00:40:37,750 --> 00:40:35,540
can do this and tie this into the remote

760
00:40:39,970 --> 00:40:37,760
learning that a lot of districts are

761
00:40:41,890 --> 00:40:39,980
doing the other thing that NASA has done

762
00:40:44,140 --> 00:40:41,900
a wonderful job and this was not just

763
00:40:47,710 --> 00:40:44,150

during the pandemic but they put a whole

764
00:40:51,700 --> 00:40:47,720
host of educational activities online so

765
00:40:54,070 --> 00:40:51,710
if you just go to WWE gov you can look

766
00:40:56,170 --> 00:40:54,080
at the the section they're under for

767
00:40:58,290 --> 00:40:56,180
educators and you can find all kinds of

768
00:41:00,970 --> 00:40:58,300
experiments that students can do at home

769
00:41:02,590 --> 00:41:00,980
complete kits of things that are

770
00:41:04,780 --> 00:41:02,600
appropriate for different grade levels

771
00:41:07,780 --> 00:41:04,790
there's a lot of information online

772
00:41:10,090 --> 00:41:07,790
either for students or for parents or

773
00:41:11,950 --> 00:41:10,100
for educators when people are remote

774
00:41:13,930 --> 00:41:11,960
learning if they want to get involved in

775
00:41:16,060 --> 00:41:13,940
NASA or get their students involved in

776
00:41:17,380 --> 00:41:16,070
science I think that's it's a wonderful

777
00:41:21,520 --> 00:41:17,390
resource I'd really recommend checking

778
00:41:23,710 --> 00:41:21,530
that out that's great all right we'll

779
00:41:25,570 --> 00:41:23,720
take one final question this one is from

780
00:41:27,460 --> 00:41:25,580
social media we have several people

781
00:41:31,120 --> 00:41:27,470
asking about the communication between

782
00:41:34,000 --> 00:41:31,130
the crew Kate do you speak Russian and

783
00:41:37,000 --> 00:41:34,010
how do you guys communicate new docking

784
00:41:39,220 --> 00:41:37,010
yashna the governing party we speak in

785
00:41:41,020 --> 00:41:39,230
Russian when we're in the US we tend to

786
00:41:43,420 --> 00:41:41,030
all speak in English when we're doing

787
00:41:46,150 --> 00:41:43,430
our training here when we're over in

788
00:41:48,340 --> 00:41:46,160

Russian it's easier to do everything in

789
00:41:51,220 --> 00:41:48,350
Russian when we're in the Soyuz our

790
00:41:52,690 --> 00:41:51,230
procedures are in Russian so I think we

791
00:41:55,000 --> 00:41:52,700
switched back and forth pretty often

792
00:41:58,180 --> 00:41:55,010
with the crewmembers confuses our

793
00:42:01,450 --> 00:41:58,190
instructors occasionally but we we don't

794
00:42:03,490 --> 00:42:01,460
usually have a problem communicating all

795
00:42:08,130 --> 00:42:03,500
right Sergei okay did you have anything

796
00:42:14,040 --> 00:42:12,670
munitia what about Ana's procrastinator

797
00:42:18,030 --> 00:42:14,050
panamanian

798
00:42:22,020 --> 00:42:18,040
mr. je Minetti Pasha Kate

799
00:42:27,640 --> 00:42:22,030
Raja Guevara - Paula - Monsieur game

800
00:42:31,420 --> 00:42:27,650
mr. game procrastination skate bottom

801
00:42:33,790 --> 00:42:31,430
paneer master additional motion tell

802
00:42:36,640 --> 00:42:33,800
Cooper other words nothing really to add

803
00:42:40,059 --> 00:42:36,650
the mutual understanding within our crew

804
00:42:42,220 --> 00:42:40,069
is fantastic Kate speaks Russian really

805
00:42:44,650 --> 00:42:42,230
well and she understands really well so

806
00:42:48,309 --> 00:42:44,660
there are runs really issues with the

807
00:42:50,380 --> 00:42:48,319
language at all that's wonderful okay

808
00:42:52,510 --> 00:42:50,390
with that we'll wrap up today's news

809
00:42:54,970 --> 00:42:52,520
conference thank you so much - Kate

810
00:42:57,069 --> 00:42:54,980
Sergei and Sergei for answering

811
00:42:59,740 --> 00:42:57,079
questions today and being with us and

812
00:43:01,720 --> 00:42:59,750
best wishes to you and your launch and

813
00:43:03,010 --> 00:43:01,730

your mission we're so excited to see you

814
00:43:05,859 --> 00:43:03,020
guys up on the International Space

815
00:43:08,020 --> 00:43:05,869
Station everyone should watch Kate

816
00:43:11,230 --> 00:43:08,030
Sergey and Sergey launched on October

817
00:43:13,990 --> 00:43:11,240
14th you can watch on NASA TV online at

818
00:43:16,480 --> 00:43:14,000
nasa.gov slash live or on Facebook live

819
00:43:18,280 --> 00:43:16,490
on the NASA Facebook page you can also

820
00:43:21,309 --> 00:43:18,290
follow the international space station

821
00:43:24,190 --> 00:43:21,319
on Twitter Instagram and Facebook for

822
00:43:26,800 --> 00:43:24,200
updates and visit nasa.gov slash station

823
00:43:36,240 --> 00:43:26,810
for more information thanks for joining