1
00:00:08,070 --> 00:00:06,070
good afternoon and welcome to nasa's

2
00:00:09,669 --> 00:00:08,080
kennedy space center in florida where

3
00:00:12,230 --> 00:00:09,679
excitement is building for the launch

4
00:00:14,549 --> 00:00:12,240
tomorrow morning at 6 20 a.m

5
00:00:17,910 --> 00:00:14,559
of a spacex falcon 9 rocket with the

6
00:00:20,230 --> 00:00:17,920
dragon payload on the spacex commercial

7
00:00:22,230 --> 00:00:20,240
resupply services flight number five to

8
00:00:24,550 --> 00:00:22,240
the international space station

9
00:00:27,670 --> 00:00:24,560
today we are here to talk about the

10
00:00:30,550 --> 00:00:27,680
nasa's fourth new earth science

11
00:00:33,270 --> 00:00:30,560
mission to launch in the past 11 months

12
00:00:35,270 --> 00:00:33,280
the cloud aerosol transport system or

13
00:00:36,709 --> 00:00:35,280

cats will begin its journey to the space

14
00:00:40,229 --> 00:00:36,719
station tomorrow

15
00:00:42,389 --> 00:00:40,239
on the spacex crs-5 launch

16
00:00:45,670 --> 00:00:42,399
cats will be nasa's second external

17
00:00:48,709 --> 00:00:45,680
payload dedicated to 24 7 scientific

18
00:00:50,790 --> 00:00:48,719
observations of our home planet cats is

19
00:00:53,110 --> 00:00:50,800
a new laser technology developed at

20
00:00:55,510 --> 00:00:53,120
nasa's goddard space flight center that

21
00:00:56,950 --> 00:00:55,520
will measure clouds and small particles

22
00:00:59,990 --> 00:00:56,960
in the atmosphere

23
00:01:01,510 --> 00:01:00,000
key players in earth's climate system

24
00:01:04,149 --> 00:01:01,520
and we're pleased today to be joined by

25
00:01:06,070 --> 00:01:04,159
our panelists to talk about cats to my

26
00:01:07,590 --> 00:01:06,080
left is julie robinson

27
00:01:09,510 --> 00:01:07,600
chief scientist of the international

28
00:01:11,510 --> 00:01:09,520
space station program from the johnson

29
00:01:13,510 --> 00:01:11,520
space center in houston

30
00:01:16,950 --> 00:01:13,520
to julie's left

31
00:01:18,789 --> 00:01:16,960
robert or bob swapp program scientist in

32
00:01:21,510 --> 00:01:18,799
the earth science division at nasa

33
00:01:23,350 --> 00:01:21,520
headquarters in washington d.c

34
00:01:24,630 --> 00:01:23,360
and to bob's left

35
00:01:26,870 --> 00:01:24,640
matt mcgill

36
00:01:30,310 --> 00:01:26,880
katz principal investigator from nasa

37
00:01:32,069 --> 00:01:30,320
goddard space flight center in maryland

38
00:01:33,749 --> 00:01:32,079

we'll begin with some presentations and

39
00:01:35,590 --> 00:01:33,759
then after the presentations we'll be

40
00:01:37,749 --> 00:01:35,600
happy to take questions from

41
00:01:40,710 --> 00:01:37,759
media and social media here at kennedy

42
00:01:42,950 --> 00:01:40,720
space center and on the phone bridge and

43
00:01:45,830 --> 00:01:42,960
also if you're watching online you can

44
00:01:48,069 --> 00:01:45,840
post a question using the hashtag ask

45
00:01:50,710 --> 00:01:48,079
nasa and we'll field questions from you

46
00:01:51,910 --> 00:01:50,720
as well so we'll begin with julie

47
00:01:53,510 --> 00:01:51,920
thanks mike

48
00:01:56,950 --> 00:01:53,520
you know we say that the space station

49
00:01:58,870 --> 00:01:56,960
is off the earth for the earth and in no

50
00:02:00,789 --> 00:01:58,880
case is this as obvious as when we

51
00:02:02,709 --> 00:02:00,799
launch our science instruments to help

52
00:02:03,910 --> 00:02:02,719
in managing and understanding our home

53
00:02:05,990 --> 00:02:03,920
planet

54
00:02:07,910 --> 00:02:06,000
the space station is maturing as an

55
00:02:09,190 --> 00:02:07,920
earth and space science platform in a

56
00:02:11,270 --> 00:02:09,200
way that

57
00:02:12,630 --> 00:02:11,280
i don't think people really imagined it

58
00:02:14,630 --> 00:02:12,640
would

59
00:02:17,350 --> 00:02:14,640
once you have this extraordinary

60
00:02:18,070 --> 00:02:17,360
platform in space you can support dozens

61
00:02:20,390 --> 00:02:18,080
and

62
00:02:22,790 --> 00:02:20,400
even as many as 30 different earth

63
00:02:24,869 --> 00:02:22,800

observing instruments also astrophysics

64
00:02:27,110 --> 00:02:24,879
instruments and technology demonstration

65
00:02:29,589 --> 00:02:27,120
payloads and this really gives us a

66
00:02:31,509 --> 00:02:29,599
great opportunity to test payloads

67
00:02:33,270 --> 00:02:31,519
before they would go on a free-flying

68
00:02:36,070 --> 00:02:33,280
satellite

69
00:02:37,910 --> 00:02:36,080
almost every spacex flight and this one

70
00:02:40,390 --> 00:02:37,920
included is going to be bringing up

71
00:02:41,670 --> 00:02:40,400
either inner science payload or some

72
00:02:44,309 --> 00:02:41,680
kind of systems hardware like the

73
00:02:46,949 --> 00:02:44,319
docking adapter that will be going up um

74
00:02:49,589 --> 00:02:46,959
in the coming year and by 2018 we'll

75
00:02:51,350 --> 00:02:49,599
only have one to two available slots of

76
00:02:52,790 --> 00:02:51,360
over 20 slots

77
00:02:54,229 --> 00:02:52,800
everything else will be occupied by

78
00:02:55,910 --> 00:02:54,239
different instruments

79
00:02:57,589 --> 00:02:55,920
and we'll even begin to rotate

80
00:02:59,110 --> 00:02:57,599
instruments for example the hico

81
00:03:00,630 --> 00:02:59,120
instrument which was a hyperspectral

82
00:03:03,509 --> 00:03:00,640
instrument for looking at the coastal

83
00:03:04,949 --> 00:03:03,519
ocean is now going to be retired it's

84
00:03:06,470 --> 00:03:04,959
come to the end of its life and that

85
00:03:07,990 --> 00:03:06,480
will be brought down and a new

86
00:03:09,589 --> 00:03:08,000
instrument can be put in its place and

87
00:03:12,949 --> 00:03:09,599
that's really unique there's no other

88
00:03:14,949 --> 00:03:12,959

satellite platform where you can do that

89
00:03:16,869 --> 00:03:14,959
take something that's worn out

90
00:03:19,110 --> 00:03:16,879
discard it bring up something new and

91
00:03:20,309 --> 00:03:19,120
trade it out and

92
00:03:22,070 --> 00:03:20,319
some of the things about the space

93
00:03:24,789 --> 00:03:22,080
station that make it totally unique are

94
00:03:26,630 --> 00:03:24,799
the fact that is a about 400 kilometers

95
00:03:28,789 --> 00:03:26,640
a normal earth remote sensing satellite

96
00:03:30,789 --> 00:03:28,799
is at over 800 kilometers so it's about

97
00:03:32,710 --> 00:03:30,799
twice as close to the earth that lets

98
00:03:34,869 --> 00:03:32,720
you use lower powered optics to get the

99
00:03:36,550 --> 00:03:34,879
same resolution or to get higher

100
00:03:38,949 --> 00:03:36,560
resolution depending on the science

101
00:03:40,390 --> 00:03:38,959
interests it has a different orbit which

102
00:03:41,910 --> 00:03:40,400
lets you see the earth at different

103
00:03:43,350 --> 00:03:41,920
times of day rather than at the same

104
00:03:46,309 --> 00:03:43,360
time of day

105
00:03:47,750 --> 00:03:46,319
it precesses its it goes around the

106
00:03:49,589 --> 00:03:47,760
earth every 90 minutes so it's

107
00:03:51,670 --> 00:03:49,599
completely unique compared to the normal

108
00:03:53,990 --> 00:03:51,680
earth remote sensing orbits now for a

109
00:03:55,350 --> 00:03:54,000
while that was seen as a drawback but

110
00:03:56,630 --> 00:03:55,360
now scientists are starting to see that

111
00:03:58,550 --> 00:03:56,640
as an advantage and you'll hear about

112
00:04:00,149 --> 00:03:58,560
that today

113
00:04:02,309 --> 00:04:00,159

the rapid rapidscat payload which went

114
00:04:05,030 --> 00:04:02,319
up on the last spacex launch has been

115
00:04:05,830 --> 00:04:05,040
already operating well and has already

116
00:04:08,390 --> 00:04:05,840
helped

117
00:04:10,229 --> 00:04:08,400
scientists to manage the impacts of

118
00:04:12,710 --> 00:04:10,239
several different hurricanes that we're

119
00:04:14,229 --> 00:04:12,720
developing by using that wind speed data

120
00:04:16,469 --> 00:04:14,239
and so what we're seeing is earth

121
00:04:18,710 --> 00:04:16,479
science as it matures on iss can really

122
00:04:20,469 --> 00:04:18,720
be a help back here on earth both to

123
00:04:23,270 --> 00:04:20,479
understanding the climate to managing

124
00:04:25,590 --> 00:04:23,280
disasters and to helping us to

125
00:04:27,590 --> 00:04:25,600
understand the earth as a system

126
00:04:29,590 --> 00:04:27,600
so um with those as sort of overall

127
00:04:31,030 --> 00:04:29,600
remarks i'll uh

128
00:04:32,710 --> 00:04:31,040
turn over to my colleagues to tell you

129
00:04:35,270 --> 00:04:32,720
more specifics about the cat's payload

130
00:04:40,150 --> 00:04:37,590
thank you good afternoon everyone

131
00:04:42,950 --> 00:04:40,160
this has been a big year for us at nasa

132
00:04:45,030 --> 00:04:42,960
earth sciences as we heard earlier

133
00:04:46,469 --> 00:04:45,040
mike was saying this is going to be the

134
00:04:47,510 --> 00:04:46,479
fourth launch

135
00:04:50,150 --> 00:04:47,520
of a

136
00:04:51,909 --> 00:04:50,160
earth sciences mission in the last uh

137
00:04:53,590 --> 00:04:51,919
the fourth of five launches in the last

138
00:04:55,830 --> 00:04:53,600

calendar year

139
00:04:57,430 --> 00:04:55,840
and we're particularly excited about

140
00:04:59,030 --> 00:04:57,440
cats tomorrow because cat's going to

141
00:05:00,629 --> 00:04:59,040
focus on something that's very important

142
00:05:02,550 --> 00:05:00,639
to us in the earth sciences and that's

143
00:05:04,070 --> 00:05:02,560
aerosols

144
00:05:05,510 --> 00:05:04,080
and what i want to do is take a step

145
00:05:07,350 --> 00:05:05,520
back for a moment and tell you a little

146
00:05:09,029 --> 00:05:07,360
bit about aerosols and why we should

147
00:05:11,189 --> 00:05:09,039
care

148
00:05:12,870 --> 00:05:11,199
simply simply stated aerosols are

149
00:05:14,150 --> 00:05:12,880
suspended particulate matter and they

150
00:05:15,909 --> 00:05:14,160
can be of

151
00:05:17,590 --> 00:05:15,919
infant almost infinitesimally small

152
00:05:19,590 --> 00:05:17,600
sizes all the way up to something that

153
00:05:21,670 --> 00:05:19,600
you could see with your eye

154
00:05:24,150 --> 00:05:21,680
and why it's important to us is that it

155
00:05:25,749 --> 00:05:24,160
can it can affect the way that we live

156
00:05:27,350 --> 00:05:25,759
in terms of health it can affect our

157
00:05:29,830 --> 00:05:27,360
health and whenever you breathe in

158
00:05:31,749 --> 00:05:29,840
respiratory from the respiratory system

159
00:05:34,310 --> 00:05:31,759
but it can also affect uh

160
00:05:36,710 --> 00:05:34,320
the way that the earth's

161
00:05:38,310 --> 00:05:36,720
radiation balance is impacted because

162
00:05:39,189 --> 00:05:38,320
wherever these aerosols are found

163
00:05:41,590 --> 00:05:39,199

whether

164
00:05:43,830 --> 00:05:41,600
different altitudes or different

165
00:05:47,270 --> 00:05:43,840
composition they can change the way that

166
00:05:49,430 --> 00:05:47,280
the the sun's incoming solar radiation

167
00:05:51,029 --> 00:05:49,440
is either reflected or absorbed and in

168
00:05:55,029 --> 00:05:51,039
the process it could change the way the

169
00:05:57,510 --> 00:05:56,309
what's also interesting to note when

170
00:05:59,430 --> 00:05:57,520
we're talking about these aerosols and

171
00:06:01,029 --> 00:05:59,440
this is something i think you and your

172
00:06:02,710 --> 00:06:01,039
your readers and

173
00:06:04,629 --> 00:06:02,720
people who follow you can understand is

174
00:06:06,629 --> 00:06:04,639
they come from various sources

175
00:06:08,309 --> 00:06:06,639
and what cats allows us to do is to get

176
00:06:10,230 --> 00:06:08,319
a better handle on these different types

177
00:06:12,870 --> 00:06:10,240
of sources mineral aerosols like the

178
00:06:14,870 --> 00:06:12,880
great dust storms that you see biomass

179
00:06:16,550 --> 00:06:14,880
burning aerosols from the large fires

180
00:06:19,029 --> 00:06:16,560
and not so large fires that you see

181
00:06:21,430 --> 00:06:19,039
across the planet

182
00:06:23,590 --> 00:06:21,440
marine aerosols sulfate aerosols that

183
00:06:26,390 --> 00:06:23,600
come out from biogenic sources and and

184
00:06:28,070 --> 00:06:26,400
more importantly industrial aerosols so

185
00:06:30,390 --> 00:06:28,080
what cats is going to allow us to do is

186
00:06:31,670 --> 00:06:30,400
to better source type these things so it

187
00:06:33,830 --> 00:06:31,680
gives us a handle where they're coming

188
00:06:35,430 --> 00:06:33,840

from and how they're being supplied in

189
00:06:37,350 --> 00:06:35,440
addition what cats is going to allow us

190
00:06:38,870 --> 00:06:37,360
to do is in the vertical have a good

191
00:06:40,790 --> 00:06:38,880
understanding of where these things are

192
00:06:42,870 --> 00:06:40,800
located and this becomes important as

193
00:06:44,550 --> 00:06:42,880
i'll show you in a couple of slides so

194
00:06:46,309 --> 00:06:44,560
what i'm going to do is step you through

195
00:06:49,029 --> 00:06:46,319
three slides if i have the first one now

196
00:06:51,029 --> 00:06:49,039
please and what we have is an image of

197
00:06:52,790 --> 00:06:51,039
south asia and this is a region that we

198
00:06:55,270 --> 00:06:52,800
know that is known to supply a lot of

199
00:06:57,830 --> 00:06:55,280
aerosols with the indian subcontinent

200
00:07:00,309 --> 00:06:57,840
and when we uh we right now currently

201
00:07:02,230 --> 00:07:00,319
with earth sciences are able to to have

202
00:07:03,830 --> 00:07:02,240
a pretty good handle on the horizontal

203
00:07:06,390 --> 00:07:03,840
extent if i could have the next slide

204
00:07:08,550 --> 00:07:06,400
please i'll show you an image of aerosol

205
00:07:10,390 --> 00:07:08,560
is detected by the modis

206
00:07:12,070 --> 00:07:10,400
instrument in space on the taran aqua

207
00:07:14,870 --> 00:07:12,080
platforms and what you see here in the

208
00:07:17,189 --> 00:07:14,880
different colors is essentially

209
00:07:19,670 --> 00:07:17,199
locations of different aerosols with the

210
00:07:21,110 --> 00:07:19,680
warmer colors being more intense uh

211
00:07:22,710 --> 00:07:21,120
concentrations

212
00:07:24,550 --> 00:07:22,720
now what we've done since then is we've

213
00:07:25,749 --> 00:07:24,560

been able to combine the horizontal with

214
00:07:29,110 --> 00:07:25,759
the vertical and if i could have the

215
00:07:30,550 --> 00:07:29,120
next slide um the spaceborne

216
00:07:32,390 --> 00:07:30,560
lidar that is currently up there is

217
00:07:34,070 --> 00:07:32,400
known as calypso and what that can do is

218
00:07:36,230 --> 00:07:34,080
that can give us a sense of where clouds

219
00:07:38,550 --> 00:07:36,240
are and where aerosols are

220
00:07:39,909 --> 00:07:38,560
in the vertical and when you combine the

221
00:07:41,670 --> 00:07:39,919
horizontal and the vertical you can

222
00:07:43,189 --> 00:07:41,680
better constrain these things in terms

223
00:07:44,390 --> 00:07:43,199
of how they're located where they're

224
00:07:45,749 --> 00:07:44,400
located

225
00:07:47,189 --> 00:07:45,759
and what we do is we take that

226
00:07:48,790 --> 00:07:47,199
information if i could have the next

227
00:07:50,950 --> 00:07:48,800
slide please

228
00:07:52,309 --> 00:07:50,960
and we feed it into complex

229
00:07:54,070 --> 00:07:52,319
earth observing

230
00:07:57,110 --> 00:07:54,080
system models and what i'm showing you

231
00:08:00,309 --> 00:07:57,120
here is a model output from the goddard

232
00:08:01,909 --> 00:08:00,319
earth observing system model

233
00:08:03,430 --> 00:08:01,919
five version five and what you see are

234
00:08:04,550 --> 00:08:03,440
the different colors so the white colors

235
00:08:07,189 --> 00:08:04,560
again are

236
00:08:09,749 --> 00:08:07,199
are the blue colors are oceanic marine

237
00:08:11,670 --> 00:08:09,759
aerosols the white colors are industrial

238
00:08:14,390 --> 00:08:11,680

aerosols or anthropogenic aerosols the

239
00:08:15,990 --> 00:08:14,400
red colors are mineral dust and then the

240
00:08:17,270 --> 00:08:16,000
green colors that you see are biomass

241
00:08:20,230 --> 00:08:17,280
burning plumes

242
00:08:22,710 --> 00:08:20,240
now by being able to better constrain

243
00:08:25,110 --> 00:08:22,720
where these aerosols are occurring in

244
00:08:27,029 --> 00:08:25,120
time and space both horizontally and

245
00:08:29,029 --> 00:08:27,039
vertically we can get a better handle on

246
00:08:30,869 --> 00:08:29,039
how the earth system is changing and we

247
00:08:33,430 --> 00:08:30,879
can also have a better understanding of

248
00:08:35,110 --> 00:08:33,440
how the radiation balance is changing

249
00:08:36,149 --> 00:08:35,120
this kind of information that cats will

250
00:08:38,070 --> 00:08:36,159
provide

251
00:08:41,589 --> 00:08:38,080
with its high spectral resolution that

252
00:08:43,350 --> 00:08:41,599
we'll hear a little bit about just now

253
00:08:44,550 --> 00:08:43,360
we'll be able to better constrain these

254
00:08:47,030 --> 00:08:44,560
models and hopefully have a better

255
00:08:48,949 --> 00:08:47,040
handle on how we move forward predicting

256
00:08:50,230 --> 00:08:48,959
how the earth is going to change and

257
00:08:52,230 --> 00:08:50,240
with that i'm going to pass it over to

258
00:08:55,670 --> 00:08:52,240
my colleague from goddard space flight

259
00:08:57,269 --> 00:08:55,680
center matt mcgill thanks bob

260
00:09:00,230 --> 00:08:57,279
excellent job of saying the why and

261
00:09:02,389 --> 00:09:00,240
where for the science case

262
00:09:05,030 --> 00:09:02,399
cats is a spectacular opportunity to now

263
00:09:06,389 --> 00:09:05,040

utilize the international space station

264
00:09:08,710 --> 00:09:06,399
to achieve important earth science

265
00:09:10,310 --> 00:09:08,720
measurements at a modest cost

266
00:09:12,470 --> 00:09:10,320
the goal of cats is to measure and

267
00:09:14,790 --> 00:09:12,480
characterize worldwide distribution of

268
00:09:16,949 --> 00:09:14,800
clouds and tiny airborne particles or

269
00:09:18,230 --> 00:09:16,959
aerosols as bob explained in the earth's

270
00:09:19,990 --> 00:09:18,240
atmosphere

271
00:09:22,150 --> 00:09:20,000
as the first our science instrument from

272
00:09:24,230 --> 00:09:22,160
goddard space flight center going to the

273
00:09:25,829 --> 00:09:24,240
international space station

274
00:09:27,430 --> 00:09:25,839
cats will provide capabilities that

275
00:09:28,949 --> 00:09:27,440
haven't been demonstrated before from

276
00:09:30,710 --> 00:09:28,959
space

277
00:09:32,790 --> 00:09:30,720
now cats is a laser remote sensing

278
00:09:34,710 --> 00:09:32,800
instrument or lidar

279
00:09:36,310 --> 00:09:34,720
works a lot like radar but using low

280
00:09:38,870 --> 00:09:36,320
energy pulses of visible and near

281
00:09:39,829 --> 00:09:38,880
visible laser light

282
00:09:41,670 --> 00:09:39,839
we have a

283
00:09:43,350 --> 00:09:41,680
animation to show you of the

284
00:09:44,949 --> 00:09:43,360
construction of cats you can see the

285
00:09:46,790 --> 00:09:44,959
size of it it's about the size of a

286
00:09:48,630 --> 00:09:46,800
refrigerator has a 60 centimeter

287
00:09:50,710 --> 00:09:48,640
telescope in the center and there are

288
00:09:52,310 --> 00:09:50,720

two lasers each one has different

289
00:09:53,910 --> 00:09:52,320
characteristics there to test different

290
00:09:56,070 --> 00:09:53,920
technologies

291
00:09:58,710 --> 00:09:56,080
and we use special photon counting

292
00:10:00,870 --> 00:09:58,720
detectors to receive the signal

293
00:10:02,710 --> 00:10:00,880
uh overall i'd say cats packs a

294
00:10:04,630 --> 00:10:02,720
significant capability

295
00:10:06,389 --> 00:10:04,640
and technology into that box about the

296
00:10:08,710 --> 00:10:06,399
size of a refrigerator

297
00:10:10,230 --> 00:10:08,720
the lidar works by sending discrete

298
00:10:11,910 --> 00:10:10,240
pulses of laser light into the earth's

299
00:10:13,430 --> 00:10:11,920
atmosphere and detecting the tiny tiny

300
00:10:15,269 --> 00:10:13,440
fraction of that light that scatters

301
00:10:17,269 --> 00:10:15,279
straight back towards our our collecting

302
00:10:18,949 --> 00:10:17,279
telescope

303
00:10:22,389 --> 00:10:18,959
to do this we're using three wavelengths

304
00:10:24,069 --> 00:10:22,399
of light 1064 532 and 355 nanometers

305
00:10:25,990 --> 00:10:24,079
which of course points to one of the

306
00:10:27,590 --> 00:10:26,000
biggest misconceptions folks always have

307
00:10:29,030 --> 00:10:27,600
they assume if we have three three

308
00:10:31,269 --> 00:10:29,040
wavelengths we must have three separate

309
00:10:34,069 --> 00:10:31,279
lasers well we don't you generate all

310
00:10:36,470 --> 00:10:34,079
three from the same laser unit

311
00:10:38,069 --> 00:10:36,480
by using a pump diode and optical

312
00:10:41,269 --> 00:10:38,079
crystals in the system we have a second

313
00:10:44,310 --> 00:10:41,279

animation that can show you um how

314
00:10:46,630 --> 00:10:44,320
uh generate the 1064 reddish light and

315
00:10:49,110 --> 00:10:46,640
then double that to green triple it to

316
00:10:50,949 --> 00:10:49,120
355 or ultraviolet all three of these

317
00:10:52,470 --> 00:10:50,959
get transmitted transmitted in discrete

318
00:10:54,710 --> 00:10:52,480
groups into the atmosphere

319
00:10:57,750 --> 00:10:54,720
simultaneously they go down and because

320
00:10:59,350 --> 00:10:57,760
the speed of light is constant and known

321
00:11:00,790 --> 00:10:59,360
timing electronics can time the

322
00:11:02,949 --> 00:11:00,800
difference between the emission of the

323
00:11:05,430 --> 00:11:02,959
pulse and when we see the return signal

324
00:11:07,110 --> 00:11:05,440
that tells us that very critical aspect

325
00:11:09,110 --> 00:11:07,120
which is the height in the atmosphere

326
00:11:10,470 --> 00:11:09,120
that the scattering occurred that's what

327
00:11:12,550 --> 00:11:10,480
bob was alluding to that's what's

328
00:11:14,230 --> 00:11:12,560
missing right now

329
00:11:15,910 --> 00:11:14,240
now these detailed observations of

330
00:11:17,269 --> 00:11:15,920
clouds and particles in the atmosphere

331
00:11:20,550 --> 00:11:17,279
they're important for lots of reasons

332
00:11:22,230 --> 00:11:20,560
but three key uses um to address are

333
00:11:24,710 --> 00:11:22,240
providing information on real-time

334
00:11:27,269 --> 00:11:24,720
hazard events like volcanic eruptions

335
00:11:28,630 --> 00:11:27,279
for studies of of energy balance or

336
00:11:30,310 --> 00:11:28,640
climate change

337
00:11:32,389 --> 00:11:30,320
and for examining the effects of both

338
00:11:35,509 --> 00:11:32,399

natural and man-made pollutants on human

339
00:11:36,949 --> 00:11:35,519
health and air quality health effects

340
00:11:39,030 --> 00:11:36,959
examine each of those three in a little

341
00:11:41,269 --> 00:11:39,040
more detail

342
00:11:42,870 --> 00:11:41,279
the part about hazard events is pretty

343
00:11:44,150 --> 00:11:42,880
obvious if there's a volcanic eruption

344
00:11:45,269 --> 00:11:44,160
you want to know

345
00:11:46,470 --> 00:11:45,279
where is it what height in the

346
00:11:48,870 --> 00:11:46,480
atmosphere is it you certainly don't

347
00:11:50,550 --> 00:11:48,880
want airplanes flying into it and

348
00:11:52,790 --> 00:11:50,560
depending on where the eruption is there

349
00:11:55,350 --> 00:11:52,800
can be significant health impacts from

350
00:11:57,030 --> 00:11:55,360
the fallout of the plume

351
00:11:59,350 --> 00:11:57,040
cats gives you the top bottom of that

352
00:12:00,710 --> 00:11:59,360
plume that's exactly what we need

353
00:12:02,470 --> 00:12:00,720
second and

354
00:12:04,550 --> 00:12:02,480
although we talk a lot about aerosols

355
00:12:05,990 --> 00:12:04,560
and particles cats permit studies of

356
00:12:09,269 --> 00:12:06,000
clouds

357
00:12:10,949 --> 00:12:09,279
uncertainties right now in predicting

358
00:12:13,430 --> 00:12:10,959
climate change because clouds are the

359
00:12:14,710 --> 00:12:13,440
key determiner of the planet's average

360
00:12:16,230 --> 00:12:14,720
temperature

361
00:12:17,190 --> 00:12:16,240
but to create more accurate climate

362
00:12:19,750 --> 00:12:17,200
models

363
00:12:21,509 --> 00:12:19,760

we need more accurate representations

364
00:12:23,430 --> 00:12:21,519
of clouds to put in the model so we need

365
00:12:25,750 --> 00:12:23,440
some more information on which to base

366
00:12:27,110 --> 00:12:25,760
the models that that is information cats

367
00:12:28,949 --> 00:12:27,120
can provide

368
00:12:31,430 --> 00:12:28,959
and third small particles such as dust

369
00:12:33,910 --> 00:12:31,440
blown from deserts or smoke from severe

370
00:12:36,389 --> 00:12:33,920
fires or pollutants

371
00:12:39,990 --> 00:12:36,399
they can have significant impacts on

372
00:12:41,910 --> 00:12:40,000
climate and human health and air quality

373
00:12:44,069 --> 00:12:41,920
so this data from cats will be used to

374
00:12:46,150 --> 00:12:44,079
improve computer models of

375
00:12:47,829 --> 00:12:46,160
of the cloud and aerosol particles

376
00:12:50,550 --> 00:12:47,839
because the vertical distributions as

377
00:12:52,389 --> 00:12:50,560
bob said they're often poorly resolved

378
00:12:55,190 --> 00:12:52,399
in the microphysical properties or what

379
00:12:57,509 --> 00:12:55,200
type of stuff is it is it dust is it

380
00:12:59,190 --> 00:12:57,519
smoke is it pollution those often aren't

381
00:13:02,150 --> 00:12:59,200
very well characterized in the models

382
00:13:03,590 --> 00:13:02,160
and it matters a significant deal

383
00:13:05,430 --> 00:13:03,600
and to improve the quality of those

384
00:13:06,389 --> 00:13:05,440
simulations so at this point we have to

385
00:13:08,470 --> 00:13:06,399
have

386
00:13:09,670 --> 00:13:08,480
real-time data about that particle type

387
00:13:12,230 --> 00:13:09,680
and height

388
00:13:14,870 --> 00:13:12,240

now that's what the lidar can provide in

389
00:13:16,310 --> 00:13:14,880
particular the vertical information

390
00:13:19,190 --> 00:13:16,320
and we have an animation a third

391
00:13:21,190 --> 00:13:19,200
animation to show that as we orbit along

392
00:13:23,190 --> 00:13:21,200
we build up this profile information

393
00:13:26,310 --> 00:13:23,200
showing the height and location of the

394
00:13:27,910 --> 00:13:26,320
different features in the atmosphere

395
00:13:30,069 --> 00:13:27,920
what's important here is this data is

396
00:13:32,310 --> 00:13:30,079
going to be coming to the ground in

397
00:13:34,470 --> 00:13:32,320
continuous near real-time fashion that's

398
00:13:36,230 --> 00:13:34,480
a capability that's made possible by the

399
00:13:38,310 --> 00:13:36,240
space station the space station

400
00:13:40,550 --> 00:13:38,320
communication infrastructure we should

401
00:13:41,990 --> 00:13:40,560
be able to collect the data transmitted

402
00:13:43,829 --> 00:13:42,000
to the ground and have it into the

403
00:13:45,910 --> 00:13:43,839
models within about a two hour time

404
00:13:47,350 --> 00:13:45,920
frame that's something we haven't been

405
00:13:49,030 --> 00:13:47,360
doing before

406
00:13:50,870 --> 00:13:49,040
and it's something that's you know at

407
00:13:55,110 --> 00:13:50,880
this point uniquely enabled by the space

408
00:13:59,509 --> 00:13:56,550
in summary then

409
00:14:01,910 --> 00:13:59,519
cats was a low-cost cost-effective way

410
00:14:03,350 --> 00:14:01,920
to utilize space station to demonstrate

411
00:14:05,189 --> 00:14:03,360
new technologies

412
00:14:07,110 --> 00:14:05,199
as julie said the station's built it's

413
00:14:08,710 --> 00:14:07,120

there we can use the infrastructure the

414
00:14:10,710 --> 00:14:08,720
cargo rockets are going there we

415
00:14:13,509 --> 00:14:10,720
launches cargo essentially

416
00:14:16,069 --> 00:14:13,519
that keeps the cost very very low

417
00:14:17,829 --> 00:14:16,079
lets us turn things around very quickly

418
00:14:19,829 --> 00:14:17,839
we can take more risk because it's a

419
00:14:22,550 --> 00:14:19,839
demonstration measurement and it's a

420
00:14:24,310 --> 00:14:22,560
demonstration of technologies

421
00:14:25,750 --> 00:14:24,320
but these demonstrations and these new

422
00:14:28,790 --> 00:14:25,760
measurements will find their way into

423
00:14:30,470 --> 00:14:28,800
future satellite missions as bob alluded

424
00:14:32,550 --> 00:14:30,480
cats will obtain important new earth

425
00:14:35,110 --> 00:14:32,560
science measurements and being able to

426
00:14:37,030 --> 00:14:35,120
utilize the space station as a platform

427
00:14:39,269 --> 00:14:37,040
does indeed begin a new and exciting era

428
00:14:40,790 --> 00:14:39,279
for earth science

429
00:14:41,670 --> 00:14:40,800
mike

430
00:14:43,829 --> 00:14:41,680
thank you

431
00:14:45,910 --> 00:14:43,839
we uh we have members of the news media

432
00:14:47,750 --> 00:14:45,920
as well as members of social media who

433
00:14:50,629 --> 00:14:47,760
are attending the nasa social for the

434
00:14:53,509 --> 00:14:50,639
spacex crs5 launch and we also have

435
00:14:55,030 --> 00:14:53,519
jason townsend from nasa social

436
00:14:57,350 --> 00:14:55,040
at nasa headquarters who is taking

437
00:14:59,269 --> 00:14:57,360
questions using

438
00:15:01,430 --> 00:14:59,279

ask nasa so feel free to ask your

439
00:15:02,790 --> 00:15:01,440
questions that way if you're online and

440
00:15:04,710 --> 00:15:02,800
here in the room please wait for the

441
00:15:06,230 --> 00:15:04,720
microphone state your name and

442
00:15:08,629 --> 00:15:06,240
affiliation and to whom you're

443
00:15:10,629 --> 00:15:08,639
addressing your question

444
00:15:14,870 --> 00:15:10,639
and we'll begin

445
00:15:19,750 --> 00:15:17,509
i'm alan boyle with nbc news uh could

446
00:15:23,350 --> 00:15:19,760
you talk about uh what the schedule

447
00:15:24,230 --> 00:15:23,360
would be for deploying cats and also

448
00:15:25,750 --> 00:15:24,240
uh

449
00:15:27,990 --> 00:15:25,760
when you expect the first light and the

450
00:15:30,470 --> 00:15:28,000
first results to come about

451
00:15:34,629 --> 00:15:32,790
okay sure well right now the launch

452
00:15:37,430 --> 00:15:34,639
scheduled for tomorrow morning

453
00:15:39,189 --> 00:15:37,440
it docks about two days later

454
00:15:40,389 --> 00:15:39,199
now after that something interesting has

455
00:15:41,990 --> 00:15:40,399
to happen i didn't

456
00:15:44,230 --> 00:15:42,000
talk about it before but it is another

457
00:15:45,990 --> 00:15:44,240
first that katz is blazing away here

458
00:15:47,910 --> 00:15:46,000
they have to pull us out of the dragon

459
00:15:50,230 --> 00:15:47,920
trunk with one robotic arm and hand us

460
00:15:51,749 --> 00:15:50,240
over to another robotic arm to install

461
00:15:54,150 --> 00:15:51,759
us onto the station

462
00:15:56,150 --> 00:15:54,160
so cats is going on to the japanese

463
00:15:58,470 --> 00:15:56,160

experiment module exposed facility or

464
00:15:59,350 --> 00:15:58,480
gem ef as it's called

465
00:16:00,870 --> 00:15:59,360
and

466
00:16:02,870 --> 00:16:00,880
this robotic transfer has to be

467
00:16:05,350 --> 00:16:02,880
carefully coordinated between the u.s

468
00:16:06,550 --> 00:16:05,360
side and the japanese side it's the

469
00:16:08,949 --> 00:16:06,560
first time they'll try one of these

470
00:16:10,790 --> 00:16:08,959
robotic handoffs so

471
00:16:12,710 --> 00:16:10,800
right now i'm waiting on what date

472
00:16:16,389 --> 00:16:12,720
that's going to happen we think it's

473
00:16:17,829 --> 00:16:16,399
going to be the 15th of january roughly

474
00:16:19,509 --> 00:16:17,839
once they get us over and get us

475
00:16:21,590 --> 00:16:19,519
installed into the gym

476
00:16:23,269 --> 00:16:21,600
then we can start through the turn on

477
00:16:25,189 --> 00:16:23,279
and check out

478
00:16:26,870 --> 00:16:25,199
it'll take us a few days we should be

479
00:16:31,110 --> 00:16:26,880
operating at this point by the end of

480
00:16:34,389 --> 00:16:32,749
jason jason ryan for

481
00:16:36,150 --> 00:16:34,399
spaceflightinsider.com this one goes to

482
00:16:37,590 --> 00:16:36,160
julie julie real quick you talked a

483
00:16:39,670 --> 00:16:37,600
little bit about the experiments that

484
00:16:41,509 --> 00:16:39,680
are being done on station and with

485
00:16:44,069 --> 00:16:41,519
extensions of the station being proposed

486
00:16:46,310 --> 00:16:44,079
to 2024 2028 can you talk a little about

487
00:16:47,590 --> 00:16:46,320
the modular nation nature of the

488
00:16:49,030 --> 00:16:47,600

experiments on the station as well as

489
00:16:51,110 --> 00:16:49,040
what we can expect to see in the future

490
00:16:52,550 --> 00:16:51,120
thank you yeah that's a great question

491
00:16:55,749 --> 00:16:52,560
because one of the things that the

492
00:16:57,350 --> 00:16:55,759
extension to 2024 would make possible is

493
00:16:58,710 --> 00:16:57,360
almost a complete new suite of

494
00:17:00,310 --> 00:16:58,720
instruments there are some instruments

495
00:17:02,310 --> 00:17:00,320
that would continue operating and

496
00:17:04,549 --> 00:17:02,320
actually have a lifespan that could go

497
00:17:06,630 --> 00:17:04,559
as far as 2028 and are getting enough

498
00:17:08,630 --> 00:17:06,640
operational data that if they're running

499
00:17:10,230 --> 00:17:08,640
scientists would want that data

500
00:17:12,949 --> 00:17:10,240
then there's another set of instruments

501
00:17:15,029 --> 00:17:12,959
that have been built to be tests that

502
00:17:17,110 --> 00:17:15,039
would be complete with their operations

503
00:17:19,189 --> 00:17:17,120
or maybe even be expected to fail by

504
00:17:20,789 --> 00:17:19,199
then and we can replace all of those and

505
00:17:23,590 --> 00:17:20,799
have another suite of instruments up

506
00:17:27,270 --> 00:17:23,600
through 2028. so essentially what you're

507
00:17:29,350 --> 00:17:27,280
doing by extending to 2024 you almost

508
00:17:31,350 --> 00:17:29,360
double the amount of earth science and

509
00:17:35,029 --> 00:17:31,360
other external payload data you can

510
00:17:37,350 --> 00:17:35,039
collect just from 2020 to 2024 by having

511
00:17:39,750 --> 00:17:37,360
all those sites full and used and of

512
00:17:42,310 --> 00:17:39,760
course if you go to 2028 you would get a

513
00:17:43,909 --> 00:17:42,320

similar kind of extension again so sort

514
00:17:46,070 --> 00:17:43,919
of if you look at it per site year

515
00:17:50,070 --> 00:17:46,080
there's enormous value to having the

516
00:17:51,990 --> 00:17:50,080
platform available to get data like this

517
00:17:52,870 --> 00:17:52,000
jason is monitoring questions coming in

518
00:17:58,630 --> 00:17:52,880
on

519
00:18:01,270 --> 00:17:58,640
coming from twitter user antoine who

520
00:18:05,270 --> 00:18:01,280
asks why is cats on the iss and not a

521
00:18:10,310 --> 00:18:07,750
well because

522
00:18:12,710 --> 00:18:10,320
back in 2011

523
00:18:13,590 --> 00:18:12,720
the space station was built as julie

524
00:18:16,310 --> 00:18:13,600
said

525
00:18:19,909 --> 00:18:16,320
and we had to start utilizing it

526
00:18:21,990 --> 00:18:19,919
so the in the iss program proper

527
00:18:24,230 --> 00:18:22,000
wanted to jump start science utilization

528
00:18:25,430 --> 00:18:24,240
in specific earth science utilization of

529
00:18:26,390 --> 00:18:25,440
the station

530
00:18:28,310 --> 00:18:26,400
so they

531
00:18:29,909 --> 00:18:28,320
approached us directly based on our

532
00:18:31,590 --> 00:18:29,919
heritage at building high altitude

533
00:18:34,549 --> 00:18:31,600
aircraft instruments

534
00:18:36,950 --> 00:18:34,559
and they also approached the the jpl

535
00:18:38,870 --> 00:18:36,960
rapid scat group that launched as julie

536
00:18:40,310 --> 00:18:38,880
said launched on the last launch

537
00:18:41,990 --> 00:18:40,320
and they said

538
00:18:43,510 --> 00:18:42,000

can you do something quick and cheap you

539
00:18:45,270 --> 00:18:43,520
build these aircraft instruments they're

540
00:18:47,909 --> 00:18:45,280
high fidelity they're autonomous that

541
00:18:49,909 --> 00:18:47,919
sounds a lot like our iss platform

542
00:18:53,110 --> 00:18:49,919
we thought about it for a very short

543
00:18:55,110 --> 00:18:53,120
time and uh we agreed collectively yes

544
00:18:57,029 --> 00:18:55,120
we could build something like that

545
00:18:58,630 --> 00:18:57,039
and so they chartered us to go off and

546
00:18:59,669 --> 00:18:58,640
do this now

547
00:19:03,750 --> 00:18:59,679
it's a

548
00:19:05,909 --> 00:19:03,760
flyer nasa has a mission out in the

549
00:19:07,909 --> 00:19:05,919
future called ace or the aerosol cloud

550
00:19:10,390 --> 00:19:07,919
ecosystem mission and a lot of the

551
00:19:12,230 --> 00:19:10,400
technology in the cat's payload is

552
00:19:15,350 --> 00:19:12,240
testing technologies that would find a

553
00:19:16,870 --> 00:19:15,360
home on ace so we're a stepping stone a

554
00:19:18,870 --> 00:19:16,880
pathfinder

555
00:19:20,710 --> 00:19:18,880
but we were also a

556
00:19:22,310 --> 00:19:20,720
an important jump start to doing our

557
00:19:25,270 --> 00:19:22,320
science on station

558
00:19:27,350 --> 00:19:25,280
and just add a couple things um so the

559
00:19:28,870 --> 00:19:27,360
the associate administrators of the

560
00:19:30,470 --> 00:19:28,880
science mission directorate and the

561
00:19:32,470 --> 00:19:30,480
human exploration and operations

562
00:19:34,310 --> 00:19:32,480
directorate had done a call for

563
00:19:37,190 --> 00:19:34,320

different technology demonstration ideas

564
00:19:39,270 --> 00:19:37,200
for iss both cats and rapidscat were

565
00:19:41,990 --> 00:19:39,280
ideas that bubbled up through that call

566
00:19:43,669 --> 00:19:42,000
as early adopters basically for the iss

567
00:19:45,669 --> 00:19:43,679
slots and

568
00:19:47,270 --> 00:19:45,679
since that time there have been a number

569
00:19:49,830 --> 00:19:47,280
of years of competition and the science

570
00:19:51,669 --> 00:19:49,840
mission directorate has selected

571
00:19:53,669 --> 00:19:51,679
multiple different instruments to fly at

572
00:19:55,909 --> 00:19:53,679
different times all the way through 2018

573
00:19:58,870 --> 00:19:55,919
under their regular um the regular

574
00:20:01,270 --> 00:19:58,880
announcements of opportunity

575
00:20:02,230 --> 00:20:01,280
wonderful twitter user frazil asks a

576
00:20:03,990 --> 00:20:02,240
couple of things looking for some

577
00:20:06,630 --> 00:20:04,000
numbers here so what is the volume of

578
00:20:08,390 --> 00:20:06,640
data per hour generated by cats and what

579
00:20:10,310 --> 00:20:08,400
is the vertical resolution of cats and

580
00:20:12,230 --> 00:20:10,320
meters

581
00:20:14,310 --> 00:20:12,240
the vertical resolution well we can

582
00:20:16,710 --> 00:20:14,320
adjust it if we wish once we're on orbit

583
00:20:19,510 --> 00:20:16,720
but 30 meters and 60 meters are our

584
00:20:21,430 --> 00:20:19,520
standard data products in the vertical

585
00:20:23,909 --> 00:20:21,440
as far as the data rate

586
00:20:28,310 --> 00:20:23,919
it's about two megabits per second

587
00:20:31,750 --> 00:20:29,669
wonderful another question here coming

588
00:20:34,630 --> 00:20:31,760

from twitter user named jeff how long

589
00:20:37,750 --> 00:20:34,640
will the mission last

590
00:20:40,230 --> 00:20:37,760
uh we're approved to be uh on the gem ef

591
00:20:41,590 --> 00:20:40,240
for up to three years if we're still

592
00:20:43,350 --> 00:20:41,600
operating at the end of three years

593
00:20:46,230 --> 00:20:43,360
we're allowed to ask for extension

594
00:20:52,149 --> 00:20:47,270
okay

595
00:20:54,950 --> 00:20:53,510
and if you're in the room and you have a

596
00:20:55,669 --> 00:20:54,960
question please raise your hand let me

597
00:20:57,830 --> 00:20:55,679
know

598
00:21:00,230 --> 00:20:57,840
stuartmuddy interspace.net and my

599
00:21:01,270 --> 00:21:00,240
question i guess is to maybe to robert

600
00:21:03,830 --> 00:21:01,280
or julie

601
00:21:04,870 --> 00:21:03,840
has the handoff been practiced before

602
00:21:05,909 --> 00:21:04,880
with

603
00:21:08,630 --> 00:21:05,919
anything

604
00:21:10,789 --> 00:21:08,640
or just the first actual handoff from

605
00:21:13,350 --> 00:21:10,799
one arm to another

606
00:21:15,190 --> 00:21:13,360
uh so we have done some other handoffs

607
00:21:18,390 --> 00:21:15,200
not of instruments

608
00:21:19,990 --> 00:21:18,400
but but uh in in the way that these are

609
00:21:21,190 --> 00:21:20,000
practiced is really in a simulation

610
00:21:22,789 --> 00:21:21,200
environment you know we have these very

611
00:21:24,310 --> 00:21:22,799
high fidelity robotic simulation

612
00:21:25,990 --> 00:21:24,320
environments so we don't have any

613
00:21:27,510 --> 00:21:26,000

concerns that this is a high-risk kind

614
00:21:29,350 --> 00:21:27,520
of mission operation

615
00:21:31,909 --> 00:21:29,360
this is this is pretty standard business

616
00:21:34,470 --> 00:21:31,919
for the robotics teams

617
00:21:36,470 --> 00:21:34,480
daryl daryl nail fox 35

618
00:21:39,029 --> 00:21:36,480
um can you tell me why uh

619
00:21:41,430 --> 00:21:39,039
three-dimensional uh cloud data is

620
00:21:43,270 --> 00:21:41,440
helpful in in assessing

621
00:21:45,510 --> 00:21:43,280
um what kind of changes are going on

622
00:21:47,350 --> 00:21:45,520
with the climate

623
00:21:49,990 --> 00:21:47,360
oh that's a that's a great question

624
00:21:52,710 --> 00:21:50,000
daryl um

625
00:21:55,510 --> 00:21:52,720
it's radiation transfer is a complex

626
00:21:57,110 --> 00:21:55,520
thing and you you can constrain it

627
00:21:59,110 --> 00:21:57,120
pretty well in two dimensions but as we

628
00:22:00,950 --> 00:21:59,120
know we live on a multi-dimensional

629
00:22:02,390 --> 00:22:00,960
planet here so when you add a third

630
00:22:04,630 --> 00:22:02,400
dimension to it and you add the fourth

631
00:22:06,630 --> 00:22:04,640
dimension of how it changes over time

632
00:22:08,630 --> 00:22:06,640
you get a better handle on how the sun's

633
00:22:11,350 --> 00:22:08,640
incoming radiation is being bounced

634
00:22:12,950 --> 00:22:11,360
around inside a cloud what i neglected

635
00:22:15,590 --> 00:22:12,960
to say we are interested in aerosols

636
00:22:18,390 --> 00:22:15,600
because aerosols provide the seed

637
00:22:20,149 --> 00:22:18,400
particles for cloud droplet formation

638
00:22:21,430 --> 00:22:20,159

you change the nature of the aerosol in

639
00:22:24,149 --> 00:22:21,440
there you change the nature of the

640
00:22:26,630 --> 00:22:24,159
clouds you change the nature of particle

641
00:22:28,310 --> 00:22:26,640
cloud condensation nuclei how many there

642
00:22:30,070 --> 00:22:28,320
are and you can change the nature of the

643
00:22:32,390 --> 00:22:30,080
cloud to go from a precipitating to a

644
00:22:34,310 --> 00:22:32,400
non-precipitating cloud from a cloud

645
00:22:36,070 --> 00:22:34,320
that absorbs radiation to a cloud that

646
00:22:39,029 --> 00:22:36,080
scatters radiation now by having

647
00:22:41,510 --> 00:22:39,039
three-dimensional information we can see

648
00:22:44,549 --> 00:22:41,520
in the atmosphere where it is

649
00:22:47,350 --> 00:22:44,559
that the cloud is being intersecting

650
00:22:49,430 --> 00:22:47,360
with the incoming solar radiation we can

651
00:22:51,110 --> 00:22:49,440
then model what the impact is in terms

652
00:22:52,710 --> 00:22:51,120
of how much radiation makes its way down

653
00:22:54,390 --> 00:22:52,720
to the earth's surface and how much

654
00:22:55,750 --> 00:22:54,400
radiation is scattered

655
00:22:58,470 --> 00:22:55,760
back into the atmosphere and how much

656
00:23:00,230 --> 00:22:58,480
back into space without that good

657
00:23:02,549 --> 00:23:00,240
vertical resolution we're a little bit

658
00:23:03,990 --> 00:23:02,559
lost 30 meters may not sound great to a

659
00:23:05,830 --> 00:23:04,000
lot of people but compared to what we're

660
00:23:08,230 --> 00:23:05,840
working with now that is it's almost a

661
00:23:09,830 --> 00:23:08,240
quantum leap for us to be able to to do

662
00:23:11,830 --> 00:23:09,840
that

663
00:23:13,669 --> 00:23:11,840

the computing power is catching up with

664
00:23:16,149 --> 00:23:13,679
the observations and we're now able to

665
00:23:18,310 --> 00:23:16,159
ingest into complex models

666
00:23:19,510 --> 00:23:18,320
the kind of information that allows us

667
00:23:21,430 --> 00:23:19,520
get ahead of what a three-dimensional

668
00:23:22,470 --> 00:23:21,440
does these big thunderstorms we had

669
00:23:25,110 --> 00:23:22,480
yesterday

670
00:23:26,549 --> 00:23:25,120
they they interact with the radiation

671
00:23:28,950 --> 00:23:26,559
incoming solar radiation differently

672
00:23:29,830 --> 00:23:28,960
than stratus clouds we had this morning

673
00:23:32,549 --> 00:23:29,840
okay

674
00:23:33,909 --> 00:23:32,559
and right now um being able to take a

675
00:23:36,390 --> 00:23:33,919
look at it in the vertical where these

676
00:23:38,149 --> 00:23:36,400
things are gives us a better handle i

677
00:23:39,270 --> 00:23:38,159
guess i hope i answered that question

678
00:23:40,870 --> 00:23:39,280
the way

679
00:23:42,710 --> 00:23:40,880
that you needed it and i'll give you my

680
00:23:44,310 --> 00:23:42,720
non-technical

681
00:23:45,669 --> 00:23:44,320
example which is if you don't know how

682
00:23:47,590 --> 00:23:45,679
thick the blanket is you don't know how

683
00:23:49,510 --> 00:23:47,600
much insulating it's going to do

684
00:23:51,190 --> 00:23:49,520
and so just in a very non-technical way

685
00:23:52,470 --> 00:23:51,200
i think everyone can understand why

686
00:23:53,510 --> 00:23:52,480
knowing the cloud thickness really

687
00:23:55,269 --> 00:23:53,520
matters

688
00:23:56,789 --> 00:23:55,279

and if you change the material of the

689
00:23:59,909 --> 00:23:56,799
blanket it can either be warmer or

690
00:24:04,549 --> 00:24:02,390
jason jason ryan spaceflight insider.com

691
00:24:05,750 --> 00:24:04,559
julie back to you um i'm getting word

692
00:24:07,750 --> 00:24:05,760
that there's been a little bit of a

693
00:24:09,830 --> 00:24:07,760
hiccup with robonaut and i'm not sure

694
00:24:11,110 --> 00:24:09,840
you can talk a whole lot about that but

695
00:24:13,029 --> 00:24:11,120
can you tell us what's going on with

696
00:24:14,870 --> 00:24:13,039
this this humanoid robot you guys got on

697
00:24:16,870 --> 00:24:14,880
station well you've got your computer in

698
00:24:18,149 --> 00:24:16,880
front of you and i don't so i'll have to

699
00:24:22,070 --> 00:24:18,159
find out what's going on with robonaut

700
00:24:25,830 --> 00:24:24,390
okay uh seeing no other questions uh

701
00:24:27,830 --> 00:24:25,840
julie do you have any closing remarks

702
00:24:29,590 --> 00:24:27,840
for this briefing so so yeah just to

703
00:24:32,630 --> 00:24:29,600
close out i mean it's been great to work

704
00:24:34,310 --> 00:24:32,640
with matt in as he was leading goddard

705
00:24:36,630 --> 00:24:34,320
and developing the capability to build

706
00:24:38,230 --> 00:24:36,640
an instrument for iss we now have two

707
00:24:40,549 --> 00:24:38,240
nasa centers with that experience

708
00:24:42,310 --> 00:24:40,559
because jpl has built rapid scat

709
00:24:44,950 --> 00:24:42,320
there are other nasa centers working to

710
00:24:46,870 --> 00:24:44,960
build payloads such as cream which will

711
00:24:48,870 --> 00:24:46,880
go up in the coming year it's really an

712
00:24:50,950 --> 00:24:48,880
exciting time to work with our science

713
00:24:52,470 --> 00:24:50,960

mission directorate colleagues and start

714
00:24:54,870 --> 00:24:52,480
testing technologies trying new

715
00:24:57,830 --> 00:24:54,880
instruments filling gaps and really

716
00:24:59,669 --> 00:24:57,840
making the iss serve the planet in every

717
00:25:01,510 --> 00:24:59,679
different way it can and it's exciting

718
00:25:03,909 --> 00:25:01,520
to see that capability maturing and

719
00:25:05,909 --> 00:25:03,919
growing on iss so we're excited and for

720
00:25:07,669 --> 00:25:05,919
the cats launch and looking forward to

721
00:25:10,149 --> 00:25:07,679
first light the first and the first

722
00:25:12,230 --> 00:25:10,159
images from the instrument

723
00:25:15,750 --> 00:25:12,240
and to find out more about cats you can

724
00:25:20,950 --> 00:25:18,549
cats c-a-t-s and to find out more about

725
00:25:23,909 --> 00:25:20,960
how nasa is using the vantage point of

726
00:25:28,789 --> 00:25:23,919
space to better understand and protect

727
00:25:32,230 --> 00:25:30,470
earthrightnow

728
00:25:33,990 --> 00:25:32,240
and as julie mentioned we have another

729
00:25:36,070 --> 00:25:34,000
briefing coming up on which she is going

730
00:25:38,870 --> 00:25:36,080
to be a panelist with some other folks

731
00:25:42,470 --> 00:25:38,880
that briefing begins at 1 30 p.m here on

732
00:25:44,789 --> 00:25:42,480
nasa television and on the nasa website

733
00:25:46,630 --> 00:25:44,799
it's an iss research and technology