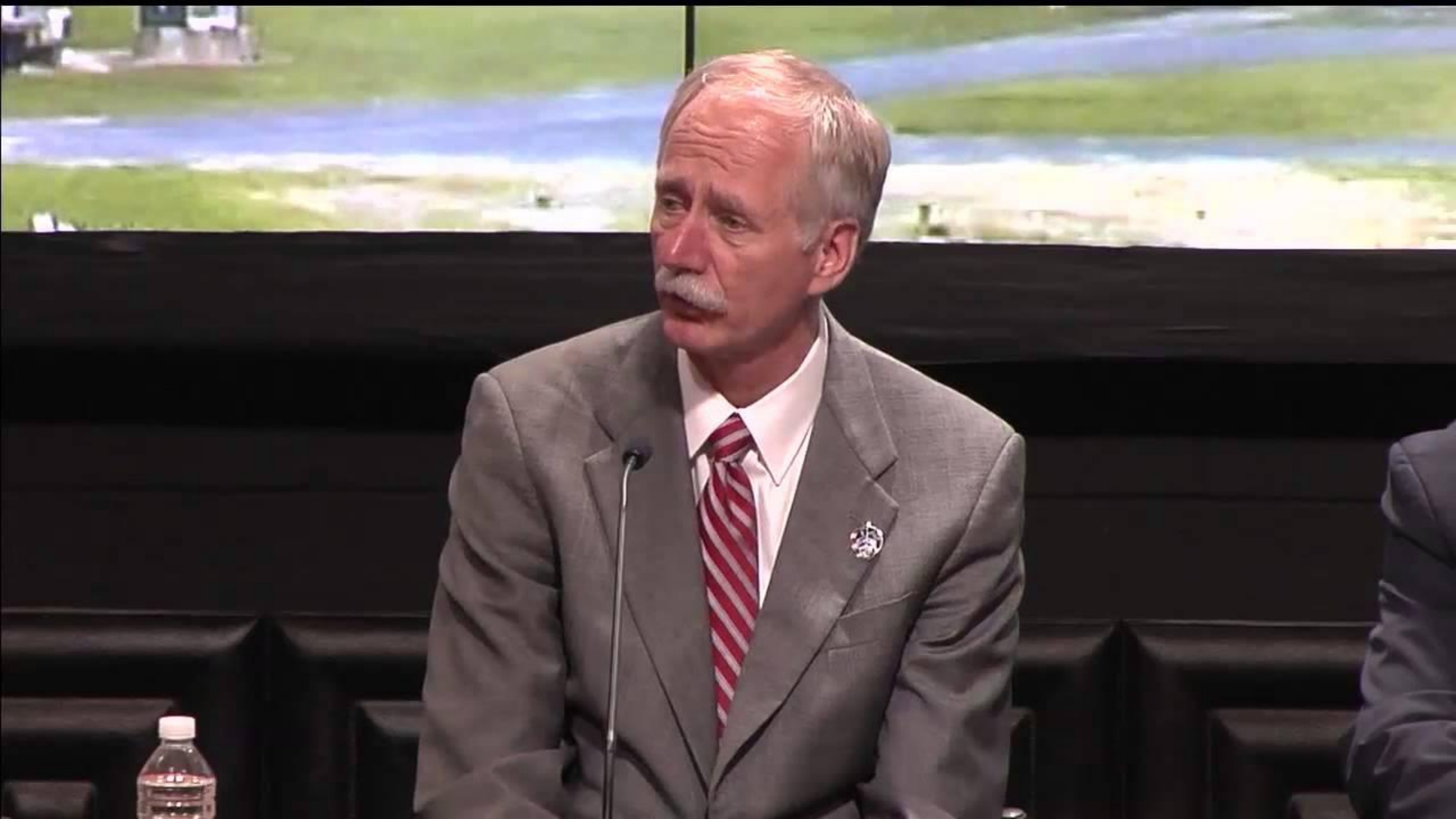

1
00:00:05,670 --> 00:00:03,830
hello everyone and welcome to today's

2
00:00:07,190 --> 00:00:05,680
post launch briefing for the orb 2

3
00:00:08,230 --> 00:00:07,200
mission to the international space

4
00:00:10,549 --> 00:00:08,240
station

5
00:00:12,870 --> 00:00:10,559
orbital sciences signal cygnus cargo

6
00:00:15,350 --> 00:00:12,880
spacecraft is on its way to the space

7
00:00:18,470 --> 00:00:15,360
station the antares rocket lifted off

8
00:00:20,710 --> 00:00:18,480
today at 12 52 pm eastern time from the

9
00:00:23,269 --> 00:00:20,720
mid-atlantic regional spaceport's launch

10
00:00:25,029 --> 00:00:23,279
pad zero a here at nasa's wallops flight

11
00:00:26,950 --> 00:00:25,039
facility in virginia

12
00:00:29,349 --> 00:00:26,960
cygnus is scheduled to arrive to the

13
00:00:31,669 --> 00:00:29,359

space station wednesday morning here to

14
00:00:33,990 --> 00:00:31,679
talk about today's launch

15
00:00:35,670 --> 00:00:34,000
are william gerstenmaier nasa's

16
00:00:37,830 --> 00:00:35,680
associate administrator for human

17
00:00:40,310 --> 00:00:37,840
exploration and operations

18
00:00:42,790 --> 00:00:40,320
and frank culbertson exec executive vice

19
00:00:44,549 --> 00:00:42,800
president of orbital sciences

20
00:00:46,310 --> 00:00:44,559
for those of you watching on tv or

21
00:00:48,229 --> 00:00:46,320
through the web we'll take questions

22
00:00:50,470 --> 00:00:48,239
from social media

23
00:00:51,790 --> 00:00:50,480
to get those questions to us you can use

24
00:00:55,590 --> 00:00:51,800
the hashtag

25
00:00:57,910 --> 00:00:55,600
asknasa and let's start with you bill

26
00:00:59,590 --> 00:00:57,920
thanks rachel again it's a great

27
00:01:02,549 --> 00:00:59,600
privilege to be here to see the launch

28
00:01:04,710 --> 00:01:02,559
today of the rocket and things went

29
00:01:07,590 --> 00:01:04,720
really well and again a tremendous team

30
00:01:09,910 --> 00:01:07,600
effort between the mars team the wallops

31
00:01:12,070 --> 00:01:09,920
team and the orbital team to make this

32
00:01:14,550 --> 00:01:12,080
launch occur today the countdown was

33
00:01:16,149 --> 00:01:14,560
extremely smooth went went very well

34
00:01:18,230 --> 00:01:16,159
again i think that shows the team's

35
00:01:20,230 --> 00:01:18,240
preparation of getting everything ready

36
00:01:22,149 --> 00:01:20,240
and and all the ground equipment worked

37
00:01:23,830 --> 00:01:22,159
extremely well the range went went

38
00:01:25,429 --> 00:01:23,840

really well the weather was good and

39
00:01:26,710 --> 00:01:25,439
just a tremendous launch we're looking

40
00:01:29,109 --> 00:01:26,720
forward to the cargo getting to the

41
00:01:30,710 --> 00:01:29,119
space station there's a lot of

42
00:01:32,310 --> 00:01:30,720
experiments that are going up for the

43
00:01:33,830 --> 00:01:32,320
crew as well as some needed equipment

44
00:01:35,749 --> 00:01:33,840
and then lots of food for the crew so

45
00:01:38,630 --> 00:01:35,759
this will be great to see this equipment

46
00:01:40,469 --> 00:01:38,640
get on orbit and it's great to

47
00:01:42,069 --> 00:01:40,479
to see this team come together and work

48
00:01:43,510 --> 00:01:42,079
and congratulations to orbital and the

49
00:01:45,670 --> 00:01:43,520
whole team down here for just a

50
00:01:46,630 --> 00:01:45,680
wonderful launch today

51
00:01:50,069 --> 00:01:46,640
frank

52
00:01:51,350 --> 00:01:50,079
that's all bill that's it okay

53
00:01:53,030 --> 00:01:51,360
all right well uh good afternoon

54
00:01:55,510 --> 00:01:53,040
everybody it's a very exciting day for

55
00:01:57,270 --> 00:01:55,520
us and bill and bill robel i think we've

56
00:01:58,149 --> 00:01:57,280
found the secret to

57
00:01:59,590 --> 00:01:58,159
to

58
00:02:01,510 --> 00:01:59,600
getting people's attention here on the

59
00:02:03,030 --> 00:02:01,520
eastern shore of virginia maryland and

60
00:02:05,990 --> 00:02:03,040
delaware and that's

61
00:02:07,670 --> 00:02:06,000
to launch on a sunday in july and

62
00:02:09,830 --> 00:02:07,680
i bet you have never had a traffic jam

63
00:02:12,229 --> 00:02:09,840

on a sunday uh in

64
00:02:14,630 --> 00:02:12,239
in chincoteague and uh there's a lot of

65
00:02:16,229 --> 00:02:14,640
traffic out there right now and in fact

66
00:02:17,750 --> 00:02:16,239
just looking at the number of rookie

67
00:02:19,830 --> 00:02:17,760
reporters we have here in the room i

68
00:02:21,350 --> 00:02:19,840
have never seen this room so jam full

69
00:02:23,350 --> 00:02:21,360
and so i appreciate everybody coming to

70
00:02:25,750 --> 00:02:23,360
watch this because uh space flight is

71
00:02:27,750 --> 00:02:25,760
exciting and it's a it's a great thing

72
00:02:29,990 --> 00:02:27,760
to to experience it's a great thing to

73
00:02:31,830 --> 00:02:30,000
be a part of uh it's also a great thing

74
00:02:34,470 --> 00:02:31,840
to take your kids and family members to

75
00:02:38,309 --> 00:02:34,480
see because it's inspiring to see what

76
00:02:40,790 --> 00:02:38,319
um uh u.s and international ingenuity

77
00:02:42,070 --> 00:02:40,800
innovation and engineering can do and

78
00:02:44,150 --> 00:02:42,080
and we've done some great things and

79
00:02:46,390 --> 00:02:44,160
today was an example of one of those

80
00:02:47,830 --> 00:02:46,400
it took a lot of effort for people to uh

81
00:02:49,190 --> 00:02:47,840
to pull this off

82
00:02:51,350 --> 00:02:49,200
we worked a lot of problems over the

83
00:02:53,670 --> 00:02:51,360
last couple of months that had to had to

84
00:02:55,030 --> 00:02:53,680
be resolved and even today as we were

85
00:02:57,030 --> 00:02:55,040
working through the countdown small

86
00:02:58,470 --> 00:02:57,040
things came up and people had to figure

87
00:03:00,390 --> 00:02:58,480
them out sometimes we had a procedure

88
00:03:01,670 --> 00:03:00,400

for it sometimes we had to say

89
00:03:03,030 --> 00:03:01,680
we've never done this before but we'll

90
00:03:05,030 --> 00:03:03,040
figure it out and we'll get it fixed and

91
00:03:07,750 --> 00:03:05,040
we did between the teams that are

92
00:03:08,790 --> 00:03:07,760
involved as bill said mars the wallops

93
00:03:12,390 --> 00:03:08,800
team

94
00:03:15,270 --> 00:03:12,400
involved there

95
00:03:16,790 --> 00:03:15,280
led by david thompson our ceo uh it's

96
00:03:19,670 --> 00:03:16,800
been a really proud day for us to be

97
00:03:21,509 --> 00:03:19,680
able to pull this off we had things like

98
00:03:23,430 --> 00:03:21,519
a couple of sailboats that tried to get

99
00:03:25,350 --> 00:03:23,440
into the area and the coast guard went

100
00:03:26,710 --> 00:03:25,360
out to try to turn them around and

101
00:03:28,390 --> 00:03:26,720
one of them didn't want to turn around i

102
00:03:30,149 --> 00:03:28,400
don't think they believed them but but

103
00:03:32,070 --> 00:03:30,159
we finally saw the little vector go a

104
00:03:34,550 --> 00:03:32,080
180 like that maybe they threatened them

105
00:03:35,990 --> 00:03:34,560
with something i don't know but but um

106
00:03:37,750 --> 00:03:36,000
but anyway they cleared the range and

107
00:03:40,309 --> 00:03:37,760
and we proceeded and we launched exactly

108
00:03:42,070 --> 00:03:40,319
on time as was planned uh we've got a

109
00:03:43,990 --> 00:03:42,080
brief video here to show you some of the

110
00:03:45,830 --> 00:03:44,000
highlights of the

111
00:03:48,869 --> 00:03:45,840
final seconds of the countdown and and

112
00:03:50,229 --> 00:03:48,879
the uh liftoff of antares and i think

113
00:03:52,229 --> 00:03:50,239

it's showing now

114
00:03:54,309 --> 00:03:52,239
you can see the rocket on the pad uh

115
00:03:56,229 --> 00:03:54,319
right before ignition we uh

116
00:03:58,070 --> 00:03:56,239
inundate the uh the flame trench with

117
00:03:59,670 --> 00:03:58,080
water to protect it and to protect the

118
00:04:01,270 --> 00:03:59,680
surrounding hardware the rocket comes

119
00:04:02,949 --> 00:04:01,280
off the pad

120
00:04:07,190 --> 00:04:02,959
majestic is the way mr thompson

121
00:04:10,550 --> 00:04:08,550
it i just like to see it clear the

122
00:04:12,229 --> 00:04:10,560
ground and get going but

123
00:04:13,670 --> 00:04:12,239
but it is majestic and it's a beautiful

124
00:04:15,030 --> 00:04:13,680
sight to see it lift off into the

125
00:04:16,789 --> 00:04:15,040
atmosphere

126
00:04:18,469 --> 00:04:16,799
we did have some clouds at

127
00:04:20,949 --> 00:04:18,479
medium levels that kind of obscured it

128
00:04:22,390 --> 00:04:20,959
for people trying to watch it today but

129
00:04:23,670 --> 00:04:22,400
we had good instrumentation and

130
00:04:25,430 --> 00:04:23,680
everything looked great in the first

131
00:04:27,110 --> 00:04:25,440
stage we burned the first stage for

132
00:04:28,870 --> 00:04:27,120
almost four minutes

133
00:04:30,550 --> 00:04:28,880
everything was as you heard from kurt

134
00:04:32,870 --> 00:04:30,560
everley nominal

135
00:04:34,230 --> 00:04:32,880
as we climbed into the uh into the stat

136
00:04:36,230 --> 00:04:34,240
into the sky

137
00:04:39,510 --> 00:04:36,240
um the first stage was powered by two

138
00:04:41,670 --> 00:04:39,520

aj26 engines provided to us by aerojet

139
00:04:43,430 --> 00:04:41,680
uh corporation uh aerojet rocketdyne

140
00:04:44,629 --> 00:04:43,440
corporation and uh and they perform

141
00:04:45,590 --> 00:04:44,639
flawlessly

142
00:04:47,670 --> 00:04:45,600
um

143
00:04:50,550 --> 00:04:47,680
the first stage itself is built by

144
00:04:53,110 --> 00:04:50,560
eugenoya uzhmash in ukraine and one of

145
00:04:55,830 --> 00:04:53,120
our international partners and it also

146
00:04:57,749 --> 00:04:55,840
performed very well once we reached and

147
00:04:59,030 --> 00:04:57,759
that didn't really happen

148
00:05:03,270 --> 00:04:59,040
once we reached the end of the first

149
00:05:05,029 --> 00:05:03,280
stage is that all of it that's it oh

150
00:05:06,390 --> 00:05:05,039
once we burned all that fuel we

151
00:05:09,110 --> 00:05:06,400
separated between the first and second

152
00:05:10,629 --> 00:05:09,120
stage the second stage powered by an atk

153
00:05:12,230 --> 00:05:10,639
gaster 30 engine

154
00:05:13,990 --> 00:05:12,240
ignited a few seconds later and then

155
00:05:16,070 --> 00:05:14,000
took us all the way into orbit and it

156
00:05:17,590 --> 00:05:16,080
also performed flawlessly and put us

157
00:05:18,749 --> 00:05:17,600
right on the right trajectory we ended

158
00:05:22,469 --> 00:05:18,759
up with about a

159
00:05:25,189 --> 00:05:22,479
284 by 190 kilometer

160
00:05:26,550 --> 00:05:25,199
orbit uh that's the perigee and apogee

161
00:05:28,150 --> 00:05:26,560
and um

162
00:05:30,150 --> 00:05:28,160
that allows us to stay in orbit long

163
00:05:32,310 --> 00:05:30,160

enough to do a couple of burns to refine

164
00:05:33,430 --> 00:05:32,320
that orbit so that we can we can begin

165
00:05:34,950 --> 00:05:33,440
the chase to catch up with the

166
00:05:36,870 --> 00:05:34,960
international space station and

167
00:05:39,110 --> 00:05:36,880
rendezvous with it we have completed the

168
00:05:41,189 --> 00:05:39,120
first burn uh we have another one coming

169
00:05:43,430 --> 00:05:41,199
up before too long we've deployed the

170
00:05:45,510 --> 00:05:43,440
solar arrays both of which uh locked

171
00:05:47,189 --> 00:05:45,520
into place and we're getting full power

172
00:05:48,790 --> 00:05:47,199
and all those systems on the spacecraft

173
00:05:49,830 --> 00:05:48,800
are operating uh

174
00:05:52,950 --> 00:05:49,840
normally

175
00:05:54,390 --> 00:05:52,960
and as we expect them to uh so we're

176
00:05:56,230 --> 00:05:54,400
very excited about uh the fact that

177
00:05:58,950 --> 00:05:56,240
we're in orbit and we're headed to the

178
00:06:00,950 --> 00:05:58,960
station we've got uh over 1600 kilograms

179
00:06:04,230 --> 00:06:00,960
of cargo as bill said it's a combination

180
00:06:06,790 --> 00:06:04,240
of experiments food clothing general

181
00:06:09,270 --> 00:06:06,800
supplies for the crew a lot of

182
00:06:11,510 --> 00:06:09,280
student experiments on board a lot of uh

183
00:06:13,909 --> 00:06:11,520
of cubesats for various organizations

184
00:06:15,909 --> 00:06:13,919
including universities and uh and other

185
00:06:18,150 --> 00:06:15,919
academic organizations and so we're very

186
00:06:20,550 --> 00:06:18,160
excited to be able to contribute to the

187
00:06:22,870 --> 00:06:20,560
continuing research on the station as

188
00:06:25,590 --> 00:06:22,880

well as spreading the ability to conduct

189
00:06:28,550 --> 00:06:25,600
research to uh to various citizens

190
00:06:29,990 --> 00:06:28,560
around the world not just americans

191
00:06:31,430 --> 00:06:30,000
it's it's a great opportunity for the

192
00:06:32,710 --> 00:06:31,440
company we're very proud to do that and

193
00:06:34,710 --> 00:06:32,720
we're really looking forward to the

194
00:06:35,749 --> 00:06:34,720
rendezvous which will occur wednesday

195
00:06:37,670 --> 00:06:35,759
morning

196
00:06:39,350 --> 00:06:37,680
that's another delicate procedure that

197
00:06:41,270 --> 00:06:39,360
has to be conducted much of it

198
00:06:43,749 --> 00:06:41,280
autonomously but closely watched by our

199
00:06:46,150 --> 00:06:43,759
mission control team in dulles

200
00:06:47,749 --> 00:06:46,160
and as we approach the station we will

201
00:06:49,670 --> 00:06:47,759
stop at about 10 meters away from the

202
00:06:52,309 --> 00:06:49,680
station at that time

203
00:06:54,230 --> 00:06:52,319
uh reed and and uh and his crewmates

204
00:06:57,110 --> 00:06:54,240
will grasp the station with the robotic

205
00:07:00,469 --> 00:06:57,120
arm uh attach it to the lower side of

206
00:07:02,629 --> 00:07:00,479
the uh of the node node two and uh and

207
00:07:04,710 --> 00:07:02,639
attach it firmly and then open the hatch

208
00:07:06,710 --> 00:07:04,720
and start pulling out their new clothes

209
00:07:08,550 --> 00:07:06,720
and food and hopefully be very happy

210
00:07:10,790 --> 00:07:08,560
about everything they find

211
00:07:12,870 --> 00:07:10,800
it's like christmas in july

212
00:07:13,990 --> 00:07:12,880
i always wanted to use that phrase

213
00:07:18,469 --> 00:07:14,000

but

214
00:07:20,070 --> 00:07:18,479
for uh our team and uh of course they're

215
00:07:21,909 --> 00:07:20,080
hard at work right now making sure that

216
00:07:24,790 --> 00:07:21,919
all the systems are working right the

217
00:07:26,550 --> 00:07:24,800
antares team of course is uh

218
00:07:28,070 --> 00:07:26,560
closing up their notebooks and

219
00:07:29,110 --> 00:07:28,080
and uh leaving the mission control

220
00:07:30,230 --> 00:07:29,120
center and i don't know what they're

221
00:07:32,150 --> 00:07:30,240
going to do tonight but they'll probably

222
00:07:33,430 --> 00:07:32,160
be really happy and

223
00:07:35,189 --> 00:07:33,440
they've been waiting two months to get

224
00:07:37,110 --> 00:07:35,199
this one off the pad and

225
00:07:40,070 --> 00:07:37,120
and that includes the nasa and mars

226
00:07:41,990 --> 00:07:40,080
teams also who work very closely with us

227
00:07:43,189 --> 00:07:42,000
so again my congratulations to the

228
00:07:44,629 --> 00:07:43,199
entire team

229
00:07:46,629 --> 00:07:44,639
bill thanks for the

230
00:07:47,670 --> 00:07:46,639
cooperation and collaboration with nasa

231
00:07:49,909 --> 00:07:47,680
you're

232
00:07:51,749 --> 00:07:49,919
a great customer

233
00:07:58,710 --> 00:07:51,759
and

234
00:08:00,309 --> 00:07:58,720
we certainly are really as i said proud

235
00:08:02,150 --> 00:08:00,319
to be a part of this endeavor the space

236
00:08:04,629 --> 00:08:02,160
station is extremely important it's an

237
00:08:06,230 --> 00:08:04,639
international space station uh the

238
00:08:07,510 --> 00:08:06,240

international cooperation there i think

239
00:08:08,629 --> 00:08:07,520
is something people should pay more

240
00:08:10,629 --> 00:08:08,639
attention to

241
00:08:13,350 --> 00:08:10,639
uh the ability of the space program to

242
00:08:14,869 --> 00:08:13,360
make sure that or to enable countries to

243
00:08:17,430 --> 00:08:14,879
come together and do something that's

244
00:08:19,189 --> 00:08:17,440
extremely difficult do it successfully

245
00:08:21,350 --> 00:08:19,199
do it with a lot of cooperation and

246
00:08:23,589 --> 00:08:21,360
trust which is really the key to us

247
00:08:24,950 --> 00:08:23,599
being able to be successful is a great

248
00:08:27,029 --> 00:08:24,960
example for the rest of the world to

249
00:08:28,710 --> 00:08:27,039
follow in orbital we have the same thing

250
00:08:30,710 --> 00:08:28,720
with our international partners that

251
00:08:33,110 --> 00:08:30,720
contribute to the success of antares and

252
00:08:35,430 --> 00:08:33,120
cygnus a pressurized cargo module is

253
00:08:38,230 --> 00:08:35,440
built in italy and same company that

254
00:08:39,029 --> 00:08:38,240
built some of the modules on the station

255
00:08:42,709 --> 00:08:39,039
and

256
00:08:45,030 --> 00:08:42,719
components so we we try to work uh with

257
00:08:47,110 --> 00:08:45,040
the best in the world and uh and we're

258
00:08:48,710 --> 00:08:47,120
looking forward of course to continuing

259
00:08:51,190 --> 00:08:48,720
to be an american company that leads in

260
00:08:52,630 --> 00:08:51,200
the commercialization of space and uh we

261
00:08:54,150 --> 00:08:52,640
appreciate the opportunity we're looking

262
00:08:55,670 --> 00:08:54,160
forward to the next six missions in the

263
00:08:58,550 --> 00:08:55,680

next contract and

264
00:08:59,509 --> 00:08:58,560
and uh go antares and go cygnus thank

265
00:09:01,430 --> 00:08:59,519
you

266
00:09:03,190 --> 00:09:01,440
thanks frank okay we'll take some

267
00:09:05,670 --> 00:09:03,200
questions here at wallops and on the

268
00:09:07,829 --> 00:09:05,680
phone and as a reminder to those

269
00:09:09,829 --> 00:09:07,839
watching from afar you can send us your

270
00:09:13,430 --> 00:09:09,839
questions on social media using the

271
00:09:19,350 --> 00:09:13,440
hashtag asknasa

272
00:09:23,190 --> 00:09:21,110
thank you ken kramer for universe today

273
00:09:24,310 --> 00:09:23,200
talking about contracts and uh the

274
00:09:26,310 --> 00:09:24,320
future

275
00:09:28,150 --> 00:09:26,320
frank last time you were hoping to

276
00:09:29,990 --> 00:09:28,160
thinking that the space station could be

277
00:09:31,670 --> 00:09:30,000
extended a few decades i'd like to ask

278
00:09:33,509 --> 00:09:31,680
bill you know what's your perspective

279
00:09:35,509 --> 00:09:33,519
can you philosophize a little bit about

280
00:09:36,470 --> 00:09:35,519
extending the space station

281
00:09:38,710 --> 00:09:36,480
and and

282
00:09:40,550 --> 00:09:38,720
the importance of these cargo missions

283
00:09:42,150 --> 00:09:40,560
and also the next step with the

284
00:09:43,430 --> 00:09:42,160
contracts tell us tell us what's going

285
00:09:45,269 --> 00:09:43,440
on when you're gonna when you're gonna

286
00:09:47,350 --> 00:09:45,279
do that how many com companies might be

287
00:09:49,190 --> 00:09:47,360
involved thank you okay sure

288
00:09:52,150 --> 00:09:49,200

the station's been extended from the

289
00:09:54,150 --> 00:09:52,160
administration standpoint to 2024.

290
00:09:56,310 --> 00:09:54,160
we see that as a pretty monumental step

291
00:09:59,030 --> 00:09:56,320
if you think we're in 2014 and in 10

292
00:10:01,190 --> 00:09:59,040
years is a nice window for researchers

293
00:10:03,590 --> 00:10:01,200
to to go ahead and build experiments to

294
00:10:05,269 --> 00:10:03,600
go utilize station we from a nasa

295
00:10:07,350 --> 00:10:05,279
standpoint see the space station as

296
00:10:09,350 --> 00:10:07,360
being extremely important to exploration

297
00:10:11,350 --> 00:10:09,360
kind of activities as you think about

298
00:10:13,829 --> 00:10:11,360
going beyond low earth orbit and you

299
00:10:15,430 --> 00:10:13,839
want to go out to mars kind of distances

300
00:10:16,870 --> 00:10:15,440
what a great platform to learn about

301
00:10:18,470 --> 00:10:16,880
microgravity and that's the space

302
00:10:19,590 --> 00:10:18,480
station so you can learn how the human

303
00:10:21,430 --> 00:10:19,600
body

304
00:10:22,790 --> 00:10:21,440
operates for extended period of time

305
00:10:24,470 --> 00:10:22,800
next year we'll do the one year

306
00:10:26,310 --> 00:10:24,480
increment with two of our crew members

307
00:10:28,230 --> 00:10:26,320
on board station for one year so we'll

308
00:10:29,670 --> 00:10:28,240
get the chance to see that if there's

309
00:10:31,910 --> 00:10:29,680
anything that happens with the human

310
00:10:33,990 --> 00:10:31,920
body that changes beyond six months we

311
00:10:35,590 --> 00:10:34,000
have a lot of experiences six months the

312
00:10:37,590 --> 00:10:35,600
russians have flown crew members to a

313
00:10:39,030 --> 00:10:37,600

year so so we know that there's nothing

314
00:10:40,790 --> 00:10:39,040
major can happen but we're really

315
00:10:42,790 --> 00:10:40,800
looking for those subtle little changes

316
00:10:44,550 --> 00:10:42,800
in the human body that that might really

317
00:10:45,829 --> 00:10:44,560
impact a mars-class mission and that's

318
00:10:47,990 --> 00:10:45,839
where that one-year increment will be

319
00:10:49,670 --> 00:10:48,000
important to us also our systems that we

320
00:10:51,990 --> 00:10:49,680
operate onboard space station they have

321
00:10:53,670 --> 00:10:52,000
to be extremely reliable you know with

322
00:10:55,350 --> 00:10:53,680
station we have to repair a lot of

323
00:10:56,710 --> 00:10:55,360
components fairly regularly there's a

324
00:10:58,870 --> 00:10:56,720
lot of critical components that are

325
00:11:01,110 --> 00:10:58,880
actually on this uh this cygnus that's

326
00:11:02,790 --> 00:11:01,120
going up today that are important to go

327
00:11:04,870 --> 00:11:02,800
change out and when you go to mars

328
00:11:06,630 --> 00:11:04,880
you've really committed yourself that

329
00:11:09,350 --> 00:11:06,640
those components everything you need

330
00:11:12,550 --> 00:11:09,360
really needs to be with you as you go so

331
00:11:15,110 --> 00:11:12,560
to get a chance to experiment on long

332
00:11:17,110 --> 00:11:15,120
long life high reliability components is

333
00:11:19,269 --> 00:11:17,120
another real strong aspect for stations

334
00:11:21,110 --> 00:11:19,279
so again we're going to utilize station

335
00:11:22,069 --> 00:11:21,120
as much as we can during these next 10

336
00:11:24,310 --> 00:11:22,079
years

337
00:11:26,230 --> 00:11:24,320
again you know i optimistically think

338
00:11:28,150 --> 00:11:26,240

that once folks start seeing how station

339
00:11:29,750 --> 00:11:28,160
can be used it'll get used more and

340
00:11:32,470 --> 00:11:29,760
we'll see station get extended even

341
00:11:33,990 --> 00:11:32,480
beyond the 2024 time frame and we we're

342
00:11:35,350 --> 00:11:34,000
putting in place some of the contracts

343
00:11:37,430 --> 00:11:35,360
for that we got the commercial crew

344
00:11:39,350 --> 00:11:37,440
transportation contract that we're

345
00:11:41,030 --> 00:11:39,360
working you know we're trying to award

346
00:11:42,630 --> 00:11:41,040
some time in august september time frame

347
00:11:44,710 --> 00:11:42,640
that's been our normal schedule we'll

348
00:11:47,269 --> 00:11:44,720
select one or more contractors for that

349
00:11:49,430 --> 00:11:47,279
crew contract cargo contract we just put

350
00:11:51,750 --> 00:11:49,440
out a draft a request for proposal from

351
00:11:53,590 --> 00:11:51,760
from the contracting community they have

352
00:11:56,069 --> 00:11:53,600
over the summer to give us comments back

353
00:11:57,910 --> 00:11:56,079
to that draft proposal we'll then

354
00:11:59,910 --> 00:11:57,920
finalize that proposal sometime in the

355
00:12:02,470 --> 00:11:59,920
fall with the idea to select sometime

356
00:12:04,230 --> 00:12:02,480
towards maybe december january of next

357
00:12:06,310 --> 00:12:04,240
year for the second phase of the cargo

358
00:12:08,310 --> 00:12:06,320
contract so again i think it's a pretty

359
00:12:10,470 --> 00:12:08,320
robust time i think what's really

360
00:12:12,710 --> 00:12:10,480
exciting is if you look at the science

361
00:12:14,629 --> 00:12:12,720
that's getting done on station this is

362
00:12:16,710 --> 00:12:14,639
probably the most productive science

363
00:12:18,550 --> 00:12:16,720

period i've ever seen on station and i

364
00:12:21,190 --> 00:12:18,560
see a lot of student experiments you can

365
00:12:22,550 --> 00:12:21,200
get the details from the press kit and

366
00:12:24,790 --> 00:12:22,560
go look at which high schools are

367
00:12:26,870 --> 00:12:24,800
participating which kids have actually

368
00:12:28,310 --> 00:12:26,880
are flying experiments to station and

369
00:12:30,550 --> 00:12:28,320
these these flights that are occurring

370
00:12:32,949 --> 00:12:30,560
fairly soon you know there'll be an atv

371
00:12:34,790 --> 00:12:32,959
launch here at the end of this month it

372
00:12:36,629 --> 00:12:34,800
docks later in august then there'll be a

373
00:12:39,269 --> 00:12:36,639
spacex launch in the fall

374
00:12:41,190 --> 00:12:39,279
that that routine of flying every couple

375
00:12:42,790 --> 00:12:41,200
months allows a lot of experiments to

376
00:12:44,550 --> 00:12:42,800
get to orbit fairly quickly which is

377
00:12:46,310 --> 00:12:44,560
important for researchers and important

378
00:12:47,910 --> 00:12:46,320
for students so so they don't have to

379
00:12:49,190 --> 00:12:47,920
wait three years before they get results

380
00:12:50,310 --> 00:12:49,200
back from their experiments they can

381
00:12:52,150 --> 00:12:50,320
start seeing results from your

382
00:12:54,310 --> 00:12:52,160
experiments fairly soon so i think this

383
00:12:55,750 --> 00:12:54,320
is a very dynamic time you have to work

384
00:12:57,910 --> 00:12:55,760
a little hard to understand what's going

385
00:12:59,350 --> 00:12:57,920
on with station but i think it's it's

386
00:13:01,110 --> 00:12:59,360
really worth your time to go out and

387
00:13:03,350 --> 00:13:01,120
look at the web and spend a little bit

388
00:13:04,870 --> 00:13:03,360

of research time and go look and i think

389
00:13:07,030 --> 00:13:04,880
it's also really cool to see here from

390
00:13:08,470 --> 00:13:07,040
virginia right we're actually launching

391
00:13:11,350 --> 00:13:08,480
from here to the international space

392
00:13:13,430 --> 00:13:11,360
station in the international um venues

393
00:13:15,030 --> 00:13:13,440
that frank just talked about so so think

394
00:13:17,590 --> 00:13:15,040
about how we've really touched kind of

395
00:13:19,910 --> 00:13:17,600
the you know the the virginia east coast

396
00:13:21,670 --> 00:13:19,920
or eastern shore here and and and really

397
00:13:23,829 --> 00:13:21,680
have changed i think the way things are

398
00:13:25,910 --> 00:13:23,839
working so so you can see benefits of

399
00:13:27,269 --> 00:13:25,920
the space program right here right here

400
00:13:28,870 --> 00:13:27,279
on the eastern shore so it's kind of

401
00:13:33,190 --> 00:13:28,880
cool

402
00:13:38,389 --> 00:13:35,670
hi it's frank mooring with aviation week

403
00:13:40,310 --> 00:13:38,399
um for bill gerstenmaier a question

404
00:13:42,710 --> 00:13:40,320
about the um

405
00:13:44,710 --> 00:13:42,720
the logistics that that are playing out

406
00:13:46,790 --> 00:13:44,720
with these commercial cargo vehicles are

407
00:13:48,470 --> 00:13:46,800
you meeting your marks are you confident

408
00:13:51,110 --> 00:13:48,480
that you'll be able to do that through

409
00:13:53,750 --> 00:13:51,120
the the life of this first contract both

410
00:13:56,310 --> 00:13:53,760
with orbital and spacex and then for

411
00:13:57,990 --> 00:13:56,320
frank um i wonder if you could tell us a

412
00:13:59,910 --> 00:13:58,000
little bit about the upgrades that you

413
00:14:04,230 --> 00:13:59,920

have planned for um

414
00:14:05,430 --> 00:14:04,240
the cygnus cargo vehicle um

415
00:14:07,110 --> 00:14:05,440
when you're gonna start bringing those

416
00:14:09,430 --> 00:14:07,120
on board too

417
00:14:10,870 --> 00:14:09,440
again you know i think we we kind of

418
00:14:12,790 --> 00:14:10,880
planned that it might take a little

419
00:14:15,110 --> 00:14:12,800
while to get some of these cargo

420
00:14:18,069 --> 00:14:15,120
vehicles established you know it's it's

421
00:14:19,670 --> 00:14:18,079
not easy launching a vehicle to space

422
00:14:21,430 --> 00:14:19,680
there's uh you know even though the

423
00:14:23,509 --> 00:14:21,440
vehicle is ready and fully designed to

424
00:14:25,910 --> 00:14:23,519
get into kind of a cadence or routine of

425
00:14:27,990 --> 00:14:25,920
launching regularly it doesn't happen

426
00:14:29,990 --> 00:14:28,000
quite as easy as as you think and you've

427
00:14:31,750 --> 00:14:30,000
and you've seen that occur frank talked

428
00:14:32,949 --> 00:14:31,760
about his team you know working a couple

429
00:14:34,629 --> 00:14:32,959
months extra from when they were

430
00:14:36,310 --> 00:14:34,639
originally going to go plan

431
00:14:37,189 --> 00:14:36,320
you know the the test stand problem

432
00:14:42,150 --> 00:14:37,199
really

433
00:14:44,310 --> 00:14:42,160
go fly and move forward we had enough

434
00:14:46,629 --> 00:14:44,320
margin on station that it was okay we

435
00:14:49,750 --> 00:14:46,639
have enough vehicles between spacex and

436
00:14:51,590 --> 00:14:49,760
atv and orbital that we're okay

437
00:14:53,430 --> 00:14:51,600
i tell you i can breathe kind of a sigh

438
00:14:55,110 --> 00:14:53,440

of relief with this flight there was

439
00:14:56,710 --> 00:14:55,120
some definitely some food and some other

440
00:14:58,470 --> 00:14:56,720
things that the crew needed there's also

441
00:15:00,069 --> 00:14:58,480
some components for the japanese module

442
00:15:01,670 --> 00:15:00,079
that are important there's some other

443
00:15:03,910 --> 00:15:01,680
upgrade things that are really important

444
00:15:06,150 --> 00:15:03,920
to get to station so so this flight i

445
00:15:08,389 --> 00:15:06,160
think is i feel really good that's

446
00:15:10,389 --> 00:15:08,399
occurred now we had some margin but it

447
00:15:12,870 --> 00:15:10,399
was getting to be where it was a little

448
00:15:14,870 --> 00:15:12,880
tense where we are overall we knew atv

449
00:15:16,710 --> 00:15:14,880
was coming online but would you like to

450
00:15:18,310 --> 00:15:16,720
have a little more margin than that so

451
00:15:19,750 --> 00:15:18,320
again i think this next year will be

452
00:15:21,990 --> 00:15:19,760
really important to us that we kind of

453
00:15:24,389 --> 00:15:22,000
establish a cadence of routine flights

454
00:15:26,150 --> 00:15:24,399
and and that's not easy and and we've

455
00:15:28,069 --> 00:15:26,160
got a little margin so we can grow and

456
00:15:29,910 --> 00:15:28,079
not push too hard but we need to get in

457
00:15:31,590 --> 00:15:29,920
kind of a cadence of where we're flying

458
00:15:32,470 --> 00:15:31,600
regularly with the cargo flights and

459
00:15:34,710 --> 00:15:32,480
frank

460
00:15:36,949 --> 00:15:34,720
and that's important both to nasa and

461
00:15:38,069 --> 00:15:36,959
the station as as well as to the

462
00:15:39,269 --> 00:15:38,079
providers

463
00:15:40,870 --> 00:15:39,279

the companies that are doing this are

464
00:15:42,710 --> 00:15:40,880
doing it under fixed price contracts so

465
00:15:44,870 --> 00:15:42,720
doing it on a regular basis

466
00:15:47,350 --> 00:15:44,880
without major delays is a is a big deal

467
00:15:49,350 --> 00:15:47,360
for us and so we are trying very hard to

468
00:15:51,110 --> 00:15:49,360
to achieve regular production and do it

469
00:15:53,430 --> 00:15:51,120
cost effectively

470
00:15:54,870 --> 00:15:53,440
in order to continue to improve what we

471
00:15:57,350 --> 00:15:54,880
on what we're doing and carry more and

472
00:15:59,189 --> 00:15:57,360
more cargo to the station we do have

473
00:16:00,550 --> 00:15:59,199
a product improvement program we've been

474
00:16:03,749 --> 00:16:00,560
working on and we have an enhanced

475
00:16:06,150 --> 00:16:03,759
version of cygnus that will begin flying

476
00:16:07,749 --> 00:16:06,160
next year we're actually upgrading the

477
00:16:09,269 --> 00:16:07,759
ataris on the next mission and we'll be

478
00:16:10,470 --> 00:16:09,279
able to carry an additional 500

479
00:16:12,310 --> 00:16:10,480
kilograms

480
00:16:14,310 --> 00:16:12,320
of cargo on that one

481
00:16:17,030 --> 00:16:14,320
it's a small it's still the standard

482
00:16:18,470 --> 00:16:17,040
size pcm so we won't be able to take

483
00:16:21,110 --> 00:16:18,480
full advantage of all that performance

484
00:16:22,870 --> 00:16:21,120
but on the following mission or four

485
00:16:24,629 --> 00:16:22,880
we'll have a

486
00:16:25,670 --> 00:16:24,639
pressurized cargo module that's a meter

487
00:16:28,150 --> 00:16:25,680
longer

488
00:16:29,509 --> 00:16:28,160

and will carry about 700 kilograms more

489
00:16:30,710 --> 00:16:29,519
than the current

490
00:16:32,470 --> 00:16:30,720
current system

491
00:16:34,069 --> 00:16:32,480
and we have some additional changes such

492
00:16:36,710 --> 00:16:34,079
as new solar arrays some different

493
00:16:38,629 --> 00:16:36,720
radios lighter weight components all

494
00:16:40,389 --> 00:16:38,639
adding up to increased performance and

495
00:16:41,670 --> 00:16:40,399
and higher cargo capability for the

496
00:16:44,069 --> 00:16:41,680
station over the remainder of the

497
00:16:45,670 --> 00:16:44,079
contract and uh and yes we will be able

498
00:16:48,829 --> 00:16:45,680
to meet our 20-ton

499
00:16:52,629 --> 00:16:50,829
missions marsha smith

500
00:16:54,389 --> 00:16:52,639
spacepolicyonline.com following up on

501
00:16:56,870 --> 00:16:54,399
frank's question i'm curious i think is

502
00:16:57,990 --> 00:16:56,880
this the last atv flight that's going up

503
00:16:59,829 --> 00:16:58,000
how many

504
00:17:02,310 --> 00:16:59,839
dragon and or

505
00:17:04,789 --> 00:17:02,320
cygnus flights does it take to

506
00:17:06,870 --> 00:17:04,799
equal an atv flight i'm curious what

507
00:17:08,309 --> 00:17:06,880
this means for the flight rate in the

508
00:17:11,350 --> 00:17:08,319
long term future when there won't be any

509
00:17:14,870 --> 00:17:11,360
more atvs and how many htvs are left

510
00:17:16,470 --> 00:17:14,880
yeah this is the last atv

511
00:17:18,789 --> 00:17:16,480
and i

512
00:17:22,549 --> 00:17:18,799
i'll have to go check on the htvs but

513
00:17:24,789 --> 00:17:22,559

there's roughly i think about four left

514
00:17:28,150 --> 00:17:24,799
on the htv line we're still negotiating

515
00:17:30,310 --> 00:17:28,160
with the japanese on those and um again

516
00:17:32,150 --> 00:17:30,320
it depends which version of cygnus you

517
00:17:34,470 --> 00:17:32,160
take if you take the enhanced cygnus

518
00:17:37,110 --> 00:17:34,480
that that frank talked about next year

519
00:17:37,990 --> 00:17:37,120
it's roughly maybe

520
00:17:43,590 --> 00:17:38,000
two

521
00:17:45,350 --> 00:17:43,600
of vehicles to equal what's in an atv

522
00:17:47,909 --> 00:17:45,360
what what's unique about atv is it can

523
00:17:49,990 --> 00:17:47,919
carry a lot of fluids it can carry water

524
00:17:52,789 --> 00:17:50,000
it also carries propellant for the

525
00:17:54,710 --> 00:17:52,799
russians to refuel their system

526
00:17:56,870 --> 00:17:54,720
htv is unique in the fact that it

527
00:17:59,190 --> 00:17:56,880
carries some external cargo a little bit

528
00:18:01,029 --> 00:17:59,200
like the dragon does so we have a nice

529
00:18:02,950 --> 00:18:01,039
mixture between all these and so when we

530
00:18:05,270 --> 00:18:02,960
looked at it there wasn't really a big

531
00:18:07,110 --> 00:18:05,280
need for the unique capabilities of atvs

532
00:18:09,669 --> 00:18:07,120
so this was the right time to phase out

533
00:18:11,110 --> 00:18:09,679
atv and and so this will be the last

534
00:18:15,270 --> 00:18:11,120
flight of atv and then we'll we'll

535
00:18:17,190 --> 00:18:15,280
continue to fly htvs and and cygnus and

536
00:18:18,710 --> 00:18:17,200
spacex dragons

537
00:18:22,150 --> 00:18:18,720
let's do one more here in the room and

538
00:18:26,470 --> 00:18:24,789

could you uh tell me the fate of the

539
00:18:27,990 --> 00:18:26,480
first stage rocket

540
00:18:29,669 --> 00:18:28,000
i know it goes into the ocean but how

541
00:18:32,630 --> 00:18:29,679
far down range

542
00:18:34,950 --> 00:18:32,640
and does it just land ballistically or

543
00:18:37,669 --> 00:18:34,960
are there parachutes to slow it and

544
00:18:40,390 --> 00:18:37,679
secondly does the second stage remain

545
00:18:42,390 --> 00:18:40,400
attached to the payload

546
00:18:44,870 --> 00:18:42,400
until it returns

547
00:18:47,909 --> 00:18:44,880
the first stage does return uh or does

548
00:18:49,510 --> 00:18:47,919
land in the atlantic uh ballistically

549
00:18:51,029 --> 00:18:49,520
we clear the range to make sure that

550
00:18:52,310 --> 00:18:51,039
people are in fact clear of that area

551
00:18:53,510 --> 00:18:52,320
before it comes in and that's one of the

552
00:18:55,350 --> 00:18:53,520
things we have to watch during the

553
00:19:00,390 --> 00:18:55,360
launch countdown i don't remember

554
00:19:05,430 --> 00:19:02,710
yeah however far that is

555
00:19:08,470 --> 00:19:05,440
uh near bermuda but um

556
00:19:11,990 --> 00:19:08,480
uh not really not very near bermuda but

557
00:19:17,029 --> 00:19:15,270
and then the second stage once it uh

558
00:19:18,710 --> 00:19:17,039
separates from the cygnus spacecraft

559
00:19:20,870 --> 00:19:18,720
remains in orbit for a certain amount of

560
00:19:23,830 --> 00:19:20,880
time and then it'll re-enter uh

561
00:19:25,830 --> 00:19:23,840
destructively usually within a few weeks

562
00:19:27,750 --> 00:19:25,840
but we make sure that the anything we

563
00:19:29,029 --> 00:19:27,760

put into orbit that uh

564
00:19:30,710 --> 00:19:29,039
is going to be there for any length of

565
00:19:32,070 --> 00:19:30,720
time is not going to stay on orbit it's

566
00:19:34,230 --> 00:19:32,080
going to return so that we don't have an

567
00:19:36,870 --> 00:19:34,240
orbital debris issue

568
00:19:39,110 --> 00:19:36,880
okay let's take a couple from the phone

569
00:19:41,830 --> 00:19:39,120
i think we have first up bill harwood

570
00:19:44,150 --> 00:19:41,840
with cbs news go ahead bill

571
00:19:45,590 --> 00:19:44,160
yeah thank you rachel uh one for mr

572
00:19:46,870 --> 00:19:45,600
gerstenmaier if i can when you were

573
00:19:48,630 --> 00:19:46,880
saying a minute ago things were a little

574
00:19:49,830 --> 00:19:48,640
bit tense from a supply standpoint i was

575
00:19:51,750 --> 00:19:49,840
under the impression you guys wouldn't

576
00:19:55,190 --> 00:19:51,760
hit your 45-day

577
00:19:57,430 --> 00:19:55,200
countdown time or until till august

578
00:19:58,789 --> 00:19:57,440
and that with atv and progress coming up

579
00:20:00,390 --> 00:19:58,799
here pretty soon you guys are pretty fat

580
00:20:01,830 --> 00:20:00,400
on supplies am i missing something there

581
00:20:03,909 --> 00:20:01,840
i want to make sure i understand how to

582
00:20:05,909 --> 00:20:03,919
characterize it thanks now i mean again

583
00:20:08,390 --> 00:20:05,919
from a requirement standpoint we had the

584
00:20:10,870 --> 00:20:08,400
right skip cycles protected and we had

585
00:20:13,590 --> 00:20:10,880
we had time until the fall but i guess

586
00:20:14,870 --> 00:20:13,600
kind of from a pragmatic warrior

587
00:20:17,270 --> 00:20:14,880
standpoint

588
00:20:18,950 --> 00:20:17,280

even though we had till the fall

589
00:20:20,789 --> 00:20:18,960
knowing the problems we had with some of

590
00:20:22,230 --> 00:20:20,799
the test stand things some of the

591
00:20:25,190 --> 00:20:22,240
challenges been working on the other

592
00:20:26,870 --> 00:20:25,200
side and then also the the french guiana

593
00:20:29,350 --> 00:20:26,880
gets kind of jammed up with a lot of

594
00:20:31,110 --> 00:20:29,360
commercial flights on the european side

595
00:20:33,029 --> 00:20:31,120
you could see all that margin evaporate

596
00:20:34,549 --> 00:20:33,039
pretty quick so if i wanted to worry a

597
00:20:36,230 --> 00:20:34,559
little bit right i could definitely

598
00:20:37,669 --> 00:20:36,240
worry myself into wanting to get a

599
00:20:39,669 --> 00:20:37,679
little more margin so we didn't really

600
00:20:41,750 --> 00:20:39,679
have any problem until the fall so

601
00:20:44,390 --> 00:20:41,760
probably over stepped a little bit by

602
00:20:45,830 --> 00:20:44,400
saying i was concerned but i will tell

603
00:20:47,830 --> 00:20:45,840
you that there were enough things there

604
00:20:49,990 --> 00:20:47,840
that when you add them all up it was it

605
00:20:51,430 --> 00:20:50,000
was a time that you want to make sure

606
00:20:52,710 --> 00:20:51,440
that you're really ready to go flying

607
00:20:54,470 --> 00:20:52,720
you don't you don't pass up an

608
00:20:57,669 --> 00:20:54,480
opportunity lightly

609
00:20:58,870 --> 00:20:57,679
it is rockets not airlines

610
00:21:02,149 --> 00:20:58,880
and bill do you have a follow-up

611
00:21:10,149 --> 00:21:04,630
he's thinking

612
00:21:14,310 --> 00:21:11,909
and then we'll take a couple from social

613
00:21:18,390 --> 00:21:14,320

media hi my name is john for countdown

614
00:21:20,630 --> 00:21:18,400
today um anterior cygnus was named for

615
00:21:23,190 --> 00:21:20,640
astronaut janet voss

616
00:21:25,270 --> 00:21:23,200
who names each spacecraft before their

617
00:21:27,510 --> 00:21:25,280
flight

618
00:21:29,669 --> 00:21:27,520
the executive team at orbital picks the

619
00:21:35,029 --> 00:21:29,679
name for each spacecraft and we have not

620
00:21:37,750 --> 00:21:36,630
okay let's take a couple from social

621
00:21:39,510 --> 00:21:37,760
media

622
00:21:41,029 --> 00:21:39,520
sure the first question is from keith on

623
00:21:42,390 --> 00:21:41,039
twitter for frank

624
00:21:45,830 --> 00:21:42,400
frank what are some of the experiments

625
00:21:48,070 --> 00:21:45,840
this mission is carrying to the iss

626
00:21:50,789 --> 00:21:48,080
we have some student experiments uh of

627
00:21:53,270 --> 00:21:50,799
various types there are some cubesats

628
00:21:56,950 --> 00:21:53,280
there's the what tech tech set for tech

629
00:21:59,029 --> 00:21:56,960
headset for tech headset for

630
00:22:04,230 --> 00:21:59,039
i don't recall all of them

631
00:22:10,470 --> 00:22:07,750
30 odd cubesats that will be deployed

632
00:22:13,909 --> 00:22:10,480
from inside the station

633
00:22:18,789 --> 00:22:16,630
uh one more uh question for frank

634
00:22:20,710 --> 00:22:18,799
from twitter how long does the docking

635
00:22:26,230 --> 00:22:20,720
process itself take

636
00:22:27,669 --> 00:22:26,240
would you characterize it as eight hours

637
00:22:29,190 --> 00:22:27,679
frank

638
00:22:30,070 --> 00:22:29,200

six

639
00:22:33,110 --> 00:22:30,080
yeah

640
00:22:34,710 --> 00:22:33,120
the the final portion is about eight

641
00:22:37,430 --> 00:22:34,720
hours uh when you're approaching the

642
00:22:39,110 --> 00:22:37,440
station and um the last four hours are

643
00:22:40,630 --> 00:22:39,120
when you're fairly close to the station

644
00:22:41,750 --> 00:22:40,640
and you're approaching fairly carefully

645
00:22:44,070 --> 00:22:41,760
from below

646
00:22:45,990 --> 00:22:44,080
and uh and then the last 250 meters are

647
00:22:48,230 --> 00:22:46,000
the or the final approach where you'll

648
00:22:49,750 --> 00:22:48,240
stop at 10 meters and and

649
00:22:51,430 --> 00:22:49,760
and then once they've grappled it'll

650
00:22:53,669 --> 00:22:51,440
take them about an hour to attach it to

651
00:22:54,950 --> 00:22:53,679
the station firmly and

652
00:22:57,110 --> 00:22:54,960
get in a position where they could open

653
00:22:58,870 --> 00:22:57,120
the hatch if they wanted to

654
00:23:00,630 --> 00:22:58,880
okay we'll take one more from the phone

655
00:23:03,110 --> 00:23:00,640
and then come back here for a final

656
00:23:06,870 --> 00:23:03,120
question um on the phone i believe we

657
00:23:09,669 --> 00:23:06,880
have stephen clark with space flight now

658
00:23:12,549 --> 00:23:09,679
hi rachel thanks uh two questions for mr

659
00:23:13,990 --> 00:23:12,559
culbertson uh first of all uh in the

660
00:23:15,909 --> 00:23:14,000
launch video it looks like there's a

661
00:23:17,110 --> 00:23:15,919
little bit of a

662
00:23:18,630 --> 00:23:17,120
tilt of the vehicle coming off the

663
00:23:20,870 --> 00:23:18,640

pattern i'm not sure i've noticed that

664
00:23:22,390 --> 00:23:20,880
before is that a normal maneuver or

665
00:23:23,430 --> 00:23:22,400
something unexpected

666
00:23:25,430 --> 00:23:23,440
and

667
00:23:26,230 --> 00:23:25,440
secondly for frank

668
00:23:29,590 --> 00:23:26,240
how

669
00:23:31,510 --> 00:23:29,600
long-term

670
00:23:33,350 --> 00:23:31,520
provider for antares for stage

671
00:23:35,029 --> 00:23:33,360
propulsion thanks

672
00:23:36,870 --> 00:23:35,039
well for the second one we're still in

673
00:23:40,310 --> 00:23:36,880
the process of negotiating with the uh

674
00:23:42,870 --> 00:23:40,320
proposers on uh uh the next uh block of

675
00:23:44,630 --> 00:23:42,880
engines for for uh antares and uh we'll

676
00:23:45,669 --> 00:23:44,640
probably announce that uh sometime this

677
00:23:48,149 --> 00:23:45,679
summer

678
00:23:49,669 --> 00:23:48,159
um and you were asking about the

679
00:23:50,789 --> 00:23:49,679
what some of us call the wiggle off the

680
00:23:52,549 --> 00:23:50,799
pad

681
00:23:54,470 --> 00:23:52,559
um others called the bomb gartner

682
00:23:55,830 --> 00:23:54,480
maneuver but uh it was a little more

683
00:23:57,750 --> 00:23:55,840
pronounced today or maybe we could just

684
00:24:00,230 --> 00:23:57,760
see it better but as a as the rocket

685
00:24:02,549 --> 00:24:00,240
lifts off it actually moves the the tail

686
00:24:03,990 --> 00:24:02,559
of the rocket closer to the structure so

687
00:24:06,149 --> 00:24:04,000
that it then flies away from the

688
00:24:08,149 --> 00:24:06,159

structure and that's to protect the tail

689
00:24:11,029 --> 00:24:08,159
and the surrounding uh hydraulic

690
00:24:12,230 --> 00:24:11,039
equipment and on electrical cables from

691
00:24:14,789 --> 00:24:12,240
the blast of

692
00:24:16,710 --> 00:24:14,799
being too close to the to the rocket

693
00:24:19,029 --> 00:24:16,720
it's only a degree or so but it is

694
00:24:20,390 --> 00:24:19,039
sometimes visible depending on the on

695
00:24:22,310 --> 00:24:20,400
the viewing angle

696
00:24:24,070 --> 00:24:22,320
uh yes it is a heart stopper when you

697
00:24:28,630 --> 00:24:24,080
see it and you don't expect it but but

698
00:24:28,640 --> 00:24:35,029
from here let's go in the front here

699
00:24:39,909 --> 00:24:37,110
how soon before we see a private company

700
00:24:42,310 --> 00:24:39,919
put a man or a woman up into space

701
00:24:43,750 --> 00:24:42,320
you'll have to ask mr garcimar that

702
00:24:46,230 --> 00:24:43,760
okay

703
00:24:49,430 --> 00:24:46,240
well we we've been kind of planning for

704
00:24:50,950 --> 00:24:49,440
late 2017 probably december 2017 from

705
00:24:52,950 --> 00:24:50,960
the us from

706
00:24:55,430 --> 00:24:52,960
from a nasa commercial crew standpoint

707
00:24:57,269 --> 00:24:55,440
that's what our our request for proposal

708
00:24:59,990 --> 00:24:57,279
is asked for from our providers and we

709
00:25:02,549 --> 00:25:00,000
believe that's achievable

710
00:25:04,230 --> 00:25:02,559
not from office

711
00:25:05,990 --> 00:25:04,240
yeah and if you're asking about other

712
00:25:07,590 --> 00:25:06,000
commercial passengers going into space

713
00:25:09,190 --> 00:25:07,600

you'll have to ask those companies how

714
00:25:11,110 --> 00:25:09,200
they're doing yep

715
00:25:13,110 --> 00:25:11,120
most of them are out west

716
00:25:14,789 --> 00:25:13,120
okay one final question in the in here

717
00:25:16,789 --> 00:25:14,799
if anyone has one

718
00:25:19,110 --> 00:25:16,799
let's go right here

719
00:25:20,070 --> 00:25:19,120
keep the black shirts

720
00:25:22,630 --> 00:25:20,080
okay

721
00:25:24,310 --> 00:25:22,640
dod with the mercury eric langer our

722
00:25:26,710 --> 00:25:24,320
question is can you elaborate a little

723
00:25:29,669 --> 00:25:26,720
bit more on the partnership you have

724
00:25:32,230 --> 00:25:29,679
with nasa and the education community

725
00:25:33,909 --> 00:25:32,240
high schools colleges and that and how

726
00:25:35,190 --> 00:25:33,919
corporations can participate in that and

727
00:25:36,710 --> 00:25:35,200
what kind of projects do you have coming

728
00:25:39,190 --> 00:25:36,720
up thank you

729
00:25:41,830 --> 00:25:39,200
sure we have an education group at nasa

730
00:25:44,149 --> 00:25:41,840
that that kind of does overall education

731
00:25:46,149 --> 00:25:44,159
activities and can can

732
00:25:47,750 --> 00:25:46,159
kind of put you in touch with if you're

733
00:25:50,390 --> 00:25:47,760
interested in doing some things with

734
00:25:51,909 --> 00:25:50,400
nasa you know rachel can the pao team

735
00:25:54,870 --> 00:25:51,919
can get you in contact with the right

736
00:25:56,549 --> 00:25:54,880
education folks we also the center for

737
00:25:59,190 --> 00:25:56,559
advancement of science and space the

738
00:26:00,870 --> 00:25:59,200

kasis organization they're managing a

739
00:26:03,669 --> 00:26:00,880
portion of the space station for us and

740
00:26:05,350 --> 00:26:03,679
they do some experiments with students

741
00:26:06,870 --> 00:26:05,360
and with high schools and that's another

742
00:26:09,590 --> 00:26:06,880
avenue that you can contact them

743
00:26:11,590 --> 00:26:09,600
directly if you're interested in in

744
00:26:13,750 --> 00:26:11,600
getting your high school or your your

745
00:26:15,510 --> 00:26:13,760
college or or even junior high we have

746
00:26:17,269 --> 00:26:15,520
some junior highs involved with doing

747
00:26:18,870 --> 00:26:17,279
some experiments in space you can do

748
00:26:20,950 --> 00:26:18,880
those activities through them if you

749
00:26:23,029 --> 00:26:20,960
want to fly something and then there's

750
00:26:25,510 --> 00:26:23,039
underneath the cases organization

751
00:26:27,669 --> 00:26:25,520
there's a nanoracks group that also does

752
00:26:29,750 --> 00:26:27,679
some science and student experiment kind

753
00:26:31,750 --> 00:26:29,760
of thing so there's many avenues

754
00:26:34,390 --> 00:26:31,760
probably the easiest one is to to reach

755
00:26:35,590 --> 00:26:34,400
out to the nasa education office and get

756
00:26:36,710 --> 00:26:35,600
in touch with them and then they can

757
00:26:38,470 --> 00:26:36,720
kind of steer you the right way

758
00:26:40,390 --> 00:26:38,480
depending on what you want to go do and

759
00:26:43,110 --> 00:26:40,400
what you're interested in doing in terms

760
00:26:44,630 --> 00:26:43,120
of classroom and education and products

761
00:26:46,710 --> 00:26:44,640
it's kind of exciting when some of the

762
00:26:47,990 --> 00:26:46,720
things we fly on station they can

763
00:26:49,669 --> 00:26:48,000

actually be

764
00:26:52,310 --> 00:26:49,679
demonstrated on the ground and students

765
00:26:53,830 --> 00:26:52,320
can kind of compare results in their own

766
00:26:56,310 --> 00:26:53,840
classrooms with what's occurring on

767
00:26:58,549 --> 00:26:56,320
space we've we've flown some some ants

768
00:27:00,230 --> 00:26:58,559
we've flown some butterflies we've flown

769
00:27:02,470 --> 00:27:00,240
some interesting things and it's kind of

770
00:27:03,909 --> 00:27:02,480
interesting to see how the terrestrial

771
00:27:05,669 --> 00:27:03,919
equivalent

772
00:27:07,110 --> 00:27:05,679
performs on the ground compared to

773
00:27:09,110 --> 00:27:07,120
what's occurring in space so the

774
00:27:10,950 --> 00:27:09,120
students can get a chance to see and

775
00:27:12,549 --> 00:27:10,960
understand what the microgravity

776
00:27:15,909 --> 00:27:12,559
environment's about

777
00:27:18,310 --> 00:27:15,919
i'm also continually amazed by the

778
00:27:20,549 --> 00:27:18,320
the inquisitiveness of students and and

779
00:27:23,830 --> 00:27:20,559
how they really grasp the uniqueness of

780
00:27:25,430 --> 00:27:23,840
space and sometimes they ask more

781
00:27:26,950 --> 00:27:25,440
i would say maybe intelligent isn't the

782
00:27:29,110 --> 00:27:26,960
right word but more inquisitive

783
00:27:31,510 --> 00:27:29,120
questions than than i get from the

784
00:27:33,269 --> 00:27:31,520
typical researchers i think by the time

785
00:27:34,870 --> 00:27:33,279
you've become an

786
00:27:37,590 --> 00:27:34,880
i'm an experienced researcher you have

787
00:27:39,269 --> 00:27:37,600
this 1g bias where your your mind always

788
00:27:41,269 --> 00:27:39,279

thinks in one gravity and you don't

789
00:27:43,110 --> 00:27:41,279
really ask those interesting questions

790
00:27:45,590 --> 00:27:43,120
and you know one of the students on the

791
00:27:47,029 --> 00:27:45,600
the butterfly experiment you know her

792
00:27:48,070 --> 00:27:47,039
and there was another one where a

793
00:27:49,110 --> 00:27:48,080
student

794
00:27:51,669 --> 00:27:49,120
did a

795
00:27:53,669 --> 00:27:51,679
it was a spider a jumping spider that

796
00:27:56,389 --> 00:27:53,679
that uses it actually jumps to capture

797
00:27:58,070 --> 00:27:56,399
its prey so the student just quietly

798
00:28:00,470 --> 00:27:58,080
asked well what happens if there's no

799
00:28:02,470 --> 00:28:00,480
microgravity with this spider

800
00:28:04,149 --> 00:28:02,480
it can't jump it's just going to float

801
00:28:06,149 --> 00:28:04,159
right is it going to walk over and get

802
00:28:08,630 --> 00:28:06,159
its prey or is it going to try to jump

803
00:28:09,669 --> 00:28:08,640
and and those kind of questions although

804
00:28:10,789 --> 00:28:09,679
simple

805
00:28:16,870 --> 00:28:10,799
they

806
00:28:19,029 --> 00:28:16,880
actually make you think about how you

807
00:28:20,710 --> 00:28:19,039
can use space in new creative innovative

808
00:28:22,710 --> 00:28:20,720
ways and actually become more innovative

809
00:28:24,950 --> 00:28:22,720
so there's a uniqueness of working with

810
00:28:26,470 --> 00:28:24,960
students that is really fun they're not

811
00:28:28,470 --> 00:28:26,480
inhibited by

812
00:28:30,870 --> 00:28:28,480
being embarrassed by asking the dumb

813
00:28:33,029 --> 00:28:30,880

questions they ask questions the right

814
00:28:34,789 --> 00:28:33,039
way and if you're really intuitive and

815
00:28:36,310 --> 00:28:34,799
you and you understand that you can get

816
00:28:37,669 --> 00:28:36,320
innovative you can get creative and you

817
00:28:39,590 --> 00:28:37,679
can see some pretty amazing things

818
00:28:41,110 --> 00:28:39,600
happen so so you should get students

819
00:28:43,110 --> 00:28:41,120
involved with the education group and

820
00:28:45,110 --> 00:28:43,120
you ought to turn loose that imagination

821
00:28:46,710 --> 00:28:45,120
turn loose that innovation and we'll see

822
00:28:49,110 --> 00:28:46,720
what we can do with this microgravity

823
00:28:50,710 --> 00:28:49,120
and the space station we've got on orbit

824
00:28:52,470 --> 00:28:50,720
if i could add just a little bit i think

825
00:28:54,630 --> 00:28:52,480
what bill is describing is what i would

826
00:28:56,789 --> 00:28:54,640
call unconstrained curiosity

827
00:28:58,389 --> 00:28:56,799
and the students really do look at

828
00:28:59,510 --> 00:28:58,399
things differently particularly the

829
00:29:01,510 --> 00:28:59,520
younger ones

830
00:29:03,669 --> 00:29:01,520
and some of the older ones too but there

831
00:29:05,590 --> 00:29:03,679
are organizations that many of them not

832
00:29:08,789 --> 00:29:05,600
for profit that conduct

833
00:29:10,149 --> 00:29:08,799
space camps academies

834
00:29:11,830 --> 00:29:10,159
weeks where students can come in from

835
00:29:14,230 --> 00:29:11,840
various places and build their own

836
00:29:16,470 --> 00:29:14,240
experiments and then cases and nanoracks

837
00:29:19,110 --> 00:29:16,480
and others will organize the ability to

838
00:29:21,350 --> 00:29:19,120

get them onto the space station on our

839
00:29:22,630 --> 00:29:21,360
last mission we flew several and we had

840
00:29:24,870 --> 00:29:22,640
students here who had designed

841
00:29:26,950 --> 00:29:24,880
experiments that flew on the station are

842
00:29:28,870 --> 00:29:26,960
on cygnus to the station we had some

843
00:29:31,190 --> 00:29:28,880
slime from king's college i think it was

844
00:29:34,310 --> 00:29:31,200
and some other places and then these

845
00:29:35,350 --> 00:29:34,320
were the selected experiments to go

846
00:29:36,789 --> 00:29:35,360
but there are lots of these

847
00:29:39,110 --> 00:29:36,799
organizations you just need to get

848
00:29:42,710 --> 00:29:39,120
online and look for them who are helping

849
00:29:44,870 --> 00:29:42,720
students uh open their minds and and uh

850
00:29:46,470 --> 00:29:44,880
and explore space in a real way and then

851
00:29:48,389 --> 00:29:46,480
they get the data back either pictures

852
00:29:51,430 --> 00:29:48,399
back or real data and occasionally

853
00:29:53,510 --> 00:29:51,440
actual uh results so it's it's the way

854
00:29:56,149 --> 00:29:53,520
to inspire children that

855
00:29:57,669 --> 00:29:56,159
and young adults that spaces

856
00:29:59,990 --> 00:29:57,679
something everybody can have access to

857
00:30:00,870 --> 00:30:00,000
eventually at least

858
00:30:03,990 --> 00:30:00,880
through

859
00:30:06,070 --> 00:30:04,000
station i think it's very important that

860
00:30:08,710 --> 00:30:06,080
we continue to motivate people into the

861
00:30:10,710 --> 00:30:08,720
science technology engineering and math

862
00:30:13,269 --> 00:30:10,720
arena

863
00:30:15,110 --> 00:30:13,279

okay well that'll do it for us i want to

864
00:30:17,990 --> 00:30:15,120
thank everyone very much for joining us

865
00:30:20,830 --> 00:30:18,000
today especially villain frank um cygnus

866
00:30:23,590 --> 00:30:20,840
is set to arrive to the space station on

867
00:30:27,830 --> 00:30:23,600
wednesday i will begin our nasa tv

868
00:30:29,990 --> 00:30:27,840
coverage at 5 15 am for a 6 39 a.m

869
00:30:32,549 --> 00:30:30,000
grapple you can follow the latest

870
00:30:34,070 --> 00:30:32,559
information on the orb 2 mission and

871
00:30:35,669 --> 00:30:34,080
find find out more about the

872
00:30:38,549 --> 00:30:35,679
international space station at