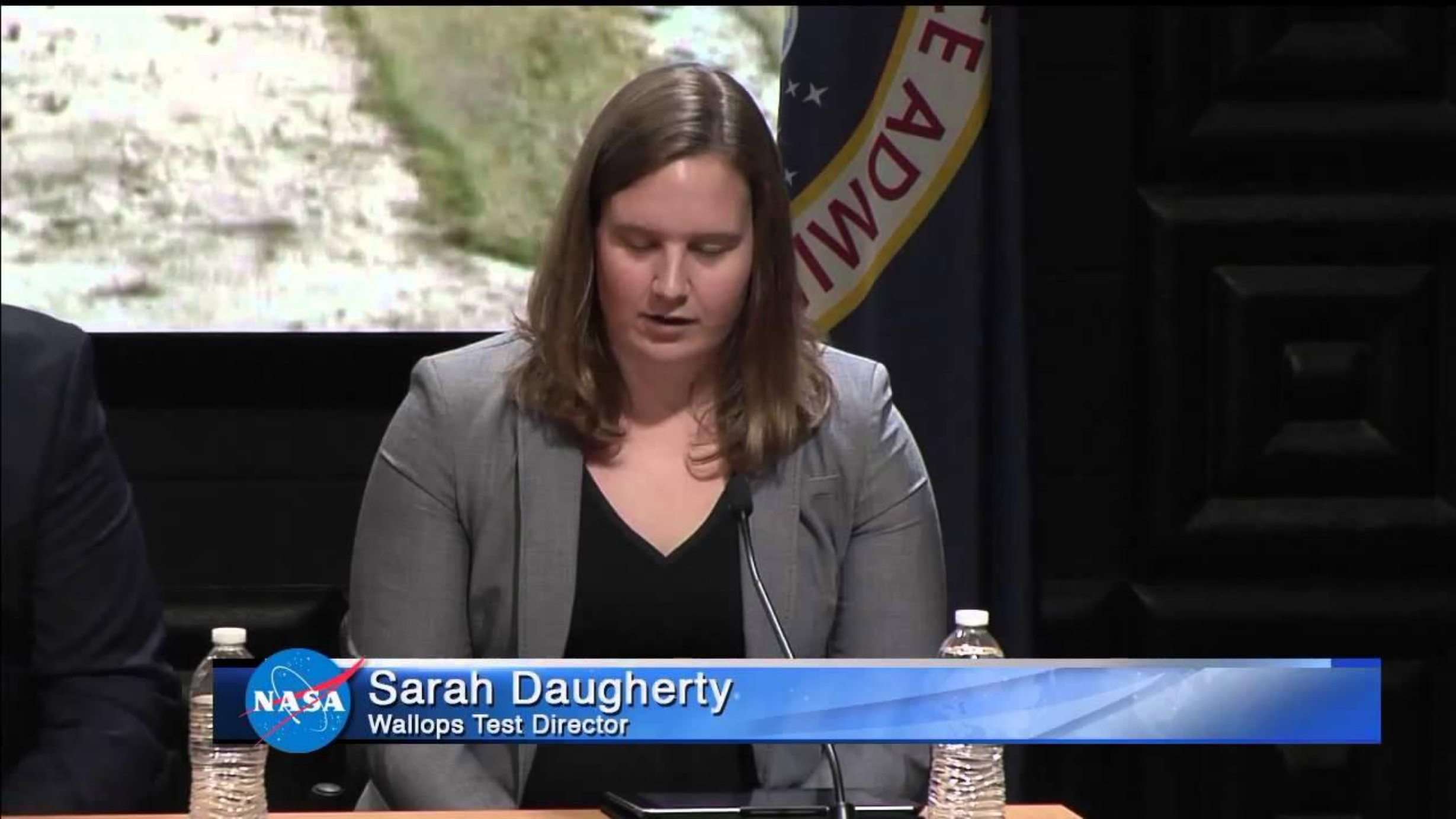
Sarah Daugherty
Wallops Test Director

1
00:00:07,349 --> 00:00:04,950
hello everyone and welcome to today's

2
00:00:08,870 --> 00:00:07,359
pre-launch status briefing for orbital's

3
00:00:09,990 --> 00:00:08,880
mission to the international space

4
00:00:12,549 --> 00:00:10,000
station

5
00:00:14,870 --> 00:00:12,559
orbital sciences cygnus cargo spacecraft

6
00:00:17,830 --> 00:00:14,880
is loaded with about 5 000 pounds of

7
00:00:20,310 --> 00:00:17,840
cargo for the space station and the crew

8
00:00:23,750 --> 00:00:20,320
the antares rocket is poised for liftoff

9
00:00:25,750 --> 00:00:23,760
tomorrow at 6 45 pm eastern time from

10
00:00:28,710 --> 00:00:25,760
the mid-atlantic regional spaceport's

11
00:00:31,029 --> 00:00:28,720
pad 0a here at nasa's wallops flight

12
00:00:32,950 --> 00:00:31,039
facility in virginia

13
00:00:34,790 --> 00:00:32,960

here to talk about how the preparations

14
00:00:36,790 --> 00:00:34,800
for launch have been going

15
00:00:39,670 --> 00:00:36,800
are gerald esquivel

16
00:00:41,350 --> 00:00:39,680
iss cygnus visiting vehicle integration

17
00:00:43,750 --> 00:00:41,360
manager

18
00:00:46,950 --> 00:00:43,760
frank culbertson executive vice

19
00:00:48,630 --> 00:00:46,960
president for orbital sciences

20
00:00:52,310 --> 00:00:48,640
mike pinkston

21
00:00:55,189 --> 00:00:52,320
antares program manager for orbital

22
00:00:57,270 --> 00:00:55,199
and sarah dardy test director at wallops

23
00:00:59,990 --> 00:00:57,280
flight facility

24
00:01:02,389 --> 00:01:00,000
for those of you watching on tv

25
00:01:04,950 --> 00:01:02,399
we'll be taking questions from media

26
00:01:07,510 --> 00:01:04,960
through a phone bridge and for those

27
00:01:09,910 --> 00:01:07,520
joining us on social media you can ask

28
00:01:12,870 --> 00:01:09,920
questions during today's briefing using

29
00:01:14,550 --> 00:01:12,880
the hashtag asknasa

30
00:01:16,950 --> 00:01:14,560
so we'll go ahead and get started gerald

31
00:01:18,950 --> 00:01:16,960
would you like to start us off

32
00:01:20,870 --> 00:01:18,960
thank you rachel and good afternoon to

33
00:01:24,469 --> 00:01:20,880
everyone

34
00:01:26,870 --> 00:01:24,479
let me first start by saying wow

35
00:01:28,630 --> 00:01:26,880
what a great time to be here in virginia

36
00:01:29,830 --> 00:01:28,640
for a launch

37
00:01:31,510 --> 00:01:29,840
we have

38
00:01:33,510 --> 00:01:31,520

some great weather couldn't be better

39
00:01:35,429 --> 00:01:33,520
here at wallops and

40
00:01:38,310 --> 00:01:35,439
we're going to have a beautiful launch

41
00:01:39,990 --> 00:01:38,320
tomorrow evening right around dusk

42
00:01:41,990 --> 00:01:40,000
right now it's an exciting time to be

43
00:01:43,429 --> 00:01:42,000
part of the nasa community and in

44
00:01:44,950 --> 00:01:43,439
particular part of the space station

45
00:01:46,789 --> 00:01:44,960
program

46
00:01:48,389 --> 00:01:46,799
the space station is becoming a very

47
00:01:50,630 --> 00:01:48,399
busy outpost

48
00:01:52,789 --> 00:01:50,640
we have vehicles coming and going on a

49
00:01:55,910 --> 00:01:52,799
pretty regular basis now

50
00:01:57,990 --> 00:01:55,920
this past friday we had our final go

51
00:01:59,749 --> 00:01:58,000
no-go readiness review it's called an

52
00:02:01,990 --> 00:01:59,759
immt

53
00:02:04,149 --> 00:02:02,000
where normally in the past

54
00:02:06,389 --> 00:02:04,159
we would only address a single visiting

55
00:02:08,630 --> 00:02:06,399
vehicle event we would either have a

56
00:02:10,550 --> 00:02:08,640
vehicle coming into the station or a

57
00:02:12,550 --> 00:02:10,560
vehicle leaving the station

58
00:02:14,070 --> 00:02:12,560
and all of the station partnership

59
00:02:16,470 --> 00:02:14,080
is involved in this meeting providing

60
00:02:17,830 --> 00:02:16,480
the go or no go for the event

61
00:02:19,750 --> 00:02:17,840
this time though

62
00:02:21,990 --> 00:02:19,760
we had to address four different

63
00:02:23,670 --> 00:02:22,000

visiting vehicle events

64
00:02:25,910 --> 00:02:23,680
in in the near term

65
00:02:28,229 --> 00:02:25,920
of course the most important topic of

66
00:02:29,990 --> 00:02:28,239
that readiness review was the station

67
00:02:32,229 --> 00:02:30,000
readiness and all of the teams readiness

68
00:02:34,390 --> 00:02:32,239
to conduct the orb 3 mission

69
00:02:36,550 --> 00:02:34,400
i'm happy to report that the station

70
00:02:38,630 --> 00:02:36,560
partnership did give a go

71
00:02:41,350 --> 00:02:38,640
to conduct the mission so tomorrow we

72
00:02:43,110 --> 00:02:41,360
will have the the nice launch and then

73
00:02:44,710 --> 00:02:43,120
the eventual cygnus arrival at the space

74
00:02:46,390 --> 00:02:44,720
station around the november second time

75
00:02:48,070 --> 00:02:46,400
frame

76
00:02:49,110 --> 00:02:48,080
the other

77
00:02:50,390 --> 00:02:49,120
another

78
00:02:52,390 --> 00:02:50,400
topic that was

79
00:02:55,270 --> 00:02:52,400
conducted in that review

80
00:02:57,430 --> 00:02:55,280
was related to the dragon spacecraft

81
00:02:59,270 --> 00:02:57,440
that vehicle was attached to the station

82
00:03:01,270 --> 00:02:59,280
at the same birthing port

83
00:03:03,509 --> 00:03:01,280
that we have planned for cygnus

84
00:03:05,110 --> 00:03:03,519
i'm happy to report that

85
00:03:06,790 --> 00:03:05,120
the dragon was released from the space

86
00:03:09,910 --> 00:03:06,800
station yesterday morning

87
00:03:11,350 --> 00:03:09,920
and it arrived back on earth splashed

88
00:03:13,430 --> 00:03:11,360

down around

89
00:03:15,589 --> 00:03:13,440
3 40 pm eastern time

90
00:03:17,589 --> 00:03:15,599
so that birthing port is now free and

91
00:03:19,270 --> 00:03:17,599
ready for cygnus

92
00:03:22,229 --> 00:03:19,280
and then the other two visiting vehicle

93
00:03:25,190 --> 00:03:22,239
events that was that we discussed

94
00:03:26,949 --> 00:03:25,200
were two russian progress vehicles

95
00:03:29,270 --> 00:03:26,959
we have 56 p

96
00:03:31,750 --> 00:03:29,280
which is departing the station on monday

97
00:03:33,430 --> 00:03:31,760
and 57 p which is arriving to the

98
00:03:34,789 --> 00:03:33,440
station on wednesday

99
00:03:36,869 --> 00:03:34,799
so as you can see there's there's quite

100
00:03:38,789 --> 00:03:36,879
a quite a bit of visiting vehicle

101
00:03:40,630 --> 00:03:38,799
traffic readiness

102
00:03:43,270 --> 00:03:40,640
discussions that are going on

103
00:03:45,270 --> 00:03:43,280
once we have the two progress vehicle

104
00:03:46,869 --> 00:03:45,280
activities out of the way

105
00:03:49,030 --> 00:03:46,879
after wednesday

106
00:03:50,070 --> 00:03:49,040
the station will be ready to accept

107
00:03:53,190 --> 00:03:50,080
cygnus

108
00:03:55,589 --> 00:03:53,200
later in the week sunday november 2nd

109
00:03:57,030 --> 00:03:55,599
and then just to complete the picture of

110
00:03:58,470 --> 00:03:57,040
all the other visiting vehicles that are

111
00:04:01,589 --> 00:03:58,480
at the space station

112
00:04:03,670 --> 00:04:01,599
we still have the european atv atv5

113
00:04:06,309 --> 00:04:03,680

vehicle which is attached and we have

114
00:04:08,470 --> 00:04:06,319
two soyuz vehicles we have the 39s

115
00:04:09,990 --> 00:04:08,480
vehicle and the 40s vehicle

116
00:04:12,149 --> 00:04:10,000
so as you can see it's it's quite an

117
00:04:15,830 --> 00:04:12,159
exciting time with all of the comings

118
00:04:17,830 --> 00:04:15,840
and goings of these visiting vehicles

119
00:04:20,069 --> 00:04:17,840
from a station subsystem and hardware

120
00:04:21,830 --> 00:04:20,079
configuration perspective

121
00:04:24,230 --> 00:04:21,840
as i mentioned the birthing port is now

122
00:04:26,950 --> 00:04:24,240
free and ready for cygnus

123
00:04:28,950 --> 00:04:26,960
the station robotics arm the ssrms

124
00:04:30,790 --> 00:04:28,960
is positioned and ready to capture

125
00:04:32,790 --> 00:04:30,800
cygnus when it arrives

126
00:04:33,830 --> 00:04:32,800
our proximity communication systems that

127
00:04:36,150 --> 00:04:33,840
we use

128
00:04:38,469 --> 00:04:36,160
to support the cygnus rendezvous

129
00:04:40,310 --> 00:04:38,479
that has been activated checked out and

130
00:04:43,189 --> 00:04:40,320
all systems are go there

131
00:04:44,790 --> 00:04:43,199
and the station crew has been um been

132
00:04:47,670 --> 00:04:44,800
readied they've conducted whatever

133
00:04:49,430 --> 00:04:47,680
proficiency training was necessary uh

134
00:04:50,710 --> 00:04:49,440
not too much is needed nowadays with as

135
00:04:52,310 --> 00:04:50,720
many vehicles that they're having to

136
00:04:55,030 --> 00:04:52,320
deal with but whatever a little bit

137
00:04:57,350 --> 00:04:55,040
necessary for specific to cygnus they've

138
00:04:59,590 --> 00:04:57,360

completed so we're all ready for cygnus

139
00:05:02,070 --> 00:04:59,600
arriving to the station

140
00:05:04,070 --> 00:05:02,080
we have reid wiseman and barry wilmore

141
00:05:05,990 --> 00:05:04,080
will be the two astronauts supporting

142
00:05:07,590 --> 00:05:06,000
the capture of cygnus

143
00:05:10,150 --> 00:05:07,600
with

144
00:05:11,830 --> 00:05:10,160
reid wiseman doing the actual arm ops

145
00:05:13,990 --> 00:05:11,840
for the capture

146
00:05:16,230 --> 00:05:14,000
as rachel mentioned we have a little

147
00:05:17,189 --> 00:05:16,240
over 5000 pounds of cargo coming to the

148
00:05:18,550 --> 00:05:17,199
station

149
00:05:20,710 --> 00:05:18,560
a couple of

150
00:05:23,110 --> 00:05:20,720
cool pieces of cargo that

151
00:05:24,629 --> 00:05:23,120
kind of excite me we have our first high

152
00:05:26,710 --> 00:05:24,639
pressure

153
00:05:29,029 --> 00:05:26,720
norse tank that stands for the nitrogen

154
00:05:31,830 --> 00:05:29,039
oxygen and resupply system

155
00:05:35,110 --> 00:05:31,840
that norse tank it's a nitrogen tank

156
00:05:37,029 --> 00:05:35,120
it's at about 6000 psi so you can

157
00:05:39,029 --> 00:05:37,039
imagine quite quite a few of our nasa

158
00:05:41,590 --> 00:05:39,039
safety types get pretty excited when you

159
00:05:43,590 --> 00:05:41,600
talk about that kind of high pressure

160
00:05:45,350 --> 00:05:43,600
but that's coming up on cygnus we're

161
00:05:46,469 --> 00:05:45,360
very thankful and that's going to

162
00:05:47,670 --> 00:05:46,479
resupply

163
00:05:50,310 --> 00:05:47,680

some of our nitrogen high pressure

164
00:05:52,469 --> 00:05:50,320
nitrogen systems in our in our airlock

165
00:05:54,710 --> 00:05:52,479
we've also got 32

166
00:05:57,110 --> 00:05:54,720
cubesats and their deployers coming up

167
00:05:58,629 --> 00:05:57,120
on cygnus uh this mission

168
00:06:00,950 --> 00:05:58,639
those are always exciting to see them

169
00:06:02,070 --> 00:06:00,960
deployed a little four inch by four inch

170
00:06:05,110 --> 00:06:02,080
cubes

171
00:06:06,550 --> 00:06:05,120
that go out the gym airlock

172
00:06:08,629 --> 00:06:06,560
and then another

173
00:06:11,590 --> 00:06:08,639
real cool piece of equipment and

174
00:06:14,070 --> 00:06:11,600
instrument is called a reber r-e-b-r

175
00:06:16,150 --> 00:06:14,080
uh that's a re-entry breakup recorder uh

176
00:06:17,749 --> 00:06:16,160
that's coming up and i believe the plan

177
00:06:21,110 --> 00:06:17,759
is to

178
00:06:23,029 --> 00:06:21,120
attach that to the atv-5 vehicle so then

179
00:06:25,350 --> 00:06:23,039
when the atv 5 comes in

180
00:06:27,430 --> 00:06:25,360
the reaper will record all the

181
00:06:29,270 --> 00:06:27,440
accelerations the stresses the vehicle

182
00:06:30,790 --> 00:06:29,280
is undertaking

183
00:06:32,150 --> 00:06:30,800
the rotational

184
00:06:33,670 --> 00:06:32,160
items of the vehicle

185
00:06:36,150 --> 00:06:33,680
giving us a better understanding of all

186
00:06:37,350 --> 00:06:36,160
the dynamics that occur during re-entry

187
00:06:39,909 --> 00:06:37,360
so that's a pretty cool little device

188
00:06:42,070 --> 00:06:39,919

there now while most of the vehicle if

189
00:06:44,309 --> 00:06:42,080
not all of it gets burned up the reaver

190
00:06:47,350 --> 00:06:44,319
is designed to remain

191
00:06:50,230 --> 00:06:47,360
intact and then before it hits the ocean

192
00:06:52,230 --> 00:06:50,240
it does send all of its telemetry

193
00:06:53,189 --> 00:06:52,240
to the various sites that are collecting

194
00:06:56,950 --> 00:06:53,199
the data

195
00:07:01,189 --> 00:06:58,950
cygnus as i mentioned arriving on

196
00:07:02,710 --> 00:07:01,199
november 2nd the plan is to have cygnus

197
00:07:04,790 --> 00:07:02,720
there for about a month

198
00:07:05,830 --> 00:07:04,800
and then around the december third time

199
00:07:07,589 --> 00:07:05,840
frame

200
00:07:09,830 --> 00:07:07,599
we should have filled up cygnus with all

201
00:07:10,629 --> 00:07:09,840
of our disposal cargo and we'll be ready

202
00:07:12,150 --> 00:07:10,639
to

203
00:07:14,230 --> 00:07:12,160
send it off

204
00:07:16,870 --> 00:07:14,240
and i know all the teams here at wallops

205
00:07:18,710 --> 00:07:16,880
the orbital mars nasa teams

206
00:07:20,150 --> 00:07:18,720
are all been working hard getting ready

207
00:07:22,629 --> 00:07:20,160
for this mission so i'll turn it over to

208
00:07:25,029 --> 00:07:22,639
frank here to give you the status of the

209
00:07:26,390 --> 00:07:25,039
antares in cygnus

210
00:07:28,150 --> 00:07:26,400
thank you very much gerald appreciate

211
00:07:29,990 --> 00:07:28,160
the summary and the

212
00:07:32,070 --> 00:07:30,000
and the optimism uh this is the first

213
00:07:34,469 --> 00:07:32,080

time i've ever seen a 98 chance of go

214
00:07:35,990 --> 00:07:34,479
from the weatherman so uh

215
00:07:38,070 --> 00:07:36,000
i don't i'd like to talk to that

216
00:07:40,309 --> 00:07:38,080
weatherman more often but um

217
00:07:42,070 --> 00:07:40,319
on behalf of our ceo david thompson and

218
00:07:43,350 --> 00:07:42,080
the entire orbital team i want to say

219
00:07:45,189 --> 00:07:43,360
what a pleasure it is to be back at

220
00:07:46,230 --> 00:07:45,199
wallops for another one of these big

221
00:07:48,469 --> 00:07:46,240
events

222
00:07:51,029 --> 00:07:48,479
we're very proud of the the

223
00:07:52,629 --> 00:07:51,039
team that we are part of here between

224
00:07:54,950 --> 00:07:52,639
nasa wallops

225
00:07:56,629 --> 00:07:54,960
nasa iss program and headquarters as

226
00:07:58,469 --> 00:07:56,639
well as the mars team

227
00:08:01,189 --> 00:07:58,479
and and all the folks that support this

228
00:08:03,189 --> 00:08:01,199
uh both our subcontractors and teammates

229
00:08:05,189 --> 00:08:03,199
i especially want to thank the folks

230
00:08:07,430 --> 00:08:05,199
that made a quick trip out to bermuda

231
00:08:09,589 --> 00:08:07,440
after the hurricane went through and and

232
00:08:11,029 --> 00:08:09,599
put that back together and and got it up

233
00:08:12,790 --> 00:08:11,039
and running in time to support this

234
00:08:14,150 --> 00:08:12,800
launch that was a lot of a lot of hard

235
00:08:15,430 --> 00:08:14,160
work and and they weren't sure what they

236
00:08:17,029 --> 00:08:15,440
were going to find when they got it got

237
00:08:18,390 --> 00:08:17,039
there after a category 3 went through

238
00:08:21,270 --> 00:08:18,400

but they did a great job of getting it

239
00:08:23,589 --> 00:08:21,280
back online and we appreciate the

240
00:08:25,029 --> 00:08:23,599
the effort

241
00:08:26,869 --> 00:08:25,039
given all the traffic that's coming and

242
00:08:29,029 --> 00:08:26,879
going gerald i think that uh we might

243
00:08:30,469 --> 00:08:29,039
want to send up a some of those red and

244
00:08:32,709 --> 00:08:30,479
green wands they use on the deck of an

245
00:08:34,230 --> 00:08:32,719
aircraft carrier so tonto wiseman can

246
00:08:36,310 --> 00:08:34,240
direct everybody in and out of the

247
00:08:37,589 --> 00:08:36,320
docking ports it's getting pretty busy

248
00:08:40,070 --> 00:08:37,599
and we're happy to be part of that

249
00:08:41,110 --> 00:08:40,080
business and a part of the business as

250
00:08:43,269 --> 00:08:41,120
it is

251
00:08:45,110 --> 00:08:43,279
um

252
00:08:47,590 --> 00:08:45,120
i should announce that uh this

253
00:08:49,269 --> 00:08:47,600
spacecraft as our past ones have been is

254
00:08:51,750 --> 00:08:49,279
named for a uh

255
00:08:53,750 --> 00:08:51,760
former um astronaut and named for a

256
00:08:55,350 --> 00:08:53,760
person who's been involved in in

257
00:08:57,350 --> 00:08:55,360
commercial space flight either directly

258
00:08:59,509 --> 00:08:57,360
or indirectly with orbital

259
00:09:01,670 --> 00:08:59,519
this one this cygnus spacecraft is the

260
00:09:04,070 --> 00:09:01,680
ss d slayton

261
00:09:05,670 --> 00:09:04,080
a member of the apollo 7

262
00:09:07,750 --> 00:09:05,680
who also was the chief astronaut for

263
00:09:09,990 --> 00:09:07,760

many years and finally had his chance to

264
00:09:11,190 --> 00:09:10,000
fly on the apollo soyuz mission

265
00:09:13,190 --> 00:09:11,200
there's a lot more information about

266
00:09:15,269 --> 00:09:13,200
deke on our website and the reasons for

267
00:09:17,350 --> 00:09:15,279
naming the spacecraft after him but he

268
00:09:18,870 --> 00:09:17,360
did have a an early tie to commercial

269
00:09:21,509 --> 00:09:18,880
space flight

270
00:09:23,350 --> 00:09:21,519
he was the president of the company that

271
00:09:25,590 --> 00:09:23,360
owned the conestoga

272
00:09:29,110 --> 00:09:25,600
conestoga rocket that was launched out

273
00:09:31,990 --> 00:09:29,120
of wallops uh october 23rd 1995 almost

274
00:09:33,430 --> 00:09:32,000
20 years ago to the date 19 years ago

275
00:09:37,190 --> 00:09:33,440
and

276
00:09:39,190 --> 00:09:37,200
effort to to commercialize space launch

277
00:09:41,509 --> 00:09:39,200
and delivery to orbit and so we feel we

278
00:09:43,190 --> 00:09:41,519
have a good connection with deke dave

279
00:09:45,030 --> 00:09:43,200
thompson and our founders had some

280
00:09:47,110 --> 00:09:45,040
connections with him and his partners

281
00:09:49,110 --> 00:09:47,120
early in the founding of orbital and in

282
00:09:50,870 --> 00:09:49,120
learning what it what this all meant

283
00:09:52,790 --> 00:09:50,880
so we think it's a good connection and

284
00:09:56,070 --> 00:09:52,800
it's a real honor for us to to carry his

285
00:09:59,269 --> 00:09:56,080
memory into into space one more time

286
00:10:01,829 --> 00:09:59,279
uh this mission as gerald said we'll

287
00:10:03,750 --> 00:10:01,839
spend some time uh we call it loitering

288
00:10:05,910 --> 00:10:03,760

but we'll actually be working

289
00:10:07,430 --> 00:10:05,920
from launch until the time we actually

290
00:10:09,829 --> 00:10:07,440
rendezvous with the space station on

291
00:10:11,990 --> 00:10:09,839
november the 2nd early in the morning i

292
00:10:13,910 --> 00:10:12,000
do want to remind you all that that is

293
00:10:15,030 --> 00:10:13,920
the night or the morning that we change

294
00:10:16,550 --> 00:10:15,040
our clocks

295
00:10:18,069 --> 00:10:16,560
so if you're planning to get up you may

296
00:10:19,910 --> 00:10:18,079
have to wait an extra hour if you get up

297
00:10:22,069 --> 00:10:19,920
on your old time

298
00:10:25,110 --> 00:10:22,079
because we fall back then we'll we'll be

299
00:10:26,710 --> 00:10:25,120
there on time right frank okay

300
00:10:27,750 --> 00:10:26,720
but it is an interesting time to try to

301
00:10:31,350 --> 00:10:27,760
adjust

302
00:10:34,550 --> 00:10:32,710
and and departure as he said is planned

303
00:10:36,389 --> 00:10:34,560
for december 3rd we actually will remain

304
00:10:37,910 --> 00:10:36,399
on orbit for about two weeks following

305
00:10:40,150 --> 00:10:37,920
our departure from the space station

306
00:10:42,389 --> 00:10:40,160
conducting tests of the spacecraft to

307
00:10:43,509 --> 00:10:42,399
continue to expand our engineering

308
00:10:45,590 --> 00:10:43,519
envelope

309
00:10:46,949 --> 00:10:45,600
to learn the spacecraft characteristics

310
00:10:49,750 --> 00:10:46,959
and to get ready for some missions that

311
00:10:52,150 --> 00:10:49,760
are coming down the line uh on later or

312
00:10:53,269 --> 00:10:52,160
orbital launches where we will conduct

313
00:10:55,269 --> 00:10:53,279

experiments

314
00:10:57,509 --> 00:10:55,279
on board the spacecraft following our

315
00:10:59,190 --> 00:10:57,519
our departure from the station so it's a

316
00:11:01,430 --> 00:10:59,200
good exercise for the team it's a good

317
00:11:02,310 --> 00:11:01,440
way to understand the the hardware

318
00:11:03,590 --> 00:11:02,320
better

319
00:11:09,030 --> 00:11:03,600
and

320
00:11:11,910 --> 00:11:09,040
this mission is going to carry over 5

321
00:11:14,230 --> 00:11:11,920
000 pounds of cargo to the crew

322
00:11:15,990 --> 00:11:14,240
a wide variety of items as you've heard

323
00:11:20,069 --> 00:11:16,000
everything from science to clothes to

324
00:11:21,910 --> 00:11:20,079
food tools replacement parts etc

325
00:11:24,230 --> 00:11:21,920
this will bring our total cargo

326
00:11:25,910 --> 00:11:24,240
delivered to over 13 thousand pounds

327
00:11:27,430 --> 00:11:25,920
once we have unloaded all of that and

328
00:11:29,430 --> 00:11:27,440
put it on the station

329
00:11:31,190 --> 00:11:29,440
in in four missions

330
00:11:32,870 --> 00:11:31,200
uh those four missions have been flown

331
00:11:34,949 --> 00:11:32,880
will have been flown in a little over a

332
00:11:37,590 --> 00:11:34,959
year and uh we're very proud of the fact

333
00:11:39,829 --> 00:11:37,600
that we're continuing to deliver on a

334
00:11:42,230 --> 00:11:39,839
regular basis and uh and especially

335
00:11:44,069 --> 00:11:42,240
deliver cargo to the station

336
00:11:45,990 --> 00:11:44,079
we're going to bring cargo away from the

337
00:11:47,829 --> 00:11:46,000
station also and

338
00:11:49,829 --> 00:11:47,839

so far we've brought almost 10 000

339
00:11:51,030 --> 00:11:49,839
pounds of of

340
00:11:54,230 --> 00:11:51,040
some people call it trash we call it

341
00:11:56,389 --> 00:11:54,240
disposable cargo uh off the station uh

342
00:11:58,389 --> 00:11:56,399
that is returned to earth uh burned up

343
00:12:01,509 --> 00:11:58,399
during reentry hopefully and especially

344
00:12:03,430 --> 00:12:01,519
with some of that stuff um and um and

345
00:12:06,629 --> 00:12:03,440
we'll bring another probably

346
00:12:08,310 --> 00:12:06,639
2 500 kilograms or about 5 000 pounds

347
00:12:09,430 --> 00:12:08,320
back on this mission uh bringing our

348
00:12:12,150 --> 00:12:09,440
total to

349
00:12:14,790 --> 00:12:12,160
almost 15 000.

350
00:12:16,550 --> 00:12:14,800
so it's it's a real pleasure and a real

351
00:12:18,310 --> 00:12:16,560
honor for us actually to be a part of

352
00:12:19,990 --> 00:12:18,320
continuing to support the space station

353
00:12:22,069 --> 00:12:20,000
to continuing to ensure that they can

354
00:12:24,550 --> 00:12:22,079
keep six people on board keep them

355
00:12:26,629 --> 00:12:24,560
supplied keep them clothed keep them

356
00:12:28,949 --> 00:12:26,639
busy with uh with the research that's

357
00:12:30,710 --> 00:12:28,959
going on and we hope to continue to

358
00:12:32,949 --> 00:12:30,720
build on that do it

359
00:12:34,790 --> 00:12:32,959
more and more frequently and do it for

360
00:12:36,790 --> 00:12:34,800
many years to come we're very proud of

361
00:12:38,470 --> 00:12:36,800
the fact that we are a part of human

362
00:12:40,389 --> 00:12:38,480
space flight in this country proud of

363
00:12:42,949 --> 00:12:40,399

the fact that we are continuing this

364
00:12:44,389 --> 00:12:42,959
outpost in low earth orbit which really

365
00:12:45,990 --> 00:12:44,399
is just a stepping stone to what we're

366
00:12:48,790 --> 00:12:46,000
going to do next which is to go beyond

367
00:12:50,310 --> 00:12:48,800
low earth orbit go out to the moon uh

368
00:12:53,590 --> 00:12:50,320
continue to explore that and eventually

369
00:12:55,750 --> 00:12:53,600
go to mars and to to asteroids and

370
00:12:57,590 --> 00:12:55,760
continue to explore our solar system and

371
00:12:59,350 --> 00:12:57,600
orbital and other companies are an

372
00:13:00,790 --> 00:12:59,360
essential part of nasa being able to do

373
00:13:01,750 --> 00:13:00,800
that as well as our international

374
00:13:03,990 --> 00:13:01,760
partners

375
00:13:05,750 --> 00:13:04,000
and we we think it's a great team effort

376
00:13:07,269 --> 00:13:05,760
we think it's important for the

377
00:13:09,350 --> 00:13:07,279
for the future of humanity it's

378
00:13:11,509 --> 00:13:09,360
important for understanding our earth as

379
00:13:12,870 --> 00:13:11,519
well as our solar system and we think

380
00:13:15,269 --> 00:13:12,880
it's important for the future of our

381
00:13:17,030 --> 00:13:15,279
next generations to come and we hope

382
00:13:18,870 --> 00:13:17,040
it's an inspiration for the next

383
00:13:20,710 --> 00:13:18,880
generations to come because

384
00:13:22,790 --> 00:13:20,720
as you probably know we fly experiments

385
00:13:24,790 --> 00:13:22,800
for all ages and

386
00:13:27,990 --> 00:13:24,800
we have experiments flying for for

387
00:13:29,829 --> 00:13:28,000
non-profits for universities for various

388
00:13:31,910 --> 00:13:29,839

organizations that go up as small

389
00:13:33,269 --> 00:13:31,920
payloads on board the uh

390
00:13:36,470 --> 00:13:33,279
the commercial

391
00:13:37,350 --> 00:13:36,480
cargo delivery vehicles and who continue

392
00:13:39,750 --> 00:13:37,360
to keep

393
00:13:41,670 --> 00:13:39,760
our kids that are in school now inspired

394
00:13:43,269 --> 00:13:41,680
keep them involved and hopefully keep

395
00:13:45,350 --> 00:13:43,279
them taking math courses so they can get

396
00:13:47,590 --> 00:13:45,360
to get through engineering in college

397
00:13:49,430 --> 00:13:47,600
but we think that's an important

398
00:13:51,509 --> 00:13:49,440
part of our job is to to keep the next

399
00:13:53,750 --> 00:13:51,519
generation interested in this so that we

400
00:13:55,910 --> 00:13:53,760
don't stop doing this because if we stop

401
00:13:57,910 --> 00:13:55,920
doing this if we stop flying humans into

402
00:13:59,269 --> 00:13:57,920
space and if the u.s stops being the

403
00:14:00,550 --> 00:13:59,279
leader on that the next generation is

404
00:14:01,990 --> 00:14:00,560
going to be really upset with us because

405
00:14:03,350 --> 00:14:02,000
they're going to have to start over and

406
00:14:06,790 --> 00:14:03,360
they really do want to go to the moon in

407
00:14:09,269 --> 00:14:07,829
so now i'm going to turn it over to a

408
00:14:11,269 --> 00:14:09,279
real rocket scientist our program

409
00:14:12,230 --> 00:14:11,279
manager for the antares program mike

410
00:14:15,189 --> 00:14:12,240
pinkston

411
00:14:16,710 --> 00:14:15,199
thanks frank uh on behalf of the entire

412
00:14:18,790 --> 00:14:16,720
antares team

413
00:14:22,069 --> 00:14:18,800

we're all excited to be back here for uh

414
00:14:24,470 --> 00:14:22,079
you know prepping at wallops for our uh

415
00:14:27,670 --> 00:14:24,480
third mission of 2014.

416
00:14:29,509 --> 00:14:27,680
i think i've got a short video to

417
00:14:31,110 --> 00:14:29,519
talk you through on some of the

418
00:14:32,550 --> 00:14:31,120
pre-launch preps that have been going on

419
00:14:35,350 --> 00:14:32,560
in our

420
00:14:36,629 --> 00:14:35,360
horizontal integrations

421
00:14:38,470 --> 00:14:36,639
this is a

422
00:14:40,470 --> 00:14:38,480
photo of the

423
00:14:41,750 --> 00:14:40,480
fairing and then the cygnus during the

424
00:14:43,590 --> 00:14:41,760
final cargo

425
00:14:46,310 --> 00:14:43,600
loading operation

426
00:14:48,310 --> 00:14:46,320
uh here we are up on the tell getting

427
00:14:51,430 --> 00:14:48,320
ready for fairing mate that's our team

428
00:14:53,430 --> 00:14:51,440
uh closing out the uh the fairing

429
00:14:55,990 --> 00:14:53,440
and then uh this is a shot of the

430
00:14:58,230 --> 00:14:56,000
fairing being uh maneuvered uh over the

431
00:14:59,829 --> 00:14:58,240
front end of the vehicle to encapsulate

432
00:15:00,870 --> 00:14:59,839
the upper stack and the cygnus payload

433
00:15:02,470 --> 00:15:00,880
for those

434
00:15:04,550 --> 00:15:02,480
paying close attention you'll notice

435
00:15:06,710 --> 00:15:04,560
that there's an extra cylinder on the

436
00:15:08,629 --> 00:15:06,720
end of the fairing this time that uh

437
00:15:10,949 --> 00:15:08,639
accommodates the extra two and a half

438
00:15:15,509 --> 00:15:10,959

meters or so of length that comes with

439
00:15:17,350 --> 00:15:15,519
our uh our new caster 30xl second stage

440
00:15:19,590 --> 00:15:17,360
this is the rollout process we actually

441
00:15:21,670 --> 00:15:19,600
got out of the hiff uh

442
00:15:24,310 --> 00:15:21,680
the afternoon of uh or friday afternoon

443
00:15:26,470 --> 00:15:24,320
around five o'clock uh got it to the pad

444
00:15:28,790 --> 00:15:26,480
and started the erection process

445
00:15:29,990 --> 00:15:28,800
uh you can see it making its way to

446
00:15:32,389 --> 00:15:30,000
vertical

447
00:15:35,110 --> 00:15:32,399
uh late friday night i think we actually

448
00:15:37,350 --> 00:15:35,120
got there and upright sometimes shortly

449
00:15:39,749 --> 00:15:37,360
after midnight it's it's quite a long

450
00:15:42,470 --> 00:15:39,759
process we drive really really slow

451
00:15:43,990 --> 00:15:42,480
and we erect really really slow but you

452
00:15:46,470 --> 00:15:44,000
know once it's up there it's a really

453
00:15:48,470 --> 00:15:46,480
beautiful sight

454
00:15:50,230 --> 00:15:48,480
so you know as far as uh where we are

455
00:15:54,310 --> 00:15:50,240
right now the team has been working hard

456
00:15:56,310 --> 00:15:54,320
at the pad uh orbital nasa wallops and

457
00:15:57,910 --> 00:15:56,320
the mars team

458
00:16:00,150 --> 00:15:57,920
we've actually

459
00:16:01,910 --> 00:16:00,160
maybe the first time yet are going to

460
00:16:03,590 --> 00:16:01,920
finish a little bit ahead of a little

461
00:16:05,110 --> 00:16:03,600
bit ahead of schedule

462
00:16:07,509 --> 00:16:05,120
we got the combined systems test

463
00:16:09,269 --> 00:16:07,519

completed last night final pad preps are

464
00:16:10,470 --> 00:16:09,279
going on and should be wrapping up right

465
00:16:12,470 --> 00:16:10,480
about now

466
00:16:13,829 --> 00:16:12,480
so just due to a combination of factors

467
00:16:15,670 --> 00:16:13,839
we actually ended up being able to roll

468
00:16:17,749 --> 00:16:15,680
out a few hours early

469
00:16:20,629 --> 00:16:17,759
friday and the team did a great job

470
00:16:22,470 --> 00:16:20,639
getting everything complete and you may

471
00:16:24,710 --> 00:16:22,480
even be able to get off and watch a

472
00:16:27,430 --> 00:16:24,720
little football sunday afternoon so

473
00:16:29,590 --> 00:16:27,440
that's that's good for for our guys i i

474
00:16:31,509 --> 00:16:29,600
would like to also add a special thanks

475
00:16:33,110 --> 00:16:31,519
to the wallops team for uh just an

476
00:16:35,509 --> 00:16:33,120
incredible job getting the bermuda site

477
00:16:37,670 --> 00:16:35,519
back up uh you know they they exceeded

478
00:16:40,069 --> 00:16:37,680
anybody's expectations in terms of our

479
00:16:41,990 --> 00:16:40,079
earliest potential launch capability

480
00:16:43,590 --> 00:16:42,000
uh but they uh they pulled off a miracle

481
00:16:45,189 --> 00:16:43,600
and have us ready to go on monday and i

482
00:16:46,790 --> 00:16:45,199
i think when you see the weather report

483
00:16:50,310 --> 00:16:46,800
you'll be as glad as i am that they made

484
00:16:51,670 --> 00:16:50,320
it so with that over to sarah thanks

485
00:16:52,389 --> 00:16:51,680
mike

486
00:16:54,550 --> 00:16:52,399
like

487
00:16:57,110 --> 00:16:54,560
frank and everyone here has mentioned

488
00:16:59,749 --> 00:16:57,120

the nasa wallops range is excited to be

489
00:17:01,670 --> 00:16:59,759
here to support this third

490
00:17:03,749 --> 00:17:01,680
mission commercial resupply mission to

491
00:17:07,029 --> 00:17:03,759
the space station and what we're

492
00:17:08,710 --> 00:17:07,039
responsible for is tracking and data

493
00:17:11,750 --> 00:17:08,720
relay as well as ensuring the safe

494
00:17:14,549 --> 00:17:11,760
flight of the of the rocket a little bit

495
00:17:16,870 --> 00:17:14,559
earlier our facility director bill robel

496
00:17:19,189 --> 00:17:16,880
gave the authority to proceed for the

497
00:17:22,470 --> 00:17:19,199
mission and that's our final milestone

498
00:17:23,909 --> 00:17:22,480
into carrying out the countdown tomorrow

499
00:17:26,150 --> 00:17:23,919
and proceeding with the rest of the

500
00:17:28,630 --> 00:17:26,160
launch operation

501
00:17:30,830 --> 00:17:28,640
from a data and communications

502
00:17:33,110 --> 00:17:30,840
perspective we have range

503
00:17:34,470 --> 00:17:33,120
instrumentation including radars and

504
00:17:36,549 --> 00:17:34,480
telemetry

505
00:17:38,870 --> 00:17:36,559
antennas as well as command

506
00:17:42,070 --> 00:17:38,880
here at wallops as well as downrange in

507
00:17:44,870 --> 00:17:42,080
bermuda and you've heard everyone talk

508
00:17:46,789 --> 00:17:44,880
about bermuda already so we had a crew

509
00:17:50,070 --> 00:17:46,799
go out there about two weeks ago to

510
00:17:54,070 --> 00:17:50,080
secure and stow the site there for us in

511
00:17:55,990 --> 00:17:54,080
preparation for hurricane gonzalo

512
00:17:57,909 --> 00:17:56,000
after that passed through

513
00:18:00,390 --> 00:17:57,919

we got the guys back out there as

514
00:18:03,830 --> 00:18:00,400
quickly as we could which was just a

515
00:18:07,110 --> 00:18:03,840
short about three days later

516
00:18:09,750 --> 00:18:07,120
and then we checked out our systems

517
00:18:13,190 --> 00:18:09,760
we unsecured everything set it all back

518
00:18:16,230 --> 00:18:13,200
up did some functional testing

519
00:18:19,270 --> 00:18:16,240
hooked of the data lines and power

520
00:18:21,590 --> 00:18:19,280
and was actually able to complete a host

521
00:18:24,230 --> 00:18:21,600
of end-to-end data flows and test

522
00:18:26,150 --> 00:18:24,240
procedures on very short order things

523
00:18:28,710 --> 00:18:26,160
that would normally take us seven to ten

524
00:18:32,150 --> 00:18:28,720
days really we got done in about three

525
00:18:35,270 --> 00:18:32,160
or four day time frame so

526
00:18:37,510 --> 00:18:35,280
definitely kudos to the team out there

527
00:18:40,470 --> 00:18:37,520
they gave quite the herculean effort

528
00:18:43,430 --> 00:18:40,480
after such a huge storm went through and

529
00:18:45,909 --> 00:18:43,440
we were we were lucky to not sustain any

530
00:18:48,630 --> 00:18:45,919
any damage at all that

531
00:18:51,350 --> 00:18:48,640
would have prevented us from doing this

532
00:18:53,590 --> 00:18:51,360
on such a short time frame

533
00:18:56,230 --> 00:18:53,600
so with that i'll also

534
00:18:58,630 --> 00:18:56,240
go into the weather report that was also

535
00:19:01,029 --> 00:18:58,640
mentioned here earlier

536
00:19:04,789 --> 00:19:01,039
the launch weather officer

537
00:19:07,430 --> 00:19:04,799
has a forecast for very clear skies very

538
00:19:08,870 --> 00:19:07,440

light winds out of the southwest

539
00:19:14,950 --> 00:19:08,880
and

540
00:19:18,070 --> 00:19:14,960
that gives us a probability of 98

541
00:19:19,590 --> 00:19:18,080
percent for go launch conditions

542
00:19:21,830 --> 00:19:19,600
and that's probably just due to the fact

543
00:19:24,230 --> 00:19:21,840
that the weatherman is never 100

544
00:19:25,669 --> 00:19:24,240
right so we had to knock it back from

545
00:19:27,190 --> 00:19:25,679
there

546
00:19:30,630 --> 00:19:27,200
and the last

547
00:19:32,630 --> 00:19:30,640
chart i have to show here is just a

548
00:19:34,870 --> 00:19:32,640
visibility map

549
00:19:36,630 --> 00:19:34,880
due to the weather forecast and the fact

550
00:19:37,669 --> 00:19:36,640
that the the launch is going to be one

551
00:19:40,630 --> 00:19:37,679
of our first

552
00:19:43,669 --> 00:19:40,640
nighttime launches of the antares rocket

553
00:19:46,230 --> 00:19:43,679
here you'll be able to see

554
00:19:47,590 --> 00:19:46,240
the rocket pretty much up and down the

555
00:19:49,430 --> 00:19:47,600
entire

556
00:19:52,230 --> 00:19:49,440
eastern seaboard there from about

557
00:19:54,789 --> 00:19:52,240
connecticut to south carolina we'll have

558
00:19:55,990 --> 00:19:54,799
a great view of antares lighting up the

559
00:19:57,590 --> 00:19:56,000
night sky

560
00:20:00,230 --> 00:19:57,600
and then just as it

561
00:20:02,870 --> 00:20:00,240
fades off if you keep your eye up there

562
00:20:05,270 --> 00:20:02,880
the iss will actually pass

563
00:20:08,870 --> 00:20:05,280

over about five minutes after launch

564
00:20:10,390 --> 00:20:08,880
around 6 50 p.m so that's kind of a cool

565
00:20:13,110 --> 00:20:10,400
uh double

566
00:20:14,870 --> 00:20:13,120
double show there for everyone so with

567
00:20:16,470 --> 00:20:14,880
that i'll turn it back over to rachel

568
00:20:19,110 --> 00:20:16,480
okay thanks

569
00:20:21,510 --> 00:20:19,120
all right we'll take some questions

570
00:20:23,430 --> 00:20:21,520
from folks in the audience here

571
00:20:25,590 --> 00:20:23,440
if you wouldn't mind stating your name

572
00:20:27,430 --> 00:20:25,600
affiliation and whom you're addressing

573
00:20:29,830 --> 00:20:27,440
your question that would be a big help

574
00:20:31,190 --> 00:20:29,840
and as a reminder to those watching on

575
00:20:33,110 --> 00:20:31,200
tv

576
00:20:36,149 --> 00:20:33,120
you can send us your questions on social

577
00:20:37,830 --> 00:20:36,159
media using the hashtag asknasa

578
00:20:39,669 --> 00:20:37,840
okay uh ken looked like you had a

579
00:20:41,750 --> 00:20:39,679
question

580
00:20:44,630 --> 00:20:41,760
hi ken kramer universe today in america

581
00:20:46,710 --> 00:20:44,640
space for gerald and uh frank mike i'm

582
00:20:50,630 --> 00:20:46,720
curious about this nitrogen tank with

583
00:20:51,909 --> 00:20:50,640
6000 psi can you talk about um

584
00:20:53,590 --> 00:20:51,919
how you're going to maneuver that in

585
00:20:55,830 --> 00:20:53,600
with what the astronauts have to do to

586
00:20:57,270 --> 00:20:55,840
get that into into the station and what

587
00:21:00,310 --> 00:20:57,280
they will do with it when they when they

588
00:21:01,270 --> 00:21:00,320

do get it inside thank you

589
00:21:04,710 --> 00:21:01,280
sure

590
00:21:05,750 --> 00:21:04,720
the nitrogen tank is actually uh coming

591
00:21:08,630 --> 00:21:05,760
up in a

592
00:21:11,590 --> 00:21:08,640
uh what looks like a very similar to

593
00:21:13,510 --> 00:21:11,600
all of our other regular cargo bags so

594
00:21:15,909 --> 00:21:13,520
uh it's got some extra

595
00:21:18,789 --> 00:21:15,919
support structure to uh

596
00:21:21,270 --> 00:21:18,799
to keep it stable but in general uh

597
00:21:23,510 --> 00:21:21,280
there's no special

598
00:21:24,630 --> 00:21:23,520
crew aids or anything to handle the tank

599
00:21:27,669 --> 00:21:24,640
uh it's

600
00:21:31,510 --> 00:21:29,750
for you know the various fault tolerance

601
00:21:32,710 --> 00:21:31,520
necessary to prevent any kind of leakage

602
00:21:35,669 --> 00:21:32,720
or burst

603
00:21:37,430 --> 00:21:35,679
and we have a assembly kit already that

604
00:21:40,230 --> 00:21:37,440
was brought up on the orb ii mission

605
00:21:41,750 --> 00:21:40,240
which the tank will be inserted into to

606
00:21:43,750 --> 00:21:41,760
transfer the nitrogen over into the

607
00:21:45,430 --> 00:21:43,760
airlock

608
00:21:46,710 --> 00:21:45,440
high pressure tanks

609
00:21:48,310 --> 00:21:46,720
so uh it

610
00:21:49,510 --> 00:21:48,320
from a crew perspective if they're going

611
00:21:51,350 --> 00:21:49,520
to be handling it just like they would

612
00:21:53,029 --> 00:21:51,360
any other cargo bags until they get it

613
00:21:54,390 --> 00:21:53,039

to the airlock and then it just goes

614
00:21:57,350 --> 00:21:54,400
right into that assembly kit that's

615
00:21:59,350 --> 00:21:57,360
already been installed previously

616
00:22:00,950 --> 00:21:59,360
from our world's perspective uh we've

617
00:22:03,190 --> 00:22:00,960
spent several years now satisfying the

618
00:22:05,590 --> 00:22:03,200
nasa safety con

619
00:22:07,669 --> 00:22:05,600
safety process in a number of areas

620
00:22:09,190 --> 00:22:07,679
this one got our attention and so we put

621
00:22:11,669 --> 00:22:09,200
them through the same ring

622
00:22:12,630 --> 00:22:11,679
through the same process

623
00:22:14,630 --> 00:22:12,640
and

624
00:22:17,270 --> 00:22:14,640
had them prove to us that it really was

625
00:22:19,510 --> 00:22:17,280
well designed its

626
00:22:21,029 --> 00:22:19,520
storage and handling is all

627
00:22:22,950 --> 00:22:21,039
as it should be and safe and we're

628
00:22:25,029 --> 00:22:22,960
convinced that it's fine our team has

629
00:22:26,549 --> 00:22:25,039
already handled it loaded it on to the

630
00:22:28,549 --> 00:22:26,559
to the cygnus as you know and it's out

631
00:22:30,310 --> 00:22:28,559
at the pad and so we feel very

632
00:22:33,110 --> 00:22:30,320
comfortable with it as a system it's

633
00:22:35,110 --> 00:22:33,120
it's not overly huge as gerald said it's

634
00:22:36,070 --> 00:22:35,120
manageable uh but it is the highest

635
00:22:38,950 --> 00:22:36,080
pressure

636
00:22:41,590 --> 00:22:38,960
vessel we've ever carried inside the

637
00:22:46,230 --> 00:22:43,830
oh i'd say it's about um three three

638
00:22:48,950 --> 00:22:46,240

feet in length and maybe

639
00:22:50,789 --> 00:22:48,960
you know 18 inches in diameter

640
00:22:52,710 --> 00:22:50,799
some people say a bread basket

641
00:22:57,270 --> 00:22:52,720
that's a really big bread bastard

642
00:23:02,310 --> 00:22:59,909
nice go ahead stephen hi stephen clark

643
00:23:03,350 --> 00:23:02,320
with uh space flight now um a couple of

644
00:23:06,470 --> 00:23:03,360
questions

645
00:23:09,029 --> 00:23:06,480
uh first maybe for uh mike can you talk

646
00:23:10,789 --> 00:23:09,039
a little bit about the caster 30xl uh

647
00:23:12,310 --> 00:23:10,799
it's differences from the upper stages

648
00:23:14,789 --> 00:23:12,320
you've flown before

649
00:23:16,070 --> 00:23:14,799
and what sort of improvements or

650
00:23:18,630 --> 00:23:16,080
improvements and performance you get out

651
00:23:21,750 --> 00:23:18,640
of out of that new upper stage

652
00:23:23,590 --> 00:23:21,760
and also maybe for frank and pitching on

653
00:23:25,350 --> 00:23:23,600
this as well do you need this new upper

654
00:23:27,190 --> 00:23:25,360
stage along with the enhanced cygnus

655
00:23:28,950 --> 00:23:27,200
that you'll debut on orb 4

656
00:23:30,710 --> 00:23:28,960
to meet your contractual requirements

657
00:23:32,630 --> 00:23:30,720
for the 20 000 kilograms or is this sort

658
00:23:35,510 --> 00:23:32,640
of icing on the cake above and beyond

659
00:23:37,750 --> 00:23:35,520
the 20 000 thanks go ahead mike

660
00:23:40,549 --> 00:23:37,760
i'll take the first uh part of that uh

661
00:23:43,669 --> 00:23:40,559
the the caster 30 xl is uh

662
00:23:45,590 --> 00:23:43,679
uh an extended length uh version uh of

663
00:23:47,990 --> 00:23:45,600

the you know the caster family of motors

664
00:23:49,510 --> 00:23:48,000
that we've flown on on all of the first

665
00:23:51,750 --> 00:23:49,520
uh four missions

666
00:23:54,310 --> 00:23:51,760
uh the uh you know in some specific

667
00:23:56,630 --> 00:23:54,320
terms it's uh it's about double the

668
00:23:59,350 --> 00:23:56,640
total impulse uh compared to the caster

669
00:24:02,710 --> 00:23:59,360
30b that we flew on orb one and orb two

670
00:24:05,430 --> 00:24:02,720
uh a little higher thrust burns about 30

671
00:24:07,350 --> 00:24:05,440
45 seconds longer than the caster 30b so

672
00:24:08,870 --> 00:24:07,360
you know overall just a much higher

673
00:24:10,950 --> 00:24:08,880
performance

674
00:24:13,029 --> 00:24:10,960
second stage as i mentioned in the you

675
00:24:15,269 --> 00:24:13,039
know talking through the video it's also

676
00:24:16,630 --> 00:24:15,279
you know quite a bit longer

677
00:24:19,669 --> 00:24:16,640
it's

678
00:24:21,510 --> 00:24:19,679
between that and the ultimate extension

679
00:24:23,510 --> 00:24:21,520
of the cygnus pcm to support the full

680
00:24:25,909 --> 00:24:23,520
enhanced cargo capability that we're uh

681
00:24:28,470 --> 00:24:25,919
we're bringing online uh it's about a

682
00:24:31,110 --> 00:24:28,480
three two and a half meter so let's say

683
00:24:33,430 --> 00:24:31,120
maybe eight to ten feet in length that's

684
00:24:34,470 --> 00:24:33,440
added to the total length of the antares

685
00:24:37,430 --> 00:24:34,480
vehicle

686
00:24:40,630 --> 00:24:37,440
uh and it roughly uh just the 30xl

687
00:24:43,110 --> 00:24:40,640
itself roughly uh gives us another 800

688
00:24:45,350 --> 00:24:43,120

to 900 kilograms of payload to orbit

689
00:24:47,350 --> 00:24:45,360
capability so

690
00:24:49,110 --> 00:24:47,360
uh overall i think it's uh it's going to

691
00:24:52,390 --> 00:24:49,120
be a great enhancement to our cargo

692
00:24:54,549 --> 00:24:52,400
service and and yeah we need it

693
00:24:56,710 --> 00:24:54,559
and as far as increasing the

694
00:24:58,390 --> 00:24:56,720
capability of the system when we won the

695
00:25:00,630 --> 00:24:58,400
contract we already had

696
00:25:02,630 --> 00:25:00,640
plans for a performance enhancement

697
00:25:04,230 --> 00:25:02,640
program part way through the system to

698
00:25:07,269 --> 00:25:04,240
ensure that we could in fact carry our

699
00:25:10,710 --> 00:25:07,279
contracted amount of 20 tons to to the

700
00:25:12,870 --> 00:25:10,720
iss we started uh with lower delivery

701
00:25:14,870 --> 00:25:12,880
numbers to begin with and

702
00:25:16,390 --> 00:25:14,880
and have gradually increased it as we

703
00:25:17,590 --> 00:25:16,400
work off our contingencies and our

704
00:25:19,590 --> 00:25:17,600
margins

705
00:25:21,110 --> 00:25:19,600
but we needed this part of it the

706
00:25:23,590 --> 00:25:21,120
enhanced

707
00:25:25,430 --> 00:25:23,600
cargo carrying module which is a meter

708
00:25:27,269 --> 00:25:25,440
longer as well as the increased

709
00:25:29,110 --> 00:25:27,279
performance on the second stage to

710
00:25:30,470 --> 00:25:29,120
really meet our goals and we are in fact

711
00:25:32,470 --> 00:25:30,480
doing that and as mike said eight or

712
00:25:34,230 --> 00:25:32,480
nine hundred kilograms of additional

713
00:25:36,789 --> 00:25:34,240

cargo over what we've done the first few

714
00:25:38,549 --> 00:25:36,799
missions uh it will be our capability

715
00:25:41,430 --> 00:25:38,559
going forward and we needed the extra

716
00:25:43,350 --> 00:25:41,440
volume in order to to carry that and as

717
00:25:45,990 --> 00:25:43,360
we go through the this program and in

718
00:25:47,750 --> 00:25:46,000
future we hope programs with nasa will

719
00:25:49,590 --> 00:25:47,760
continue to increase that performance as

720
00:25:51,669 --> 00:25:49,600
we go

721
00:25:53,269 --> 00:25:51,679
okay robert hi robert with

722
00:25:55,750 --> 00:25:53,279
collectspace.com

723
00:25:57,750 --> 00:25:55,760
um for gerald and frank uh sort of

724
00:25:58,950 --> 00:25:57,760
building off of that and the mention of

725
00:26:01,830 --> 00:25:58,960
all the visiting vehicles that are

726
00:26:04,470 --> 00:26:01,840
coming back and forth uh when cygnus

727
00:26:06,310 --> 00:26:04,480
births it'll be the 14th anniversary of

728
00:26:07,909 --> 00:26:06,320
expedition 1

729
00:26:09,990 --> 00:26:07,919
and 14 years of continuous crude

730
00:26:11,590 --> 00:26:10,000
operations can you talk a little bit

731
00:26:14,230 --> 00:26:11,600
towards the

732
00:26:16,070 --> 00:26:14,240
evolution of logistic support on orbit

733
00:26:17,590 --> 00:26:16,080
and what it says about our current

734
00:26:19,830 --> 00:26:17,600
capabilities that

735
00:26:22,950 --> 00:26:19,840
so much payload so much cargo comes back

736
00:26:25,750 --> 00:26:22,960
and forth between the space station

737
00:26:27,830 --> 00:26:25,760
go ahead boss

738
00:26:29,590 --> 00:26:27,840

wow

739
00:26:30,950 --> 00:26:29,600
you make me feel old by talking all the

740
00:26:32,390 --> 00:26:30,960
way back to expedition one i've been

741
00:26:34,470 --> 00:26:32,400
part of the space station program since

742
00:26:37,350 --> 00:26:34,480
the beginning so i'm feeling

743
00:26:41,190 --> 00:26:39,430
uh but like you said um you know we had

744
00:26:43,669 --> 00:26:41,200
a very robust capability when we had the

745
00:26:45,350 --> 00:26:43,679
shuttle around and uh when we retired

746
00:26:46,950 --> 00:26:45,360
the shuttle

747
00:26:48,470 --> 00:26:46,960
it was uh

748
00:26:50,710 --> 00:26:48,480
we had to rely on our international

749
00:26:53,830 --> 00:26:50,720
partners to provide uh the resupply to

750
00:26:56,149 --> 00:26:53,840
the station and when we had the

751
00:26:57,830 --> 00:26:56,159
the concept the the strategy to involve

752
00:26:59,990 --> 00:26:57,840
the commercial partners uh commercial

753
00:27:01,830 --> 00:27:00,000
providers in in starting to bring our

754
00:27:02,950 --> 00:27:01,840
cargo to station

755
00:27:04,789 --> 00:27:02,960
that was

756
00:27:06,149 --> 00:27:04,799
quite an exciting time not only was it

757
00:27:07,590 --> 00:27:06,159
going to be doing something different at

758
00:27:09,350 --> 00:27:07,600
nasa but

759
00:27:11,110 --> 00:27:09,360
we were going to be returning some of

760
00:27:12,950 --> 00:27:11,120
that resupply capability to the united

761
00:27:14,710 --> 00:27:12,960
states

762
00:27:16,230 --> 00:27:14,720
when you include the two demonstration

763
00:27:18,389 --> 00:27:16,240

missions

764
00:27:21,990 --> 00:27:18,399
we this will be our ninth commercial

765
00:27:22,710 --> 00:27:22,000
flight to the station and as as they've

766
00:27:24,789 --> 00:27:22,720
been

767
00:27:26,549 --> 00:27:24,799
as they have demonstrated

768
00:27:27,909 --> 00:27:26,559
they're very capable of bringing all the

769
00:27:30,310 --> 00:27:27,919
cargo needs

770
00:27:32,470 --> 00:27:30,320
that's the station has

771
00:27:34,870 --> 00:27:32,480
the htv and the atv vehicles provide

772
00:27:36,789 --> 00:27:34,880
some other unique capabilities but

773
00:27:38,870 --> 00:27:36,799
getting the day in and day out needs of

774
00:27:40,950 --> 00:27:38,880
the station now via our commercial

775
00:27:43,990 --> 00:27:40,960
providers is has been key

776
00:27:45,830 --> 00:27:44,000
and we see that continuing on with our

777
00:27:48,549 --> 00:27:45,840
future contracts as well as when we

778
00:27:49,909 --> 00:27:48,559
eventually uh go with the crew

779
00:27:52,870 --> 00:27:49,919
crew transport

780
00:27:54,389 --> 00:27:52,880
and i'll let frank answer any other part

781
00:27:56,870 --> 00:27:54,399
well first of all gerald when you said

782
00:27:58,710 --> 00:27:56,880
you feel old

783
00:28:00,149 --> 00:27:58,720
i started working this stuff almost 20

784
00:28:03,269 --> 00:28:00,159
years before that so what are you trying

785
00:28:06,389 --> 00:28:04,630
it is

786
00:28:07,350 --> 00:28:06,399
gratifying to see it going so well and

787
00:28:09,190 --> 00:28:07,360
to see

788
00:28:10,870 --> 00:28:09,200

the ability of american industry as well

789
00:28:13,190 --> 00:28:10,880
as our international partners to support

790
00:28:14,789 --> 00:28:13,200
this program even without the shuttle

791
00:28:16,870 --> 00:28:14,799
shuttle was a key part of building the

792
00:28:17,750 --> 00:28:16,880
station if it had been able to continue

793
00:28:19,669 --> 00:28:17,760
it would have been a key part of

794
00:28:21,909 --> 00:28:19,679
continuing to supply it and probably

795
00:28:23,350 --> 00:28:21,919
expand it but without the shuttle we we

796
00:28:25,029 --> 00:28:23,360
need all of these vehicles coming and

797
00:28:27,110 --> 00:28:25,039
going in order to support the research

798
00:28:28,310 --> 00:28:27,120
on board and to keep the crew

799
00:28:32,230 --> 00:28:28,320
healthy and

800
00:28:33,750 --> 00:28:32,240
well sustained it is a logistics problem

801
00:28:35,909 --> 00:28:33,760
as well as an operational problem for

802
00:28:37,510 --> 00:28:35,919
the program to to solve but that's part

803
00:28:39,269 --> 00:28:37,520
of what we do

804
00:28:40,870 --> 00:28:39,279
in the space program as we continue to

805
00:28:43,190 --> 00:28:40,880
increase capabilities and if we're going

806
00:28:44,789 --> 00:28:43,200
to want to keep people in space and go

807
00:28:46,470 --> 00:28:44,799
beyond the space station which means

808
00:28:48,389 --> 00:28:46,480
even more people going into space we've

809
00:28:49,830 --> 00:28:48,399
got to keep this going and we've got to

810
00:28:51,669 --> 00:28:49,840
figure out how to do it as efficiently

811
00:28:54,870 --> 00:28:51,679
as possible

812
00:28:57,350 --> 00:28:54,880
i think it's a testament to the both the

813
00:28:58,470 --> 00:28:57,360

the program as well as the suppliers

814
00:29:00,630 --> 00:28:58,480
that we can

815
00:29:02,470 --> 00:29:00,640
interweave all these capabilities

816
00:29:04,549 --> 00:29:02,480
coordinate between the various entities

817
00:29:06,630 --> 00:29:04,559
and international partners and still

818
00:29:09,590 --> 00:29:06,640
keep it flowing fairly smoothly

819
00:29:11,510 --> 00:29:09,600
and keep the research going so

820
00:29:13,830 --> 00:29:11,520
i think that you'll see even more

821
00:29:15,990 --> 00:29:13,840
complicated scenarios in the future as

822
00:29:18,070 --> 00:29:16,000
we as we go forward and try to go beyond

823
00:29:19,669 --> 00:29:18,080
where we are now

824
00:29:21,669 --> 00:29:19,679
okay let's take some questions that

825
00:29:23,110 --> 00:29:21,679
we're getting on social media go ahead

826
00:29:24,070 --> 00:29:23,120
jason

827
00:29:25,430 --> 00:29:24,080
indeed

828
00:29:27,750 --> 00:29:25,440
this first question comes from twitter

829
00:29:29,510 --> 00:29:27,760
user launch complex who's asking i'm

830
00:29:31,830 --> 00:29:29,520
wondering will the recent solar flares

831
00:29:35,590 --> 00:29:31,840
present any issues for orb 3 launch like

832
00:29:38,870 --> 00:29:35,600
they did for the orb 1 launch in january

833
00:29:38,880 --> 00:29:43,190
but we always watch space weather

834
00:29:47,350 --> 00:29:44,950
all right this question comes from

835
00:29:49,510 --> 00:29:47,360
twitter user james who asks with the

836
00:29:51,590 --> 00:29:49,520
launch scheduled about 37 minutes after

837
00:29:53,669 --> 00:29:51,600
sunset will the vehicle reach sunlight

838
00:29:57,110 --> 00:29:53,679

during ascent

839
00:29:58,789 --> 00:29:57,120
i predict that it will but i'm not sure

840
00:30:00,549 --> 00:29:58,799
that's my prediction also frank but i

841
00:30:02,389 --> 00:30:00,559
don't have any hard evidence to support

842
00:30:04,470 --> 00:30:02,399
it

843
00:30:07,750 --> 00:30:04,480
this is this comes from experience of

844
00:30:09,909 --> 00:30:07,760
seeing launches right at sunset

845
00:30:11,669 --> 00:30:09,919
indeed twitter user jim asks what are

846
00:30:14,950 --> 00:30:11,679
the benefits of launching from virginia

847
00:30:16,630 --> 00:30:14,960
versus florida versus california

848
00:30:18,710 --> 00:30:16,640
um well the benefits are that we have a

849
00:30:23,669 --> 00:30:18,720
launch pad here that is compatible with

850
00:30:28,230 --> 00:30:24,950
number one

851
00:30:29,909 --> 00:30:28,240
and uh uh secondly um we feel it's

852
00:30:31,909 --> 00:30:29,919
important for the united states to have

853
00:30:34,070 --> 00:30:31,919
as many capable launch vehicles or

854
00:30:36,870 --> 00:30:34,080
launch processing and launching

855
00:30:39,750 --> 00:30:36,880
facilities as the industry can support

856
00:30:41,909 --> 00:30:39,760
wallops is a very capable site it's been

857
00:30:43,830 --> 00:30:41,919
developed to uh to deal with larger

858
00:30:45,350 --> 00:30:43,840
vehicles now that that antares is

859
00:30:47,269 --> 00:30:45,360
launching out of there and they and out

860
00:30:49,110 --> 00:30:47,279
of here and we could they could support

861
00:30:51,190 --> 00:30:49,120
even others that if others wanted to

862
00:30:53,590 --> 00:30:51,200
come here but it also helps deconflict

863
00:30:55,750 --> 00:30:53,600

some of the traffic that also goes down

864
00:30:58,789 --> 00:30:55,760
goes on at the kennedy space center in

865
00:31:00,549 --> 00:30:58,799
cape canaveral just like the station has

866
00:31:02,950 --> 00:31:00,559
traffic issues there are launch traffic

867
00:31:04,710 --> 00:31:02,960
issues going out of florida so having

868
00:31:06,470 --> 00:31:04,720
the two sites virginia and florida we

869
00:31:09,350 --> 00:31:06,480
think is is very good for the country

870
00:31:11,110 --> 00:31:09,360
and good for the iss

871
00:31:13,430 --> 00:31:11,120
excellent last question here comes from

872
00:31:17,110 --> 00:31:13,440
scott on twitter who asks what kind of

873
00:31:20,310 --> 00:31:17,120
trash does the iss generate

874
00:31:24,070 --> 00:31:23,110
was it the kind or the amount the kind

875
00:31:25,750 --> 00:31:24,080
yeah

876
00:31:28,070 --> 00:31:25,760
let me take that sure

877
00:31:30,830 --> 00:31:28,080
since i generated some of that

878
00:31:34,149 --> 00:31:30,840
many many years ago gerald

879
00:31:36,470 --> 00:31:34,159
um uh a lot of it is is uh packing for

880
00:31:38,789 --> 00:31:36,480
your food that you consume you've got to

881
00:31:41,190 --> 00:31:38,799
do something with the food trash um

882
00:31:42,310 --> 00:31:41,200
a lot of it is clothing that's been worn

883
00:31:44,070 --> 00:31:42,320
and since we don't have a laundry

884
00:31:46,230 --> 00:31:44,080
facility up there you just you throw it

885
00:31:48,549 --> 00:31:46,240
away and then you return it in whatever

886
00:31:51,750 --> 00:31:48,559
vehicle is leaving next

887
00:31:52,870 --> 00:31:51,760
wet towels from from bathing

888
00:31:55,110 --> 00:31:52,880

the

889
00:31:57,350 --> 00:31:55,120
remnants of of old experiments that are

890
00:32:00,070 --> 00:31:57,360
no longer being used and have produced

891
00:32:02,789 --> 00:32:00,080
all their data they will sometimes uh

892
00:32:05,269 --> 00:32:02,799
send that that hardware down not to be

893
00:32:06,789 --> 00:32:05,279
recovered but to be disposed of uh there

894
00:32:08,950 --> 00:32:06,799
is certainly human waste that has to

895
00:32:11,669 --> 00:32:08,960
leave the station in

896
00:32:13,990 --> 00:32:11,679
very tight containers

897
00:32:15,990 --> 00:32:14,000
that actually works very well and so we

898
00:32:19,110 --> 00:32:16,000
return that in in all the vehicles that

899
00:32:20,470 --> 00:32:19,120
that are disposed of in the atmosphere

900
00:32:22,950 --> 00:32:20,480
and then anything else the crew just

901
00:32:24,230 --> 00:32:22,960
doesn't need anymore um when you think

902
00:32:26,710 --> 00:32:24,240
about it the station is a closed

903
00:32:28,549 --> 00:32:26,720
environment so anything that goes up

904
00:32:30,389 --> 00:32:28,559
there has to have an end-of-life plan

905
00:32:31,750 --> 00:32:30,399
for how does it get off the station

906
00:32:32,950 --> 00:32:31,760
otherwise you just keep filling up that

907
00:32:35,190 --> 00:32:32,960
container and there's eventually not

908
00:32:37,669 --> 00:32:35,200
going to be room for the crew so every

909
00:32:40,630 --> 00:32:37,679
every kilogram that goes to the station

910
00:32:42,789 --> 00:32:40,640
an equal kilogram has to come off or a

911
00:32:44,630 --> 00:32:42,799
cubic meter cubic meter has to come off

912
00:32:46,549 --> 00:32:44,640
so you got to think of it in in those

913
00:32:47,909 --> 00:32:46,559

terms there's only so much room it's

914
00:32:49,669 --> 00:32:47,919
like my daughter's bedroom you know i

915
00:32:53,509 --> 00:32:49,679
mean that only so much can go in there

916
00:32:56,710 --> 00:32:54,789
okay let's see do we have any more

917
00:33:00,230 --> 00:32:56,720
questions here in the room let's go

918
00:33:04,310 --> 00:33:02,549
hi my name is rebecca moore

919
00:33:06,870 --> 00:33:04,320
i'm one of the social media contacts for

920
00:33:08,789 --> 00:33:06,880
nasa uh before i came i took some

921
00:33:10,310 --> 00:33:08,799
questions from some of my followers that

922
00:33:11,190 --> 00:33:10,320
i have

923
00:33:13,029 --> 00:33:11,200
and

924
00:33:15,190 --> 00:33:13,039
this question um

925
00:33:17,909 --> 00:33:15,200
really goes to you spoke earlier about

926
00:33:20,389 --> 00:33:17,919
how the missions like this are important

927
00:33:22,710 --> 00:33:20,399
for continuing to be able for the next

928
00:33:24,630 --> 00:33:22,720
generation to be able to go to the moon

929
00:33:26,470 --> 00:33:24,640
and go to mars and a lot of the

930
00:33:29,350 --> 00:33:26,480
questions i was getting are when's the

931
00:33:30,789 --> 00:33:29,360
next big deal things when's the next you

932
00:33:32,470 --> 00:33:30,799
know when are we going to set up a

933
00:33:35,669 --> 00:33:32,480
permanent colony when are we putting a

934
00:33:37,990 --> 00:33:35,679
man on mars um and so how are missions

935
00:33:39,590 --> 00:33:38,000
like this contributing to those you know

936
00:33:42,870 --> 00:33:39,600
long-term goals

937
00:33:46,710 --> 00:33:42,880
that orbital science and nasa and other

938
00:33:47,909 --> 00:33:46,720

uh commercial space flight places have

939
00:33:48,870 --> 00:33:47,919
let me just say one thing then i'm going

940
00:33:50,389 --> 00:33:48,880
to turn it over to the government

941
00:33:52,710 --> 00:33:50,399
official here who

942
00:33:54,870 --> 00:33:52,720
has all those answers but uh we are this

943
00:33:56,389 --> 00:33:54,880
is the next big thing flying on the

944
00:33:58,310 --> 00:33:56,399
space station is a big deal and i wish

945
00:34:00,070 --> 00:33:58,320
people understood that better because

946
00:34:01,509 --> 00:34:00,080
it's not easy to get six people up there

947
00:34:03,430 --> 00:34:01,519
and get them back safely and it's not

948
00:34:05,190 --> 00:34:03,440
easy to keep them supplied it's not easy

949
00:34:06,870 --> 00:34:05,200
to develop the payloads and the research

950
00:34:09,190 --> 00:34:06,880
that goes on up there people put their

951
00:34:11,190 --> 00:34:09,200
entire careers into these projects that

952
00:34:13,190 --> 00:34:11,200
end up on the station and some of them

953
00:34:15,190 --> 00:34:13,200
last for years and years and people

954
00:34:18,149 --> 00:34:15,200
really do build careers around them but

955
00:34:19,669 --> 00:34:18,159
it is the future for low earth orbit for

956
00:34:22,389 --> 00:34:19,679
people who want to be astronauts or who

957
00:34:24,629 --> 00:34:22,399
want to be involved in in space

958
00:34:26,710 --> 00:34:24,639
on the human space flight side and so it

959
00:34:28,950 --> 00:34:26,720
is a big deal and i wish people

960
00:34:30,790 --> 00:34:28,960
understood how difficult it still is to

961
00:34:32,629 --> 00:34:30,800
get people and things into orbit and to

962
00:34:34,310 --> 00:34:32,639
get them home safely and to live up

963
00:34:36,790 --> 00:34:34,320

there they have to do spacewalks they've

964
00:34:38,310 --> 00:34:36,800
got to work a full schedule and

965
00:34:39,589 --> 00:34:38,320
it's like being on an outpost anywhere

966
00:34:41,270 --> 00:34:39,599
else where you're living in hazardous

967
00:34:42,869 --> 00:34:41,280
conditions and you can't always go

968
00:34:45,990 --> 00:34:42,879
outside when you want to

969
00:34:47,510 --> 00:34:46,000
to get away so it is a big deal and then

970
00:34:51,750 --> 00:34:47,520
the future of nasa i think gerald is

971
00:34:55,349 --> 00:34:53,909
well as frank is saying

972
00:34:58,069 --> 00:34:55,359
space flight

973
00:34:59,670 --> 00:34:58,079
is very difficult business and having

974
00:35:00,630 --> 00:34:59,680
the space station in low earth orbit

975
00:35:02,470 --> 00:35:00,640
they're

976
00:35:04,310 --> 00:35:02,480
providing a microgravity

977
00:35:06,630 --> 00:35:04,320
environment for both science as well as

978
00:35:09,430 --> 00:35:06,640
technology advancement is is very key

979
00:35:11,990 --> 00:35:09,440
for our future travels to the moon the

980
00:35:13,349 --> 00:35:12,000
mars and and further out

981
00:35:15,109 --> 00:35:13,359
we have

982
00:35:17,109 --> 00:35:15,119
a lot of things geared going on at the

983
00:35:19,750 --> 00:35:17,119
station right now to support

984
00:35:22,630 --> 00:35:19,760
understanding those longer term missions

985
00:35:24,630 --> 00:35:22,640
next year we have our our first

986
00:35:27,190 --> 00:35:24,640
expedition where we have

987
00:35:28,310 --> 00:35:27,200
crew members staying on orbit for a full

988
00:35:30,069 --> 00:35:28,320

year

989
00:35:31,589 --> 00:35:30,079
normally they are staying up there no

990
00:35:33,589 --> 00:35:31,599
longer than six months and so we're

991
00:35:35,190 --> 00:35:33,599
trying to make sure we understand all of

992
00:35:37,030 --> 00:35:35,200
the physiological changes that might

993
00:35:40,230 --> 00:35:37,040
occur to the human body

994
00:35:42,069 --> 00:35:40,240
with a lengthier time on orbit

995
00:35:44,310 --> 00:35:42,079
and then when you talk about some of the

996
00:35:45,589 --> 00:35:44,320
systems spacecraft systems that are

997
00:35:46,790 --> 00:35:45,599
going to be necessary for these long

998
00:35:47,670 --> 00:35:46,800
missions

999
00:35:52,390 --> 00:35:47,680
those

1000
00:35:53,750 --> 00:35:52,400
have multiple strings of redundancy

1001
00:35:55,589 --> 00:35:53,760
because you are going to eventually have

1002
00:35:57,990 --> 00:35:55,599
a failure from time to time

1003
00:35:59,589 --> 00:35:58,000
and demonstrating those technologies the

1004
00:36:01,670 --> 00:35:59,599
reliability

1005
00:36:03,109 --> 00:36:01,680
aspect of those devices those subsystems

1006
00:36:05,430 --> 00:36:03,119
on space station

1007
00:36:07,750 --> 00:36:05,440
is providing invaluable information to

1008
00:36:09,030 --> 00:36:07,760
our engineers to our scientists in

1009
00:36:10,069 --> 00:36:09,040
developing those systems that are going

1010
00:36:11,750 --> 00:36:10,079
to take us

1011
00:36:12,550 --> 00:36:11,760
beyond low earth orbit

1012
00:36:14,470 --> 00:36:12,560
so

1013
00:36:16,710 --> 00:36:14,480

um and then later this year i understand

1014
00:36:18,950 --> 00:36:16,720
we are having a big orion uh mission so

1015
00:36:21,030 --> 00:36:18,960
that will be our first uh real good test

1016
00:36:21,910 --> 00:36:21,040
of of that vehicle that's intended to

1017
00:36:24,550 --> 00:36:21,920
take us

1018
00:36:26,710 --> 00:36:24,560
beyond low low earth orbit so it's

1019
00:36:28,630 --> 00:36:26,720
pretty exciting if i could have one

1020
00:36:29,990 --> 00:36:28,640
other thing there is one other big deal

1021
00:36:32,390 --> 00:36:30,000
here that's uh

1022
00:36:34,150 --> 00:36:32,400
uh being demonstrated by this particular

1023
00:36:36,390 --> 00:36:34,160
launch tomorrow and that's the fact that

1024
00:36:38,150 --> 00:36:36,400
uh nasa and industry are changing their

1025
00:36:39,750 --> 00:36:38,160
approach to how we do exploration and

1026
00:36:41,750 --> 00:36:39,760
how we

1027
00:36:44,470 --> 00:36:41,760
maintain a presence in space the

1028
00:36:46,310 --> 00:36:44,480
commercial resupply services contract

1029
00:36:48,710 --> 00:36:46,320
between orbital and

1030
00:36:50,310 --> 00:36:48,720
nasa and spacex and nasa is a good

1031
00:36:51,270 --> 00:36:50,320
example of that but it's not the only

1032
00:36:52,710 --> 00:36:51,280
one

1033
00:36:54,790 --> 00:36:52,720
nasa and other government agencies have

1034
00:36:57,750 --> 00:36:54,800
always relied on contractors to to

1035
00:36:59,589 --> 00:36:57,760
implement and develop and and execute

1036
00:37:01,430 --> 00:36:59,599
new programs and build hardware but this

1037
00:37:05,109 --> 00:37:01,440
is a more commercial approach

1038
00:37:06,950 --> 00:37:05,119

uh that was begun back in the uh

1039
00:37:09,430 --> 00:37:06,960
actually 80s and 90s

1040
00:37:11,750 --> 00:37:09,440
on a small scale by deak and his company

1041
00:37:14,310 --> 00:37:11,760
by dave thompson and his company and now

1042
00:37:16,630 --> 00:37:14,320
by elon and others who are moving the

1043
00:37:18,630 --> 00:37:16,640
boundaries of of commercial activity in

1044
00:37:20,069 --> 00:37:18,640
space further and further out and i

1045
00:37:22,790 --> 00:37:20,079
think that partnership is going to

1046
00:37:25,030 --> 00:37:22,800
enable us to go beyond low earth orbit

1047
00:37:27,190 --> 00:37:25,040
and allow industry to be a different

1048
00:37:29,349 --> 00:37:27,200
type of partner with with nasa and other

1049
00:37:31,990 --> 00:37:29,359
agencies in in developing our access to

1050
00:37:34,310 --> 00:37:32,000
space both for humans and for robots as

1051
00:37:37,190 --> 00:37:34,320
we continue to explore the solar system

1052
00:37:40,950 --> 00:37:37,200
so the the business frontier is moving

1053
00:37:42,630 --> 00:37:40,960
along with the space frontier

1054
00:37:45,910 --> 00:37:42,640
okay we have time for one or two more

1055
00:37:50,310 --> 00:37:45,920
questions if there anymore here

1056
00:37:50,320 --> 00:37:54,710
let's go here in the front

1057
00:37:59,349 --> 00:37:56,950
hi robert perlman with collectspace.com

1058
00:38:00,230 --> 00:37:59,359
again um with halloween right around the

1059
00:38:02,950 --> 00:38:00,240
corner

1060
00:38:04,950 --> 00:38:02,960
uh is it safe to say there are or

1061
00:38:09,430 --> 00:38:04,960
are there any treats on board for the

1062
00:38:09,440 --> 00:38:13,510
i'm not at liberty to say

1063
00:38:19,190 --> 00:38:16,069

might be a trick

1064
00:38:23,510 --> 00:38:19,200
and they might be watching

1065
00:38:28,870 --> 00:38:27,270
and i have questions from second graders

1066
00:38:30,550 --> 00:38:28,880
second graders at oakville elementary

1067
00:38:32,390 --> 00:38:30,560
would like to know what's the best thing

1068
00:38:37,270 --> 00:38:32,400
about being an engineer or scientist

1069
00:38:41,670 --> 00:38:40,150
well you get to work on space flight

1070
00:38:43,829 --> 00:38:41,680
that's that's the most exciting part

1071
00:38:45,349 --> 00:38:43,839
we're leaving the boundaries of earth

1072
00:38:47,750 --> 00:38:45,359
you're working on some of the newest

1073
00:38:50,550 --> 00:38:47,760
technologies you're always pushing the

1074
00:38:51,670 --> 00:38:50,560
envelope it's things that engineers

1075
00:38:53,589 --> 00:38:51,680
strive for

1076
00:38:56,310 --> 00:38:53,599
so working for nasa working in the

1077
00:38:57,990 --> 00:38:56,320
aerospace industry

1078
00:39:00,470 --> 00:38:58,000
is just a wonderful place to work as an

1079
00:39:04,069 --> 00:39:00,480
engineer so that's what i would tell any

1080
00:39:08,230 --> 00:39:06,870
i i'd just say watch a rocket launch and

1081
00:39:09,510 --> 00:39:08,240
and you'll

1082
00:39:11,750 --> 00:39:09,520
you'll have a hard time finding

1083
00:39:12,630 --> 00:39:11,760
something cooler than that and uh you

1084
00:39:14,390 --> 00:39:12,640
know

1085
00:39:15,190 --> 00:39:14,400
between that and what what we're doing

1086
00:39:17,510 --> 00:39:15,200
to

1087
00:39:19,589 --> 00:39:17,520
really expand the frontier it's just

1088
00:39:21,190 --> 00:39:19,599

exciting and i'm not sure

1089
00:39:23,349 --> 00:39:21,200
there's a better job for an engineer or

1090
00:39:24,470 --> 00:39:23,359
a scientist

1091
00:39:28,150 --> 00:39:24,480
mike

1092
00:39:30,390 --> 00:39:28,160
say tomorrow that's the most exciting

1093
00:39:31,510 --> 00:39:30,400
thing is actually launching a rocket and

1094
00:39:33,430 --> 00:39:31,520
when you're a part of that and

1095
00:39:34,710 --> 00:39:33,440
experience that it motivates you to want

1096
00:39:36,790 --> 00:39:34,720
to learn

1097
00:39:40,150 --> 00:39:36,800
and have hands-on experience with

1098
00:39:41,589 --> 00:39:40,160
everything involved in that

1099
00:39:42,950 --> 00:39:41,599
all those things are true and the only

1100
00:39:44,470 --> 00:39:42,960
thing i'd add is that you get to work

1101
00:39:46,470 --> 00:39:44,480
with people like these and people like

1102
00:39:48,470 --> 00:39:46,480
out there uh some of the smartest people

1103
00:39:50,790 --> 00:39:48,480
in the world some of the people who are

1104
00:39:52,950 --> 00:39:50,800
most excited about their jobs and uh who

1105
00:39:55,670 --> 00:39:52,960
feel the greatest sense of satisfaction

1106
00:39:57,270 --> 00:39:55,680
when it goes well and the the most

1107
00:40:00,230 --> 00:39:57,280
frustration when it doesn't but who

1108
00:40:02,630 --> 00:40:00,240
never give up and it's an amazing

1109
00:40:04,550 --> 00:40:02,640
industry to be a part of and i highly

1110
00:40:05,990 --> 00:40:04,560
recommend it whether you are going to be

1111
00:40:09,030 --> 00:40:06,000
a political scientist or a business

1112
00:40:10,950 --> 00:40:09,040
major or an engineer or a scientist or a

1113
00:40:12,790 --> 00:40:10,960

doctor um that there is nothing better

1114
00:40:15,910 --> 00:40:12,800
than space flight in terms of having a

1115
00:40:18,710 --> 00:40:15,920
future that uh is probably somewhat

1116
00:40:20,470 --> 00:40:18,720
unknown but always always exciting and

1117
00:40:22,309 --> 00:40:20,480
if i could maybe add a little bit more

1118
00:40:25,109 --> 00:40:22,319
to the halloween question

1119
00:40:27,510 --> 00:40:25,119
um robert when uh uh when i was on

1120
00:40:29,190 --> 00:40:27,520
station during expedition 3 we did have

1121
00:40:31,750 --> 00:40:29,200
a crew come knock on our door on

1122
00:40:33,109 --> 00:40:31,760
halloween october 31st they had launched

1123
00:40:35,430 --> 00:40:33,119
from baikonur

1124
00:40:41,109 --> 00:40:35,440
and uh they were there trick-or-treating

1125
00:40:45,510 --> 00:40:43,510
and they brought us treats so uh and we

1126
00:40:47,349 --> 00:40:45,520
had a few for them so it was it was a

1127
00:40:49,030 --> 00:40:47,359
nice halloween

1128
00:40:50,309 --> 00:40:49,040
okay let's take one more in the back

1129
00:40:52,230 --> 00:40:50,319
from social media and then we'll go

1130
00:40:53,910 --> 00:40:52,240
ahead and conclude

1131
00:40:56,069 --> 00:40:53,920
this question comes from twitter user

1132
00:41:01,270 --> 00:40:56,079
kieran who asks wondering how long the

1133
00:41:06,470 --> 00:41:04,230
the the orb 3 launch window's 10 minutes

1134
00:41:08,309 --> 00:41:06,480
in length and it's really driven by

1135
00:41:10,630 --> 00:41:08,319
uh you know performance and targeting

1136
00:41:13,510 --> 00:41:10,640
requirements that uh get us in the right

1137
00:41:14,790 --> 00:41:13,520
orbit at the right time uh that allows

1138
00:41:16,390 --> 00:41:14,800

cygnus to

1139
00:41:18,390 --> 00:41:16,400
uh do what they need to do to rendezvous

1140
00:41:19,829 --> 00:41:18,400
with the space station it is actually a

1141
00:41:21,030 --> 00:41:19,839
little bit longer than the last couple i

1142
00:41:22,870 --> 00:41:21,040
think we were working with five minute

1143
00:41:24,150 --> 00:41:22,880
windows previously but because of this

1144
00:41:25,990 --> 00:41:24,160
particular

1145
00:41:28,790 --> 00:41:26,000
uh configuration with the with the

1146
00:41:30,550 --> 00:41:28,800
bigger second stage and and not a full

1147
00:41:31,829 --> 00:41:30,560
you know fully enhanced cygnus we're

1148
00:41:32,950 --> 00:41:31,839
able to open the window up a little bit

1149
00:41:35,990 --> 00:41:32,960
and give us a little more time if we

1150
00:41:38,390 --> 00:41:36,000
need it and as sarah mentioned uh if you

1151
00:41:39,910 --> 00:41:38,400
watch the night sky after after liftoff

1152
00:41:41,670 --> 00:41:39,920
a few minutes later you'll see the

1153
00:41:43,829 --> 00:41:41,680
international station go space station

1154
00:41:45,349 --> 00:41:43,839
go over five minutes right bill

1155
00:41:46,790 --> 00:41:45,359
and that tells you what's happening is

1156
00:41:48,230 --> 00:41:46,800
we are launching

1157
00:41:50,069 --> 00:41:48,240
so that we end up slightly ahead of the

1158
00:41:52,230 --> 00:41:50,079
station and then it'll start catching up

1159
00:41:53,990 --> 00:41:52,240
and then we will phase until we end up

1160
00:41:56,390 --> 00:41:54,000
beneath the station and uh two or three

1161
00:41:58,550 --> 00:41:56,400
days later if if it depending on when

1162
00:42:00,790 --> 00:41:58,560
our rendezvous actually occurs uh when

1163
00:42:02,390 --> 00:42:00,800

we'll be in in the same orbit with it so

1164
00:42:06,790 --> 00:42:02,400
it's all part of orbital mechanics and

1165
00:42:10,150 --> 00:42:08,550
okay well i want to thank everyone for

1166
00:42:11,670 --> 00:42:10,160
joining us today

1167
00:42:14,230 --> 00:42:11,680
if you'd like to watch tomorrow

1168
00:42:18,069 --> 00:42:14,240
evening's launch our nasa tv coverage

1169
00:42:20,790 --> 00:42:18,079
starts at 5 45 pm eastern time for the 6

1170
00:42:22,630 --> 00:42:20,800
45 pm launch

1171
00:42:27,510 --> 00:42:22,640
and you can find out more about