
РОСКОСМОС
РКК ЭНЕРГИЯ
СОЮЗ
ДОРОГА К ЗВЕЗДАМ ОТКРЫТА
NASA
РОСКОСМОС

1
00:00:24,240 --> 00:01:15,760
so

2
00:01:26,230 --> 00:01:24,390
[Music]

3
00:01:27,910 --> 00:01:26,240
it's morning at the baikonur cosmodrome

4
00:01:29,749 --> 00:01:27,920
in kazakhstan where an american

5
00:01:32,550 --> 00:01:29,759
astronaut and two russian cosmonauts are

6
00:01:35,109 --> 00:01:32,560
already atop the 160 foot tall soyuz

7
00:01:38,390 --> 00:01:35,119
booster ready for today's lunch an hour

8
00:01:41,109 --> 00:01:38,400
from now at 12 45 a.m central time 10 45

9
00:01:43,190 --> 00:01:41,119
a.m in baikonur

10
00:01:45,990 --> 00:01:43,200
this is a live view of the soyuz rocket

11
00:01:47,910 --> 00:01:46,000
on the site 31 launch pad at bike norm

12
00:01:50,870 --> 00:01:47,920
this is the second crude launch on the

13
00:01:53,429 --> 00:01:50,880

upgraded soyuz 2.1 a booster which made

14
00:01:55,190 --> 00:01:53,439
its first uncrewed flight with a soyuz

15
00:01:56,870 --> 00:01:55,200
spacecraft on the internet to the

16
00:01:59,109 --> 00:01:56,880
international space station in the

17
00:02:01,190 --> 00:01:59,119
summer of 2019

18
00:02:04,069 --> 00:02:01,200
the first flight with people on board on

19
00:02:06,950 --> 00:02:04,079
a new soyuz 2.1a booster launched from

20
00:02:08,550 --> 00:02:06,960
site 31 in april of this year

21
00:02:10,550 --> 00:02:08,560
today a team of launch controllers are

22
00:02:12,630 --> 00:02:10,560
watching over all the systems aboard the

23
00:02:13,910 --> 00:02:12,640
rocket which is now fully fueled and

24
00:02:15,430 --> 00:02:13,920
ready for launch

25
00:02:17,990 --> 00:02:15,440
no issues are being tracked throughout

26
00:02:21,510 --> 00:02:18,000
today which begin with fuel and oxidizer

27
00:02:24,150 --> 00:02:21,520
loading at about 7 45 pm central tuesday

28
00:02:26,229 --> 00:02:24,160
which is 3 45 a.m wednesday out at the

29
00:02:27,830 --> 00:02:26,239
launch site in baccanor

30
00:02:29,670 --> 00:02:27,840
the loading was completed about two

31
00:02:31,670 --> 00:02:29,680
hours later

32
00:02:33,910 --> 00:02:31,680
hello everyone from mission control in

33
00:02:35,190 --> 00:02:33,920
houston i'm brandi dean

34
00:02:38,150 --> 00:02:35,200
here in mission control the team is

35
00:02:40,390 --> 00:02:38,160
watching over the expedition 63 crew and

36
00:02:43,350 --> 00:02:40,400
space station systems and preparing to

37
00:02:45,430 --> 00:02:43,360
support the arrival of soyuz ms-17 the

38
00:02:47,430 --> 00:02:45,440

station's population will increase from

39
00:02:50,070 --> 00:02:47,440
three to six with the addition of nasa

40
00:02:52,949 --> 00:02:50,080
astronaut kate rubens russian cosmonaut

41
00:02:57,190 --> 00:02:52,959
sergey kutzberzkov and russian cosmonaut

42
00:03:01,350 --> 00:02:59,190
these three are about to be in the first

43
00:03:02,710 --> 00:03:01,360
planned two-orbit

44
00:03:04,710 --> 00:03:02,720
flight to the international space

45
00:03:06,470 --> 00:03:04,720
station with humans on board and their

46
00:03:08,949 --> 00:03:06,480
docking is scheduled approximately three

47
00:03:12,550 --> 00:03:08,959
hours after launch at 3 52 a.m central

48
00:03:14,070 --> 00:03:12,560
time or 1 52 p.m wednesday october 14th

49
00:03:15,990 --> 00:03:14,080
in baikonur

50
00:03:17,350 --> 00:03:16,000
where nasa and rose cosmo support teams

51
00:03:24,470 --> 00:03:17,360
and officials will be watching the

52
00:03:28,630 --> 00:03:26,789
the soyuz ms-17 spacecraft will be

53
00:03:30,390 --> 00:03:28,640
docking with the rosvett docking port on

54
00:03:32,390 --> 00:03:30,400
the earth-facing side of the russian

55
00:03:34,630 --> 00:03:32,400
segment of the space station

56
00:03:37,270 --> 00:03:34,640
once there the crew will join the three

57
00:03:39,270 --> 00:03:37,280
current space station residents on board

58
00:03:41,670 --> 00:03:39,280
that's nasa astronaut and space station

59
00:03:44,830 --> 00:03:41,680
commander chris cassidy and russian

60
00:03:47,030 --> 00:03:44,840
cosmonauts anatoly ivanishin and yvonne

61
00:03:50,550 --> 00:03:47,040
wagner they arrived at space station

62
00:03:52,470 --> 00:03:50,560
aboard soyuz ms-16 in april

63
00:03:54,949 --> 00:03:52,480

sergey rizhikov will take over as the

64
00:03:56,949 --> 00:03:54,959
expedition 64 commander at the change of

65
00:04:00,789 --> 00:03:56,959
command ceremony before the crew goes to

66
00:04:02,789 --> 00:04:00,799
bed on october 20th day prior to cassidy

67
00:04:04,710 --> 00:04:02,799
ivanishin and wagner undocking from the

68
00:04:07,589 --> 00:04:04,720
station and returning to earth aboard

69
00:04:09,990 --> 00:04:07,599
soyuz ms-16

70
00:04:11,670 --> 00:04:10,000
rubens rizzikov and kutzkerchov will be

71
00:04:13,429 --> 00:04:11,680
left behind to celebrate the 20th

72
00:04:15,190 --> 00:04:13,439
anniversary of human presence onboard

73
00:04:22,550 --> 00:04:15,200
the international space station which is

74
00:04:26,150 --> 00:04:24,790
in the meantime here in houston the team

75
00:04:27,909 --> 00:04:26,160
in mission control will be monitoring

76
00:04:29,749 --> 00:04:27,919
today's launch and getting updates from

77
00:04:32,790 --> 00:04:29,759
the flight

78
00:04:35,030 --> 00:04:32,800
from their russian counterparts

79
00:04:37,749 --> 00:04:35,040
flight director marcos flores will be on

80
00:04:39,749 --> 00:04:37,759
console for the soyuz launch today and

81
00:04:43,749 --> 00:04:39,759
capcom for today's launch is isa

82
00:04:45,830 --> 00:04:43,759
astronaut andreas mogensen

83
00:04:47,830 --> 00:04:45,840
during the soyuz climbed orbit tracking

84
00:04:50,150 --> 00:04:47,840
and telemetry is down linked to ground

85
00:04:52,230 --> 00:04:50,160
stations along its fat flight path and

86
00:04:53,909 --> 00:04:52,240
routed to the russian mission control

87
00:04:56,790 --> 00:04:53,919
center outside of moscow which you're

88
00:04:58,150 --> 00:04:56,800

seeing a view of here

89
00:04:59,909 --> 00:04:58,160
and throughout tonight's coverage we'll

90
00:05:01,510 --> 00:04:59,919
be trying to answer your questions about

91
00:05:03,350 --> 00:05:01,520
the launch which you can submit via

92
00:05:04,710 --> 00:05:03,360
social media if you have any questions

93
00:05:07,189 --> 00:05:04,720
you'd like to have us answer you can

94
00:05:09,590 --> 00:05:07,199
send those now to us using the hashtag

95
00:05:12,790 --> 00:05:09,600
asknasa we'll try and answer a few of

96
00:05:19,749 --> 00:05:12,800
those soon so go ahead and send them in

97
00:05:24,390 --> 00:05:22,469
today's launch marks the second flight

98
00:05:26,550 --> 00:05:24,400
into space for nasa astronaut kate

99
00:05:28,629 --> 00:05:26,560
rubins the second for russian cosmonaut

100
00:05:30,790 --> 00:05:28,639
and soyuz ms-17 commander sergey

101
00:05:34,230 --> 00:05:30,800
ryzhikov and the first for russian

102
00:05:36,070 --> 00:05:34,240
cosmonaut sergey kuzkov of russ cosmos

103
00:05:38,390 --> 00:05:36,080
let's take a moment to learn more about

104
00:05:40,310 --> 00:05:38,400
dr kate rubens nasa's next astronaut to

105
00:05:49,670 --> 00:05:40,320
fly in space and her work aboard the

106
00:05:54,150 --> 00:05:52,070
the reason that you would do any kind of

107
00:05:55,830 --> 00:05:54,160
experiment in space is if there's

108
00:05:58,150 --> 00:05:55,840
something particular about the space

109
00:06:01,510 --> 00:05:58,160
environment most often that is

110
00:06:05,350 --> 00:06:02,390
so

111
00:06:07,430 --> 00:06:05,360
mostly the iss gives us the ability to

112
00:06:10,710 --> 00:06:07,440
either do something that we can't do in

113
00:06:13,430 --> 00:06:10,720

a facility on earth or investigate some

114
00:06:15,749 --> 00:06:13,440
phenomenon some property in a way that

115
00:06:17,990 --> 00:06:15,759
we can't on earth so for example some of

116
00:06:20,390 --> 00:06:18,000
the tissue architecture these really

117
00:06:22,710 --> 00:06:20,400
delicate tissues as you start to build

118
00:06:24,629 --> 00:06:22,720
them up they would collapse

119
00:06:26,390 --> 00:06:24,639
because you have gravity or the cells

120
00:06:28,390 --> 00:06:26,400
would naturally settle to the bottom of

121
00:06:30,309 --> 00:06:28,400
the plate and so

122
00:06:32,550 --> 00:06:30,319
you just can't study the answer to the

123
00:06:34,550 --> 00:06:32,560
question that you're looking for so

124
00:06:36,550 --> 00:06:34,560
the space station lets us

125
00:06:39,670 --> 00:06:36,560
have that ability to either test what

126
00:06:41,830 --> 00:06:39,680
the effect of gravity is or remove that

127
00:06:45,029 --> 00:06:41,840
problem entirely from our experimental

128
00:06:48,710 --> 00:06:46,629
yeah the space station is an incredible

129
00:06:51,270 --> 00:06:48,720
place to conduct research it was sort of

130
00:06:54,390 --> 00:06:51,280
like being in the world's most amazing

131
00:06:55,909 --> 00:06:54,400
lab when i was up there in 2016.

132
00:06:58,150 --> 00:06:55,919
so when you're scientists you're used to

133
00:07:00,550 --> 00:06:58,160
working on one thing over and over and

134
00:07:03,189 --> 00:07:00,560
maybe really refining the details on

135
00:07:04,629 --> 00:07:03,199
that over the course of a phd thesis or

136
00:07:06,790 --> 00:07:04,639
a lab project

137
00:07:09,589 --> 00:07:06,800
on space station you get somebody's

138
00:07:11,990 --> 00:07:09,599

incredibly refined project times 200

139
00:07:13,830 --> 00:07:12,000
different fields so for me it was a

140
00:07:15,830 --> 00:07:13,840
chance to learn about all these

141
00:07:19,670 --> 00:07:15,840
different areas of science and they each

142
00:07:21,189 --> 00:07:19,680
have a team behind them so i was usually

143
00:07:22,790 --> 00:07:21,199
pretty excited to

144
00:07:25,029 --> 00:07:22,800
open the container and do whatever

145
00:07:26,950 --> 00:07:25,039
experiment that they brought

146
00:07:29,749 --> 00:07:26,960
i also really got a chance to talk to

147
00:07:32,950 --> 00:07:29,759
those pis the principal investigators

148
00:07:34,390 --> 00:07:32,960
and the scientific teams and understand

149
00:07:36,629 --> 00:07:34,400
everything that was going on behind

150
00:07:38,790 --> 00:07:36,639
their experiments and read their papers

151
00:07:41,350 --> 00:07:38,800
so by the time i got to doing the

152
00:07:42,950 --> 00:07:41,360
experiment i was i was pretty excited to

153
00:07:44,629 --> 00:07:42,960
to take it out and to see what was going

154
00:07:46,950 --> 00:07:44,639
to change in microgravity

155
00:07:49,270 --> 00:07:46,960
yeah science in space it's an amazing

156
00:07:52,140 --> 00:07:49,280
lab and it's incredibly fun so

157
00:07:55,350 --> 00:07:52,150
we are smiling all the time

158
00:07:59,800 --> 00:07:57,749
i'm kate rubins i'm a scientist and an

159
00:08:30,629 --> 00:07:59,810
astronaut

160
00:08:34,870 --> 00:08:32,630
and raised in napa california nasa

161
00:08:37,110 --> 00:08:34,880
astronaut dr kate rubins conducted her

162
00:08:39,430 --> 00:08:37,120
undergraduate research on hiv-1

163
00:08:41,269 --> 00:08:39,440

integration in the infectious disease

164
00:08:43,430 --> 00:08:41,279
laboratory at the salk institute for

165
00:08:45,110 --> 00:08:43,440
biological studies earning a bachelor's

166
00:08:47,350 --> 00:08:45,120
degree in molecular biology from the

167
00:08:49,030 --> 00:08:47,360
university of california san diego in

168
00:08:51,590 --> 00:08:49,040
1999.

169
00:08:53,590 --> 00:08:51,600
she earned a phd in cancer biology from

170
00:08:55,829 --> 00:08:53,600
stanford university medical school's

171
00:08:57,990 --> 00:08:55,839
biochemistry department and microbiology

172
00:08:59,750 --> 00:08:58,000
and immunology department with the u.s

173
00:09:01,590 --> 00:08:59,760
army medical research institute of

174
00:09:03,829 --> 00:09:01,600
infectious diseases and the center for

175
00:09:05,350 --> 00:09:03,839
disease control and prevention rubens

176
00:09:07,910 --> 00:09:05,360
and her colleagues developed the first

177
00:09:10,070 --> 00:09:07,920
model of smallpox infection she also

178
00:09:12,150 --> 00:09:10,080
studied poxvirus and virus host

179
00:09:13,670 --> 00:09:12,160
interactions rubens then accepted a

180
00:09:15,430 --> 00:09:13,680
fellowship position as a principal

181
00:09:17,590 --> 00:09:15,440
investigator at the whitehead institute

182
00:09:19,910 --> 00:09:17,600
for biomedical research at mit in

183
00:09:22,070 --> 00:09:19,920
cambridge massachusetts and headed a lab

184
00:09:24,150 --> 00:09:22,080
of 14 researchers studying viral

185
00:09:25,670 --> 00:09:24,160
diseases that primarily affect central

186
00:09:27,190 --> 00:09:25,680
and west africa

187
00:09:29,269 --> 00:09:27,200
she presented her work at numerous

188
00:09:30,710 --> 00:09:29,279

international scientific conferences and

189
00:09:33,670 --> 00:09:30,720
was published in many scientific

190
00:09:35,590 --> 00:09:33,680
journals then in july 2009 after

191
00:09:37,829 --> 00:09:35,600
applying on a whim rubens was selected

192
00:09:39,110 --> 00:09:37,839
as one of nine members of the 2009 nasa

193
00:09:40,630 --> 00:09:39,120
astronaut class

194
00:09:43,990 --> 00:09:40,640
she launched into space for the first

195
00:09:46,630 --> 00:09:44,000
time aboard soyuz ms-1 in 2016 as part

196
00:09:48,310 --> 00:09:46,640
of expeditions 48 and 49. during that

197
00:09:50,949 --> 00:09:48,320
mission rubens became the first person

198
00:09:52,630 --> 00:09:50,959
to sequence dna in space in addition she

199
00:09:54,710 --> 00:09:52,640
conducted two spacewalks along with

200
00:09:56,550 --> 00:09:54,720
astronaut jeff williams installing the

201
00:09:58,550 --> 00:09:56,560
first docking port for u.s commercial

202
00:09:59,990 --> 00:09:58,560
crew spacecraft

203
00:10:02,150 --> 00:10:00,000
rubens is seated to the right of the

204
00:10:03,829 --> 00:10:02,160
soyuz commander rose cosmos cosmonaut

205
00:10:05,990 --> 00:10:03,839
sergey rizhikov who is returning to

206
00:10:08,790 --> 00:10:06,000
space for the second time today born in

207
00:10:10,790 --> 00:10:08,800
bogoma tatarstan russia rizhikov went to

208
00:10:13,590 --> 00:10:10,800
high school and young aviator school in

209
00:10:16,069 --> 00:10:13,600
the tumen region of russia afterward he

210
00:10:19,430 --> 00:10:16,079
attended katja air force pilot school

211
00:10:21,190 --> 00:10:19,440
graduating in 1996 as a pilot engineer

212
00:10:24,870 --> 00:10:21,200
richkoff served as a pilot in the

213
00:10:25,990 --> 00:10:24,880

russian air force from 1996 to 2007. by

214
00:10:28,470 --> 00:10:26,000
the time of his election by the

215
00:10:30,230 --> 00:10:28,480
cosmonaut corps he was a military pilot

216
00:10:33,030 --> 00:10:30,240
of the second class having logged more

217
00:10:35,670 --> 00:10:33,040
than 700 flight hours piloting the l-9

218
00:10:38,389 --> 00:10:35,680
and mig-29 planes he is certified as a

219
00:10:40,790 --> 00:10:38,399
military officer diver and paratrooper

220
00:10:42,790 --> 00:10:40,800
instructor with more than 350 parachute

221
00:10:45,350 --> 00:10:42,800
jumps after beginning his training in

222
00:10:46,949 --> 00:10:45,360
2006 as a member of class 14 of the

223
00:10:49,590 --> 00:10:46,959
gagarin cosmonaut training center

224
00:10:52,069 --> 00:10:49,600
cosmonaut core rizhikov completed basic

225
00:10:54,150 --> 00:10:52,079
space flight training in 2009 qualifying

226
00:10:57,110 --> 00:10:54,160
as a test cosmonaut his first trip into

227
00:10:59,030 --> 00:10:57,120
space was in 2016 as the soyuz ms o2

228
00:11:01,750 --> 00:10:59,040
commander and is a flight engineer for

229
00:11:03,509 --> 00:11:01,760
space station expeditions 49 and 50.

230
00:11:05,350 --> 00:11:03,519
while aboard he conducted dozens of

231
00:11:07,910 --> 00:11:05,360
russian science program experiments in

232
00:11:10,389 --> 00:11:07,920
medicine space biology biotechnology

233
00:11:12,790 --> 00:11:10,399
physics and chemistry among others his

234
00:11:14,630 --> 00:11:12,800
call sign this favor a reference to

235
00:11:16,389 --> 00:11:14,640
mount tabor in israel

236
00:11:17,990 --> 00:11:16,399
rizhikov is serving as the ms-17

237
00:11:19,190 --> 00:11:18,000
commander and will become a space

238
00:11:21,509 --> 00:11:19,200

station commander as well when

239
00:11:23,430 --> 00:11:21,519
expedition 64 begins

240
00:11:26,949 --> 00:11:23,440
seated to his left is first time fire

241
00:11:28,870 --> 00:11:26,959
rose cosmos cosmonaut sergey kuzkurskov

242
00:11:30,710 --> 00:11:28,880
born in lennisk now baikonur in the

243
00:11:32,790 --> 00:11:30,720
cozlorato region of kazakhstan

244
00:11:34,870 --> 00:11:32,800
kudzkritchkov went to high school in

245
00:11:37,110 --> 00:11:34,880
korolev in the moscow region of russia

246
00:11:39,269 --> 00:11:37,120
graduating in 2000

247
00:11:41,350 --> 00:11:39,279
in 2006 he graduated with a first class

248
00:11:43,350 --> 00:11:41,360
honors degree from the moscow bauman

249
00:11:44,630 --> 00:11:43,360
technical university as a rocket engine

250
00:11:46,389 --> 00:11:44,640
engineer

251
00:11:48,389 --> 00:11:46,399
he went on to serve at the inergia

252
00:11:51,829 --> 00:11:48,399
rocket and space corporation as an

253
00:11:53,829 --> 00:11:51,839
engineer from 2006 to 2009 in 2010 he

254
00:11:55,509 --> 00:11:53,839
was admitted into class 17 of the

255
00:11:57,670 --> 00:11:55,519
inergia rocket and space corporation

256
00:11:59,350 --> 00:11:57,680
cosmonaut corps completing his training

257
00:12:00,710 --> 00:11:59,360
and qualifying as a test cosmonaut in

258
00:12:03,269 --> 00:12:00,720
2012.

259
00:12:05,030 --> 00:12:03,279
from august 2012 to october 2019 he took

260
00:12:06,870 --> 00:12:05,040
advanced training specializing in the

261
00:12:08,310 --> 00:12:06,880
space station program

262
00:12:10,710 --> 00:12:08,320
working from the left seat today is

263
00:12:12,790 --> 00:12:10,720

soyuz ms-17 flight engineer one

264
00:12:14,550 --> 00:12:12,800
kudzkurchgov will surf aboard the space

265
00:12:20,069 --> 00:12:14,560
station as an expedition 64 flight

266
00:12:24,870 --> 00:12:21,590
once again we are taking questions

267
00:12:26,310 --> 00:12:24,880
online via the hashtag ask nasa so if

268
00:12:27,910 --> 00:12:26,320
you're following along on social media

269
00:12:29,430 --> 00:12:27,920
you can get your questions into us and

270
00:12:30,790 --> 00:12:29,440
we have a couple that have already been

271
00:12:33,190 --> 00:12:30,800
submitted that we'll go ahead and try to

272
00:12:35,670 --> 00:12:33,200
answer you answer for you now

273
00:12:38,389 --> 00:12:35,680
uh this first one coming from rob wood

274
00:12:40,150 --> 00:12:38,399
in uk asking when will chris cassidy

275
00:12:42,870 --> 00:12:40,160
return from the space station

276
00:12:44,629 --> 00:12:42,880
cassidy is on board now with two other

277
00:12:46,069 --> 00:12:44,639
russian cosmonauts and they are all

278
00:12:47,829 --> 00:12:46,079
going to be returning next week they'll

279
00:12:50,470 --> 00:12:47,839
have just a short handover time where

280
00:12:53,509 --> 00:12:50,480
they can make sure that their

281
00:12:55,430 --> 00:12:53,519
colleagues that are on their way today

282
00:12:56,949 --> 00:12:55,440
uh will be ready to take care of the

283
00:12:59,750 --> 00:12:56,959
space station once they've left and then

284
00:13:01,110 --> 00:12:59,760
they will be coming home on october 21st

285
00:13:03,030 --> 00:13:01,120
just like tonight you'll be able to

286
00:13:05,030 --> 00:13:03,040
watch all of our coverage of those

287
00:13:08,310 --> 00:13:05,040
events starting with uh

288
00:13:09,269 --> 00:13:08,320

their undocking and and then a return to

289
00:13:15,030 --> 00:13:09,279
the

290
00:13:17,590 --> 00:13:15,040
down uh that coverage will begin at 7 pm

291
00:13:22,310 --> 00:13:17,600
central time on wednesday october 21st

292
00:13:28,389 --> 00:13:26,470
we also have a second question this one

293
00:13:29,670 --> 00:13:28,399
coming from

294
00:13:31,190 --> 00:13:29,680
omar

295
00:13:34,550 --> 00:13:31,200
and asking whether or not astronauts

296
00:13:36,470 --> 00:13:34,560
ever suffer from motion sickness and it

297
00:13:38,310 --> 00:13:36,480
varies from astronaut to astronaut but

298
00:13:39,990 --> 00:13:38,320
there are definitely some who suffer

299
00:13:41,350 --> 00:13:40,000
from a little bit of motion sickness

300
00:13:43,030 --> 00:13:41,360
when they first

301
00:13:45,990 --> 00:13:43,040
go to space and then also when they

302
00:13:47,829 --> 00:13:46,000
return from space they tend to have

303
00:13:51,110 --> 00:13:47,839
they can they can have a trouble

304
00:13:53,430 --> 00:13:51,120
adjusting to to the uh to the

305
00:13:55,750 --> 00:13:53,440
return of gravity in their lives um that

306
00:13:56,949 --> 00:13:55,760
can be a little rough on both ends so

307
00:13:59,189 --> 00:13:56,959
when they arrive at the space station

308
00:14:00,790 --> 00:13:59,199
they're given a little um time to adjust

309
00:14:03,030 --> 00:14:00,800
there's some time built in into their

310
00:14:05,990 --> 00:14:03,040
schedule specifically for microgravity

311
00:14:08,310 --> 00:14:06,000
adjustment and then once they return

312
00:14:09,670 --> 00:14:08,320
a lot of times you'll see the the people

313
00:14:11,350 --> 00:14:09,680

who are supporting them on the ground

314
00:14:13,590 --> 00:14:11,360
being very careful

315
00:14:15,910 --> 00:14:13,600
to help them move around make sure

316
00:14:18,069 --> 00:14:15,920
they've got some support once they get

317
00:14:21,110 --> 00:14:18,079
out of the spacecraft and and onto solid

318
00:14:22,069 --> 00:14:21,120
ground again to make sure that they um

319
00:14:24,470 --> 00:14:22,079
they have

320
00:14:26,550 --> 00:14:24,480
all the help that's possible um

321
00:14:28,790 --> 00:14:26,560
adjusting to that that first feel of

322
00:14:32,389 --> 00:14:28,800
gravity for for once after they've

323
00:14:36,710 --> 00:14:34,230
you can keep sending those in using the

324
00:14:39,189 --> 00:14:36,720
hashtag ask nasa but

325
00:14:41,590 --> 00:14:39,199
one of the questions that we often get

326
00:14:44,710 --> 00:14:41,600
is about the cruise patch

327
00:14:47,829 --> 00:14:44,720
and we actually have a clip now

328
00:14:53,269 --> 00:14:47,839
of kate rubens explaining that during a

329
00:14:58,310 --> 00:14:56,069
the 64 patch is actually a photograph

330
00:14:59,590 --> 00:14:58,320
that i took when i was on board iss the

331
00:15:01,110 --> 00:14:59,600
last time

332
00:15:03,269 --> 00:15:01,120
and it's the underside of the

333
00:15:05,990 --> 00:15:03,279
international space station as we're

334
00:15:08,150 --> 00:15:06,000
flying over uh city lights in europe and

335
00:15:10,470 --> 00:15:08,160
so you can see all the lights of these

336
00:15:12,629 --> 00:15:10,480
cities being reflected

337
00:15:14,550 --> 00:15:12,639
on on the underside of the space station

338
00:15:17,430 --> 00:15:14,560

i just thought it was this great uh

339
00:15:19,509 --> 00:15:17,440
analogy of the connectedness between uh

340
00:15:21,030 --> 00:15:19,519
earth and space and and the fact that

341
00:15:23,430 --> 00:15:21,040
you've got lights in these cities down

342
00:15:26,069 --> 00:15:23,440
below and they're reflected in the space

343
00:15:28,470 --> 00:15:26,079
station and uh then you can see of

344
00:15:35,030 --> 00:15:28,480
course the space station pass overhead

345
00:15:38,949 --> 00:15:37,189
back now with a live view of the soyuz

346
00:15:40,790 --> 00:15:38,959
on the launch pad in baikonur as we

347
00:15:43,430 --> 00:15:40,800
continue our coverage of the launch of

348
00:15:45,430 --> 00:15:43,440
kate rubins sergey rizhikov and sergey

349
00:15:46,710 --> 00:15:45,440
kuzkov to the international space

350
00:15:49,590 --> 00:15:46,720
station

351
00:15:51,910 --> 00:15:49,600
we're now 45 minutes away from today's

352
00:15:55,590 --> 00:15:51,920
launch with liftoff scheduled for 12 45

353
00:15:57,189 --> 00:15:55,600
am central time 10 45 a.m in baikonur

354
00:15:58,870 --> 00:15:57,199
and just a reminder that we are taking

355
00:16:20,069 --> 00:15:58,880
those questions so keep sending them in

356
00:16:20,079 --> 00:16:34,710
what's up

357
00:16:34,720 --> 00:16:37,910
20.

358
00:16:43,990 --> 00:16:41,350
one minute 21 seconds for the first 141

359
00:16:45,110 --> 00:16:44,000
for the second

360
00:16:47,670 --> 00:16:45,120
year

361
00:16:56,980 --> 00:16:47,680
the pressure is 816.

362
00:17:05,590 --> 00:17:02,870
[Music]

363
00:17:12,349 --> 00:17:08,549

the second section is 208

364
00:17:14,549 --> 00:17:12,359
and 224 in the second section as well

365
00:17:17,350 --> 00:17:14,559
[Music]

366
00:17:19,110 --> 00:17:17,360
i am 16-3 i understand that the suits

367
00:17:21,510 --> 00:17:19,120
are airtight

368
00:17:26,630 --> 00:17:21,520
i've also received the pressure on

369
00:17:26,640 --> 00:18:04,630
i understand

370
00:18:04,640 --> 00:18:16,490
foreign

371
00:18:20,230 --> 00:18:18,549
[Music]

372
00:18:21,990 --> 00:18:20,240
as i was saying you can send in your

373
00:18:24,230 --> 00:18:22,000
questions to us using the hashtag ask

374
00:18:26,950 --> 00:18:24,240
nasa and we've got a few more ready for

375
00:18:30,549 --> 00:18:26,960
you now uh the next one

376
00:18:32,390 --> 00:18:30,559
coming from pratham who is asking uh

377
00:18:34,390 --> 00:18:32,400
how long will these astronauts stay on

378
00:18:36,310 --> 00:18:34,400
board the space station the plan right

379
00:18:37,830 --> 00:18:36,320
now is for them to stay about six months

380
00:18:41,669 --> 00:18:37,840
which is about the standard amount of

381
00:18:44,870 --> 00:18:41,679
time uh that is always a little uh

382
00:18:49,270 --> 00:18:47,190
dependent on circumstances but in this

383
00:18:50,710 --> 00:18:49,280
case uh and for the most part the

384
00:18:52,390 --> 00:18:50,720
astronauts will stay about six months at

385
00:18:54,230 --> 00:18:52,400
a time which gives them a good chance to

386
00:18:56,870 --> 00:18:54,240
get very used to the international space

387
00:18:59,190 --> 00:18:56,880
station and really dig in on the work

388
00:19:01,110 --> 00:18:59,200

that goes on there and contribute to the

389
00:19:06,789 --> 00:19:01,120
science that the space station does and

390
00:19:10,630 --> 00:19:08,950
and we also have another one this one

391
00:19:12,150 --> 00:19:10,640
coming in from dan asking how many

392
00:19:13,990 --> 00:19:12,160
astronauts can the space station

393
00:19:15,750 --> 00:19:14,000
accommodate and how many are there at

394
00:19:17,590 --> 00:19:15,760
this time

395
00:19:21,190 --> 00:19:17,600
right now we've just got the three

396
00:19:24,710 --> 00:19:21,200
members of the expedition 60 through 63

397
00:19:26,630 --> 00:19:24,720
crew waiting for this new uh influx of

398
00:19:28,230 --> 00:19:26,640
of uh astronauts who are on their way

399
00:19:29,510 --> 00:19:28,240
today

400
00:19:30,230 --> 00:19:29,520
once they get there of course there will

401
00:19:32,070 --> 00:19:30,240
be

402
00:19:35,029 --> 00:19:32,080
six for a short amount of time and then

403
00:19:38,390 --> 00:19:35,039
they will soon be joined by the spacex

404
00:19:40,230 --> 00:19:38,400
crew one crew they'll be launching in in

405
00:19:41,750 --> 00:19:40,240
november and joining them that'll add

406
00:19:45,110 --> 00:19:41,760
four more people to the space station

407
00:19:47,350 --> 00:19:45,120
bringing that total of up to seven which

408
00:19:49,830 --> 00:19:47,360
we are hoping to have be kind of the

409
00:19:52,150 --> 00:19:49,840
normal number for the space station crew

410
00:19:53,830 --> 00:19:52,160
now that uh her commercial crew partners

411
00:19:55,510 --> 00:19:53,840
are being beginning to launch crew to

412
00:19:57,669 --> 00:19:55,520
the international space station that's

413
00:19:59,750 --> 00:19:57,679

not the limit of what the space station

414
00:20:02,789 --> 00:19:59,760
can accommodate though uh that'll be

415
00:20:04,950 --> 00:20:02,799
kind of the the normal operating amount

416
00:20:08,149 --> 00:20:04,960
but when there are handovers like we'll

417
00:20:09,830 --> 00:20:08,159
be experiencing this week while chris

418
00:20:11,029 --> 00:20:09,840
cassidy is uh

419
00:20:12,870 --> 00:20:11,039
is uh

420
00:20:14,390 --> 00:20:12,880
welcoming kate rubens and her crewmate

421
00:20:16,950 --> 00:20:14,400
to the space station

422
00:20:19,350 --> 00:20:16,960
there will be a few more uh there so

423
00:20:21,750 --> 00:20:19,360
there could be as many as about

424
00:20:26,620 --> 00:20:21,760
nine or ten there at a time

425
00:20:26,630 --> 00:20:30,310
[Music]

426
00:20:33,669 --> 00:20:31,750
here in just a moment we'll begin seeing

427
00:20:35,190 --> 00:20:33,679
some video that's been recorded over the

428
00:20:36,870 --> 00:20:35,200
course of the day as the crew walk

429
00:20:41,669 --> 00:20:36,880
through their activities leading up to

430
00:20:44,630 --> 00:20:43,029
but once again you can keep submitting

431
00:20:46,710 --> 00:20:44,640
those questions using the hashtag ask

432
00:20:51,240 --> 00:20:46,720
nasa and we'll try and take a few more

433
00:21:07,520 --> 00:20:51,250
before today's broadcast is over

434
00:21:14,590 --> 00:21:13,270
[Music]

435
00:21:17,190 --> 00:21:14,600
so

436
00:21:19,190 --> 00:21:17,200
[Music]

437
00:21:21,190 --> 00:21:19,200
and here is the promised video showing

438
00:21:23,830 --> 00:21:21,200

what the crew has been up to today as

439
00:21:25,590 --> 00:21:23,840
they prepared for their launch

440
00:21:27,430 --> 00:21:25,600
today's activities in baikonur began

441
00:21:30,230 --> 00:21:27,440
several hours ago as the crew was

442
00:21:32,070 --> 00:21:30,240
awakened around 2 pm central time on

443
00:21:33,990 --> 00:21:32,080
tuesday or midnight local time on

444
00:21:35,909 --> 00:21:34,000
wednesday in baikonur

445
00:21:37,510 --> 00:21:35,919
about 10 hours and 45 minutes ahead of

446
00:21:39,350 --> 00:21:37,520
their launch

447
00:21:42,149 --> 00:21:39,360
crew members here you see participating

448
00:21:45,510 --> 00:21:42,159
in that time modern tradition that they

449
00:21:46,950 --> 00:21:45,520
always do in baikonur signing the doors

450
00:21:48,470 --> 00:21:46,960
of their

451
00:21:51,590 --> 00:21:48,480
the rooms that they stayed in at their

452
00:21:53,350 --> 00:21:51,600
crew quarters are at the cosmonaut hotel

453
00:21:55,110 --> 00:21:53,360
in uh

454
00:21:58,390 --> 00:21:55,120
in the town of baikonur

455
00:22:00,470 --> 00:21:58,400
around 5 45 pm central on tuesday 3 45

456
00:22:02,470 --> 00:22:00,480
a.m wednesday in baikonur

457
00:22:03,590 --> 00:22:02,480
the crew then departed the cosmonaut

458
00:22:06,070 --> 00:22:03,600
hotel

459
00:22:08,070 --> 00:22:06,080
and boarded the bus for a 40 minute ride

460
00:22:10,870 --> 00:22:08,080
to the integration and student facility

461
00:22:12,870 --> 00:22:10,880
that's building 254 inside the cosm the

462
00:22:14,470 --> 00:22:12,880
baikonur cosmodrome

463
00:22:15,990 --> 00:22:14,480

you can see i'm walking out from the

464
00:22:18,549 --> 00:22:16,000
hotel here

465
00:22:20,789 --> 00:22:18,559
the crowd much more limited than usual

466
00:22:24,230 --> 00:22:20,799
due to the restrictions associated with

467
00:22:26,149 --> 00:22:24,240
coronavirus precautions

468
00:22:28,870 --> 00:22:26,159
still just a few people who were able to

469
00:22:29,590 --> 00:22:28,880
attend uh that carefully controlled but

470
00:22:31,750 --> 00:22:29,600
uh

471
00:22:33,110 --> 00:22:31,760
normally the crew's family would be

472
00:22:35,110 --> 00:22:33,120
there as well as a pretty good

473
00:22:37,190 --> 00:22:35,120
contingent of vips but that wasn't

474
00:22:43,070 --> 00:22:37,200
possible for this launch due to those

475
00:22:43,080 --> 00:22:52,950
[Music]

476
00:22:58,789 --> 00:22:55,270
again getting on the bus here to take

477
00:23:00,310 --> 00:22:58,799
that 40 minute ride to the

478
00:23:01,750 --> 00:23:00,320
building where they uh getting to get

479
00:23:04,789 --> 00:23:01,760
into their spacesuits the integration

480
00:23:07,270 --> 00:23:04,799
and suit up facility

481
00:23:11,029 --> 00:23:07,280
waving some final goodbyes to the crowd

482
00:23:16,630 --> 00:23:14,070
crew spends their last few weeks uh

483
00:23:18,230 --> 00:23:16,640
ahead of launch in that hotel

484
00:23:19,669 --> 00:23:18,240
they have a little bit of time to rest

485
00:23:21,350 --> 00:23:19,679
and do some

486
00:23:23,669 --> 00:23:21,360
last minute studying making sure that

487
00:23:46,380 --> 00:23:23,679
they are ready for the launch and all

488
00:23:46,390 --> 00:24:01,830

[Music]

489
00:24:06,710 --> 00:24:04,149
and pulling away here from the baikonur

490
00:24:08,470 --> 00:24:06,720
uh the cosmonaut hotel in baikonur again

491
00:24:11,590 --> 00:24:08,480
heading to the building where they get

492
00:24:13,350 --> 00:24:11,600
into their so-called spacesuits

493
00:24:15,669 --> 00:24:13,360
this ride takes about 40 minutes and

494
00:24:17,430 --> 00:24:15,679
then they uh

495
00:24:20,070 --> 00:24:17,440
arrive at the integration building where

496
00:24:22,149 --> 00:24:20,080
each crew member underwent final medical

497
00:24:23,750 --> 00:24:22,159
exams and then suited up in their launch

498
00:24:25,350 --> 00:24:23,760
and entry suits the suits are

499
00:24:27,269 --> 00:24:25,360
pressurized to ensure that they're free

500
00:24:29,909 --> 00:24:27,279
from leaks

501
00:24:32,149 --> 00:24:29,919
as program officials look on through

502
00:24:35,430 --> 00:24:32,159
protective glass that helps them

503
00:24:39,510 --> 00:24:37,190
suit up takes about five and a half

504
00:24:53,350 --> 00:24:39,520
hours or is completed about five and a

505
00:25:08,390 --> 00:24:55,190
sergey rizhikov there

506
00:25:08,400 --> 00:25:37,590
and sergey kudzburch called there

507
00:26:09,470 --> 00:25:57,029
okay

508
00:26:09,480 --> 00:26:14,230
[Music]

509
00:26:18,870 --> 00:26:16,870
and nasa astronaut kate rubens here

510
00:26:19,909 --> 00:26:18,880
getting into her suit

511
00:26:22,789 --> 00:26:19,919
this again

512
00:26:29,830 --> 00:26:22,799
all took place about uh

513
00:26:32,549 --> 00:26:30,950

in the

514
00:26:36,230 --> 00:26:32,559
integration and suit-up facility at the

515
00:26:38,070 --> 00:26:36,240
baikonur cosmodrome that's building 254

516
00:26:41,750 --> 00:26:38,080
so the crew's first stop after leaving

517
00:26:44,710 --> 00:26:43,110
they went through a series of checks

518
00:26:46,870 --> 00:26:44,720
here to make sure these suits were

519
00:27:04,630 --> 00:26:46,880
leak-free and would be ready to serve

520
00:27:08,149 --> 00:27:06,549
and taking a few minutes there to to

521
00:27:11,909 --> 00:27:08,159
grab a little bit of rest before the

522
00:27:13,590 --> 00:27:11,919
launch which is now just 34 minutes away

523
00:27:15,750 --> 00:27:13,600
again this video was recorded earlier

524
00:27:17,990 --> 00:27:15,760
and during the day as the crew was

525
00:27:20,470 --> 00:27:18,000
making their final preparations

526
00:27:31,430 --> 00:27:20,480
once again this is a view of kate rubins

527
00:27:35,110 --> 00:27:33,430
it is a long day for the crew with those

528
00:27:36,710 --> 00:27:35,120
uh

529
00:27:38,389 --> 00:27:36,720
with their wake-up call coming again

530
00:27:40,070 --> 00:27:38,399
about 10 hours and 45 minutes ahead of

531
00:27:44,070 --> 00:27:40,080
their launch and

532
00:27:45,350 --> 00:27:44,080
quite a bit of time to go once they

533
00:27:46,870 --> 00:27:45,360
do launch to make their way to the

534
00:27:49,269 --> 00:27:46,880
international space station although

535
00:27:51,110 --> 00:27:49,279
this trip will be shorter than any

536
00:27:53,190 --> 00:27:51,120
previous trip that

537
00:27:55,269 --> 00:27:53,200
soyuz crews have made

538
00:27:56,230 --> 00:27:55,279

we'll be making this trip in just two

539
00:28:03,590 --> 00:27:56,240
orbits

540
00:28:03,600 --> 00:28:28,830
um

541
00:28:33,430 --> 00:28:31,830
whoa those leak checks that occurred

542
00:28:35,029 --> 00:28:33,440
earlier today here

543
00:28:36,630 --> 00:28:35,039
crews also uh

544
00:28:38,310 --> 00:28:36,640
in real time going through some final

545
00:28:41,350 --> 00:28:38,320
leak checks as well and that was

546
00:28:43,430 --> 00:28:41,360
actually completed uh just momentarily

547
00:28:44,549 --> 00:28:43,440
just a moment ago

548
00:28:46,230 --> 00:28:44,559
all good

549
00:28:48,070 --> 00:28:46,240
readings from those leak checks so they

550
00:29:15,110 --> 00:28:48,080
should be ready to take off on time at

551
00:29:15,120 --> 00:29:52,230
here

552
00:29:52,240 --> 00:29:56,389
you know

553
00:29:56,399 --> 00:30:13,430
president

554
00:30:17,430 --> 00:30:15,269
continuing to see video from today's

555
00:30:19,029 --> 00:30:17,440
earlier preparations this again was the

556
00:30:22,070 --> 00:30:19,039
crew's first stop after they left the

557
00:30:25,029 --> 00:30:22,080
cosmonaut hotel this morning

558
00:30:34,149 --> 00:30:25,039
here seeing kate rubens get her

559
00:30:40,549 --> 00:30:36,710
and the crew here is pausing for a photo

560
00:30:45,269 --> 00:30:42,149
and just on the other side of the glass

561
00:30:47,590 --> 00:30:45,279
out of view here number of uh

562
00:30:50,710 --> 00:30:47,600
vips and guests were watching again a

563
00:30:52,470 --> 00:30:50,720

smaller group than usual but

564
00:30:55,190 --> 00:30:52,480
but still a good number of people

565
00:30:57,590 --> 00:30:55,200
interested in their launch all uh behind

566
00:30:59,430 --> 00:30:57,600
a glass that helps protect the crew

567
00:31:01,430 --> 00:30:59,440
members that glass is always there but

568
00:31:02,789 --> 00:31:01,440
especially important right now

569
00:31:05,029 --> 00:31:02,799
with the coved

570
00:31:06,149 --> 00:31:05,039
restrictions that are protecting them

571
00:31:07,909 --> 00:31:06,159
before they make their way to

572
00:31:09,750 --> 00:31:07,919
international space station those have

573
00:31:10,549 --> 00:31:09,760
been very uh

574
00:31:13,830 --> 00:31:10,559
very

575
00:31:16,470 --> 00:31:13,840
strictly watched throughout

576
00:31:18,389 --> 00:31:16,480
good morning happy birthday kate

577
00:31:20,310 --> 00:31:18,399
we have a great space station that's

578
00:31:21,750 --> 00:31:20,320
waiting the three years arrival and

579
00:31:22,789 --> 00:31:21,760
we're looking forward to seeing you on

580
00:31:29,110 --> 00:31:22,799
orb with all three of you

581
00:31:35,590 --> 00:31:31,190
with space station program manager joe

582
00:31:38,070 --> 00:31:36,870
we will be

583
00:31:41,029 --> 00:31:38,080
glad

584
00:31:43,909 --> 00:31:41,039
to see you in a few hours just a little

585
00:31:46,710 --> 00:31:43,919
over three hours after lunch

586
00:31:49,430 --> 00:31:46,720
when you arrive on station

587
00:31:56,470 --> 00:31:49,440
have a safe trip and a great

588
00:32:01,430 --> 00:31:58,870

it is an honor to continue

589
00:32:03,909 --> 00:32:01,440
this tradition you started it mr

590
00:32:07,269 --> 00:32:03,919
kurikaliov and we are continuing it 20

591
00:32:25,520 --> 00:32:07,279
years later thank you

592
00:32:28,470 --> 00:32:26,870
[Applause]

593
00:32:31,669 --> 00:32:28,480
following those leak checks and some

594
00:32:33,590 --> 00:32:31,679
final well wishes from the from those uh

595
00:32:35,190 --> 00:32:33,600
managers and uh from nasa and rose

596
00:32:37,269 --> 00:32:35,200
cosmos there who were

597
00:32:39,909 --> 00:32:37,279
watching the proceedings they

598
00:32:42,789 --> 00:32:39,919
again uh went on to maintain tradition

599
00:32:44,389 --> 00:32:42,799
tradition and strode out of the site 254

600
00:32:46,230 --> 00:32:44,399
integration building towards russian

601
00:32:58,400 --> 00:32:46,240
managers to declare one final time that

602
00:33:02,389 --> 00:33:00,230
[Music]

603
00:33:05,190 --> 00:33:02,399
this is taking place about 8 59 pm

604
00:33:07,190 --> 00:33:05,200
central time on tuesday 4 59 a.m

605
00:33:11,110 --> 00:33:07,200
wednesday in baikonur

606
00:33:13,269 --> 00:33:11,120
and here you can see them

607
00:33:16,070 --> 00:33:13,279
boarding their bus again this time for

608
00:33:19,909 --> 00:33:16,080
the ride to launch pad 31.

609
00:33:22,149 --> 00:33:19,919
all the best of luck to everyone

610
00:33:35,750 --> 00:33:22,159
everything will be great you will be

611
00:33:40,230 --> 00:33:37,830
final goodbyes also to their backup crew

612
00:33:42,470 --> 00:33:40,240
now relieved their duty

613
00:33:49,430 --> 00:33:42,480

that was a mark vanda high that kate

614
00:33:53,669 --> 00:33:51,190
the drive to the pad took about 50

615
00:33:55,750 --> 00:33:53,679
minutes and they arrived at 10 14 p.m

616
00:34:07,190 --> 00:33:55,760
central time or 8 14 a.m wednesday in

617
00:34:19,349 --> 00:34:08,069
okay

618
00:34:23,270 --> 00:34:21,109
and of course this would not be the time

619
00:34:25,109 --> 00:34:23,280
to trip and fall and those uh so-called

620
00:34:27,190 --> 00:34:25,119
spacesuits aren't the easiest thing to

621
00:34:28,869 --> 00:34:27,200
walk in so they're helped carefully

622
00:34:30,869 --> 00:34:28,879
there to the uh

623
00:34:33,349 --> 00:34:30,879
to their rocket where they're where they

624
00:34:35,190 --> 00:34:33,359
climb just a few stairs

625
00:34:36,950 --> 00:34:35,200
to wave goodbye to well-wishers before

626
00:34:39,030 --> 00:34:36,960
getting into an elevator for a ride to

627
00:34:41,430 --> 00:34:39,040
the top of their soyuz rocket

628
00:34:42,950 --> 00:34:41,440
it's where they board their spacecraft

629
00:35:01,670 --> 00:34:42,960
which they've now been inside of for the

630
00:35:06,390 --> 00:35:03,910
and kate rubins they're waving their

631
00:35:07,750 --> 00:35:06,400
final goodbyes before they get into

632
00:35:09,829 --> 00:35:07,760
their

633
00:35:11,990 --> 00:35:09,839
soyuz spacecraft

634
00:35:21,910 --> 00:35:12,000
preparing for launch that is now just 26

635
00:35:21,920 --> 00:35:30,950
here we go

636
00:35:36,790 --> 00:35:32,710
and we're back now with a live view of

637
00:35:44,570 --> 00:35:36,800
the crew inside their soyuz ms-17 ready

638
00:36:00,710 --> 00:35:59,030

[Music]

639
00:36:04,150 --> 00:36:00,720
you can see uh

640
00:36:05,589 --> 00:36:04,160
here uh on the bottom corner or bottom

641
00:36:06,710 --> 00:36:05,599
left-hand corner

642
00:36:09,270 --> 00:36:06,720
sergey

643
00:36:11,589 --> 00:36:09,280
rizhikov who is the soyuz commander for

644
00:36:13,990 --> 00:36:11,599
its trip to international space station

645
00:36:15,109 --> 00:36:14,000
and on the top right hand side of the

646
00:36:18,230 --> 00:36:15,119
screen

647
00:36:21,270 --> 00:36:18,240
sergey kudsperchkov out of view here is

648
00:36:27,490 --> 00:36:21,280
kate rubins who is on uh

649
00:36:47,190 --> 00:36:32,730
[Music]

650
00:36:51,190 --> 00:36:48,790
and there we're seeing astronaut kate

651
00:36:54,310 --> 00:36:51,200
rubens and her seat

652
00:36:56,390 --> 00:36:54,320
to the uh to the right of uh sergey

653
00:36:59,349 --> 00:36:56,400
rizhikov waving

654
00:37:02,310 --> 00:36:59,359
uh waving to the audience and

655
00:37:04,310 --> 00:37:02,320
ready for her launch coming up now in 24

656
00:37:06,550 --> 00:37:04,320
minutes and 14 seconds

657
00:37:17,890 --> 00:37:06,560
safe trip it's been a pleasure working

658
00:37:31,750 --> 00:37:29,510
[Music]

659
00:37:34,069 --> 00:37:31,760
and another live view of the soyuz ms-17

660
00:37:36,950 --> 00:37:34,079
on the launch pad in baikonur liftoff

661
00:37:38,550 --> 00:37:36,960
scheduled for 12 a.m central time 10 45

662
00:37:40,390 --> 00:37:38,560
a.m in baikonur

663
00:37:42,230 --> 00:37:40,400

atop the rocket and within the soyuz

664
00:37:46,710 --> 00:37:42,240
spacecraft as we just saw are kate

665
00:37:48,710 --> 00:37:46,720
rubens sergey rizhikov and sergey kuzkov

666
00:38:03,829 --> 00:37:48,720
now just three 23 minutes away from

667
00:38:09,109 --> 00:38:06,390
the whole soyuz spacecraft is 24.5 feet

668
00:38:11,270 --> 00:38:09,119
long with an overall volume of 177 cubic

669
00:38:13,349 --> 00:38:11,280
feet and comprised of three modules the

670
00:38:15,430 --> 00:38:13,359
descent module situated in the middle of

671
00:38:16,950 --> 00:38:15,440
the soyuz vehicle contains customized

672
00:38:18,790 --> 00:38:16,960
seats for the crew members during launch

673
00:38:20,390 --> 00:38:18,800
entry and landing and contains all the

674
00:38:22,550 --> 00:38:20,400
controls and displays necessary for the

675
00:38:24,470 --> 00:38:22,560
flight it also houses life support

676
00:38:25,990 --> 00:38:24,480
systems batteries for the re-entry and

677
00:38:27,589 --> 00:38:26,000
landing and the parachute and soft

678
00:38:29,270 --> 00:38:27,599
landing rocket engines that slow the

679
00:38:30,829 --> 00:38:29,280
soyuz just before touchdown as a

680
00:38:32,950 --> 00:38:30,839
spacecraft lands in

681
00:38:35,270 --> 00:38:32,960
kazakhstan there are eight hydrogen

682
00:38:36,550 --> 00:38:35,280
peroxide thrusters located on the module

683
00:38:38,790 --> 00:38:36,560
which are used to control the

684
00:38:40,550 --> 00:38:38,800
spacecraft's orientation or attitude

685
00:38:41,829 --> 00:38:40,560
during the descent until parachute

686
00:38:43,349 --> 00:38:41,839
deployment

687
00:38:44,950 --> 00:38:43,359
the descent module also contains a

688
00:38:46,710 --> 00:38:44,960

guidance navigation and control system

689
00:38:48,550 --> 00:38:46,720
used to maneuver the vehicle during the

690
00:38:50,710 --> 00:38:48,560
descent phase of the mission

691
00:38:52,870 --> 00:38:50,720
this descent module is 7.3 feet long

692
00:38:56,150 --> 00:38:52,880
with a diameter of 7.1 feet and a

693
00:38:57,430 --> 00:38:56,160
habitable volume of 124 cubic feet it is

694
00:38:59,750 --> 00:38:57,440
the only portion of the soyuz that

695
00:39:02,550 --> 00:38:59,760
survives the return to earth the orbital

696
00:39:03,990 --> 00:39:02,560
module at the top is 9.8 feet long it

697
00:39:06,069 --> 00:39:04,000
connects to the descent module via

698
00:39:07,270 --> 00:39:06,079
pressurized hatch this is where the crew

699
00:39:08,710 --> 00:39:07,280
has a small amount of room to move

700
00:39:10,550 --> 00:39:08,720
around following launch during the

701
00:39:12,470 --> 00:39:10,560
flight to the space station

702
00:39:14,390 --> 00:39:12,480
it has a docking mechanism hatch and

703
00:39:16,390 --> 00:39:14,400
rendezvous antennas located at the front

704
00:39:17,990 --> 00:39:16,400
end the docking mechanism is used to

705
00:39:19,510 --> 00:39:18,000
dock with the space station and the

706
00:39:20,630 --> 00:39:19,520
hatch allows entry into the orbiting

707
00:39:22,310 --> 00:39:20,640
complex

708
00:39:23,910 --> 00:39:22,320
the rendezvous antennas are used by the

709
00:39:26,069 --> 00:39:23,920
automated docking system which uses

710
00:39:27,349 --> 00:39:26,079
radar to maneuver toward the station for

711
00:39:28,950 --> 00:39:27,359
docking

712
00:39:30,710 --> 00:39:28,960
there's also a forward-looking window in

713
00:39:32,310 --> 00:39:30,720

the module that the crew can use to take

714
00:39:34,470 --> 00:39:32,320
manual measurements of distance and

715
00:39:35,990 --> 00:39:34,480
closing speed with a laser rangefinder

716
00:39:38,390 --> 00:39:36,000
in the event of failure of the

717
00:39:40,310 --> 00:39:38,400
rendezvous radar system

718
00:39:42,230 --> 00:39:40,320
the propulsion module houses the oxygen

719
00:39:44,630 --> 00:39:42,240
storage tanks the main engine and the

720
00:39:46,390 --> 00:39:44,640
attitude control thrusters avionics and

721
00:39:48,069 --> 00:39:46,400
communication and control equipment the

722
00:39:49,829 --> 00:39:48,079
propulsion portion of this module

723
00:39:51,270 --> 00:39:49,839
handles all orbital maneuvers including

724
00:39:53,430 --> 00:39:51,280
those needed for the rendezvous with the

725
00:39:55,109 --> 00:39:53,440
space station and the orbit burn at the

726
00:39:56,710 --> 00:39:55,119
end of the spacecraft's mission before

727
00:39:57,990 --> 00:39:56,720
they are deployed the two solar arrays

728
00:39:59,990 --> 00:39:58,000
are folded against the body of the

729
00:40:01,750 --> 00:40:00,000
propulsion module which along with the

730
00:40:03,910 --> 00:40:01,760
orbital module separates from the

731
00:40:06,870 --> 00:40:03,920
descent module after the orbit burn the

732
00:40:08,790 --> 00:40:06,880
solar panels span almost 35 feet

733
00:40:10,390 --> 00:40:08,800
the entire spacecraft serves not only as

734
00:40:12,069 --> 00:40:10,400
a crew transport vehicle to and from the

735
00:40:14,069 --> 00:40:12,079
space station but also as an emergency

736
00:40:15,349 --> 00:40:14,079
return vehicle in the unlikely event the

737
00:40:19,670 --> 00:40:15,359
crew needs to leave the station

738
00:40:25,109 --> 00:40:22,470

just one uh here now is from sebastian

739
00:40:26,069 --> 00:40:25,119
asking can astronaut kate rubins speak

740
00:40:28,150 --> 00:40:26,079
russian

741
00:40:29,910 --> 00:40:28,160
and she can all astronauts who go to the

742
00:40:33,030 --> 00:40:29,920
international space station are required

743
00:40:35,109 --> 00:40:33,040
to speak both english and russian so

744
00:40:37,910 --> 00:40:35,119
kate rubens can speak

745
00:40:41,030 --> 00:40:37,920
russian and sergey rizhikov and sergey

746
00:40:42,630 --> 00:40:41,040
kuzkov can both speak english as well

747
00:40:44,950 --> 00:40:42,640
you find uh that

748
00:40:46,390 --> 00:40:44,960
you know individuals vary um on how

749
00:40:48,309 --> 00:40:46,400
comfortable they are with the language

750
00:40:49,589 --> 00:40:48,319
but they at least have some baseline

751
00:40:51,510 --> 00:40:49,599
proficiency

752
00:40:53,990 --> 00:40:51,520
that's uh i've heard particularly

753
00:40:57,109 --> 00:40:54,000
challenging however for our uh

754
00:40:58,150 --> 00:40:57,119
international partners from japan and

755
00:40:59,589 --> 00:40:58,160
canada

756
00:41:00,870 --> 00:40:59,599
and uh

757
00:41:02,550 --> 00:41:00,880
not so much canada since they speak

758
00:41:03,990 --> 00:41:02,560
english to begin with but from the

759
00:41:05,750 --> 00:41:04,000
european countries who may not be

760
00:41:07,910 --> 00:41:05,760
speaking english as a foreign language

761
00:41:10,710 --> 00:41:07,920
because they learn

762
00:41:12,630 --> 00:41:10,720
russian via english so they are learning

763
00:41:17,109 --> 00:41:12,640

a foreign language

764
00:41:19,190 --> 00:41:17,119
have another question now

765
00:41:21,030 --> 00:41:19,200
from brandon who is asking what role

766
00:41:23,190 --> 00:41:21,040
does nasa mission control play in the

767
00:41:25,589 --> 00:41:23,200
launch from baikonur

768
00:41:27,430 --> 00:41:25,599
the team here in the flight control room

769
00:41:29,270 --> 00:41:27,440
in mission control houston

770
00:41:30,950 --> 00:41:29,280
is monitoring the events going on in

771
00:41:33,990 --> 00:41:30,960
baikonur but they don't have a great

772
00:41:36,150 --> 00:41:34,000
deal to do with the actual launch and

773
00:41:37,349 --> 00:41:36,160
accent what they are working on however

774
00:41:40,390 --> 00:41:37,359
is making sure that the international

775
00:41:41,670 --> 00:41:40,400
space station is ready for the soyuz to

776
00:41:43,510 --> 00:41:41,680
dock to it

777
00:41:45,589 --> 00:41:43,520
later tonight that docking is coming up

778
00:41:47,510 --> 00:41:45,599
at 3 52 a.m central time so it'll be a

779
00:41:49,510 --> 00:41:47,520
particularly short amount of time to get

780
00:41:51,670 --> 00:41:49,520
ready once launch

781
00:41:53,670 --> 00:41:51,680
is completed but everything looking good

782
00:41:55,349 --> 00:41:53,680
on this end as well they've been working

783
00:41:57,670 --> 00:41:55,359
ahead to make sure that

784
00:41:59,750 --> 00:41:57,680
when the soyuz arrives the rosvett

785
00:42:11,050 --> 00:41:59,760
docking port and the crew on board will

786
00:42:24,250 --> 00:42:20,460
[Music]

787
00:42:44,710 --> 00:42:24,260
oh

788
00:42:48,470 --> 00:42:47,190

one more question from social media uh

789
00:42:49,109 --> 00:42:48,480
although you can keep them coming using

790
00:42:51,670 --> 00:42:49,119
the

791
00:42:53,829 --> 00:42:51,680
ask nasa uh this one coming from k

792
00:42:55,349 --> 00:42:53,839
asking do astronauts have a practice to

793
00:42:57,430 --> 00:42:55,359
stay mentally healthy and maintain their

794
00:42:58,390 --> 00:42:57,440
cognitive functions in space that is a

795
00:43:00,069 --> 00:42:58,400
very important

796
00:43:02,069 --> 00:43:00,079
piece of the puzzle for

797
00:43:04,069 --> 00:43:02,079
astronauts working on board the

798
00:43:06,150 --> 00:43:04,079
international space station

799
00:43:07,910 --> 00:43:06,160
one of the things that is part of the

800
00:43:09,910 --> 00:43:07,920
astronauts training once they arrive at

801
00:43:10,950 --> 00:43:09,920
nasa and become astronauts is what we

802
00:43:12,870 --> 00:43:10,960
call

803
00:43:15,349 --> 00:43:12,880
expeditionary skills and that is making

804
00:43:17,270 --> 00:43:15,359
sure that you are a good team member

805
00:43:19,430 --> 00:43:17,280
you're serving your team well and and

806
00:43:20,870 --> 00:43:19,440
that can mean taking care of yourself

807
00:43:22,950 --> 00:43:20,880
self-care or taking care of your

808
00:43:24,950 --> 00:43:22,960
teammates also being a leader or a

809
00:43:27,670 --> 00:43:24,960
follower as the situation

810
00:43:30,470 --> 00:43:27,680
calls for that's a major part of their

811
00:43:31,589 --> 00:43:30,480
training alongside more practical things

812
00:43:33,510 --> 00:43:31,599
like

813
00:43:35,589 --> 00:43:33,520

international space station systems and

814
00:43:38,230 --> 00:43:35,599
spacewalk training but it's an important

815
00:43:40,309 --> 00:43:38,240
part of the training

816
00:43:42,470 --> 00:43:40,319
once again you can send those hat those

817
00:43:44,470 --> 00:43:42,480
questions in using the hashtag ask nasa

818
00:44:01,829 --> 00:43:44,480
on social media we'll try to take a few

819
00:44:31,750 --> 00:44:08,470
oh

820
00:44:31,760 --> 00:44:38,380
mr

821
00:44:38,390 --> 00:44:48,829
[Music]

822
00:44:48,839 --> 00:45:16,790
oh oh

823
00:45:16,800 --> 00:45:43,349
foreign

824
00:45:43,359 --> 00:45:49,910
you are 10 minutes

825
00:45:54,870 --> 00:45:51,589
those just joining us you're looking at

826
00:45:56,710 --> 00:45:54,880
a live view of the soyuz ms-17 that

827
00:45:59,990 --> 00:45:56,720
currently holds kate rubins sergey

828
00:46:01,349 --> 00:46:00,000
rizhikov and sergey kuzkov waiting their

829
00:46:04,390 --> 00:46:01,359
launch to the international space

830
00:46:06,069 --> 00:46:04,400
station that's just 14 minutes to go now

831
00:46:08,870 --> 00:46:06,079
until today's liftoff which is scheduled

832
00:46:12,829 --> 00:46:08,880
for 12 45 a.m central time

833
00:46:34,480 --> 00:46:15,910
baikonur fridge temperature four degrees

834
00:46:34,490 --> 00:46:54,069
[Music]

835
00:46:57,750 --> 00:46:55,829
13 minutes away from launch now and we

836
00:46:59,750 --> 00:46:57,760
have some infrared for you now on the

837
00:47:04,790 --> 00:46:59,760
booster that will carry the crew into

838
00:47:10,150 --> 00:47:07,510

the soyuz rocket stands 162 feet tall

839
00:47:12,630 --> 00:47:10,160
weighs about 640 000 pounds and consists

840
00:47:14,550 --> 00:47:12,640
of the soyuz ms-17 spacecraft inside a

841
00:47:17,670 --> 00:47:14,560
protective shroud at the top and the

842
00:47:19,510 --> 00:47:17,680
three-stage soyuz 2.1a booster below the

843
00:47:21,190 --> 00:47:19,520
spacecraft was made into its booster and

844
00:47:23,430 --> 00:47:21,200
the three main stages were joined

845
00:47:26,150 --> 00:47:23,440
together on saturday

846
00:47:28,069 --> 00:47:26,160
just 24 hours later on sunday the soyuz

847
00:47:30,470 --> 00:47:28,079
rocket began its trek to the launch pad

848
00:47:31,910 --> 00:47:30,480
right at 7 am baikonur time arriving

849
00:47:33,430 --> 00:47:31,920
less than two hours later where it was

850
00:47:36,309 --> 00:47:33,440
raised into a vertical position for

851
00:47:37,910 --> 00:47:36,319
final pre-launch preparations

852
00:47:39,750 --> 00:47:37,920
now poised for lunch with its three crew

853
00:47:41,510 --> 00:47:39,760
members on board the soyuz spacecraft

854
00:47:43,349 --> 00:47:41,520
sits high above the three stages of the

855
00:47:46,309 --> 00:47:43,359
soyuz booster which uses kerosene and

856
00:47:48,230 --> 00:47:46,319
liquid oxygen as the propellant

857
00:47:50,069 --> 00:47:48,240
the first stage has four liquid engines

858
00:47:52,069 --> 00:47:50,079
strapped to the side of the core vehicle

859
00:47:55,030 --> 00:47:52,079
each will burn for one minute and 58

860
00:47:56,870 --> 00:47:55,040
seconds before they drop away

861
00:47:58,630 --> 00:47:56,880
the core engine of the first stage also

862
00:48:00,870 --> 00:47:58,640
serves as the second stage and continues

863
00:48:02,630 --> 00:48:00,880

to burn until 4 minutes and 57 seconds

864
00:48:04,230 --> 00:48:02,640
into the flight

865
00:48:05,829 --> 00:48:04,240
the third stage has a single engine that

866
00:48:07,910 --> 00:48:05,839
will ignite before the separation of the

867
00:48:10,150 --> 00:48:07,920
second stage helping to push it away

868
00:48:12,630 --> 00:48:10,160
safely it will burn into the 8 minutes

869
00:48:14,069 --> 00:48:12,640
and 46 seconds mark of the flight and at

870
00:48:15,670 --> 00:48:14,079
that point the soyuz spacecraft will

871
00:48:24,390 --> 00:48:15,680
separate from the third stage having

872
00:48:28,630 --> 00:48:25,829
i'm back now with a live view of the

873
00:48:31,030 --> 00:48:28,640
soyuz on the pad in baikonur

874
00:48:33,430 --> 00:48:31,040
just uh 12 minutes now from today's

875
00:48:38,150 --> 00:48:33,440
liftoff scheduled for 12 45 a.m central

876
00:48:42,150 --> 00:48:39,990
i'm getting a lot of questions on social

877
00:48:43,750 --> 00:48:42,160
media about the music that we're hearing

878
00:48:48,069 --> 00:48:43,760
that is played for the benefit of the

879
00:48:50,309 --> 00:48:48,079
crew and chosen by the crew

880
00:48:52,790 --> 00:48:50,319
have information on which crew member

881
00:48:54,309 --> 00:48:52,800
chose uh which particular songs they get

882
00:48:57,910 --> 00:48:54,319
to hear but um

883
00:48:57,920 --> 00:49:02,069
any of them could have

884
00:49:05,190 --> 00:49:03,589
one of the other things that the crew

885
00:49:07,510 --> 00:49:05,200
gets to choose

886
00:49:12,110 --> 00:49:07,520
is the zero gravity indicator that they

887
00:49:12,120 --> 00:49:23,349
[Music]

888
00:49:28,710 --> 00:49:25,829

for this mission uh the zero gravity

889
00:49:30,790 --> 00:49:28,720
indicator that the crew uses is a small

890
00:49:33,589 --> 00:49:30,800
knitting cosmonaut that was made by

891
00:49:35,109 --> 00:49:33,599
sergey koons perchkov's wife

892
00:49:37,910 --> 00:49:35,119
this will be

893
00:49:39,829 --> 00:49:37,920
hanging from the

894
00:49:42,230 --> 00:49:39,839
ceiling of the soyuz so that they are

895
00:49:43,430 --> 00:49:42,240
able to tell when it no longer hangs and

896
00:49:45,990 --> 00:49:43,440
starts to float that they have

897
00:49:49,030 --> 00:49:46,000
successfully mated to microgravity and

898
00:49:52,710 --> 00:49:50,309
each crew

899
00:50:03,829 --> 00:49:52,720
is able to choose a different talisman

900
00:50:03,839 --> 00:50:14,950
her head

901
00:50:18,790 --> 00:50:17,030
one other milestone to note today before

902
00:50:20,870 --> 00:50:18,800
we get into the last few minutes of the

903
00:50:23,430 --> 00:50:20,880
countdown is that it is astronaut kate

904
00:50:25,510 --> 00:50:23,440
rubin's birthday she will be

905
00:50:26,710 --> 00:50:25,520
launching with an extremely big birthday

906
00:50:28,790 --> 00:50:26,720
candle making her way to the

907
00:50:30,230 --> 00:50:28,800
international space station and

908
00:50:42,050 --> 00:50:30,240
having an

909
00:50:42,060 --> 00:50:50,150
[Music]

910
00:50:50,160 --> 00:50:53,280
is

911
00:50:53,290 --> 00:50:58,150
[Music]

912
00:51:02,230 --> 00:51:00,230
getting back some views of the crew

913
00:51:03,750 --> 00:51:02,240

inside the soyuz

914
00:51:06,150 --> 00:51:03,760
now less than 10 minutes away from

915
00:51:07,109 --> 00:51:06,160
today's launch this is uh kate rubens

916
00:51:09,270 --> 00:51:07,119
again

917
00:51:10,549 --> 00:51:09,280
celebrating her birthday today with a

918
00:51:13,270 --> 00:51:10,559
launch to the international space

919
00:51:23,589 --> 00:51:13,280
station

920
00:51:28,680 --> 00:51:24,470
we

921
00:51:49,190 --> 00:51:41,800
[Music]

922
00:51:50,870 --> 00:51:49,200
nasa and risk cosmos representatives are

923
00:51:53,109 --> 00:51:50,880
watching just a short distance away from

924
00:51:54,710 --> 00:51:53,119
the launch pad in baikonur for an update

925
00:51:56,630 --> 00:51:54,720
on activities there we're going to go

926
00:51:58,630 --> 00:51:56,640
now to nasa public affairs officer rob

927
00:52:00,150 --> 00:51:58,640
davies

928
00:52:02,230 --> 00:52:00,160
randy it has been a very different

929
00:52:04,069 --> 00:52:02,240
atmosphere at the baikonur cosmodrome

930
00:52:05,750 --> 00:52:04,079
than we're typically accustomed to in

931
00:52:07,510 --> 00:52:05,760
the run-up to launch

932
00:52:10,470 --> 00:52:07,520
so many global events have been affected

933
00:52:11,829 --> 00:52:10,480
by the covet 19 pandemic and this launch

934
00:52:14,230 --> 00:52:11,839
is no different

935
00:52:16,150 --> 00:52:14,240
stringent precautions have been taken to

936
00:52:18,790 --> 00:52:16,160
ensure that the crew remains isolated

937
00:52:21,190 --> 00:52:18,800
from everyone except essential personnel

938
00:52:23,270 --> 00:52:21,200

and face masks and social distancing are

939
00:52:25,270 --> 00:52:23,280
the name of the game here for everyone

940
00:52:27,750 --> 00:52:25,280
and anyone in close proximity to the

941
00:52:28,710 --> 00:52:27,760
crew or russian and american support

942
00:52:30,470 --> 00:52:28,720
teams

943
00:52:33,589 --> 00:52:30,480
there are no family members attending

944
00:52:35,270 --> 00:52:33,599
launch and no vips for this final crude

945
00:52:37,030 --> 00:52:35,280
launch of the year

946
00:52:38,870 --> 00:52:37,040
kate rubins and her crewmates are ready

947
00:52:40,150 --> 00:52:38,880
for a super fast express ride to the

948
00:52:42,790 --> 00:52:40,160
space station

949
00:52:45,270 --> 00:52:42,800
this first two orbit scheme for the crew

950
00:52:47,190 --> 00:52:45,280
following five two orbit test runs with

951
00:52:49,829 --> 00:52:47,200
progress cargo ships

952
00:52:51,670 --> 00:52:49,839
ironically enough it will take us around

953
00:52:54,309 --> 00:52:51,680
an hour to get back into the town of

954
00:52:57,510 --> 00:52:54,319
baikonur from our launch complex viewing

955
00:52:59,829 --> 00:52:57,520
site at site-31 it'll take just three

956
00:53:01,349 --> 00:52:59,839
hours for rubens and her crewmates to

957
00:53:02,549 --> 00:53:01,359
arrive at the international space

958
00:53:05,270 --> 00:53:02,559
station

959
00:53:07,589 --> 00:53:05,280
nonetheless even with just a fraction of

960
00:53:10,390 --> 00:53:07,599
the people usually in attendance here

961
00:53:12,069 --> 00:53:10,400
the excitement is as palpable as ever as

962
00:53:13,990 --> 00:53:12,079
we approach launch

963
00:53:16,390 --> 00:53:14,000

that's it from the baikonur cosmodrome

964
00:53:20,950 --> 00:53:16,400
in kazakhstan now back to you at mission

965
00:53:26,710 --> 00:53:23,750
thanks rob we are now at the

966
00:53:28,950 --> 00:53:26,720
t-minus seven minute point

967
00:53:30,630 --> 00:53:28,960
pre-launch operations are complete to

968
00:53:32,630 --> 00:53:30,640
this point in the countdown the soyuz's

969
00:53:33,750 --> 00:53:32,640
first and second stage engines are ready

970
00:53:35,190 --> 00:53:33,760
for launch

971
00:53:37,190 --> 00:53:35,200
and telemetry has been received from the

972
00:53:38,870 --> 00:53:37,200
rocket indicating that all primary and

973
00:53:42,950 --> 00:53:38,880
backup systems are set to support

974
00:53:47,589 --> 00:53:45,829
at the time of launch at six minutes and

975
00:53:50,549 --> 00:53:47,599
40 seconds now the international space

976
00:53:53,670 --> 00:53:50,559
station is going to be flying 259 miles

977
00:53:57,910 --> 00:53:53,680
over northwest ubex uzbekistan

978
00:54:00,230 --> 00:53:57,920
at the border of kazakhstan 339 miles

979
00:54:01,270 --> 00:54:00,240
ahead of soyuz as it leaves the launch

980
00:54:03,030 --> 00:54:01,280
pad

981
00:54:04,790 --> 00:54:03,040
the launch is precisely timed for the

982
00:54:06,390 --> 00:54:04,800
moment when the earth's rotation will

983
00:54:28,549 --> 00:54:06,400
place the baikonur cosmodrome in the

984
00:54:32,309 --> 00:54:30,230
six minutes now until launch at this

985
00:54:34,549 --> 00:54:32,319
point the launch key has been inserted

986
00:54:36,630 --> 00:54:34,559
in the launch bunker that's a real key

987
00:55:19,270 --> 00:54:36,640
that transitions launch sequence into

988
00:55:26,069 --> 00:55:20,950

ground measurement system is activated

989
00:55:29,829 --> 00:55:28,069
five minutes now until launch on board

990
00:55:30,870 --> 00:55:29,839
systems have been switched to onboard

991
00:55:32,309 --> 00:55:30,880
control

992
00:55:33,589 --> 00:55:32,319
commander's cockpit displays and

993
00:55:35,910 --> 00:55:33,599
controls have been activated and the

994
00:56:25,750 --> 00:55:35,920
crew members are closing their helmets

995
00:56:30,390 --> 00:56:28,309
four minutes and counting now until cade

996
00:56:32,390 --> 00:56:30,400
reuben's circuit kudz skirchkov and

997
00:56:34,630 --> 00:56:32,400
sergey rizhikov make their way to the

998
00:56:36,309 --> 00:56:34,640
international space station this point

999
00:56:37,990 --> 00:56:36,319
fuel lines and other elements of the

1000
00:56:40,470 --> 00:56:38,000
rocket engines are being purged with

1001
00:57:26,150 --> 00:56:40,480
nitrogen to fireproof them by removing

1002
00:57:30,230 --> 00:57:27,829
three minutes and counting now today's

1003
00:57:33,030 --> 00:57:30,240
tool today is lift off at 12 45 a.m

1004
00:57:42,470 --> 00:57:33,040
central time

1005
00:57:46,230 --> 00:57:43,910
boosters fuel tanks now being

1006
00:57:48,150 --> 00:57:46,240
pressurized for flight optimizing the

1007
00:58:06,549 --> 00:57:48,160
flow of fuel and helping to add

1008
00:58:06,559 --> 00:58:25,589
what about my watch pressurization

1009
00:58:25,599 --> 00:58:37,589
two minutes left before today's liftoff

1010
00:58:37,599 --> 00:58:50,230
foreign

1011
00:58:55,510 --> 00:58:52,230
i'm back with an inside view looking at

1012
00:58:57,670 --> 00:58:55,520
sergey rizhikov and sergey kuzkov

1013
00:59:00,150 --> 00:58:57,680

one minute and 30 seconds left to go

1014
00:59:25,030 --> 00:59:00,160
before liftoff ground propellant feed

1015
00:59:39,750 --> 00:59:27,109
one minute to go soyuz is now on

1016
00:59:43,589 --> 00:59:41,589
as we speak space stations flying

1017
00:59:45,349 --> 00:59:43,599
directly over the baikonur cosmodrome in

1018
00:59:47,829 --> 00:59:45,359
the launch pad at the time of launch the

1019
00:59:51,990 --> 00:59:47,839
station will be 339 miles above the

1020
01:00:08,710 --> 00:59:53,670
there's the first umbilical tower

1021
01:00:17,829 --> 01:00:10,390
launch

1022
01:00:22,150 --> 01:00:21,030
eight seven six five

1023
01:00:23,190 --> 01:00:22,160
four

1024
01:00:24,309 --> 01:00:23,200
three

1025
01:00:28,630 --> 01:00:24,319
two

1026
01:00:34,230 --> 01:00:31,910
and liftoff kate rubin sergey rizhikov

1027
01:00:36,150 --> 01:00:34,240
and sergey kuzkov now on their way to

1028
01:00:38,309 --> 01:00:36,160
the international space station the

1029
01:00:40,230 --> 01:00:38,319
latest in a chain that spans almost 20

1030
01:00:42,309 --> 01:00:40,240
years of continuous human presence in

1031
01:00:44,710 --> 01:00:42,319
space

1032
01:00:47,040 --> 01:00:44,720
10 seconds the parameters of the rocket

1033
01:00:51,430 --> 01:00:47,050
are nominal

1034
01:00:56,230 --> 01:00:53,910
20 seconds

1035
01:00:59,430 --> 01:00:56,240
the thrusters of the first and second

1036
01:01:02,069 --> 01:00:59,440
stage are operating nominally

1037
01:01:03,670 --> 01:01:02,079
hearing first good reports of a

1038
01:01:05,030 --> 01:01:03,680

good first stage performance everything

1039
01:01:07,990 --> 01:01:05,040
looking nominal

1040
01:01:09,750 --> 01:01:08,000
soyuz is currently delivering 930 000

1041
01:01:12,789 --> 01:01:09,760
pounds of thrust from its four boosters

1042
01:01:15,190 --> 01:01:12,799
and single engine of that first stage it

1043
01:01:17,109 --> 01:01:15,200
measures 68 feet in length and 24 feet

1044
01:01:18,870 --> 01:01:17,119
in diameter and birds liquid fuel for

1045
01:01:21,510 --> 01:01:18,880
the first two minutes and six seconds of

1046
01:01:25,750 --> 01:01:23,910
50 seconds the pressure in the chambers

1047
01:01:29,430 --> 01:01:25,760
is phenomenal

1048
01:01:31,430 --> 01:01:29,440
everything is good on board we feel well

1049
01:01:32,870 --> 01:01:31,440
good reports from the crew as well

1050
01:01:37,030 --> 01:01:32,880
everything looking good for today's

1051
01:01:38,950 --> 01:01:37,040
flight teach your role phenomenally

1052
01:01:40,230 --> 01:01:38,960
roll pitch y'all all normal meaning

1053
01:01:42,470 --> 01:01:40,240
spacecraft is exactly where it's

1054
01:01:45,990 --> 01:01:42,480
expected to be at this point velocity is

1055
01:01:47,750 --> 01:01:46,000
100 100 miles per hour

1056
01:01:57,589 --> 01:01:47,760
first stage of the soyuz less than a

1057
01:01:57,599 --> 01:02:01,510
everything is good we feel well

1058
01:02:01,520 --> 01:02:05,430
we feel the g loads

1059
01:02:08,870 --> 01:02:06,950
first milestone we'll be watching for

1060
01:02:11,349 --> 01:02:08,880
here is the escape tower jettison which

1061
01:02:35,750 --> 01:02:11,359
will come at the 1 minute and 54 second

1062
01:02:39,829 --> 01:02:37,670
and there's the separation of the four

1063
01:02:41,430 --> 01:02:39,839

strap on boosters that are jettisoned

1064
01:02:43,430 --> 01:02:41,440
these have completed their job and are

1065
01:02:45,349 --> 01:02:43,440
dropping away now at an altitude of 28

1066
01:02:47,430 --> 01:02:45,359
miles above the earth while the soyuz

1067
01:02:49,109 --> 01:02:47,440
continues on with its flight traveling

1068
01:02:51,190 --> 01:02:49,119
at about 3

1069
01:02:53,109 --> 01:02:51,200
350 miles an hour

1070
01:02:55,029 --> 01:02:53,119
powered by the rocket's second or core

1071
01:02:57,829 --> 01:02:55,039
stage

1072
01:02:59,190 --> 01:02:57,839
rocket parameters are nominal

1073
01:03:00,470 --> 01:02:59,200
while still looking good and the next

1074
01:03:02,150 --> 01:03:00,480
milestone we're looking for is the

1075
01:03:04,380 --> 01:03:02,160
jettison of the launch drought at two

1076
01:03:08,069 --> 01:03:04,390
minutes and 37 seconds

1077
01:03:12,630 --> 01:03:10,230
and you see that launch route jettison

1078
01:03:16,230 --> 01:03:12,640
we're now getting uh some views from the

1079
01:03:18,390 --> 01:03:16,240
external rocket camera

1080
01:03:20,549 --> 01:03:18,400
you looking towards the bottom of this

1081
01:03:22,829 --> 01:03:20,559
rocket and at the earth below solar

1082
01:03:29,589 --> 01:03:22,839
arrays waiting to be unfurled once the

1083
01:03:36,150 --> 01:03:32,230
soyuz traveling at a speed of 4 700

1084
01:03:41,589 --> 01:03:39,910
on board everything is good we feel well

1085
01:03:44,230 --> 01:03:41,599
continuing to hear good calls from the

1086
01:03:46,710 --> 01:03:44,240
crew core stage performing as expected

1087
01:03:48,470 --> 01:03:46,720
the core stage of the soyuz is 56 feet

1088
01:03:50,630 --> 01:03:48,480

in length and 13 and a half feet in

1089
01:03:53,109 --> 01:03:50,640
diameter with single engine

1090
01:03:56,150 --> 01:03:53,119
and four fuel chambers providing between

1091
01:03:58,470 --> 01:03:56,160
178 thousand and 222 thousand pounds of

1092
01:04:01,270 --> 01:03:58,480
thrust at various points of its 3

1093
01:04:07,109 --> 01:04:01,280
minutes and 28 seconds of operation we

1094
01:04:13,750 --> 01:04:08,549
this stage will continue to burn into

1095
01:04:17,029 --> 01:04:15,990
soyuz uses what's called a hot stage

1096
01:04:18,549 --> 01:04:17,039
technique

1097
01:04:21,349 --> 01:04:18,559
meaning third stage ignites while the

1098
01:04:24,710 --> 01:04:21,359
second is still burning

1099
01:04:27,190 --> 01:04:24,720
230 seconds stabilization of the craft

1100
01:04:29,109 --> 01:04:27,200
is doing well

1101
01:04:31,910 --> 01:04:29,119
four minutes into the asset of soyuz

1102
01:04:33,990 --> 01:04:31,920
ms-17 now kate rubin sergey rizhikov and

1103
01:04:35,430 --> 01:04:34,000
sergey kuzkov on their way to the

1104
01:04:37,910 --> 01:04:35,440
international space station following

1105
01:04:42,029 --> 01:04:37,920
today's 12 45 am central launch from the

1106
01:04:46,390 --> 01:04:45,270
250 seconds pitch raw and rotation is

1107
01:04:47,990 --> 01:04:46,400
nominal

1108
01:04:49,670 --> 01:04:48,000
everything continuing to go well in the

1109
01:04:50,950 --> 01:04:49,680
climb to orbit we'll be looking for a

1110
01:04:53,829 --> 01:04:50,960
next

1111
01:04:56,390 --> 01:04:53,839
second stage cut off coming up at the 4

1112
01:05:08,710 --> 01:04:56,400
minute and 45 second mark about 15

1113
01:05:08,720 --> 01:05:12,950

all still looking good

1114
01:05:17,829 --> 01:05:15,029
four minutes and 45 seconds in third

1115
01:05:20,829 --> 01:05:17,839
stage is igniting second stage should be

1116
01:05:27,829 --> 01:05:24,390
down we have confirmation of

1117
01:05:28,789 --> 01:05:27,839
the initiation of thrusters of the

1118
01:05:30,630 --> 01:05:28,799
second

1119
01:05:33,109 --> 01:05:30,640
third stage

1120
01:05:34,470 --> 01:05:33,119
and unpowering of the thrusters of the

1121
01:05:36,470 --> 01:05:34,480
second stage

1122
01:05:38,069 --> 01:05:36,480
capital we feel well everything is

1123
01:05:39,589 --> 01:05:38,079
nominal on board

1124
01:05:41,510 --> 01:05:39,599
i understand as you heard there

1125
01:05:43,990 --> 01:05:41,520
everything's still looking good core

1126
01:05:46,470 --> 01:05:44,000
booster separated at an altitude of 105

1127
01:05:47,270 --> 01:05:46,480
miles and with it gone soyuz is now

1128
01:05:49,750 --> 01:05:47,280
being

1129
01:05:52,230 --> 01:05:49,760
propelled by a single engine of its

1130
01:05:53,910 --> 01:05:52,240
third stage that engine provides sixty

1131
01:05:58,549 --> 01:05:53,920
seven thousand pounds of thrust and will

1132
01:06:02,710 --> 01:06:00,230
day's flight going smoothly and all

1133
01:06:04,789 --> 01:06:02,720
systems working nominally the crew

1134
01:06:07,190 --> 01:06:04,799
reporting they are feeling good and on

1135
01:06:09,109 --> 01:06:07,200
their way to the space station

1136
01:06:26,630 --> 01:06:09,119
i'm bored everything is good we feel

1137
01:06:26,640 --> 01:06:41,430
everything is good on board

1138
01:06:48,950 --> 01:06:43,349

about two minutes left before the crew

1139
01:06:52,630 --> 01:06:50,309
next milestone that we'll be watching

1140
01:06:55,430 --> 01:06:52,640
for comes at the 8 minute and 40 seconds

1141
01:06:58,390 --> 01:06:55,440
46 second mark that's the third stage

1142
01:07:00,549 --> 01:06:58,400
cut off and separation

1143
01:07:10,950 --> 01:07:00,559
copy everything is good on board we feel

1144
01:07:15,270 --> 01:07:14,470
100 seconds stabilization of the vehicle

1145
01:07:16,390 --> 01:07:15,280
is

1146
01:07:20,870 --> 01:07:16,400
steady

1147
01:07:24,470 --> 01:07:22,470
crews still calling down that everything

1148
01:07:25,910 --> 01:07:24,480
is looking good inside the soyuz rocket

1149
01:07:28,470 --> 01:07:25,920
seeing a view from cameras on the

1150
01:07:30,789 --> 01:07:28,480
exterior of the soyuz here looking down

1151
01:07:33,670 --> 01:07:30,799
towards the bottom of the rocket

1152
01:07:35,190 --> 01:07:33,680
and uh in the four screen so the solar

1153
01:07:37,270 --> 01:07:35,200
array that will

1154
01:07:55,270 --> 01:07:37,280
unfold once the crew does make it safely

1155
01:08:00,950 --> 01:07:57,109
now seven and a half minutes in today's

1156
01:08:02,789 --> 01:08:00,960
flight velocity of the soyuz is 13 500

1157
01:08:05,109 --> 01:08:02,799
miles an hour

1158
01:08:06,630 --> 01:08:05,119
once this final third stage delivers the

1159
01:08:09,029 --> 01:08:06,640
soyuz to orbit and the module is

1160
01:08:10,870 --> 01:08:09,039
separated a series of pre-programmed

1161
01:08:12,309 --> 01:08:10,880
commands will be executed

1162
01:08:13,829 --> 01:08:12,319
to prepare the soyuz for orbital

1163
01:08:15,670 --> 01:08:13,839

operations

1164
01:08:17,430 --> 01:08:15,680
those storm commands are called time tag

1165
01:08:19,590 --> 01:08:17,440
commands and allow many of the soyuz

1166
01:08:22,070 --> 01:08:19,600
systems to be automatically activated by

1167
01:08:25,749 --> 01:08:22,080
onboard computers at precise times

1168
01:08:30,709 --> 01:08:28,470
about 45 seconds left before the crew is

1169
01:08:49,749 --> 01:08:30,719
on orbit and safely in space everything

1170
01:08:49,759 --> 01:08:54,019
500 seconds flight is nominal

1171
01:09:00,550 --> 01:08:58,630
[Music]

1172
01:09:02,950 --> 01:09:00,560
copy all

1173
01:09:05,280 --> 01:09:02,960
everything is good on board we are

1174
01:09:11,669 --> 01:09:05,290
standing by for the separation

1175
01:09:24,229 --> 01:09:13,349
everything is numb now prepare for the

1176
01:09:28,950 --> 01:09:26,870
thrusters powered off confirmed

1177
01:09:30,870 --> 01:09:28,960
separation is confirmed

1178
01:09:32,630 --> 01:09:30,880
and there you have this confirmation

1179
01:09:36,229 --> 01:09:32,640
that the third stage cut off and

1180
01:09:38,229 --> 01:09:36,239
separated as planned single

1181
01:09:41,510 --> 01:09:38,239
liquid-fueled engine shut down and

1182
01:09:43,829 --> 01:09:41,520
dropped away at an altitude of 126 miles

1183
01:09:47,110 --> 01:09:43,839
above the earth and there you see now

1184
01:09:49,430 --> 01:09:47,120
also the soyuz have unfurled that's a

1185
01:09:50,870 --> 01:09:49,440
key milestone as well

1186
01:09:52,870 --> 01:09:50,880
to ensure that the

1187
01:09:54,149 --> 01:09:52,880
soyuz is able to power itself on its

1188
01:09:57,990 --> 01:09:54,159

journey to the international space

1189
01:09:58,000 --> 01:10:13,990
divorce this is mcc moscow

1190
01:10:17,830 --> 01:10:15,270
spacecraft from this point will be

1191
01:10:19,350 --> 01:10:17,840
overseen by the russian mission control

1192
01:10:22,950 --> 01:10:19,360
center outside of moscow that you're

1193
01:10:27,110 --> 01:10:25,590
is nominal copy

1194
01:10:40,390 --> 01:10:27,120
we are working

1195
01:10:40,400 --> 01:10:51,350
and also we are pulling up

1196
01:11:08,149 --> 01:10:53,830
please take the measurements for this

1197
01:11:13,590 --> 01:11:10,310
following today's launch just 10 minutes

1198
01:11:16,550 --> 01:11:13,600
ago now at 12 45 a.m central time kate

1199
01:11:19,030 --> 01:11:16,560
rubins sergey ryzikov and sergey kuz are

1200
01:11:20,390 --> 01:11:19,040
now safely in orbit and on their way to

1201
01:11:22,310 --> 01:11:20,400
the international space station

1202
01:11:24,310 --> 01:11:22,320
following a flawless launch in eight and

1203
01:11:25,590 --> 01:11:24,320
a half minute climb to orbit

1204
01:11:27,430 --> 01:11:25,600
they'll be working through some initial

1205
01:11:30,149 --> 01:11:27,440
checkouts now but everything is looking

1206
01:11:32,070 --> 01:11:30,159
good as they head off on the first two

1207
01:11:35,430 --> 01:11:32,080
orbit rendezvous for a

1208
01:11:37,669 --> 01:11:35,440
human crew uh with the space station

1209
01:11:39,270 --> 01:11:37,679
that's scheduled for 3 52 a.m central

1210
01:11:40,790 --> 01:11:39,280
time when they'll dock to the rosvette

1211
01:11:46,550 --> 01:11:40,800
module on the russian segment of the

1212
01:11:46,560 --> 01:11:53,990
it is on copy

1213
01:12:03,189 --> 01:11:56,229

second set of the course hardware is

1214
01:12:07,910 --> 01:12:05,350
and heard there that the curse antenna

1215
01:12:09,830 --> 01:12:07,920
that will be used to guide the soyuz to

1216
01:12:11,669 --> 01:12:09,840
its automated docking

1217
01:12:14,070 --> 01:12:11,679
passage checkout that's one of the key

1218
01:12:16,550 --> 01:12:14,080
milestones that occurs once the soyuz

1219
01:12:19,189 --> 01:12:16,560
does reach orbit

1220
01:12:21,030 --> 01:12:19,199
also be doing some leak checks and

1221
01:12:24,470 --> 01:12:21,040
communication checkouts making sure

1222
01:12:40,550 --> 01:12:24,480
everything is looking good as it's as it

1223
01:12:45,189 --> 01:12:43,189
we have confirmation of

1224
01:13:04,149 --> 01:12:45,199
operations of our

1225
01:13:11,830 --> 01:13:07,030
are less than 10 degrees copy

1226
01:13:15,990 --> 01:13:11,840
standing by for your filled out form 0 3

1227
01:13:20,709 --> 01:13:18,470
17 decimal four

1228
01:13:23,430 --> 01:13:20,719
sixteen decimal four

1229
01:13:26,070 --> 01:13:23,440
three sixty eight twenty

1230
01:13:29,590 --> 01:13:26,080
two decimal zero twenty one

1231
01:13:34,310 --> 01:13:29,600
one decimal eight twenty two

1232
01:13:38,510 --> 01:13:35,870
24

1233
01:13:41,430 --> 01:13:38,520
19.3 25th

1234
01:13:44,950 --> 01:13:41,440
17.3 26.

1235
01:13:44,960 --> 01:13:50,390
propellant 878.

1236
01:13:55,410 --> 01:13:53,110
we have copied the data for form 3.

1237
01:13:57,669 --> 01:13:55,420
let's check the configuration

1238
01:14:11,350 --> 01:13:57,679

[Music]

1239
01:14:11,360 --> 01:14:25,110
um

1240
01:14:25,120 --> 01:14:31,160
manifold

1241
01:14:31,170 --> 01:14:40,830
[Music]

1242
01:14:52,950 --> 01:14:46,870
yes do tests of the manual controls at 0

1243
01:15:00,390 --> 01:14:55,110
it is written in your

1244
01:15:00,400 --> 01:15:08,550
divorce how do you copy

1245
01:15:08,560 --> 01:15:21,430
our followers

1246
01:15:21,440 --> 01:15:34,790
moscow we do not copy you

1247
01:15:34,800 --> 01:15:51,430
manual mode

1248
01:15:58,310 --> 01:15:55,270
after the burn we will go to kudo mode

1249
01:16:02,630 --> 01:15:58,320
okay copy we have confirmation of the

1250
01:16:05,590 --> 01:16:02,640
check of the first course set copy

1251
01:16:08,950 --> 01:16:05,600
we are standing by for your confirmation

1252
01:16:12,950 --> 01:16:11,990
in five minutes after

1253
01:16:17,590 --> 01:16:12,960
w

1254
01:16:17,600 --> 01:16:22,149
8.74 copy

1255
01:16:25,090 --> 01:16:23,590
redux

1256
01:16:30,149 --> 01:16:25,100
how do you copy us now

1257
01:16:41,830 --> 01:16:31,830
we have a solar

1258
01:16:41,840 --> 01:17:11,590
we are completing the compass at 0.905

1259
01:17:16,550 --> 01:17:13,910
of your structure were feathered

1260
01:17:20,070 --> 01:17:16,560
nominally the parameters are

1261
01:17:20,080 --> 01:17:28,709
band is 51.6

1262
01:17:34,470 --> 01:17:31,110
you are going to loosen the shoulder

1263
01:17:36,630 --> 01:17:34,480

straps to open up your helmets

1264
01:17:51,030 --> 01:17:36,640
and to check the thermal sensors how do

1265
01:17:55,510 --> 01:17:53,350
crews continuing to go through their uh

1266
01:17:57,590 --> 01:17:55,520
checkouts that occur once the soyuz does

1267
01:17:59,990 --> 01:17:57,600
make it to orbit they launched again at

1268
01:18:03,030 --> 01:18:00,000
12 45 just as planned and launch went

1269
01:18:05,110 --> 01:18:03,040
smoothly uh we've i've been getting your

1270
01:18:06,470 --> 01:18:05,120
questions using the hashtag asknassa and

1271
01:18:08,229 --> 01:18:06,480
we're going to

1272
01:18:10,310 --> 01:18:08,239
take a couple before we go into some

1273
01:18:12,790 --> 01:18:10,320
launch replays that are coming up next

1274
01:18:15,350 --> 01:18:12,800
this first one coming from

1275
01:18:18,470 --> 01:18:15,360
avia who's asking how much g-force the

1276
01:18:21,110 --> 01:18:18,480
crew sees during their ascent to space

1277
01:18:23,669 --> 01:18:21,120
um at the launch the crew experiences

1278
01:18:25,510 --> 01:18:23,679
about 1.7 times the force of gravity and

1279
01:18:27,189 --> 01:18:25,520
by the time the solid rocket boosters

1280
01:18:29,669 --> 01:18:27,199
separate about two minutes into the

1281
01:18:31,990 --> 01:18:29,679
flight it'll be already over two times

1282
01:18:34,310 --> 01:18:32,000
the force of gravity

1283
01:18:35,750 --> 01:18:34,320
during the last minute of ascent which

1284
01:18:37,430 --> 01:18:35,760
uh that's about

1285
01:18:39,030 --> 01:18:37,440
seven and a half minute point until

1286
01:18:41,030 --> 01:18:39,040
about eight and a half minutes when the

1287
01:18:42,630 --> 01:18:41,040
main engines are ignited in the last in

1288
01:18:45,030 --> 01:18:42,640

that last little time

1289
01:18:47,750 --> 01:18:45,040
they experience about three times the

1290
01:18:49,270 --> 01:18:47,760
force of gravities

1291
01:18:52,630 --> 01:18:49,280
then you go from that straightened to

1292
01:18:56,950 --> 01:18:52,640
zero once they reach zero gravity

1293
01:19:00,390 --> 01:18:56,960
we also have a another question this one

1294
01:19:02,390 --> 01:19:00,400
coming to us from all the

1295
01:19:04,229 --> 01:19:02,400
indicators are they all nominal did you

1296
01:19:06,790 --> 01:19:04,239
check this one coming to us from kent

1297
01:19:09,830 --> 01:19:06,800
asking whether or not astronauts sleep

1298
01:19:12,390 --> 01:19:09,840
during flight or eat and because this

1299
01:19:14,870 --> 01:19:12,400
one is a very short flight they probably

1300
01:19:16,630 --> 01:19:14,880
will not have time to to take a nap

1301
01:19:18,310 --> 01:19:16,640
maybe they can grab a snack they have

1302
01:19:20,070 --> 01:19:18,320
been sitting and waiting for lunch for

1303
01:19:22,149 --> 01:19:20,080
several hours now so

1304
01:19:26,229 --> 01:19:22,159
that would be uh one of the first things

1305
01:19:27,430 --> 01:19:26,239
i might reach for but um on some um some

1306
01:19:29,910 --> 01:19:27,440
travels to the international space

1307
01:19:31,830 --> 01:19:29,920
station can take much longer um

1308
01:19:33,910 --> 01:19:31,840
used to the the

1309
01:19:35,510 --> 01:19:33,920
the journey would take a couple of days

1310
01:19:37,669 --> 01:19:35,520
um it's continued to get shorter and

1311
01:19:39,189 --> 01:19:37,679
shorter for soyuz crew members but for

1312
01:19:40,630 --> 01:19:39,199
instance uh

1313
01:19:42,950 --> 01:19:40,640

the first

1314
01:19:45,990 --> 01:19:42,960
spacex dragon crew that launched earlier

1315
01:19:47,669 --> 01:19:46,000
this year had uh about a day's

1316
01:19:49,030 --> 01:19:47,679
amount of time between their launch and

1317
01:19:50,709 --> 01:19:49,040
their talking at the international space

1318
01:19:53,189 --> 01:19:50,719
station so they did get a little bit of

1319
01:20:11,189 --> 01:19:53,199
time to take a quick nap and grab

1320
01:20:14,709 --> 01:20:12,790
in a few minutes we hope to have some

1321
01:20:17,830 --> 01:20:14,719
additional views of launch to play for

1322
01:20:20,149 --> 01:20:17,840
you that again took place at 12 45 a.m

1323
01:20:23,669 --> 01:20:20,159
central time in the baikonur cosmodrome

1324
01:20:28,790 --> 01:20:26,229
crew continuing to go through their uh

1325
01:20:30,790 --> 01:20:28,800
early checkouts now they are safely in

1326
01:20:33,750 --> 01:20:30,800
orbit and everything going smoothly so

1327
01:20:35,350 --> 01:20:33,760
far they continue at that rate they are

1328
01:20:38,070 --> 01:20:35,360
scheduled to talk to the international

1329
01:20:57,350 --> 01:20:38,080
space station at 3 52 a.m central time

1330
01:21:01,189 --> 01:20:59,910
and here are those replays beginning now

1331
01:21:03,189 --> 01:21:01,199
these coming

1332
01:21:07,750 --> 01:21:03,199
from different cameras than we were able

1333
01:21:11,430 --> 01:21:07,760
to see in real time when the soyuz ms-17

1334
01:21:13,510 --> 01:21:11,440
lifted off from the launch pad 31 launch

1335
01:21:14,709 --> 01:21:13,520
site 31

1336
01:21:19,430 --> 01:21:14,719
in the back of north cosmodrome in

1337
01:21:25,590 --> 01:21:23,030
on board kate rubins sergey kuzkov and

1338
01:22:20,950 --> 01:21:25,600

sergey rizzikov now all on their way to

1339
01:22:20,960 --> 01:22:25,430
first

1340
01:22:30,229 --> 01:22:27,910
second view there of today's launch at

1341
01:23:04,830 --> 01:22:30,239
12 45 we'll have a total of five of

1342
01:23:04,840 --> 01:23:18,990
oh is

1343
01:25:32,149 --> 01:24:38,870
[Music]

1344
01:25:53,360 --> 01:25:34,940
so

1345
01:26:13,430 --> 01:25:57,430
[Music]

1346
01:26:13,440 --> 01:26:27,189
uh

1347
01:26:27,199 --> 01:26:38,629
time

1348
01:26:38,639 --> 01:27:41,940
okay

1349
01:28:18,870 --> 01:28:08,650
[Music]

1350
01:28:18,880 --> 01:28:22,790
so

1351
01:29:11,430 --> 01:28:43,230
[Music]

1352
01:29:11,440 --> 01:29:29,430
um

1353
01:29:59,510 --> 01:29:47,350
so

1354
01:29:59,520 --> 01:30:11,430
let's get the material

1355
01:30:16,629 --> 01:30:13,990
that was a series of replays of today's

1356
01:30:17,830 --> 01:30:16,639
12 45 a.m central time launch the crew

1357
01:30:20,790 --> 01:30:17,840
on board

1358
01:30:24,149 --> 01:30:20,800
nasa astronaut kate rubins and roscosmos

1359
01:30:26,950 --> 01:30:24,159
cosmonauts sergey kudskrichkov and soyuz

1360
01:30:28,310 --> 01:30:26,960
commander sergey rizhikov are all now on

1361
01:30:30,070 --> 01:30:28,320
their way to the international space

1362
01:30:32,950 --> 01:30:30,080
station and scheduled to make the first

1363
01:30:35,830 --> 01:30:32,960

two orbit rendezvous for a

1364
01:30:39,030 --> 01:30:35,840
soyuz with crew aboard that is uh coming

1365
01:30:40,629 --> 01:30:39,040
up at 3 52 a.m central today so you

1366
01:30:42,310 --> 01:30:40,639
won't uh

1367
01:30:43,910 --> 01:30:42,320
you'll want to stay tuned to nasa tv

1368
01:30:45,750 --> 01:30:43,920
we're going to take a quick break now

1369
01:30:47,669 --> 01:30:45,760
that the crew is safely in orbit but

1370
01:30:50,149 --> 01:30:47,679
we'll be back at 3 a.m central for our

1371
01:30:52,629 --> 01:30:50,159
docking coverage again that docking

1372
01:30:55,510 --> 01:30:52,639
scheduled to occur at 3 52 a.m after

1373
01:30:57,830 --> 01:30:55,520
which we'll take a quick break while we

1374
01:30:59,430 --> 01:30:57,840
show you some post launch video files

1375
01:31:01,350 --> 01:30:59,440
and then come back for hatch opening

1376
01:31:03,189 --> 01:31:01,360
coverage at 5 am

1377
01:31:06,390 --> 01:31:03,199
today today's activities will wrap up at

1378
01:31:07,910 --> 01:31:06,400
5 45 am when the hatch is open and the

1379
01:31:10,550 --> 01:31:07,920
international space station is able to

1380
01:31:13,350 --> 01:31:10,560
welcome their three new crew members and

1381
01:31:15,750 --> 01:31:13,360
then we will uh finish up the day with a

1382
01:31:18,310 --> 01:31:15,760
video file of all of it at 8 am that's

1383
01:31:20,229 --> 01:31:18,320
all that's coming up here on nasa tv so

1384
01:31:22,310 --> 01:31:20,239
stick with us tonight and

1385
01:31:23,590 --> 01:31:22,320
get ready to welcome the new crew

1386
01:31:24,950 --> 01:31:23,600
members to the international space

1387
01:31:48,140 --> 01:31:24,960
station

1388
01:31:54,570 --> 01:31:51,990

[Music]