
GPM Core Observatory Development at GSFC

1
00:00:06,230 --> 00:00:04,710
good morning welcome to nasa's goddard

2
00:00:07,670 --> 00:00:06,240
space flight center and the nasa social

3
00:00:11,270 --> 00:00:07,680
for the blooming partnership between

4
00:00:12,549 --> 00:00:11,280
nasa and jaxa the japanese space agency

5
00:00:14,150 --> 00:00:12,559
today we're going to get an in-depth

6
00:00:16,870 --> 00:00:14,160
look at the global precipitation

7
00:00:18,710 --> 00:00:16,880
measurement mission or gpm i'm jason

8
00:00:20,950 --> 00:00:18,720
townsend nasa's deputy social media

9
00:00:22,710 --> 00:00:20,960
manager today we've invited 60 of our

10
00:00:23,990 --> 00:00:22,720
social media followers to join us here

11
00:00:24,950 --> 00:00:24,000
in greenbelt maryland for this nasa

12
00:00:26,470 --> 00:00:24,960
social

13
00:00:27,750 --> 00:00:26,480

but before we start going into too much

14
00:00:30,150 --> 00:00:27,760
more detail for the benefit of the

15
00:00:32,389 --> 00:00:30,160
viewers on nasa tv just what is a nasa

16
00:00:34,549 --> 00:00:32,399
social well nasa social is all about

17
00:00:36,549 --> 00:00:34,559
taking the online offline we invite our

18
00:00:38,630 --> 00:00:36,559
followers our fans and our social media

19
00:00:40,549 --> 00:00:38,640
community members out to nasa facilities

20
00:00:41,990 --> 00:00:40,559
to take part in these special events

21
00:00:43,670 --> 00:00:42,000
where you can get access to see our

22
00:00:45,510 --> 00:00:43,680
facilities and meet our passionate

23
00:00:47,830 --> 00:00:45,520
employees that most folks don't really

24
00:00:49,670 --> 00:00:47,840
get a chance to do but you can share

25
00:00:51,510 --> 00:00:49,680
that experience back online with the

26
00:00:53,029 --> 00:00:51,520
online community out there so think of

27
00:00:54,709 --> 00:00:53,039
these folks as your representatives in

28
00:00:56,150 --> 00:00:54,719
this room

29
00:00:58,869 --> 00:00:56,160
we hope that you'll follow along online

30
00:01:00,950 --> 00:00:58,879
by ask by following at nasa and at nasa

31
00:01:03,029 --> 00:01:00,960
underscore rain on twitter or you can

32
00:01:05,830 --> 00:01:03,039
like the nasa or nasa rain pages on

33
00:01:07,429 --> 00:01:05,840
facebook or you can follow nasa on

34
00:01:08,469 --> 00:01:07,439
google plus

35
00:01:10,149 --> 00:01:08,479
if you want to follow or join the

36
00:01:12,230 --> 00:01:10,159
conversation be sure to use the hashtag

37
00:01:13,830 --> 00:01:12,240
for today's event which is pound nasa

38
00:01:15,590 --> 00:01:13,840

social

39
00:01:17,109 --> 00:01:15,600
we're also taking questions online for

40
00:01:19,350 --> 00:01:17,119
those of you who are following along and

41
00:01:21,590 --> 00:01:19,360
watching our broadcast using the hashtag

42
00:01:24,149 --> 00:01:21,600
poundasknasa

43
00:01:25,590 --> 00:01:24,159
also for our japanese speakers today

44
00:01:27,350 --> 00:01:25,600
we're doing something special by taking

45
00:01:28,870 --> 00:01:27,360
questions in japanese using the hashtag

46
00:01:30,230 --> 00:01:28,880
poundaskjaxa

47
00:01:33,830 --> 00:01:30,240
for those of you unfamiliar with that

48
00:01:36,310 --> 00:01:33,840
that's pound ask j-a-x-a

49
00:01:37,830 --> 00:01:36,320
now you might ask yourself why rain why

50
00:01:38,950 --> 00:01:37,840
is this mission social media accounts

51
00:01:40,710 --> 00:01:38,960
called rain

52
00:01:42,069 --> 00:01:40,720
we have several past current and future

53
00:01:43,830 --> 00:01:42,079
missions that measure rainfall around

54
00:01:45,590 --> 00:01:43,840
the globe you'll hear more about this

55
00:01:47,109 --> 00:01:45,600
constellation of precipitation measuring

56
00:01:49,030 --> 00:01:47,119
missions and the data that they collect

57
00:01:50,469 --> 00:01:49,040
during the next 90 minutes you'll hear

58
00:01:51,990 --> 00:01:50,479
from a variety of different folks who

59
00:01:53,190 --> 00:01:52,000
each have a unique perspective on this

60
00:01:54,630 --> 00:01:53,200
mission

61
00:01:56,950 --> 00:01:54,640
from the hands-on science work being

62
00:01:58,230 --> 00:01:56,960
done by both nasa and jaxa all the way

63
00:01:59,749 --> 00:01:58,240

to the big picture of our earth

64
00:02:01,190 --> 00:01:59,759
observing programs

65
00:02:05,510 --> 00:02:01,200
these speakers are part of this event

66
00:02:07,030 --> 00:02:05,520
the 61st nasa social media event

67
00:02:09,109 --> 00:02:07,040
it's experiences like these that really

68
00:02:11,029 --> 00:02:09,119
help share nasa with new audiences in

69
00:02:12,470 --> 00:02:11,039
new ways and it gets shared in very

70
00:02:13,830 --> 00:02:12,480
non-traditional ways that show off the

71
00:02:15,670 --> 00:02:13,840
science and engineering work that we do

72
00:02:17,190 --> 00:02:15,680
here at nasa we strive every day to

73
00:02:18,550 --> 00:02:17,200
promote the diversity of amazing work

74
00:02:20,790 --> 00:02:18,560
done here and to share our missions

75
00:02:22,790 --> 00:02:20,800
programs and talented employees in ways

76
00:02:24,070 --> 00:02:22,800
that connect with everybody the nasa

77
00:02:25,830 --> 00:02:24,080
socials are just one part of this

78
00:02:27,430 --> 00:02:25,840
strategy and the strategy is always

79
00:02:28,869 --> 00:02:27,440
evolving we're always looking for new

80
00:02:30,470 --> 00:02:28,879
opportunities to connect with new

81
00:02:31,509 --> 00:02:30,480
audiences and share information in new

82
00:02:32,949 --> 00:02:31,519
ways

83
00:02:35,350 --> 00:02:32,959
we're also exploring where you the

84
00:02:37,030 --> 00:02:35,360
public is and figuring out on what

85
00:02:38,949 --> 00:02:37,040
social media you guys are going to be

86
00:02:41,030 --> 00:02:38,959
connecting with us on where is it all

87
00:02:42,550 --> 00:02:41,040
headed next we're on the most popular

88
00:02:44,390 --> 00:02:42,560

platforms now and we're always looking

89
00:02:46,070 --> 00:02:44,400
for new and emerging ones so keep an eye

90
00:02:47,910 --> 00:02:46,080
out for us as these new platforms come

91
00:02:49,830 --> 00:02:47,920
online so thank you for joining us for

92
00:02:51,110 --> 00:02:49,840
this event today and this experience no

93
00:02:52,869 --> 00:02:51,120
matter if you're here in person or

94
00:02:54,070 --> 00:02:52,879
watching online today

95
00:02:55,589 --> 00:02:54,080
without any further ado we're going to

96
00:03:06,869 --> 00:02:55,599
go ahead and go into a video here to

97
00:03:10,949 --> 00:03:08,550
only three percent of water on earth

98
00:03:12,790 --> 00:03:10,959
resides as fresh water and only a tiny

99
00:03:15,350 --> 00:03:12,800
fraction of that is actually accessible

100
00:03:17,270 --> 00:03:15,360
to us on the surface seven billion of us

101
00:03:19,190 --> 00:03:17,280
live on this planet we all have to drink

102
00:03:21,190 --> 00:03:19,200
water to live where's the water that we

103
00:03:24,789 --> 00:03:21,200
drink come from by and large

104
00:03:29,350 --> 00:03:27,110
gpm is an international satellite

105
00:03:31,990 --> 00:03:29,360
mission providing a new generation of

106
00:03:35,350 --> 00:03:32,000
observations of rain and snow in all

107
00:03:36,550 --> 00:03:35,360
parts of the world every three hours

108
00:03:38,390 --> 00:03:36,560
if you have good precipitation

109
00:03:40,869 --> 00:03:38,400
information you can do a very good job

110
00:03:42,470 --> 00:03:40,879
characterizing drought and often its

111
00:03:45,589 --> 00:03:42,480
subsequent impact on agricultural

112
00:03:48,789 --> 00:03:45,599
productivity there's about one major

113
00:03:51,350 --> 00:03:48,799

flood a day someplace in the world

114
00:03:53,270 --> 00:03:51,360
so it's not as if it's a rare event

115
00:03:55,750 --> 00:03:53,280
understanding how much snow is falling

116
00:03:58,390 --> 00:03:55,760
is important for transportation

117
00:04:00,949 --> 00:03:58,400
safety how much fresh water falls and is

118
00:04:01,750 --> 00:04:00,959
stored in snowpacks but we really need

119
00:04:06,470 --> 00:04:01,760
to

120
00:04:09,750 --> 00:04:06,480
precipitation so that we know the global

121
00:04:23,270 --> 00:04:09,760
picture of where fresh water exists in

122
00:04:26,310 --> 00:04:24,469
wonderful we're going to go ahead and

123
00:04:28,150 --> 00:04:26,320
get started with our first speaker here

124
00:04:38,790 --> 00:04:28,160
from nasa's earth science division at

125
00:04:42,950 --> 00:04:40,870
thank you jason good morning yes i'm

126
00:04:45,270 --> 00:04:42,960
from nasa headquarters and i'm program

127
00:04:48,469 --> 00:04:45,280
scientist for the

128
00:04:51,030 --> 00:04:48,479
trim and gpm satellite missions

129
00:04:53,670 --> 00:04:51,040
as the video showed

130
00:04:55,270 --> 00:04:53,680
water is an integral part of life on

131
00:04:59,909 --> 00:04:55,280
this planet

132
00:05:02,629 --> 00:04:59,919
and nasa is at the forefront

133
00:05:05,189 --> 00:05:02,639
nasa plays a major role at the forefront

134
00:05:07,830 --> 00:05:05,199
of water cycle research

135
00:05:09,270 --> 00:05:07,840
study of the water cycle is

136
00:05:11,110 --> 00:05:09,280
important

137
00:05:11,830 --> 00:05:11,120
because

138
00:05:14,870 --> 00:05:11,840

it

139
00:05:17,189 --> 00:05:14,880
creates an understanding of weather

140
00:05:18,710 --> 00:05:17,199
climate

141
00:05:20,950 --> 00:05:18,720
droughts

142
00:05:24,790 --> 00:05:20,960
floods etc

143
00:05:28,070 --> 00:05:24,800
so here are some examples of

144
00:05:29,510 --> 00:05:28,080
the satellite missions that are involved

145
00:05:31,670 --> 00:05:29,520
in

146
00:05:33,110 --> 00:05:31,680
water cycle research

147
00:05:36,390 --> 00:05:33,120
are trim

148
00:05:38,870 --> 00:05:36,400
aqua grace aquarius

149
00:05:41,270 --> 00:05:38,880
they're flying right now and they're

150
00:05:42,790 --> 00:05:41,280
making measurements

151
00:05:45,110 --> 00:05:42,800
gpm

152
00:05:47,510 --> 00:05:45,120
as we'll be explained later on

153
00:05:49,189 --> 00:05:47,520
is going to be launched

154
00:05:52,469 --> 00:05:49,199
early next year

155
00:05:56,390 --> 00:05:52,479
and smap the soil moisture mission

156
00:05:59,189 --> 00:05:56,400
is going to be launched in 2015.

157
00:06:04,150 --> 00:06:02,469
trim is a collaborative effort between

158
00:06:07,430 --> 00:06:04,160
nasa and

159
00:06:10,550 --> 00:06:07,440
japanese space agency jaxa

160
00:06:13,590 --> 00:06:10,560
it was launched in 1997 as a three-year

161
00:06:16,150 --> 00:06:13,600
mission but it's still flying

162
00:06:17,189 --> 00:06:16,160
and making measurements its enormous

163
00:06:20,550 --> 00:06:17,199

success

164
00:06:24,150 --> 00:06:20,560
led to nasa and jaxa collaborating again

165
00:06:25,590 --> 00:06:24,160
on gpm another precipitation

166
00:06:27,670 --> 00:06:25,600
mission

167
00:06:29,990 --> 00:06:27,680
japan also provided an important

168
00:06:32,230 --> 00:06:30,000
instrument for the aqua satellite the

169
00:06:36,070 --> 00:06:32,240
second one there

170
00:06:39,270 --> 00:06:36,080
so to celebrate this u.s japan

171
00:06:41,510 --> 00:06:39,280
cooperation cherry blossom social

172
00:06:43,029 --> 00:06:41,520
is an appropriate theme for today's

173
00:06:44,950 --> 00:06:43,039
meeting

174
00:06:46,830 --> 00:06:44,960
um one interesting thing i wanted to

175
00:06:49,670 --> 00:06:46,840
point out here is

176
00:06:50,790 --> 00:06:49,680
um can we move on to the next

177
00:06:51,990 --> 00:06:50,800
slide

178
00:06:53,990 --> 00:06:52,000
as

179
00:06:56,870 --> 00:06:54,000
trim did before

180
00:06:59,909 --> 00:06:56,880
gpm will do an excellent job of

181
00:07:00,950 --> 00:06:59,919
measuring rain or precipitation

182
00:07:02,790 --> 00:07:00,960
but

183
00:07:05,110 --> 00:07:02,800
you know the problem is most of the time

184
00:07:08,710 --> 00:07:05,120
when it is raining somewhere

185
00:07:10,950 --> 00:07:08,720
uh gpm or trim are somewhere else

186
00:07:13,029 --> 00:07:10,960
so that brings us the concept of

187
00:07:14,550 --> 00:07:13,039
constellation satellites these

188
00:07:16,230 --> 00:07:14,560

constellation satellites are

189
00:07:17,670 --> 00:07:16,240
cross-calibrated

190
00:07:20,710 --> 00:07:17,680
against

191
00:07:24,070 --> 00:07:20,720
the gpm core satellite

192
00:07:27,189 --> 00:07:24,080
so even if the gpm core is elsewhere

193
00:07:29,270 --> 00:07:27,199
a constellation satellite that is tuned

194
00:07:31,830 --> 00:07:29,280
with the gpm core

195
00:07:34,150 --> 00:07:31,840
is likely to be

196
00:07:35,430 --> 00:07:34,160
allowing us to make the measurements

197
00:07:37,749 --> 00:07:35,440
that we seek

198
00:07:38,710 --> 00:07:37,759
so for right now this is all i have to

199
00:07:42,550 --> 00:07:38,720
say

200
00:07:51,830 --> 00:07:42,560
uh we'll wait for the qnas later on and

201
00:07:55,270 --> 00:07:53,270
wonderful before we move into our next

202
00:07:57,110 --> 00:07:55,280
speaker we've got another video here

203
00:08:02,469 --> 00:07:57,120
that talks about some of the uh water

204
00:08:07,749 --> 00:08:03,990
this is what we call

205
00:08:20,550 --> 00:08:10,390
this is the bridge out of town and

206
00:08:26,469 --> 00:08:22,629
this is the worst flooding vermont has

207
00:08:28,469 --> 00:08:26,479
seen in nearly 75 years

208
00:08:31,189 --> 00:08:28,479
tropical cyclones a general term for

209
00:08:33,350 --> 00:08:31,199
hurricanes typhoons and tropical storms

210
00:08:34,709 --> 00:08:33,360
like irene don't just stick to the

211
00:08:36,870 --> 00:08:34,719
tropics

212
00:08:39,029 --> 00:08:36,880
these storms can charge northward and

213
00:08:40,550 --> 00:08:39,039

wreak havoc in areas that normally

214
00:08:42,469 --> 00:08:40,560
wouldn't see this kind of extreme

215
00:08:44,230 --> 00:08:42,479
weather

216
00:08:46,550 --> 00:08:44,240
satellites provide us with near

217
00:08:48,550 --> 00:08:46,560
real-time information about the

218
00:08:50,630 --> 00:08:48,560
intensity of storms and where they're

219
00:08:53,670 --> 00:08:50,640
headed

220
00:08:55,670 --> 00:08:53,680
since its launch in 1997 trim the

221
00:08:57,750 --> 00:08:55,680
tropical rainfall measuring mission has

222
00:09:01,750 --> 00:08:57,760
remained a gold standard in collecting

223
00:09:05,190 --> 00:09:03,190
and while trim provides essential

224
00:09:06,150 --> 00:09:05,200
information on cyclones for tropical

225
00:09:08,550 --> 00:09:06,160
areas

226
00:09:11,509 --> 00:09:08,560
for regions like new england trim simply

227
00:09:16,150 --> 00:09:13,509
the global precipitation measurement

228
00:09:18,550 --> 00:09:16,160
mission or gpm is a constellation of

229
00:09:20,470 --> 00:09:18,560
satellites unified by the gpm core

230
00:09:22,790 --> 00:09:20,480
spacecraft that will provide a global

231
00:09:23,750 --> 00:09:22,800
picture of rain and snow every three

232
00:09:26,470 --> 00:09:23,760
hours

233
00:09:28,310 --> 00:09:26,480
when gpm launches in 2014 it will

234
00:09:30,389 --> 00:09:28,320
greatly improve upon some of the

235
00:09:32,310 --> 00:09:30,399
limitations of trim

236
00:09:34,550 --> 00:09:32,320
in addition to measuring a wider swath

237
00:09:36,630 --> 00:09:34,560
of the globe the gpm core spacecraft

238
00:09:39,190 --> 00:09:36,640

will carry more advanced instruments

239
00:09:41,590 --> 00:09:39,200
with greater sensitivity

240
00:09:44,550 --> 00:09:41,600
there's the gpm microwave imager or the

241
00:09:46,150 --> 00:09:44,560
gmi a radiometer that will use 13

242
00:09:48,949 --> 00:09:46,160
microwave channels to capture

243
00:09:50,870 --> 00:09:48,959
precipitation intensities and horizontal

244
00:09:52,310 --> 00:09:50,880
patterns

245
00:09:55,430 --> 00:09:52,320
then there's the dual frequency

246
00:09:57,910 --> 00:09:55,440
precipitation radar or the dpr

247
00:10:00,630 --> 00:09:57,920
that uses two frequencies to visualize

248
00:10:04,630 --> 00:10:00,640
in 3d the precipitation structure from

249
00:10:06,550 --> 00:10:04,640
the cloud down to the surface

250
00:10:08,550 --> 00:10:06,560
with gpm's more sensitive instruments

251
00:10:10,710 --> 00:10:08,560
and wider coverage of the globe we can

252
00:10:13,190 --> 00:10:10,720
more accurately profile a tropical

253
00:10:15,750 --> 00:10:13,200
cyclone predicting where they're likely

254
00:10:17,829 --> 00:10:15,760
to form how intense they're likely to

255
00:10:20,230 --> 00:10:17,839
become and tracking the path they'll

256
00:10:22,230 --> 00:10:20,240
take so that agencies can make better

257
00:10:36,949 --> 00:10:22,240
decisions to help get people out of

258
00:10:40,630 --> 00:10:38,710
it's really scary to see some of the

259
00:10:41,829 --> 00:10:40,640
power of water that's out there so as

260
00:10:44,069 --> 00:10:41,839
you saw with some of the flooding and

261
00:10:45,269 --> 00:10:44,079
things that was going on there

262
00:10:48,790 --> 00:10:45,279
right now we're getting ready to hear

263
00:10:51,030 --> 00:10:48,800

from uh dr gail scafronic jackson she is

264
00:10:52,230 --> 00:10:51,040
the deputy project scientist for the gpm

265
00:11:01,350 --> 00:10:52,240
mission and she's here to tell you a

266
00:11:05,350 --> 00:11:03,430
thank you jason and actually thank you

267
00:11:08,069 --> 00:11:05,360
for our audience that braved the wet

268
00:11:09,910 --> 00:11:08,079
weather and got rain on their head to

269
00:11:11,350 --> 00:11:09,920
come out to find out why nasa is

270
00:11:13,509 --> 00:11:11,360
building a satellite to measure

271
00:11:16,150 --> 00:11:13,519
precipitation from the vantage point of

272
00:11:18,630 --> 00:11:16,160
space so thank you for coming

273
00:11:20,470 --> 00:11:18,640
so you've seen the videos here and why

274
00:11:22,150 --> 00:11:20,480
water so important and precipitation

275
00:11:23,350 --> 00:11:22,160
that's falling is so important and i'm

276
00:11:25,110 --> 00:11:23,360
just going to give you a couple more

277
00:11:27,110 --> 00:11:25,120
details first of all you may be

278
00:11:29,030 --> 00:11:27,120
wondering why

279
00:11:30,470 --> 00:11:29,040
go through all the effort of building a

280
00:11:32,630 --> 00:11:30,480
satellite to measure what you can just

281
00:11:34,790 --> 00:11:32,640
put a rain gauge out in your backyard

282
00:11:36,710 --> 00:11:34,800
well the reality is if you look at all

283
00:11:39,430 --> 00:11:36,720
the rain gauges in the world represented

284
00:11:41,110 --> 00:11:39,440
by those yellow dots

285
00:11:42,630 --> 00:11:41,120
and you try to look at those you can see

286
00:11:44,310 --> 00:11:42,640
that most of them there's not very many

287
00:11:46,550 --> 00:11:44,320
over the oceans but if you were trying

288
00:11:48,710 --> 00:11:46,560

to put them side by side next to each

289
00:11:50,550 --> 00:11:48,720
other they would actually only fit on

290
00:11:55,509 --> 00:11:50,560
two basketball courts

291
00:11:57,430 --> 00:11:55,519
global precipitation no way know how can

292
00:11:58,870 --> 00:11:57,440
you use that to represent global

293
00:12:01,990 --> 00:11:58,880
precipitation

294
00:12:03,910 --> 00:12:02,000
so one of the issues then is how can we

295
00:12:06,150 --> 00:12:03,920
take this data i mean why not just use

296
00:12:08,069 --> 00:12:06,160
your cell phone to get the weather so we

297
00:12:10,069 --> 00:12:08,079
want to be able to do it globally one of

298
00:12:12,790 --> 00:12:10,079
the reasons to do it globally is because

299
00:12:14,550 --> 00:12:12,800
you can't get the measurements over land

300
00:12:16,710 --> 00:12:14,560
another thing is

301
00:12:19,110 --> 00:12:16,720
well how is it to measure precipitation

302
00:12:21,350 --> 00:12:19,120
from space how can you do it well the

303
00:12:23,829 --> 00:12:21,360
terminology is called remote sensing

304
00:12:25,910 --> 00:12:23,839
remote sensing essentially means that

305
00:12:28,870 --> 00:12:25,920
you're taking a measurement from far

306
00:12:31,350 --> 00:12:28,880
away and using that indirect measurement

307
00:12:33,030 --> 00:12:31,360
to estimate the actual precipitation or

308
00:12:35,350 --> 00:12:33,040
other field that you're measuring for

309
00:12:38,150 --> 00:12:35,360
gpm it's pretty cool because we're

310
00:12:40,310 --> 00:12:38,160
looking at say rain over the statue of

311
00:12:42,389 --> 00:12:40,320
liberty in new york city and measuring

312
00:12:44,069 --> 00:12:42,399
it from the distance of washington dc

313
00:12:47,110 --> 00:12:44,079

that's the actual distance between the

314
00:12:49,509 --> 00:12:47,120
surface and the satellite it's about 250

315
00:12:51,829 --> 00:12:49,519
miles and yes we can estimate

316
00:12:54,150 --> 00:12:51,839
precipitation from

317
00:12:57,430 --> 00:12:54,160
miles away it's great

318
00:12:59,269 --> 00:12:57,440
so if we move on to the next slide

319
00:13:01,190 --> 00:12:59,279
i want to talk about specifically a

320
00:13:02,949 --> 00:13:01,200
little bit more details about how these

321
00:13:05,590 --> 00:13:02,959
instruments measure you saw some of that

322
00:13:08,710 --> 00:13:05,600
in the video so as a spacecraft flies

323
00:13:10,310 --> 00:13:08,720
overhead from 250 miles or 407

324
00:13:11,269 --> 00:13:10,320
kilometers if you like to use those

325
00:13:14,069 --> 00:13:11,279
units

326
00:13:16,710 --> 00:13:14,079
we have two frequency radar that it does

327
00:13:18,870 --> 00:13:16,720
the three-dimensional um imaging of the

328
00:13:21,750 --> 00:13:18,880
cloud it's like taking a cat scan of the

329
00:13:23,910 --> 00:13:21,760
cloud we also have the gmi which is our

330
00:13:26,470 --> 00:13:23,920
radiometer which makes a wide swath that

331
00:13:29,750 --> 00:13:26,480
essentially projects all the rain or

332
00:13:31,910 --> 00:13:29,760
snow in the in the column of the uh

333
00:13:33,910 --> 00:13:31,920
cloud and projects it two dimensionally

334
00:13:35,990 --> 00:13:33,920
on the ground and so that way you get

335
00:13:39,189 --> 00:13:36,000
both a three-dimensional structure and a

336
00:13:40,389 --> 00:13:39,199
wide swath data and we can use this data

337
00:13:42,310 --> 00:13:40,399
to um

338
00:13:44,790 --> 00:13:42,320

the radar the radiometer data is more

339
00:13:47,750 --> 00:13:44,800
like taking an x-ray and just like a

340
00:13:49,269 --> 00:13:47,760
doctor uses x-rays and cat scans to

341
00:13:50,230 --> 00:13:49,279
diagnose what's happening in your own

342
00:13:53,590 --> 00:13:50,240
body

343
00:13:55,910 --> 00:13:53,600
we for gpm use the cat scans and the

344
00:13:57,910 --> 00:13:55,920
x-rays of our instruments to diagnose

345
00:13:59,350 --> 00:13:57,920
and tell us exactly what's happening

346
00:14:00,870 --> 00:13:59,360
within the cloud

347
00:14:02,710 --> 00:14:00,880
this is the way we put together the

348
00:14:04,230 --> 00:14:02,720
puzzle of precipitation so that we can

349
00:14:05,590 --> 00:14:04,240
understand it better

350
00:14:07,430 --> 00:14:05,600
the other cool thing about these

351
00:14:10,230 --> 00:14:07,440
instruments are they measure rain rates

352
00:14:12,629 --> 00:14:10,240
from 0.2 millimeters an hour all the way

353
00:14:14,949 --> 00:14:12,639
up to 110 millimeters an hour and

354
00:14:18,470 --> 00:14:14,959
they're able to detect falling snow this

355
00:14:20,310 --> 00:14:18,480
is a great accomplishment beyond trim

356
00:14:21,910 --> 00:14:20,320
so if we move on to the next movie which

357
00:14:24,470 --> 00:14:21,920
is the constellation sequence which

358
00:14:25,829 --> 00:14:24,480
you've already seen gpm is using these

359
00:14:28,470 --> 00:14:25,839
advanced measurements from the

360
00:14:31,030 --> 00:14:28,480
radiometer and the radar to give us more

361
00:14:32,550 --> 00:14:31,040
information about the precipitation the

362
00:14:34,629 --> 00:14:32,560
first thing we want to do to make sure

363
00:14:37,750 --> 00:14:34,639

that our precipitation estimates from

364
00:14:40,790 --> 00:14:37,760
gpm are uniform across the globe is to

365
00:14:42,310 --> 00:14:40,800
make sure that there's no biases in the

366
00:14:43,590 --> 00:14:42,320
measurements from one satellite to

367
00:14:45,829 --> 00:14:43,600
another and we have a large group

368
00:14:47,829 --> 00:14:45,839
working on that the second thing is we

369
00:14:49,670 --> 00:14:47,839
use that three-dimensional structure we

370
00:14:52,069 --> 00:14:49,680
get from the radar to improve the

371
00:14:54,150 --> 00:14:52,079
algorithms the best that we can and once

372
00:14:57,110 --> 00:14:54,160
we improve the algorithms on our core

373
00:14:59,030 --> 00:14:57,120
satellite we can transfer that standard

374
00:14:59,990 --> 00:14:59,040
to all of our other constellation

375
00:15:02,069 --> 00:15:00,000
members

376
00:15:04,629 --> 00:15:02,079
so in this way we're able to get rain

377
00:15:06,949 --> 00:15:04,639
rates every three hours everywhere on

378
00:15:09,030 --> 00:15:06,959
the globe so wherever you live wherever

379
00:15:11,110 --> 00:15:09,040
you've come from you will know how much

380
00:15:13,030 --> 00:15:11,120
it's rained or if it snowed every three

381
00:15:15,189 --> 00:15:13,040
hours and this is great for all the

382
00:15:17,189 --> 00:15:15,199
societal applications the floods the

383
00:15:19,430 --> 00:15:17,199
landslides the hurricanes we want to

384
00:15:21,030 --> 00:15:19,440
know how much it's raining globally and

385
00:15:23,350 --> 00:15:21,040
then we can use that information to

386
00:15:24,670 --> 00:15:23,360
improve weather forecasting and climate

387
00:15:27,430 --> 00:15:24,680
change

388
00:15:29,430 --> 00:15:27,440

models so so um now i'm going to

389
00:15:31,910 --> 00:15:29,440
finalize i'm going to i mentioned when i

390
00:15:34,310 --> 00:15:31,920
introduced myself that i love snow

391
00:15:37,189 --> 00:15:34,320
and actually falling snow research is my

392
00:15:40,629 --> 00:15:37,199
second job at goddard and i really do

393
00:15:42,389 --> 00:15:40,639
like snow um the guys up uh ryan up in

394
00:15:44,710 --> 00:15:42,399
the video area he put this together

395
00:15:46,629 --> 00:15:44,720
because i love to talk about snow snow

396
00:15:49,189 --> 00:15:46,639
is a new challenge for

397
00:15:51,670 --> 00:15:49,199
precipitation measurements from space

398
00:15:54,389 --> 00:15:51,680
most raindrops are either spheres or you

399
00:15:56,710 --> 00:15:54,399
have one of these in your packets it's a

400
00:15:59,110 --> 00:15:56,720
this is what we call a droplet when it

401
00:16:01,189 --> 00:15:59,120
falls it gets kind of flat but rain is

402
00:16:03,189 --> 00:16:01,199
almost always either spheres or this

403
00:16:05,430 --> 00:16:03,199
shape for snowflakes as you know they

404
00:16:07,749 --> 00:16:05,440
can be all sorts of shapes and sizes

405
00:16:09,430 --> 00:16:07,759
they can have different amounts of water

406
00:16:10,870 --> 00:16:09,440
they flutter as they fall to the ground

407
00:16:12,629 --> 00:16:10,880
so it makes it quite a challenge but

408
00:16:15,749 --> 00:16:12,639
it's great to be on the cutting edge

409
00:16:17,350 --> 00:16:15,759
edge of research and we snow

410
00:16:19,030 --> 00:16:17,360
experts here that are working on this

411
00:16:21,110 --> 00:16:19,040
project are really looking forward to

412
00:16:22,710 --> 00:16:21,120
the data that we get from gpm and we

413
00:16:33,110 --> 00:16:22,720

hope that you're just as excited about

414
00:16:37,030 --> 00:16:35,269
wonderful thank you very very much next

415
00:16:38,870 --> 00:16:37,040
up we're going to hear from

416
00:16:41,030 --> 00:16:38,880
rico okie

417
00:16:49,749 --> 00:16:41,040
she is from the japanese space agency

418
00:16:56,870 --> 00:16:53,189
so thank you so i'm very happy to be

419
00:16:59,749 --> 00:16:56,880
here today to meet all of you so and i

420
00:17:03,110 --> 00:16:59,759
would like to introduce our expectation

421
00:17:04,549 --> 00:17:03,120
for gpm from japanese point of view

422
00:17:08,390 --> 00:17:04,559
so um

423
00:17:11,350 --> 00:17:08,400
so japan is located in east north asia

424
00:17:12,630 --> 00:17:11,360
and affected strongly by asia monsoon

425
00:17:15,590 --> 00:17:12,640
climate

426
00:17:19,350 --> 00:17:15,600
we have four beautiful seasons

427
00:17:22,470 --> 00:17:19,360
june is a month length rainy season

428
00:17:23,669 --> 00:17:22,480
and in autumn every year our life is

429
00:17:25,829 --> 00:17:23,679
affected

430
00:17:28,150 --> 00:17:25,839
by several typhoons

431
00:17:29,669 --> 00:17:28,160
approaching to japan

432
00:17:33,430 --> 00:17:29,679
in winter

433
00:17:36,230 --> 00:17:33,440
a north-west monsoon rain from eurasia

434
00:17:39,190 --> 00:17:36,240
becomes wet growing over japan sea and

435
00:17:42,390 --> 00:17:39,200
bring a lot of snow in japan seaside

436
00:17:43,669 --> 00:17:42,400
along the central mountains

437
00:17:47,190 --> 00:17:43,679
people

438
00:17:50,150 --> 00:17:47,200

in not only japan but also in asian

439
00:17:52,950 --> 00:17:50,160
countries in southeast asia

440
00:17:56,310 --> 00:17:52,960
live with the blessings of

441
00:18:00,150 --> 00:17:56,320
monsoon and its lane

442
00:18:04,470 --> 00:18:00,160
but at the same time we are exposed to

443
00:18:05,830 --> 00:18:04,480
danger by water-related disasters

444
00:18:08,510 --> 00:18:05,840
actually

445
00:18:11,909 --> 00:18:08,520
the most deaths are because of

446
00:18:15,430 --> 00:18:11,919
water-related disasters among natural

447
00:18:18,070 --> 00:18:15,440
disasters not because of earthquakes or

448
00:18:21,430 --> 00:18:19,990
so and

449
00:18:24,390 --> 00:18:21,440
the next

450
00:18:27,430 --> 00:18:24,400
movie shows the detailed three

451
00:18:29,270 --> 00:18:27,440
dimensional distribution of landfall

452
00:18:32,950 --> 00:18:29,280
inside typhoons

453
00:18:37,270 --> 00:18:32,960
was firstly observed by the observation

454
00:18:39,510 --> 00:18:37,280
of precipitation radar onboard the trim

455
00:18:43,110 --> 00:18:39,520
tropical rainfall measurement mission

456
00:18:45,190 --> 00:18:43,120
satellite that launched 15 years before

457
00:18:47,830 --> 00:18:45,200
gpm

458
00:18:48,710 --> 00:18:47,840
so and

459
00:18:52,870 --> 00:18:48,720
the

460
00:18:56,870 --> 00:18:52,880
dual frequency ladder called dpr has a

461
00:18:59,350 --> 00:18:56,880
new care band channel which can detect

462
00:19:01,909 --> 00:18:59,360
snow and weak lane

463
00:19:04,950 --> 00:19:01,919

and for lane late

464
00:19:07,909 --> 00:19:04,960
more accurate estimates can be expected

465
00:19:12,870 --> 00:19:07,919
using information from dual frequency

466
00:19:19,750 --> 00:19:16,549
so and the next animation shows

467
00:19:21,990 --> 00:19:19,760
the annual change of rain and snow

468
00:19:24,870 --> 00:19:22,000
area on the globe

469
00:19:28,230 --> 00:19:24,880
we can see the seasonal match of lane

470
00:19:31,430 --> 00:19:28,240
systems like this the lane band

471
00:19:32,710 --> 00:19:31,440
moves between north and south

472
00:19:33,830 --> 00:19:32,720
and

473
00:19:37,830 --> 00:19:33,840
gpm

474
00:19:41,270 --> 00:19:37,840
observation will expand to

475
00:19:42,470 --> 00:19:41,280
65 degrees in latitudes from south to

476
00:19:46,549 --> 00:19:42,480
north

477
00:19:49,029 --> 00:19:46,559
the combination of dpr and gmi

478
00:19:51,909 --> 00:19:49,039
will observe liquid and solid

479
00:19:54,950 --> 00:19:51,919
precipitation particles from the tropics

480
00:19:58,150 --> 00:19:54,960
to the median high latitude

481
00:20:00,950 --> 00:19:58,160
so precipitation is one of the most

482
00:20:02,070 --> 00:20:00,960
basic and important environmental

483
00:20:07,110 --> 00:20:02,080
elements

484
00:20:14,549 --> 00:20:11,110
so information of global precipitation

485
00:20:15,430 --> 00:20:14,559
which will be delivered in in near real

486
00:20:19,510 --> 00:20:15,440
time

487
00:20:20,870 --> 00:20:19,520
will be utilized in various areas such

488
00:20:22,549 --> 00:20:20,880

as flood

489
00:20:24,149 --> 00:20:22,559
drought warning

490
00:20:25,909 --> 00:20:24,159
agriculture

491
00:20:28,549 --> 00:20:25,919
weather forecasting

492
00:20:31,909 --> 00:20:28,559
and global warming research

493
00:20:42,710 --> 00:20:31,919
so we are waiting in expectation for the

494
00:20:46,070 --> 00:20:44,230
thank you very much we're going to move

495
00:20:47,990 --> 00:20:46,080
into some q a now

496
00:20:49,990 --> 00:20:48,000
for our first three speakers here if you

497
00:20:51,990 --> 00:20:50,000
have a question and this is a good time

498
00:20:53,909 --> 00:20:52,000
to move to the either the aisles here or

499
00:20:56,390 --> 00:20:53,919
if you're online at home you can also be

500
00:20:59,430 --> 00:20:56,400
asking a question um at using the

501
00:21:00,470 --> 00:20:59,440
hashtag poundasknasa so

502
00:21:02,149 --> 00:21:00,480
we'll go ahead and with our first

503
00:21:04,549 --> 00:21:02,159
question here okay hi then this question

504
00:21:07,110 --> 00:21:04,559
our three speakers come up

505
00:21:08,070 --> 00:21:07,120
um so this question is uh

506
00:21:11,190 --> 00:21:08,080
from

507
00:21:13,750 --> 00:21:11,200
at shea woo who's following along um and

508
00:21:15,430 --> 00:21:13,760
it's a question for ramesh

509
00:21:16,950 --> 00:21:15,440
and

510
00:21:19,190 --> 00:21:16,960
what he said is

511
00:21:20,950 --> 00:21:19,200
how does the salty satellite fit into

512
00:21:23,190 --> 00:21:20,960
this what he means i think is how does

513
00:21:25,590 --> 00:21:23,200

aquarius

514
00:21:26,470 --> 00:21:25,600
fit into this oh okay that's a good

515
00:21:27,590 --> 00:21:26,480
question

516
00:21:30,070 --> 00:21:27,600
um

517
00:21:31,270 --> 00:21:30,080
no aquarius measures sea surface

518
00:21:33,909 --> 00:21:31,280
salinity

519
00:21:35,750 --> 00:21:33,919
and you can ask how is that related to

520
00:21:37,350 --> 00:21:35,760
the water cycle

521
00:21:40,950 --> 00:21:37,360
studies that we're doing

522
00:21:43,590 --> 00:21:40,960
very simple salinity determines how much

523
00:21:45,669 --> 00:21:43,600
evaporation has taken place from the

524
00:21:47,750 --> 00:21:45,679
ocean surface so if we can

525
00:21:50,070 --> 00:21:47,760
simultaneously

526
00:21:52,149 --> 00:21:50,080
measure salinity and through that

527
00:21:55,669 --> 00:21:52,159
evaporation

528
00:21:58,950 --> 00:21:55,679
and also then measure precipitation

529
00:22:02,310 --> 00:21:58,960
from a trim and gpm

530
00:22:04,710 --> 00:22:02,320
then we can determine e minus p

531
00:22:07,669 --> 00:22:04,720
evaporation minus precipitation that's

532
00:22:11,029 --> 00:22:07,679
the total amount of water vapor

533
00:22:14,470 --> 00:22:11,039
that is getting from the ocean into the

534
00:22:16,789 --> 00:22:14,480
atmosphere and so from there from

535
00:22:20,310 --> 00:22:16,799
the atmosphere some of it will condense

536
00:22:22,390 --> 00:22:20,320
out as precipitation as clouds and some

537
00:22:25,430 --> 00:22:22,400
of it will be transported

538
00:22:27,029 --> 00:22:25,440

um over land etc so this is the

539
00:22:30,230 --> 00:22:27,039
beginning of the water cycle so that's

540
00:22:33,190 --> 00:22:30,240
why i think it's a very important

541
00:22:38,310 --> 00:22:33,200
companion instrument to

542
00:22:40,789 --> 00:22:39,590
all right guys don't be shy if you have

543
00:22:41,990 --> 00:22:40,799
a question come on out to one of the

544
00:22:43,830 --> 00:22:42,000
aisles here and we'll go ahead and get

545
00:22:46,070 --> 00:22:43,840
going i got another one but yeah queue

546
00:22:48,070 --> 00:22:46,080
up just behind me if you do have one

547
00:22:50,789 --> 00:22:48,080
um

548
00:22:52,950 --> 00:22:50,799
okay this is for uh rico okey

549
00:22:54,870 --> 00:22:52,960
and uh

550
00:22:56,149 --> 00:22:54,880
what's the difference between

551
00:22:58,789 --> 00:22:56,159
the scientists i think they mean the

552
00:23:01,350 --> 00:22:58,799
researchers um in japan versus the

553
00:23:05,029 --> 00:23:01,360
scientists in the united states i'm sure

554
00:23:05,039 --> 00:24:08,950
can i answer in japanese

555
00:24:08,960 --> 00:24:14,789
in japan that

556
00:24:20,470 --> 00:24:17,110
usually the presentation you know it's a

557
00:24:22,149 --> 00:24:20,480
global but in japan it um they study

558
00:24:25,269 --> 00:24:22,159
more in the local

559
00:24:27,029 --> 00:24:25,279
especially japan around japan and

560
00:24:27,830 --> 00:24:27,039
asia area

561
00:24:30,789 --> 00:24:27,840
but

562
00:24:32,950 --> 00:24:30,799
in america you know scientists study

563
00:24:35,830 --> 00:24:32,960

more on in north america and south

564
00:24:37,909 --> 00:24:35,840
america brazil and so on

565
00:24:40,230 --> 00:24:37,919
that

566
00:24:41,269 --> 00:24:40,240
answer yeah yes so

567
00:24:44,070 --> 00:24:41,279
for me

568
00:24:48,789 --> 00:24:44,080
the differences so there's a differences

569
00:24:54,310 --> 00:24:51,430
can i just add that the japanese and the

570
00:24:56,070 --> 00:24:54,320
us science teams we do work together we

571
00:24:57,909 --> 00:24:56,080
are all in this mission together and

572
00:24:59,269 --> 00:24:57,919
we're trying to even though there are

573
00:25:00,390 --> 00:24:59,279
separate teams we work together and we

574
00:25:04,070 --> 00:25:00,400
meet together

575
00:25:06,789 --> 00:25:05,350
okay we'll take our next question from

576
00:25:08,710 --> 00:25:06,799
over on the side here

577
00:25:10,710 --> 00:25:08,720
um i heard about the weather

578
00:25:12,870 --> 00:25:10,720
applications for this data but it seems

579
00:25:14,630 --> 00:25:12,880
to me that it would also have

580
00:25:16,310 --> 00:25:14,640
significant

581
00:25:17,990 --> 00:25:16,320
impact on planting

582
00:25:19,190 --> 00:25:18,000
farmers

583
00:25:21,990 --> 00:25:19,200
they would have a lot of interest in

584
00:25:23,830 --> 00:25:22,000
knowing this precipitation

585
00:25:26,070 --> 00:25:23,840
in more detail the kind of detail that

586
00:25:27,669 --> 00:25:26,080
gpm is going to provide is there any

587
00:25:30,390 --> 00:25:27,679
effort being made to disseminate the

588
00:25:33,909 --> 00:25:30,400

information to those

589
00:25:38,870 --> 00:25:35,669
yes this data is

590
00:25:42,870 --> 00:25:38,880
freely available to all the uh

591
00:25:46,630 --> 00:25:45,590
get hold of this data

592
00:25:48,549 --> 00:25:46,640
so

593
00:25:51,750 --> 00:25:48,559
the important thing actually is that

594
00:25:53,830 --> 00:25:51,760
nasa is a research organization

595
00:25:56,230 --> 00:25:53,840
originally

596
00:26:00,710 --> 00:25:56,240
the requirement was that we released the

597
00:26:01,590 --> 00:26:00,720
data 72 hours very early on we found out

598
00:26:03,350 --> 00:26:01,600
that

599
00:26:06,390 --> 00:26:03,360
or we

600
00:26:09,269 --> 00:26:06,400
surmised that nobody wants to know

601
00:26:11,669 --> 00:26:09,279
if it rained 72 hours ago so we made a

602
00:26:14,950 --> 00:26:11,679
lot of effort to make sure

603
00:26:16,870 --> 00:26:14,960
that the data is available online in

604
00:26:19,990 --> 00:26:16,880
near real time

605
00:26:22,710 --> 00:26:20,000
and many entities get hold of our data

606
00:26:26,390 --> 00:26:22,720
in near real time

607
00:26:27,909 --> 00:26:26,400
thank you keep that answer your question

608
00:26:29,350 --> 00:26:27,919
all right just a reminder for our online

609
00:26:30,950 --> 00:26:29,360
audience at home if you have a question

610
00:26:32,950 --> 00:26:30,960
you can ask it using the hashtag

611
00:26:35,029 --> 00:26:32,960
poundasknasa we're going to take our

612
00:26:37,029 --> 00:26:35,039
next question here in the room

613
00:26:38,390 --> 00:26:37,039

hi this one's this question's for gail

614
00:26:41,350 --> 00:26:38,400
on gpm

615
00:26:43,430 --> 00:26:41,360
um i was curious about the k-band will

616
00:26:45,430 --> 00:26:43,440
it be possible for the k-band to detect

617
00:26:47,590 --> 00:26:45,440
any amounts of pollutants within the

618
00:26:50,870 --> 00:26:47,600
precipitation and let's say

619
00:26:53,909 --> 00:26:50,880
heavy toxic areas around the world

620
00:26:55,669 --> 00:26:53,919
so the the ka and ku bands on the dual

621
00:26:58,870 --> 00:26:55,679
precipitation radar are designed

622
00:27:00,789 --> 00:26:58,880
specifically for the sizes of raindrops

623
00:27:03,430 --> 00:27:00,799
aerosols and pollutants are much much

624
00:27:04,549 --> 00:27:03,440
smaller nasa does have other satellites

625
00:27:06,310 --> 00:27:04,559
that are taking these types of

626
00:27:08,789 --> 00:27:06,320
measurements but they will not be on

627
00:27:12,710 --> 00:27:08,799
board the gpm mission

628
00:27:15,990 --> 00:27:13,669
all right do we have another question

629
00:27:17,750 --> 00:27:16,000
here in the room

630
00:27:19,269 --> 00:27:17,760
thanks very much for this presentation

631
00:27:21,669 --> 00:27:19,279
so far

632
00:27:23,430 --> 00:27:21,679
so i grew up in vermont and i

633
00:27:25,190 --> 00:27:23,440
saw a lot of what happened in irene i

634
00:27:27,110 --> 00:27:25,200
just wanted to know had gpm been up and

635
00:27:29,510 --> 00:27:27,120
running how might have you like to have

636
00:27:33,110 --> 00:27:29,520
seen that happen differently what would

637
00:27:37,590 --> 00:27:35,510
so i guess i'll answer that as well um

638
00:27:39,269 --> 00:27:37,600

if gpm had been up there

639
00:27:42,789 --> 00:27:39,279
we would have hoped to been able to get

640
00:27:43,909 --> 00:27:42,799
the gpm core satellite to overfly it and

641
00:27:45,669 --> 00:27:43,919
then we would be able to have the

642
00:27:47,590 --> 00:27:45,679
three-dimensional structure from the

643
00:27:49,269 --> 00:27:47,600
storm and then we could put that in the

644
00:27:51,669 --> 00:27:49,279
models that they're using

645
00:27:53,430 --> 00:27:51,679
post-processing of irene to better

646
00:27:55,350 --> 00:27:53,440
understand the storm and to find out

647
00:27:57,190 --> 00:27:55,360
whether the intensity would increase or

648
00:27:58,950 --> 00:27:57,200
decrease one of the other things with

649
00:28:00,710 --> 00:27:58,960
all the constellations is we would be

650
00:28:03,029 --> 00:28:00,720
able to tell you

651
00:28:05,110 --> 00:28:03,039
very near real time which is about one

652
00:28:07,029 --> 00:28:05,120
to three hours after we collect the data

653
00:28:09,510 --> 00:28:07,039
how much rain accumulation has actually

654
00:28:12,789 --> 00:28:09,520
occurred so that the

655
00:28:14,549 --> 00:28:12,799
local populations and the um

656
00:28:19,029 --> 00:28:14,559
operational communities can say all

657
00:28:21,909 --> 00:28:20,230
all right wonderful we have another

658
00:28:24,389 --> 00:28:21,919
question here in the room

659
00:28:26,789 --> 00:28:24,399
uh hi um as you move more towards uh

660
00:28:28,789 --> 00:28:26,799
real-time uh data release

661
00:28:30,950 --> 00:28:28,799
how is this fitting into the the

662
00:28:33,750 --> 00:28:30,960
predictive analysis is is the data

663
00:28:35,269 --> 00:28:33,760

starting to feed back into modeling that

664
00:28:37,430 --> 00:28:35,279
whether the national weather service or

665
00:28:38,310 --> 00:28:37,440
noaa are doing absolutely

666
00:28:42,149 --> 00:28:38,320
um

667
00:28:46,470 --> 00:28:43,590
noaa is a

668
00:28:47,909 --> 00:28:46,480
very important partner in all of this

669
00:28:49,029 --> 00:28:47,919
and we have

670
00:28:51,269 --> 00:28:49,039
several

671
00:28:52,230 --> 00:28:51,279
team members from noaa on our science

672
00:28:54,149 --> 00:28:52,240
team

673
00:28:56,630 --> 00:28:54,159
and

674
00:28:58,870 --> 00:28:56,640
actually you know let me go back you

675
00:29:00,710 --> 00:28:58,880
know when we first launched we had very

676
00:29:03,909 --> 00:29:00,720
modest dreams

677
00:29:06,710 --> 00:29:03,919
and we didn't even know if we can

678
00:29:09,269 --> 00:29:06,720
um study hurricanes with it and lo and

679
00:29:11,269 --> 00:29:09,279
behold not only we could study it we

680
00:29:14,710 --> 00:29:11,279
could um

681
00:29:17,350 --> 00:29:14,720
as uh explained by rico we could cat

682
00:29:20,389 --> 00:29:17,360
scan the internals of the storm

683
00:29:22,310 --> 00:29:20,399
and now um we uh

684
00:29:24,310 --> 00:29:22,320
you know 600

685
00:29:28,470 --> 00:29:24,320
times a year

686
00:29:29,909 --> 00:29:28,480
um agencies across the world they use

687
00:29:32,789 --> 00:29:29,919
trim data

688
00:29:35,590 --> 00:29:32,799

to locate the center of hurricanes for

689
00:29:39,029 --> 00:29:35,600
example just to give an example so yeah

690
00:29:41,990 --> 00:29:39,039
it's very much in use and

691
00:29:44,710 --> 00:29:42,000
the importance of it is being realized

692
00:29:48,149 --> 00:29:44,720
every day and we are

693
00:29:50,070 --> 00:29:48,159
getting a lot more attention from the

694
00:29:53,110 --> 00:29:50,080
weather services from around the world

695
00:29:55,510 --> 00:29:53,120
the noaa and the japanese meteorological

696
00:29:57,750 --> 00:29:55,520
are especially engaged but many other

697
00:30:00,149 --> 00:29:57,760
agencies around the world are also

698
00:30:04,230 --> 00:30:00,159
getting engaged for example the european

699
00:30:08,870 --> 00:30:05,909
all right

700
00:30:10,630 --> 00:30:08,880
my question is to gail uh

701
00:30:13,350 --> 00:30:10,640
i just wanted to know what's the swat

702
00:30:15,430 --> 00:30:13,360
sides of the data i mean for the

703
00:30:17,590 --> 00:30:15,440
satellite and another question was the

704
00:30:20,070 --> 00:30:17,600
spatial resolution of the

705
00:30:21,669 --> 00:30:20,080
data we are providing and another is the

706
00:30:23,990 --> 00:30:21,679
new uh you're saying like there it will

707
00:30:25,590 --> 00:30:24,000
be near real time data so what will be

708
00:30:27,990 --> 00:30:25,600
the time lag

709
00:30:29,909 --> 00:30:28,000
between when it's come to the users or

710
00:30:31,990 --> 00:30:29,919
or will it be available for this

711
00:30:34,230 --> 00:30:32,000
researchers to get those hand of the

712
00:30:35,510 --> 00:30:34,240
data as it comes

713
00:30:37,190 --> 00:30:35,520

thank you for asking that question

714
00:30:39,350 --> 00:30:37,200
because i wanted to answer that question

715
00:30:42,070 --> 00:30:39,360
i wasn't able to put in my presentation

716
00:30:44,789 --> 00:30:42,080
so um as this video was showing the um

717
00:30:48,470 --> 00:30:44,799
the radar images um the inner swath one

718
00:30:50,230 --> 00:30:48,480
is about 145 kilometer swath and the

719
00:30:52,470 --> 00:30:50,240
radar is actually our crosstrack scanner

720
00:30:56,230 --> 00:30:52,480
so they go back and forth like this

721
00:30:58,630 --> 00:30:56,240
and um the the ku has about a 245

722
00:31:01,029 --> 00:30:58,640
kilometer swath the radiometer which

723
00:31:02,630 --> 00:31:01,039
will show up in just a second has 880

724
00:31:04,710 --> 00:31:02,640
kilometer swath

725
00:31:06,630 --> 00:31:04,720
the resolution of these the best

726
00:31:09,269 --> 00:31:06,640
resolution from all the different

727
00:31:10,870 --> 00:31:09,279
channels here is about five kilometers

728
00:31:12,230 --> 00:31:10,880
so you know if you go out and put a rain

729
00:31:15,190 --> 00:31:12,240
gauge in your backyard it's only

730
00:31:18,070 --> 00:31:15,200
measuring a very small area so this is

731
00:31:19,830 --> 00:31:18,080
like a three mile diameter

732
00:31:21,830 --> 00:31:19,840
from your your neighborhood which is

733
00:31:23,350 --> 00:31:21,840
really kind of measuring the local scale

734
00:31:24,470 --> 00:31:23,360
of precipitation

735
00:31:26,310 --> 00:31:24,480
um

736
00:31:28,230 --> 00:31:26,320
last question oh yeah it was on the near

737
00:31:30,470 --> 00:31:28,240
real time so

738
00:31:33,590 --> 00:31:30,480

for the radiometer for the passive one

739
00:31:36,470 --> 00:31:33,600
that has a wider swath we hope to be

740
00:31:38,710 --> 00:31:36,480
able to put the data out online within

741
00:31:41,590 --> 00:31:38,720
an hour after collecting it

742
00:31:44,310 --> 00:31:41,600
and work we collect each cycle of the

743
00:31:45,430 --> 00:31:44,320
overpass so each cycle is about 90

744
00:31:47,190 --> 00:31:45,440
minutes so

745
00:31:49,750 --> 00:31:47,200
the earliest data would be one hour it

746
00:31:51,990 --> 00:31:49,760
might be in two and a half hours for the

747
00:31:53,830 --> 00:31:52,000
any uh products that include the radar

748
00:31:56,230 --> 00:31:53,840
data they're going to be about three

749
00:31:59,590 --> 00:31:56,240
hours after we collect them so it's near

750
00:32:02,149 --> 00:31:59,600
real time it's enough time if the um

751
00:32:04,470 --> 00:32:02,159
operational people and the disaster

752
00:32:05,990 --> 00:32:04,480
prepared people are looking at our data

753
00:32:08,389 --> 00:32:06,000
that they could um go out and tell their

754
00:32:09,750 --> 00:32:08,399
communities if they're looking at it we

755
00:32:11,669 --> 00:32:09,760
you know it's up to them to come look at

756
00:32:12,870 --> 00:32:11,679
it

757
00:32:14,870 --> 00:32:12,880
wonderful then do we have any more

758
00:32:16,149 --> 00:32:14,880
online questions

759
00:32:18,149 --> 00:32:16,159
all right then any other questions here

760
00:32:19,669 --> 00:32:18,159
in the room

761
00:32:30,389 --> 00:32:19,679
okay we're gonna go ahead and move on

762
00:32:30,399 --> 00:32:32,870
thank you

763
00:32:37,110 --> 00:32:35,269

we've got a few uh interesting uh things

764
00:32:39,350 --> 00:32:37,120
that we have learned about the mission

765
00:32:40,789 --> 00:32:39,360
and and other things related to rain and

766
00:32:43,029 --> 00:32:40,799
and waterfall and everything and

767
00:33:02,630 --> 00:32:43,039
precipitation so without any further ado

768
00:33:02,640 --> 00:33:14,389
do

769
00:34:08,790 --> 00:33:42,950
so

770
00:34:12,149 --> 00:34:10,310
all right without any further ado i want

771
00:34:15,990 --> 00:34:12,159
to introduce our next speaker here this

772
00:34:17,990 --> 00:34:16,000
is art azerbaijan he is the program or

773
00:34:19,829 --> 00:34:18,000
the project manager for the gpm

774
00:34:27,750 --> 00:34:19,839
satellite here so without any further

775
00:34:31,270 --> 00:34:29,430
thank you jason

776
00:34:33,349 --> 00:34:31,280
good morning everyone and welcome to

777
00:34:34,710 --> 00:34:33,359
goddard space flight center another fun

778
00:34:37,030 --> 00:34:34,720
fact for you

779
00:34:39,669 --> 00:34:37,040
goddard is the first

780
00:34:40,389 --> 00:34:39,679
and the oldest center of nasa

781
00:34:43,030 --> 00:34:40,399
was

782
00:34:45,030 --> 00:34:43,040
established in 1959

783
00:34:49,030 --> 00:34:45,040
i've been a project manager of gpm since

784
00:34:51,589 --> 00:34:49,040
2000 2006 and candace carla our deputy

785
00:34:52,710 --> 00:34:51,599
project manager we've been together here

786
00:34:55,750 --> 00:34:52,720
since then

787
00:34:57,750 --> 00:34:55,760
and we've had a lot of fun so far

788
00:34:59,990 --> 00:34:57,760

as you look at our logo

789
00:35:03,109 --> 00:35:00,000
in the bottom here and then

790
00:35:04,950 --> 00:35:03,119
as gail explained we picked that logo

791
00:35:07,589 --> 00:35:04,960
the shape because of the true shape of

792
00:35:08,950 --> 00:35:07,599
rain if you if you look on the internet

793
00:35:10,710 --> 00:35:08,960
and if you

794
00:35:12,870 --> 00:35:10,720
you know google two shape of rain you

795
00:35:15,349 --> 00:35:12,880
realize it really does not look like

796
00:35:17,910 --> 00:35:15,359
teardrop

797
00:35:19,270 --> 00:35:17,920
now you heard from gail and rico

798
00:35:20,550 --> 00:35:19,280
and what we're going to accomplish in

799
00:35:21,430 --> 00:35:20,560
this mission

800
00:35:23,109 --> 00:35:21,440
now

801
00:35:25,190 --> 00:35:23,119
how do we do that

802
00:35:25,990 --> 00:35:25,200
and how do we implement this

803
00:35:27,109 --> 00:35:26,000
well

804
00:35:29,589 --> 00:35:27,119
we couldn't have done it with our

805
00:35:31,829 --> 00:35:29,599
japanese partner and this has been a

806
00:35:34,390 --> 00:35:31,839
very strong partnership and he's been a

807
00:35:36,310 --> 00:35:34,400
great success for us

808
00:35:37,829 --> 00:35:36,320
now

809
00:35:41,349 --> 00:35:37,839
gpm

810
00:35:43,430 --> 00:35:41,359
is comprised of four elements

811
00:35:46,069 --> 00:35:43,440
one of them is the data processing

812
00:35:48,390 --> 00:35:46,079
center known as precipitation processing

813
00:35:51,430 --> 00:35:48,400

system or pps capable of putting a

814
00:35:52,710 --> 00:35:51,440
global products within three hours the

815
00:35:53,670 --> 00:35:52,720
second one

816
00:35:59,190 --> 00:35:53,680
is a

817
00:36:00,870 --> 00:35:59,200
element that's another international

818
00:36:02,870 --> 00:36:00,880
it's another international

819
00:36:04,950 --> 00:36:02,880
partnership which gives us a capability

820
00:36:06,710 --> 00:36:04,960
to measure the satellite data and

821
00:36:09,030 --> 00:36:06,720
comparing with ground base mission

822
00:36:11,030 --> 00:36:09,040
operations center is for operating the

823
00:36:13,270 --> 00:36:11,040
core observatory that's also located at

824
00:36:14,470 --> 00:36:13,280
goddard across the facility

825
00:36:16,230 --> 00:36:14,480
the last

826
00:36:17,670 --> 00:36:16,240
is the core observatory development of

827
00:36:20,710 --> 00:36:17,680
goddard

828
00:36:24,390 --> 00:36:20,720
a cross calibrator as romesh mentioned

829
00:36:26,950 --> 00:36:24,400
for the entire constellation of the gpm

830
00:36:30,150 --> 00:36:26,960
now where are we with the gpm

831
00:36:31,910 --> 00:36:30,160
development at uh at goddard we are in

832
00:36:35,030 --> 00:36:31,920
the middle of a test program we should

833
00:36:37,750 --> 00:36:35,040
be finishing that by the end of summer

834
00:36:39,990 --> 00:36:37,760
uh here's a uh there's a quick animation

835
00:36:43,190 --> 00:36:40,000
that's coming up that's showing how our

836
00:36:44,230 --> 00:36:43,200
satellite is put together

837
00:36:45,829 --> 00:36:44,240
i wish

838
00:36:47,910 --> 00:36:45,839

we could put all the satellites this

839
00:36:48,870 --> 00:36:47,920
quickly together we could launch more of

840
00:36:51,430 --> 00:36:48,880
them

841
00:36:53,829 --> 00:36:51,440
unfortunately it's not that quick

842
00:36:55,829 --> 00:36:53,839
we started the core observatory with the

843
00:36:58,630 --> 00:36:55,839
with the qualification of flight such

844
00:37:00,470 --> 00:36:58,640
structure we use a centrifuge at goddard

845
00:37:01,990 --> 00:37:00,480
to perform that test

846
00:37:04,390 --> 00:37:02,000
in parallel

847
00:37:06,150 --> 00:37:04,400
we developed a lot of components soil

848
00:37:08,310 --> 00:37:06,160
rays and other needed things that we

849
00:37:10,069 --> 00:37:08,320
procured either from private industry or

850
00:37:13,349 --> 00:37:10,079
we built it

851
00:37:14,470 --> 00:37:13,359
now the core observatory has ha does

852
00:37:17,109 --> 00:37:14,480
have

853
00:37:19,190 --> 00:37:17,119
two very sophisticated instruments on

854
00:37:20,829 --> 00:37:19,200
board as you have heard

855
00:37:22,630 --> 00:37:20,839
um

856
00:37:25,510 --> 00:37:22,640
the the

857
00:37:27,190 --> 00:37:25,520
dual frequency ra precipitation radar

858
00:37:30,069 --> 00:37:27,200
known as dpr

859
00:37:31,670 --> 00:37:30,079
is provided by by our partner jaxa for

860
00:37:33,270 --> 00:37:31,680
the for this mission

861
00:37:36,310 --> 00:37:33,280
and the other one's the

862
00:37:38,550 --> 00:37:36,320
gpm microwave imager which also known as

863
00:37:41,510 --> 00:37:38,560

gmi

864
00:37:44,150 --> 00:37:41,520
and it's balled by ball aerospace and

865
00:37:47,030 --> 00:37:44,160
don figgins here is representing ball

866
00:37:48,470 --> 00:37:47,040
and we are very proud of the performance

867
00:37:51,270 --> 00:37:48,480
of this instrument

868
00:37:52,470 --> 00:37:51,280
gmi has 13 channels it covers 10

869
00:37:57,510 --> 00:37:52,480
gigahertz

870
00:38:00,870 --> 00:37:57,520
snow

871
00:38:03,270 --> 00:38:00,880
to ice and is one of the best calibrated

872
00:38:05,990 --> 00:38:03,280
radiometers in its class

873
00:38:09,030 --> 00:38:06,000
gmi was delivered to nasa

874
00:38:12,470 --> 00:38:09,040
in february 2012 and was integrated on

875
00:38:15,750 --> 00:38:12,480
the observatory the month after in march

876
00:38:16,790 --> 00:38:15,760
and the dpr was delivered to us

877
00:38:25,750 --> 00:38:16,800
in

878
00:38:28,790 --> 00:38:25,760
month of april

879
00:38:31,109 --> 00:38:28,800
now after completing the the assembly of

880
00:38:33,109 --> 00:38:31,119
the spacecraft we prepared for

881
00:38:34,150 --> 00:38:33,119
environmental test program as you saw in

882
00:38:36,069 --> 00:38:34,160
the video

883
00:38:37,030 --> 00:38:36,079
first we tested in the thermal vacuum

884
00:38:38,230 --> 00:38:37,040
chamber

885
00:38:40,230 --> 00:38:38,240
and this

886
00:38:41,349 --> 00:38:40,240
exposes it to the space environment that

887
00:38:44,390 --> 00:38:41,359
it sees

888
00:38:45,750 --> 00:38:44,400

by by doing a thermal and in a vacuum of

889
00:38:47,190 --> 00:38:45,760
the space

890
00:38:49,510 --> 00:38:47,200
and

891
00:38:51,510 --> 00:38:49,520
since the door of the chamber was on top

892
00:38:53,670 --> 00:38:51,520
we had to lift the spacecraft into the

893
00:38:56,069 --> 00:38:53,680
chamber following the completion of that

894
00:38:58,310 --> 00:38:56,079
test we prepared it

895
00:39:00,470 --> 00:38:58,320
we brought it back to our clean room

896
00:39:02,790 --> 00:39:00,480
and we um

897
00:39:05,030 --> 00:39:02,800
prepared it for a electromagnetic

898
00:39:07,750 --> 00:39:05,040
interference testing which you see in a

899
00:39:09,910 --> 00:39:07,760
in a visual here and like that test it's

900
00:39:12,550 --> 00:39:09,920
currently in progress

901
00:39:16,069 --> 00:39:12,560
after completing uh the test program

902
00:39:18,150 --> 00:39:16,079
we'll ship to uh to the launch site but

903
00:39:19,670 --> 00:39:18,160
at the end of october early november

904
00:39:22,870 --> 00:39:19,680
2013.

905
00:39:25,829 --> 00:39:22,880
we ship via c5 air force aircraft we

906
00:39:30,470 --> 00:39:25,839
refuel in air and land in

907
00:39:31,829 --> 00:39:30,480
in kirikou japan once we land we offload

908
00:39:34,390 --> 00:39:31,839
to a barge

909
00:39:36,710 --> 00:39:34,400
and from there

910
00:39:39,670 --> 00:39:36,720
we transport from kitakushu to

911
00:39:43,510 --> 00:39:39,680
tanagashima island we plan to launch

912
00:39:46,870 --> 00:39:43,520
within a two-month window in 2014 which

913
00:39:50,310 --> 00:39:46,880

starts on january 24th

914
00:39:55,109 --> 00:39:51,349
shows

915
00:39:57,750 --> 00:39:55,119
the the the spacecraft on the h2a rocket

916
00:40:00,150 --> 00:39:57,760
launching from tanagashima space center

917
00:40:01,990 --> 00:40:00,160
now following the separation

918
00:40:04,069 --> 00:40:02,000
from the second stage

919
00:40:06,309 --> 00:40:04,079
the observatory is placed in a 400

920
00:40:07,510 --> 00:40:06,319
kilometer orbit in a 65 degree

921
00:40:11,430 --> 00:40:07,520
inclination

922
00:40:13,670 --> 00:40:11,440
it is roughly about the same

923
00:40:16,230 --> 00:40:13,680
same location as international space

924
00:40:18,069 --> 00:40:16,240
station it's another fun fact for you

925
00:40:20,069 --> 00:40:18,079
but you can't see it when it goes across

926
00:40:21,510 --> 00:40:20,079
because we're too small

927
00:40:24,390 --> 00:40:21,520
okay

928
00:40:26,630 --> 00:40:24,400
following that uh once we're on orbit uh

929
00:40:27,670 --> 00:40:26,640
we start our deployments we do the solar

930
00:40:30,550 --> 00:40:27,680
arrays

931
00:40:32,950 --> 00:40:30,560
we to be power positive then we do a

932
00:40:35,589 --> 00:40:32,960
high gain antenna to downlink the data

933
00:40:37,829 --> 00:40:35,599
and then we deploy the gmi reflector and

934
00:40:38,950 --> 00:40:37,839
start rotating them and then we activate

935
00:40:41,349 --> 00:40:38,960
the dpr

936
00:40:44,150 --> 00:40:41,359
and after that activation is complete it

937
00:40:46,710 --> 00:40:44,160
takes us about 60 days to go through a

938
00:40:49,270 --> 00:40:46,720

checkout period and hand that over to

939
00:40:50,950 --> 00:40:49,280
the operation teams for the science

940
00:40:53,270 --> 00:40:50,960
observation

941
00:40:56,150 --> 00:40:53,280
that's all i had for you

942
00:40:56,160 --> 00:41:04,710
indeed

943
00:41:08,550 --> 00:41:06,150
next up we're going to hear a little bit

944
00:41:09,829 --> 00:41:08,560
from uh one of the

945
00:41:11,990 --> 00:41:09,839
from the project excuse me from the

946
00:41:13,910 --> 00:41:12,000
project manager for uh jax's um

947
00:41:15,670 --> 00:41:13,920
contribution to the spacecraft here and

948
00:41:18,710 --> 00:41:15,680
that's the dual frequency precipitation

949
00:41:25,270 --> 00:41:18,720
radar or dpr and this is matcha hero

950
00:41:30,790 --> 00:41:27,589
good morning everyone my name is imasa

951
00:41:35,030 --> 00:41:30,800
hirokosima i am jaxa project manager for

952
00:41:37,670 --> 00:41:35,040
dpr instrument on gpm coil observatory

953
00:41:41,430 --> 00:41:37,680
uh dpl project team was established in

954
00:41:43,670 --> 00:41:41,440
jackson's space center in 2003

955
00:41:45,670 --> 00:41:43,680
and since then i have been managing the

956
00:41:48,630 --> 00:41:45,680
project in jaxa

957
00:41:51,510 --> 00:41:48,640
dpr stands for the dual frequency

958
00:41:54,150 --> 00:41:51,520
presentation rather it is the only one

959
00:41:56,870 --> 00:41:54,160
space-borne dual frequency precipitation

960
00:42:00,390 --> 00:41:56,880
radar in the world and it will play a

961
00:42:03,990 --> 00:42:00,400
key role for gpm mission

962
00:42:05,270 --> 00:42:04,000
dpr consists of the ku band radar and ka

963
00:42:08,390 --> 00:42:05,280

band radar

964
00:42:11,030 --> 00:42:08,400
kupl is similar to the precipitation

965
00:42:14,470 --> 00:42:11,040
ladder on trim satellite

966
00:42:18,230 --> 00:42:14,480
kpl is the new development it has a very

967
00:42:20,069 --> 00:42:18,240
high sensitivity so it can detect 0.2

968
00:42:21,430 --> 00:42:20,079
millimeter per hour

969
00:42:24,950 --> 00:42:21,440
rainfall

970
00:42:28,150 --> 00:42:24,960
you can stay without an umbrella in the

971
00:42:32,230 --> 00:42:28,160
one millimeter per hour rainfall so 0.2

972
00:42:34,710 --> 00:42:32,240
is a very really very weak rainfall

973
00:42:37,109 --> 00:42:34,720
one important feature of the dpr is its

974
00:42:39,910 --> 00:42:37,119
high sensitivity and accuracy but

975
00:42:43,270 --> 00:42:39,920
another important feature is that ku

976
00:42:46,390 --> 00:42:43,280
band beam and k band beam is precisely

977
00:42:48,710 --> 00:42:46,400
matched so that we can observe the same

978
00:42:50,470 --> 00:42:48,720
rainfall in two frequencies

979
00:42:53,510 --> 00:42:50,480
simultaneously

980
00:42:55,990 --> 00:42:53,520
and this is very important to improve

981
00:42:58,390 --> 00:42:56,000
the estimation accuracy of the rainfall

982
00:43:02,069 --> 00:42:58,400
rate

983
00:43:05,030 --> 00:43:02,079
dpr adopts a facelift technique and it

984
00:43:07,829 --> 00:43:05,040
does the beam scanning in a closed track

985
00:43:09,910 --> 00:43:07,839
direction electrically

986
00:43:13,270 --> 00:43:09,920
dpl has been

987
00:43:15,910 --> 00:43:13,280
designed built and tested in japan

988
00:43:18,550 --> 00:43:15,920

all the dpi system tests was performed

989
00:43:21,910 --> 00:43:18,560
at scuba space center

990
00:43:25,910 --> 00:43:21,920
during the test we experienced great

991
00:43:27,750 --> 00:43:25,920
east japan earthquake on march 11

992
00:43:30,550 --> 00:43:27,760
2011.

993
00:43:32,470 --> 00:43:30,560
fortunately there was no human loss in

994
00:43:35,270 --> 00:43:32,480
skipper space center

995
00:43:38,630 --> 00:43:35,280
and there was no severe damage to the

996
00:43:41,670 --> 00:43:38,640
dpr but our test buildings and test

997
00:43:44,309 --> 00:43:41,680
facilities were severely damaged

998
00:43:47,349 --> 00:43:44,319
and also the social infrastructure

999
00:43:50,630 --> 00:43:47,359
such as the power and water supply

1000
00:43:53,990 --> 00:43:50,640
and the transportation system was lost

1001
00:43:56,390 --> 00:43:54,000
so we needed a tremendous effort for the

1002
00:43:59,270 --> 00:43:56,400
recovery of the damaged buildings and

1003
00:44:02,390 --> 00:43:59,280
facilities so that we can restart the

1004
00:44:07,030 --> 00:44:05,109
eventually we completed the dpl testing

1005
00:44:09,750 --> 00:44:07,040
in march last year

1006
00:44:11,589 --> 00:44:09,760
and dpr was shipped from scuba space

1007
00:44:14,870 --> 00:44:11,599
center to nasa goddard space flight

1008
00:44:17,349 --> 00:44:14,880
center and officially delivered to nasa

1009
00:44:20,150 --> 00:44:17,359
at the end of march last year

1010
00:44:24,390 --> 00:44:20,160
and after the delivery we continued to

1011
00:44:27,670 --> 00:44:24,400
support nasa for dpr handling inspection

1012
00:44:31,829 --> 00:44:27,680
and performance testing

1013
00:44:34,790 --> 00:44:31,839

i'd like to introduce you the dpl logo

1014
00:44:36,470 --> 00:44:34,800
i wanted to give a japanese flavor in it

1015
00:44:38,630 --> 00:44:36,480
so i selected

1016
00:44:41,190 --> 00:44:38,640
this this logo design

1017
00:44:42,790 --> 00:44:41,200
calligraphy is one of the traditional

1018
00:44:46,150 --> 00:44:42,800
culture in japan

1019
00:44:48,630 --> 00:44:46,160
so that this dpr logo represents a

1020
00:44:51,670 --> 00:44:48,640
strong japanese spirit towards the

1021
00:44:54,470 --> 00:44:51,680
success of gpm mission

1022
00:44:56,630 --> 00:44:54,480
a gpm will be launched in early 2014 by

1023
00:44:58,710 --> 00:44:56,640
japanese h2o launchpad group from

1024
00:45:02,150 --> 00:44:58,720
tanyashima space center

1025
00:45:04,470 --> 00:45:02,160
hd launch has been successful in all the

1026
00:45:06,870 --> 00:45:04,480
past 22 launches

1027
00:45:09,750 --> 00:45:06,880
the launch site is at the south end of

1028
00:45:12,069 --> 00:45:09,760
stanination island international island

1029
00:45:14,390 --> 00:45:12,079
itself is located in the south end of

1030
00:45:16,950 --> 00:45:14,400
japanese islands

1031
00:45:19,670 --> 00:45:16,960
this island is famous historically

1032
00:45:23,510 --> 00:45:19,680
because the gun was firstly introduced

1033
00:45:25,430 --> 00:45:23,520
to japan in 1543 by portuguese

1034
00:45:27,750 --> 00:45:25,440
they were on board the chinese ship and

1035
00:45:30,630 --> 00:45:27,760
the ship was stranded near the

1036
00:45:37,190 --> 00:45:34,230
lastly in north japan we stoke the river

1037
00:45:38,630 --> 00:45:37,200
with baby salmons for the future salmon

1038
00:45:40,790 --> 00:45:38,640

harvest

1039
00:45:43,430 --> 00:45:40,800
baby summons will go to the pacific

1040
00:45:46,390 --> 00:45:43,440
ocean spend several years there and

1041
00:45:48,309 --> 00:45:46,400
return to japanese rivers as grown up

1042
00:45:51,510 --> 00:45:48,319
for making babies

1043
00:45:55,349 --> 00:45:51,520
and dpr is a kind of baby for me and i

1044
00:45:57,510 --> 00:45:55,359
have released dpr to the united states

1045
00:46:00,309 --> 00:45:57,520
and i'm very happy that the dpr will

1046
00:46:02,790 --> 00:46:00,319
come back to japan grown up as the gpm

1047
00:46:12,390 --> 00:46:02,800
observatory and will be launched by

1048
00:46:16,309 --> 00:46:13,910
wonderful we're going to move into some

1049
00:46:18,550 --> 00:46:16,319
q a here for our online audience here at

1050
00:46:20,230 --> 00:46:18,560
home uh if you are

1051
00:46:22,710 --> 00:46:20,240
going to be asking a question please use

1052
00:46:24,710 --> 00:46:22,720
the hashtag poundasknasa um if you're

1053
00:46:28,069 --> 00:46:24,720
tweeting in japanese you can also ask it

1054
00:46:29,270 --> 00:46:28,079
using poundaskjaxa that's j-a-x-a

1055
00:46:32,950 --> 00:46:29,280
um if we can go ahead and have uh

1056
00:46:33,990 --> 00:46:32,960
masahiro and art come on up here

1057
00:46:35,270 --> 00:46:34,000
we're gonna go ahead and take questions

1058
00:46:37,910 --> 00:46:35,280
if you're in the room here remember to

1059
00:46:39,510 --> 00:46:37,920
move to the aisles

1060
00:46:41,510 --> 00:46:39,520
and we'll go ahead and get started with

1061
00:46:44,230 --> 00:46:41,520
our first question

1062
00:46:45,349 --> 00:46:44,240
okay um this one is from

1063
00:46:46,950 --> 00:46:45,359

atkat

1064
00:46:48,150 --> 00:46:46,960
42.

1065
00:46:50,870 --> 00:46:48,160
and it's

1066
00:46:52,870 --> 00:46:50,880
i want to know essentially more about

1067
00:46:54,950 --> 00:46:52,880
the testing of the satellite and the

1068
00:46:56,470 --> 00:46:54,960
assembly i think it's a question for art

1069
00:46:58,150 --> 00:46:56,480
should we just talk more a little bit

1070
00:46:59,910 --> 00:46:58,160
about how the pieces move from place to

1071
00:47:01,589 --> 00:46:59,920
place i know you sort of did that but

1072
00:47:05,510 --> 00:47:01,599
just why were they sort of moved from

1073
00:47:08,550 --> 00:47:06,470
well

1074
00:47:10,390 --> 00:47:08,560
the reason this is obviously the

1075
00:47:13,109 --> 00:47:10,400
international partnership

1076
00:47:14,390 --> 00:47:13,119
and if you would have done this

1077
00:47:16,630 --> 00:47:14,400
if you would have done this mission

1078
00:47:19,109 --> 00:47:16,640
alone would have been very costly for

1079
00:47:21,190 --> 00:47:19,119
each country to do it alone therefore

1080
00:47:23,109 --> 00:47:21,200
the contribution with the jaxa which

1081
00:47:25,670 --> 00:47:23,119
launched services to us

1082
00:47:28,390 --> 00:47:25,680
and with the dprs

1083
00:47:31,589 --> 00:47:28,400
in order to uh you know save taxpayers

1084
00:47:34,390 --> 00:47:31,599
money we did this collaboration and then

1085
00:47:37,750 --> 00:47:34,400
shipping it from here to jaxa to launch

1086
00:47:38,549 --> 00:47:37,760
it on h2a does save both countries money

1087
00:47:43,030 --> 00:47:38,559
in

1088
00:47:46,150 --> 00:47:44,950

okay next question do we have one here

1089
00:47:48,150 --> 00:47:46,160
in the room over there

1090
00:47:49,910 --> 00:47:48,160
uh yeah this may be a stupid question

1091
00:47:52,710 --> 00:47:49,920
but the reflector appears to be on the

1092
00:47:54,390 --> 00:47:52,720
top of the satellite and it is the

1093
00:47:55,990 --> 00:47:54,400
because it's measuring in microwaves is

1094
00:47:56,710 --> 00:47:56,000
does the body of the satellite and the

1095
00:47:58,390 --> 00:47:56,720
other

1096
00:48:00,230 --> 00:47:58,400
uh receptors

1097
00:48:01,589 --> 00:48:00,240
block its transmission at all or is it

1098
00:48:04,710 --> 00:48:01,599
the microwaves just pass through the

1099
00:48:07,670 --> 00:48:04,720
body of the satellite uh okay so

1100
00:48:09,910 --> 00:48:07,680
the question is well the the

1101
00:48:11,270 --> 00:48:09,920
the reflector is on top and rotates

1102
00:48:13,430 --> 00:48:11,280
however

1103
00:48:17,349 --> 00:48:13,440
it rotates all the way across

1104
00:48:20,309 --> 00:48:17,359
but we only use about a 800 or so 880 uh

1105
00:48:21,430 --> 00:48:20,319
swath which is does not go across the

1106
00:48:22,790 --> 00:48:21,440
like a

1107
00:48:25,270 --> 00:48:22,800
solar arrays on the body of the

1108
00:48:27,910 --> 00:48:25,280
spacecraft that data is available but we

1109
00:48:30,710 --> 00:48:27,920
do ignore that data extract that data so

1110
00:48:32,829 --> 00:48:30,720
it does not corrupt the data

1111
00:48:35,829 --> 00:48:32,839
great thank

1112
00:48:38,710 --> 00:48:35,839
you all right do we have another online

1113
00:48:45,990 --> 00:48:41,430

um this question is how does the data

1114
00:48:48,390 --> 00:48:46,829
okay

1115
00:48:51,030 --> 00:48:48,400
um

1116
00:48:52,790 --> 00:48:51,040
as we talked about we have a mission

1117
00:48:55,990 --> 00:48:52,800
operations center

1118
00:48:58,230 --> 00:48:56,000
okay so the satellite has a

1119
00:49:00,549 --> 00:48:58,240
high gain antenna which is hidden behind

1120
00:49:03,589 --> 00:49:00,559
the sea of the social media

1121
00:49:05,190 --> 00:49:03,599
and that is a main

1122
00:49:07,829 --> 00:49:05,200
is a main

1123
00:49:08,710 --> 00:49:07,839
point for us to uh take the data to the

1124
00:49:11,270 --> 00:49:08,720
ground

1125
00:49:13,670 --> 00:49:11,280
from from satellite from the high gain

1126
00:49:14,950 --> 00:49:13,680
antenna goes to a tdrs we have three

1127
00:49:17,910 --> 00:49:14,960
tdrses

1128
00:49:19,349 --> 00:49:17,920
and we are continuous uh communication

1129
00:49:20,870 --> 00:49:19,359
with the tdrs

1130
00:49:23,990 --> 00:49:20,880
uh throughout the mission that's one

1131
00:49:25,829 --> 00:49:24,000
reason we can give you a near real time

1132
00:49:26,630 --> 00:49:25,839
with less than an hour

1133
00:49:32,150 --> 00:49:26,640
the

1134
00:49:34,150 --> 00:49:32,160
goes to white sands

1135
00:49:35,589 --> 00:49:34,160
in new mexico and the white sand the

1136
00:49:37,510 --> 00:49:35,599
data comes back

1137
00:49:38,950 --> 00:49:37,520
to the mission op center which is right

1138
00:49:41,589 --> 00:49:38,960

across

1139
00:49:42,870 --> 00:49:41,599
the street from here in the in building

1140
00:49:44,390 --> 00:49:42,880
32

1141
00:49:47,510 --> 00:49:44,400
and then from then

1142
00:49:49,430 --> 00:49:47,520
it gets goes to from there to the pps

1143
00:49:51,750 --> 00:49:49,440
the science that gets extracted goes to

1144
00:49:52,630 --> 00:49:51,760
the pps and gets processed

1145
00:49:53,510 --> 00:49:52,640
and then

1146
00:49:56,390 --> 00:49:53,520
gets

1147
00:49:58,950 --> 00:49:56,400
distributed via the pps system the

1148
00:50:00,710 --> 00:49:58,960
precipitation processing system and that

1149
00:50:03,589 --> 00:50:00,720
we talked about that whole length

1150
00:50:05,750 --> 00:50:03,599
operation collecting all that is

1151
00:50:07,030 --> 00:50:05,760
within three hours now three hours is a

1152
00:50:09,349 --> 00:50:07,040
combined

1153
00:50:12,390 --> 00:50:09,359
um consolidated

1154
00:50:14,549 --> 00:50:12,400
the the product the global product

1155
00:50:18,630 --> 00:50:14,559
that we put together within three hours

1156
00:50:20,790 --> 00:50:18,640
uh but the uh the gmi radiometer

1157
00:50:23,430 --> 00:50:20,800
is within less than an hour that could

1158
00:50:24,549 --> 00:50:23,440
be real time

1159
00:50:27,510 --> 00:50:24,559
do you have another question over on the

1160
00:50:28,710 --> 00:50:27,520
other side over here yeah um sort of

1161
00:50:29,990 --> 00:50:28,720
following up on that actually you kind

1162
00:50:31,670 --> 00:50:30,000
of addressed this with that last

1163
00:50:33,510 --> 00:50:31,680

question but i was just going to ask how

1164
00:50:34,710 --> 00:50:33,520
much uh you know once the satellite

1165
00:50:35,510 --> 00:50:34,720
launches

1166
00:50:38,790 --> 00:50:35,520
what

1167
00:50:40,870 --> 00:50:38,800
on the ground here at goddard and how

1168
00:50:43,190 --> 00:50:40,880
much of the you know mission operation

1169
00:50:45,990 --> 00:50:43,200
is divided between you know here or

1170
00:50:47,030 --> 00:50:46,000
somewhere you know with jaxa or anywhere

1171
00:50:49,670 --> 00:50:47,040
else

1172
00:50:52,470 --> 00:50:49,680
okay the way uh the way you work is uh

1173
00:50:54,390 --> 00:50:52,480
candace and i will split uh either she

1174
00:50:55,190 --> 00:50:54,400
stays here and i'll be in the control

1175
00:50:56,470 --> 00:50:55,200
room

1176
00:51:01,190 --> 00:50:56,480
in the

1177
00:51:03,430 --> 00:51:01,200
and once we launch

1178
00:51:05,910 --> 00:51:03,440
i mean we the the grounds mission

1179
00:51:07,270 --> 00:51:05,920
operations center is always in contact

1180
00:51:09,750 --> 00:51:07,280
and online

1181
00:51:11,030 --> 00:51:09,760
uh even before launch so our team will

1182
00:51:13,910 --> 00:51:11,040
come in here

1183
00:51:16,150 --> 00:51:13,920
about seven eight hours before launch

1184
00:51:17,910 --> 00:51:16,160
we check into mission operations center

1185
00:51:19,349 --> 00:51:17,920
and we also check in

1186
00:51:22,069 --> 00:51:19,359
into the

1187
00:51:23,430 --> 00:51:22,079
control center within like couple hours

1188
00:51:24,549 --> 00:51:23,440

of the launch

1189
00:51:28,470 --> 00:51:24,559
and then

1190
00:51:30,710 --> 00:51:28,480
once the once we have launched separated

1191
00:51:33,349 --> 00:51:30,720
the mission operation basically takes

1192
00:51:35,670 --> 00:51:33,359
over from that point on and observing

1193
00:51:37,670 --> 00:51:35,680
and commanding the spacecraft once we

1194
00:51:40,390 --> 00:51:37,680
separate it and

1195
00:51:42,069 --> 00:51:40,400
uh from and and the

1196
00:51:45,349 --> 00:51:42,079
high gain antenna is up

1197
00:51:47,589 --> 00:51:45,359
uh deployed we do have omni antennas

1198
00:51:49,030 --> 00:51:47,599
that we do communicate during the sand

1199
00:51:51,109 --> 00:51:49,040
before the high gain comes out but

1200
00:51:52,870 --> 00:51:51,119
that's we only do that for the first

1201
00:51:54,549 --> 00:51:52,880
part of the mission before high gain

1202
00:51:56,630 --> 00:51:54,559
antenna comes up but that's how the

1203
00:51:58,710 --> 00:51:56,640
mission operation center gets involved

1204
00:52:00,549 --> 00:51:58,720
but in the first 60 days

1205
00:52:02,309 --> 00:52:00,559
i mean it takes us several days first

1206
00:52:05,670 --> 00:52:02,319
check out the spacecraft

1207
00:52:06,870 --> 00:52:05,680
then after that we deployed a uh gmi the

1208
00:52:08,549 --> 00:52:06,880
reflector

1209
00:52:10,950 --> 00:52:08,559
and then after that we activate the

1210
00:52:13,349 --> 00:52:10,960
radar and as i explained it takes us 60

1211
00:52:14,870 --> 00:52:13,359
days for us to get through that process

1212
00:52:16,790 --> 00:52:14,880
and then we completely check out the

1213
00:52:20,150 --> 00:52:16,800

spacecraft and hand it to mission

1214
00:52:22,069 --> 00:52:20,160
operation for science observation

1215
00:52:24,390 --> 00:52:22,079
wonderful just a reminder for our online

1216
00:52:25,829 --> 00:52:24,400
audience here at home you are able to

1217
00:52:27,510 --> 00:52:25,839
ask questions using the hashtag

1218
00:52:28,790 --> 00:52:27,520
poundasknasa

1219
00:52:31,510 --> 00:52:28,800
we're going to take another one here

1220
00:52:34,309 --> 00:52:31,520
from online okay and this is from at

1221
00:52:35,990 --> 00:52:34,319
happiness wins heidi um it's actually

1222
00:52:38,710 --> 00:52:36,000
not quite a question but she really

1223
00:52:41,109 --> 00:52:38,720
loves the dpr logo and how it's been

1224
00:52:43,349 --> 00:52:41,119
developed and i know that jax is very

1225
00:52:45,349 --> 00:52:43,359
proud of the logo kojima was that

1226
00:52:47,349 --> 00:52:45,359
something that jaxa

1227
00:52:49,430 --> 00:52:47,359
pulled together there's an artist i know

1228
00:52:50,390 --> 00:52:49,440
who developed it yes

1229
00:52:53,670 --> 00:52:50,400
there

1230
00:52:55,829 --> 00:52:53,680
is a artist who is a

1231
00:52:56,950 --> 00:52:55,839
modern calligrapher and also the

1232
00:53:00,630 --> 00:52:56,960
designer

1233
00:53:01,750 --> 00:53:00,640
and there were actually several

1234
00:53:04,470 --> 00:53:01,760
designs

1235
00:53:05,750 --> 00:53:04,480
and we discussed internally and also we

1236
00:53:07,670 --> 00:53:05,760
discussed with

1237
00:53:13,750 --> 00:53:07,680
japanese scientists and

1238
00:53:18,470 --> 00:53:15,109

wonderful do we have another question

1239
00:53:21,829 --> 00:53:20,309
okay oh one second we'll take another

1240
00:53:23,990 --> 00:53:21,839
online question here then and it's

1241
00:53:26,309 --> 00:53:24,000
another question for kojima um it's

1242
00:53:28,870 --> 00:53:26,319
about how did the the earth japanese

1243
00:53:30,950 --> 00:53:28,880
earthquake affect this really delicate

1244
00:53:32,150 --> 00:53:30,960
space instrument

1245
00:53:35,030 --> 00:53:32,160
yes

1246
00:53:37,750 --> 00:53:35,040
when the uh after the shake

1247
00:53:40,790 --> 00:53:37,760
about one or two hours after the shake i

1248
00:53:43,589 --> 00:53:40,800
went to the satellite test building

1249
00:53:46,710 --> 00:53:43,599
and i was very shocked that the building

1250
00:53:49,670 --> 00:53:46,720
was severely damaged and although there

1251
00:53:50,790 --> 00:53:49,680
were some after uh shake

1252
00:53:53,349 --> 00:53:50,800
continued

1253
00:53:56,630 --> 00:53:53,359
we went into the building to see the

1254
00:53:58,870 --> 00:53:56,640
state of the dpr and i was very relieved

1255
00:54:02,309 --> 00:53:58,880
that although some dust were over the

1256
00:54:06,549 --> 00:54:02,319
dpl the dpr itself was not severely

1257
00:54:11,510 --> 00:54:07,589
just

1258
00:54:13,430 --> 00:54:11,520
it's like an earthquake is something

1259
00:54:15,750 --> 00:54:13,440
that goes all parts of gpm the most

1260
00:54:18,069 --> 00:54:15,760
severe one is in japan we had one in

1261
00:54:20,150 --> 00:54:18,079
maryland during the integration of the

1262
00:54:22,150 --> 00:54:20,160
satellite and then we had one in

1263
00:54:23,589 --> 00:54:22,160

california where some of the components

1264
00:54:26,470 --> 00:54:23,599
was being uh

1265
00:54:28,710 --> 00:54:26,480
tested actually our gyroscopes that's uh

1266
00:54:30,790 --> 00:54:28,720
that's not on our spacecraft and then

1267
00:54:32,710 --> 00:54:30,800
actually it was under test when the

1268
00:54:35,670 --> 00:54:32,720
california earthquake happened and it

1269
00:54:37,589 --> 00:54:35,680
detected the uh the events while doing

1270
00:54:39,109 --> 00:54:37,599
the test because that's what gyroscopes

1271
00:54:43,109 --> 00:54:39,119
do it sounds like you guys will be happy

1272
00:54:47,430 --> 00:54:44,150
we have a question over on the other

1273
00:54:50,309 --> 00:54:47,440
side now hi my name is jason sanchez uh

1274
00:54:51,589 --> 00:54:50,319
i'm an online quarkety on twitter i have

1275
00:54:52,390 --> 00:54:51,599
a question this is actually a little

1276
00:54:54,870 --> 00:54:52,400
different

1277
00:54:56,870 --> 00:54:54,880
than the gpm did you speak louder a

1278
00:55:00,230 --> 00:54:56,880
little bit yes sir this is a different

1279
00:55:01,109 --> 00:55:00,240
question than the gpm questions and and

1280
00:55:04,309 --> 00:55:01,119
this

1281
00:55:07,190 --> 00:55:04,319
is more so towards the future launches a

1282
00:55:08,309 --> 00:55:07,200
question for nasa and also for jaxa

1283
00:55:10,309 --> 00:55:08,319
um

1284
00:55:13,190 --> 00:55:10,319
now that bolivia's in south america

1285
00:55:15,750 --> 00:55:13,200
bolivia has started uh operations for

1286
00:55:18,390 --> 00:55:15,760
mining pure lithium in the salt flats in

1287
00:55:21,190 --> 00:55:18,400
salah the uni do you think there will be

1288
00:55:23,430 --> 00:55:21,200

a realizable future on the fusion-driven

1289
00:55:25,829 --> 00:55:23,440
rocket now that there's so much lithium

1290
00:55:27,270 --> 00:55:25,839
at stake since they're finally starting

1291
00:55:29,270 --> 00:55:27,280
to

1292
00:55:32,870 --> 00:55:29,280
you know harvest this material because

1293
00:55:35,190 --> 00:55:32,880
it uses a pure solid lithium to

1294
00:55:37,990 --> 00:55:35,200
potentially theoretically

1295
00:55:39,829 --> 00:55:38,000
use this material to launch

1296
00:55:41,990 --> 00:55:39,839
well even though we're supposed to be

1297
00:55:44,309 --> 00:55:42,000
rocket scientists but we don't have any

1298
00:55:47,109 --> 00:55:44,319
actual rocket scientists in a room that

1299
00:55:49,349 --> 00:55:47,119
can answer your question

1300
00:55:51,990 --> 00:55:49,359
but i think all nasa people are rocket

1301
00:55:55,430 --> 00:55:52,000
scientists but um that's a question

1302
00:55:57,990 --> 00:55:55,440
really for uh uh for nasa headquarter

1303
00:55:59,589 --> 00:55:58,000
and also especially for the kennedy

1304
00:56:02,390 --> 00:55:59,599
space center which handles all the

1305
00:56:04,069 --> 00:56:02,400
launches and what the future is if you

1306
00:56:06,470 --> 00:56:04,079
tweet at nasa kennedy they should be

1307
00:56:09,670 --> 00:56:06,480
able to get you an answer to that so

1308
00:56:13,270 --> 00:56:11,510
do we have another online question here

1309
00:56:14,309 --> 00:56:13,280
i have a old school paper question from

1310
00:56:17,990 --> 00:56:14,319
someone too shy to come to the

1311
00:56:19,990 --> 00:56:18,000
microphone so um and it's

1312
00:56:22,870 --> 00:56:20,000
okay i should have read it first uh what

1313
00:56:25,109 --> 00:56:22,880

is the coolest test the satellite goes

1314
00:56:27,109 --> 00:56:25,119
through before launch and coolest has

1315
00:56:28,390 --> 00:56:27,119
little marks finger marks around it so i

1316
00:56:33,430 --> 00:56:28,400
don't know if they actually mean coldest

1317
00:56:39,589 --> 00:56:37,030
okay well i'll answer both so

1318
00:56:40,789 --> 00:56:39,599
call this is in thermovac

1319
00:56:43,829 --> 00:56:40,799
chamber

1320
00:56:45,910 --> 00:56:43,839
that we run our satellite but actually

1321
00:56:48,549 --> 00:56:45,920
the where the way our spacecraft as you

1322
00:56:50,710 --> 00:56:48,559
noticed all these

1323
00:56:52,470 --> 00:56:50,720
you know duct tape type material

1324
00:56:54,549 --> 00:56:52,480
blankets that we have

1325
00:56:56,150 --> 00:56:54,559
uh that keeps us at spacecraft warm and

1326
00:56:59,030 --> 00:56:56,160
there is a reason why is that duct tape

1327
00:57:01,510 --> 00:56:59,040
material because most of our components

1328
00:57:03,190 --> 00:57:01,520
on this observatory is on the outside

1329
00:57:04,150 --> 00:57:03,200
and therefore we have to use a different

1330
00:57:05,670 --> 00:57:04,160
type of

1331
00:57:07,030 --> 00:57:05,680
blankets which is not orange

1332
00:57:08,470 --> 00:57:07,040
traditionally you've seen orange

1333
00:57:09,910 --> 00:57:08,480
blankets on all the spacecraft with

1334
00:57:11,750 --> 00:57:09,920
hours of duct tape and there's a reason

1335
00:57:15,510 --> 00:57:11,760
for that but because we have those

1336
00:57:17,990 --> 00:57:15,520
blankets it does see a very uh

1337
00:57:20,710 --> 00:57:18,000
benign environment but

1338
00:57:23,270 --> 00:57:20,720

for the coolest test i guess i'll i'll

1339
00:57:24,630 --> 00:57:23,280
pick one the cool test that we do on

1340
00:57:26,390 --> 00:57:24,640
orbit

1341
00:57:28,069 --> 00:57:26,400
which we didn't talk about

1342
00:57:29,589 --> 00:57:28,079
now that we're in a 65 degree

1343
00:57:31,750 --> 00:57:29,599
inclination

1344
00:57:33,430 --> 00:57:31,760
and so the sun moves all over the

1345
00:57:35,910 --> 00:57:33,440
spacecraft if you're familiar with some

1346
00:57:37,829 --> 00:57:35,920
spacecraft called sun synchronous those

1347
00:57:40,230 --> 00:57:37,839
are the polar that go north south sun

1348
00:57:42,789 --> 00:57:40,240
always stays the same side but for us

1349
00:57:45,349 --> 00:57:42,799
sun is comes from one side goes to the

1350
00:57:48,630 --> 00:57:45,359
top and moves to the other side

1351
00:57:50,549 --> 00:57:48,640
but so in order for us to avoid the sun

1352
00:57:53,190 --> 00:57:50,559
to heat up because we have to design the

1353
00:57:55,990 --> 00:57:53,200
spacecraft that one side is cool and one

1354
00:57:59,270 --> 00:57:56,000
side it stays the warm side so every 30

1355
00:58:01,510 --> 00:57:59,280
days when the sun moves to the top

1356
00:58:04,390 --> 00:58:01,520
we turn the spacecraft 180 degrees

1357
00:58:07,349 --> 00:58:04,400
around and fly backward for another 30

1358
00:58:09,750 --> 00:58:07,359
days until sun goes to the other side

1359
00:58:12,230 --> 00:58:09,760
and then we turn again and then sun

1360
00:58:13,750 --> 00:58:12,240
comes up top then we turn again so

1361
00:58:16,069 --> 00:58:13,760
that's one of the coolest thing that we

1362
00:58:19,750 --> 00:58:16,079
do and we also do calibration we point

1363
00:58:21,510 --> 00:58:19,760

at this at the cold space stair and and

1364
00:58:23,750 --> 00:58:21,520
for a long time and calibrate our

1365
00:58:25,510 --> 00:58:23,760
instruments

1366
00:58:26,549 --> 00:58:25,520
wonderful i personally have a question

1367
00:58:27,910 --> 00:58:26,559
here

1368
00:58:29,750 --> 00:58:27,920
you're the project manager for this and

1369
00:58:31,190 --> 00:58:29,760
everything what keeps you awake at night

1370
00:58:32,630 --> 00:58:31,200
what's the one thing that you're really

1371
00:58:34,069 --> 00:58:32,640
really worried about with this mission

1372
00:58:37,190 --> 00:58:34,079
and that once it's on orbit and

1373
00:58:38,870 --> 00:58:37,200
everything you'll stop worrying about

1374
00:58:40,630 --> 00:58:38,880
um

1375
00:58:42,309 --> 00:58:40,640
it's hard to say i think all the stuff

1376
00:58:43,829 --> 00:58:42,319
that kept us awake

1377
00:58:45,670 --> 00:58:43,839
so far

1378
00:58:48,150 --> 00:58:45,680
most hardest ones are behind us we

1379
00:58:49,910 --> 00:58:48,160
finished thermal back and but you know

1380
00:58:51,990 --> 00:58:49,920
they're always an element to supplies as

1381
00:58:54,549 --> 00:58:52,000
much as you have planned as much as you

1382
00:58:56,789 --> 00:58:54,559
have practice as much as you have

1383
00:58:58,789 --> 00:58:56,799
you always you know we do a lot of lift

1384
00:59:00,309 --> 00:58:58,799
operations we do a lot of moving around

1385
00:59:01,829 --> 00:59:00,319
on the spacecraft

1386
00:59:03,670 --> 00:59:01,839
and uh you know

1387
00:59:05,829 --> 00:59:03,680
until we stop i'm putting the shipping

1388
00:59:08,870 --> 00:59:05,839

container i think we're still going to

1389
00:59:09,910 --> 00:59:08,880
keep us awake at night

1390
00:59:12,470 --> 00:59:09,920
all right then do we have any other

1391
00:59:14,309 --> 00:59:12,480
questions here in the audience

1392
00:59:16,230 --> 00:59:14,319
do you have a question sir

1393
00:59:18,470 --> 00:59:16,240
okay

1394
00:59:20,069 --> 00:59:18,480
hi my name's scott um just a quick

1395
00:59:23,030 --> 00:59:20,079
question how long is submission

1396
00:59:25,510 --> 00:59:23,040
scheduled to go for

1397
00:59:26,470 --> 00:59:25,520
our mission is uh designed for three

1398
00:59:29,670 --> 00:59:26,480
years

1399
00:59:30,470 --> 00:59:29,680
and we have fuel on board

1400
00:59:33,829 --> 00:59:30,480
to

1401
00:59:35,750 --> 00:59:33,839
carry us for minimum of five years now

1402
00:59:39,270 --> 00:59:35,760
since we're launching in

1403
00:59:41,190 --> 00:59:39,280
early 2014 we passed the solar

1404
00:59:43,030 --> 00:59:41,200
max affair so therefore our

1405
00:59:45,109 --> 00:59:43,040
recalculation says

1406
00:59:47,589 --> 00:59:45,119
on the worst case condition

1407
00:59:49,510 --> 00:59:47,599
the fuel should last us

1408
00:59:50,470 --> 00:59:49,520
about seven years or so

1409
00:59:54,549 --> 00:59:50,480
now

1410
00:59:56,230 --> 00:59:54,559
top of worst case on top of worst case

1411
00:59:57,349 --> 00:59:56,240
and train was supposed to last only

1412
00:59:59,349 --> 00:59:57,359
three years

1413
01:00:01,430 --> 00:59:59,359

and then so i think

1414
01:00:04,069 --> 01:00:01,440
the bar is set way too high for us and

1415
01:00:06,309 --> 01:00:04,079
expects us last more than 15 years but

1416
01:00:08,630 --> 01:00:06,319
minimum we expect

1417
01:00:10,390 --> 01:00:08,640
as on the worst case condition for us to

1418
01:00:12,829 --> 01:00:10,400
be at least seven years

1419
01:00:14,309 --> 01:00:12,839
okay thank you

1420
01:00:16,230 --> 01:00:14,319
wonderful do we have another question

1421
01:00:18,390 --> 01:00:16,240
over on this side here hi just wondering

1422
01:00:21,430 --> 01:00:18,400
about the lifetime costs of the project

1423
01:00:23,190 --> 01:00:21,440
and how secure that funding is given

1424
01:00:24,390 --> 01:00:23,200
uh track record on on some other

1425
01:00:25,430 --> 01:00:24,400
projects

1426
01:00:27,589 --> 01:00:25,440
um

1427
01:00:30,549 --> 01:00:27,599
the life the life cycle costs for this

1428
01:00:32,510 --> 01:00:30,559
project i think is on the nasa website

1429
01:00:34,710 --> 01:00:32,520
is about

1430
01:00:37,670 --> 01:00:34,720
933 million dollars and the

1431
01:00:38,950 --> 01:00:37,680
sequestration has had no impact on our

1432
01:00:39,990 --> 01:00:38,960
mission

1433
01:00:42,549 --> 01:00:40,000
um

1434
01:00:43,750 --> 01:00:42,559
one thing you can say but this 933 you

1435
01:00:44,549 --> 01:00:43,760
have to remember

1436
01:00:46,549 --> 01:00:44,559
is

1437
01:00:49,270 --> 01:00:46,559
covers the four elements that i talked

1438
01:00:51,510 --> 01:00:49,280

about it's not only just a satellite and

1439
01:00:53,990 --> 01:00:51,520
a build satellite on the build is a

1440
01:00:57,589 --> 01:00:54,000
fraction a third or or or a fourth of

1441
01:01:01,030 --> 01:00:57,599
that but a lot of testing ground system

1442
01:01:03,190 --> 01:01:01,040
mission operations and and operations on

1443
01:01:05,750 --> 01:01:03,200
orbit which is passed which makes up the

1444
01:01:08,630 --> 01:01:05,760
total life cycle of this mission cost of

1445
01:01:11,910 --> 01:01:10,470
wonderful we have a question over here

1446
01:01:14,549 --> 01:01:11,920
on the other side

1447
01:01:17,190 --> 01:01:14,559
yes i was curious if uh you were able to

1448
01:01:19,270 --> 01:01:17,200
use any of the data collected by the

1449
01:01:24,309 --> 01:01:19,280
sensors during the earthquake

1450
01:01:25,829 --> 01:01:24,319
to calibrate uh any of the sensors

1451
01:01:27,750 --> 01:01:25,839
did you get anything useful out of the

1452
01:01:30,150 --> 01:01:27,760
event well

1453
01:01:32,950 --> 01:01:30,160
when the earthquake happened all we know

1454
01:01:35,349 --> 01:01:32,960
is gyros are functioning properly which

1455
01:01:38,309 --> 01:01:35,359
was in california which is a

1456
01:01:40,309 --> 01:01:38,319
they did see a seismic event and then

1457
01:01:42,069 --> 01:01:40,319
this was sort of correlated with the

1458
01:01:45,270 --> 01:01:42,079
numbers that was uh

1459
01:01:46,870 --> 01:01:45,280
but that's not the purpose of those uh

1460
01:01:48,470 --> 01:01:46,880
having those components on the

1461
01:01:50,470 --> 01:01:48,480
spacecraft it just happens to have that

1462
01:01:52,950 --> 01:01:50,480
feature that it does catch the

1463
01:01:56,309 --> 01:01:52,960

earthquakes as well if it's sitting on a

1464
01:01:59,990 --> 01:01:57,270
all right wonderful we'll take a

1465
01:02:02,549 --> 01:02:00,000
question over on this side now

1466
01:02:04,549 --> 01:02:02,559
hi this is for jaxa

1467
01:02:07,109 --> 01:02:04,559
once gpm is launched

1468
01:02:08,630 --> 01:02:07,119
how far in advance or how much notice

1469
01:02:11,829 --> 01:02:08,640
will you get

1470
01:02:13,510 --> 01:02:11,839
in noticing a typhoon or monsoon over

1471
01:02:15,670 --> 01:02:13,520
your region

1472
01:02:17,589 --> 01:02:15,680
how quickly would you be able to react

1473
01:02:20,069 --> 01:02:17,599
and and get the information out to your

1474
01:02:22,470 --> 01:02:20,079
people

1475
01:02:24,390 --> 01:02:22,480
i think that uh

1476
01:02:29,029 --> 01:02:24,400
as uh

1477
01:02:30,549 --> 01:02:29,039
mr zabari and other scientists explained

1478
01:02:34,069 --> 01:02:30,559
gpm data

1479
01:02:37,270 --> 01:02:34,079
is uh collected and processed in near

1480
01:02:39,670 --> 01:02:37,280
real-time basis and those near real-time

1481
01:02:42,069 --> 01:02:39,680
data will be transmitted to japan also

1482
01:02:45,190 --> 01:02:42,079
and those data will be used in the japan

1483
01:02:47,750 --> 01:02:45,200
materials meteorological agency also and

1484
01:02:50,069 --> 01:02:47,760
they lose those data the

1485
01:02:52,230 --> 01:02:50,079
weather production and also the typhoon

1486
01:02:54,069 --> 01:02:52,240
prediction those kind of activities we

1487
01:02:56,150 --> 01:02:54,079
are planning

1488
01:02:57,270 --> 01:02:56,160

okay

1489
01:02:59,750 --> 01:02:57,280
wonderful then is there any other

1490
01:03:01,750 --> 01:02:59,760
questions here in the room

1491
01:03:02,789 --> 01:03:01,760
all right let's thank our two uh folks

1492
01:03:13,829 --> 01:03:02,799
here for answering all these wonderful

1493
01:03:17,910 --> 01:03:15,990
all right so a little bit earlier um

1494
01:03:20,309 --> 01:03:17,920
during art's presentation you saw a clip

1495
01:03:21,510 --> 01:03:20,319
of the launch animation and so on but

1496
01:03:23,589 --> 01:03:21,520
we're going to show you the full launch

1497
01:03:25,750 --> 01:03:23,599
sequence here uh the full animation and

1498
01:03:27,829 --> 01:03:25,760
everything um it's really pretty to

1499
01:03:29,589 --> 01:03:27,839
watch but it also really shows you all

1500
01:03:37,430 --> 01:03:29,599
the different moments during the entire

1501
01:03:37,440 --> 01:03:43,029
then you

1502
01:03:43,039 --> 01:05:22,230
and stopped

1503
01:05:25,829 --> 01:05:23,910
wonderful so hopefully next early next

1504
01:05:27,910 --> 01:05:25,839
year uh everybody will be watching nasa

1505
01:05:29,990 --> 01:05:27,920
tv and tuning in and to see that happen

1506
01:05:31,670 --> 01:05:30,000
in real life and so uh that'll be a

1507
01:05:33,109 --> 01:05:31,680
pretty good momentous occasion to get

1508
01:05:34,950 --> 01:05:33,119
the satellite on orbit and begin

1509
01:05:36,230 --> 01:05:34,960
collecting data and everything so

1510
01:05:38,230 --> 01:05:36,240
without any further ado we're going to

1511
01:05:39,910 --> 01:05:38,240
move on to our next speaker um we have

1512
01:05:41,109 --> 01:05:39,920
peter hildebrand he's the director of

1513
01:05:42,630 --> 01:05:41,119

the earth science division here at

1514
01:05:44,230 --> 01:05:42,640
goddard space flight center and he's

1515
01:05:45,829 --> 01:05:44,240
here to give you a little bit of the

1516
01:05:53,349 --> 01:05:45,839
earth science perspective on on where

1517
01:05:57,910 --> 01:05:55,430
uh thank you jason it's thrilled to be

1518
01:05:58,870 --> 01:05:57,920
here and and i'll just uh say a few

1519
01:05:59,750 --> 01:05:58,880
things

1520
01:06:01,670 --> 01:05:59,760
um

1521
01:06:03,829 --> 01:06:01,680
about how cool

1522
01:06:06,630 --> 01:06:03,839
uh a mission this is i mean it's just

1523
01:06:08,789 --> 01:06:06,640
really amazing and the other thing i

1524
01:06:10,710 --> 01:06:08,799
want to leave you with is the importance

1525
01:06:11,670 --> 01:06:10,720
of the international collaboration that

1526
01:06:13,910 --> 01:06:11,680
has made

1527
01:06:15,349 --> 01:06:13,920
this possible but also i'll say a whole

1528
01:06:17,670 --> 01:06:15,359
bunch about trim

1529
01:06:19,910 --> 01:06:17,680
because trim was launched in

1530
01:06:22,069 --> 01:06:19,920
in 97

1531
01:06:24,230 --> 01:06:22,079
that's just a few years ago

1532
01:06:26,230 --> 01:06:24,240
and it's still up there

1533
01:06:27,589 --> 01:06:26,240
it was supposed to be operating for five

1534
01:06:30,390 --> 01:06:27,599
years isn't that right

1535
01:06:33,109 --> 01:06:30,400
middle three three okay

1536
01:06:34,950 --> 01:06:33,119
but that was the worst case scenario and

1537
01:06:39,829 --> 01:06:34,960
then

1538
01:06:41,670 --> 01:06:39,839

turned out to be so important

1539
01:06:43,270 --> 01:06:41,680
as an international collaboration and a

1540
01:06:45,670 --> 01:06:43,280
scientific tool

1541
01:06:48,630 --> 01:06:45,680
that we figured out it that if the

1542
01:06:50,789 --> 01:06:48,640
satellite was moved higher away from the

1543
01:06:53,270 --> 01:06:50,799
drag of the atmosphere it would last

1544
01:06:55,910 --> 01:06:53,280
longer well it's still doing it

1545
01:06:57,990 --> 01:06:55,920
in fact this actually took a campaign by

1546
01:06:59,829 --> 01:06:58,000
researchers in the community to do it i

1547
01:07:01,349 --> 01:06:59,839
mean nasa was struggling with it and

1548
01:07:02,950 --> 01:07:01,359
couldn't quite make the decision that

1549
01:07:04,870 --> 01:07:02,960
we're going to run it so long as this

1550
01:07:07,029 --> 01:07:04,880
because it costs a lot of money but

1551
01:07:09,029 --> 01:07:07,039
there was a big campaign from university

1552
01:07:09,910 --> 01:07:09,039
researchers to keep that satellite

1553
01:07:11,910 --> 01:07:09,920
running

1554
01:07:15,510 --> 01:07:11,920
so i want to talk a little bit about the

1555
01:07:17,750 --> 01:07:15,520
science that happened and and about the

1556
01:07:19,029 --> 01:07:17,760
human impact and then about the

1557
01:07:20,950 --> 01:07:19,039
importance of the international

1558
01:07:23,750 --> 01:07:20,960
collaboration which is something that

1559
01:07:24,710 --> 01:07:23,760
started in this particular case with

1560
01:07:27,589 --> 01:07:24,720
trim

1561
01:07:29,589 --> 01:07:27,599
that was back before i even came to nasa

1562
01:07:30,950 --> 01:07:29,599
15 years ago there was discussion about

1563
01:07:32,789 --> 01:07:30,960

how to build trim and what was it going

1564
01:07:35,109 --> 01:07:32,799
to look like so it's a long-term

1565
01:07:36,630 --> 01:07:35,119
collaboration that has involved the

1566
01:07:38,710 --> 01:07:36,640
japanese and the united states

1567
01:07:41,430 --> 01:07:38,720
researchers

1568
01:07:43,349 --> 01:07:41,440
now trim is just one of

1569
01:07:45,190 --> 01:07:43,359
and then gpm which is going to be

1570
01:07:48,549 --> 01:07:45,200
launched it's just one of a whole bunch

1571
01:07:50,630 --> 01:07:48,559
of missions that are operating right now

1572
01:07:52,470 --> 01:07:50,640
and uh we've seen those animations

1573
01:07:55,589 --> 01:07:52,480
before um

1574
01:07:57,990 --> 01:07:55,599
of the whole slew of satellites there

1575
01:07:59,270 --> 01:07:58,000
are a couple dozen of them up there

1576
01:08:01,670 --> 01:07:59,280
here they are

1577
01:08:03,270 --> 01:08:01,680
and you can see trim going behind going

1578
01:08:04,789 --> 01:08:03,280
in front of the earth there

1579
01:08:06,069 --> 01:08:04,799
and a whole bunch of other satellites

1580
01:08:09,109 --> 01:08:06,079
the reason they're all those different

1581
01:08:11,190 --> 01:08:09,119
satellites is that you really need

1582
01:08:13,029 --> 01:08:11,200
only can make measurements about

1583
01:08:14,870 --> 01:08:13,039
one or two types of things on any

1584
01:08:18,390 --> 01:08:14,880
different satellite because they're very

1585
01:08:20,390 --> 01:08:18,400
complicated instruments because on trim

1586
01:08:21,829 --> 01:08:20,400
and on gpm we have a radar that's

1587
01:08:23,590 --> 01:08:21,839
looking down

1588
01:08:25,349 --> 01:08:23,600

from the bottom of the satellite and we

1589
01:08:26,870 --> 01:08:25,359
have a radiometer that's scanning out

1590
01:08:29,110 --> 01:08:26,880
ahead of the satellite to make these

1591
01:08:30,630 --> 01:08:29,120
measurements and that's a big satellite

1592
01:08:33,030 --> 01:08:30,640
if you want to know how big it is it

1593
01:08:34,950 --> 01:08:33,040
would just barely fit in this space

1594
01:08:36,870 --> 01:08:34,960
right here on this stage

1595
01:08:39,189 --> 01:08:36,880
i don't know if this is tall enough to

1596
01:08:40,709 --> 01:08:39,199
take it i don't i'm not questioning art

1597
01:08:42,309 --> 01:08:40,719
would it fit i didn't think so i was

1598
01:08:44,390 --> 01:08:42,319
sitting there wondering it would go up

1599
01:08:47,110 --> 01:08:44,400
above the roof it's so big this is the

1600
01:08:50,470 --> 01:08:47,120
size of fire truck

1601
01:08:51,590 --> 01:08:50,480
and it's getting launched into space

1602
01:08:54,229 --> 01:08:51,600
now

1603
01:08:56,470 --> 01:08:54,239
what was so interesting about trim and

1604
01:08:58,309 --> 01:08:56,480
that that we pushed so hard to keep it

1605
01:08:59,590 --> 01:08:58,319
going if we could go to the next

1606
01:09:02,470 --> 01:08:59,600
animation

1607
01:09:04,950 --> 01:09:02,480
before

1608
01:09:07,669 --> 01:09:04,960
the things that we noticed because of of

1609
01:09:10,309 --> 01:09:07,679
this is for the first time

1610
01:09:13,030 --> 01:09:10,319
we had an idea of what the precipitation

1611
01:09:15,110 --> 01:09:13,040
was like around the earth and so you can

1612
01:09:17,910 --> 01:09:15,120
see this band of more precipitation

1613
01:09:20,630 --> 01:09:17,920

around the equator and it moves

1614
01:09:23,110 --> 01:09:20,640
north and south actually what it does is

1615
01:09:25,590 --> 01:09:23,120
it moves away from where the summer is

1616
01:09:27,749 --> 01:09:25,600
because the summer

1617
01:09:29,829 --> 01:09:27,759
hemisphere is a little more powerful and

1618
01:09:32,789 --> 01:09:29,839
it pushes that intertropical convergence

1619
01:09:35,269 --> 01:09:32,799
zone away the other thing that we

1620
01:09:37,349 --> 01:09:35,279
measured for the first time is you can

1621
01:09:41,590 --> 01:09:37,359
see these bands going from the

1622
01:09:42,789 --> 01:09:41,600
equatorial regions towards the the poles

1623
01:09:44,789 --> 01:09:42,799
like here

1624
01:09:46,070 --> 01:09:44,799
and there and up there

1625
01:09:48,550 --> 01:09:46,080
those are the priests those are the

1626
01:09:51,189 --> 01:09:48,560
precipitation tracks and we didn't know

1627
01:09:53,269 --> 01:09:51,199
exactly how they operated we didn't know

1628
01:09:55,669 --> 01:09:53,279
exactly how all this moved when there

1629
01:09:58,470 --> 01:09:55,679
was an el nino or some other big

1630
01:10:00,830 --> 01:09:58,480
oscillation of the earth's atmosphere so

1631
01:10:03,669 --> 01:10:00,840
i hope we learned a whole bunch

1632
01:10:05,350 --> 01:10:03,679
about global precipitation

1633
01:10:08,229 --> 01:10:05,360
and how that

1634
01:10:10,310 --> 01:10:08,239
changes with time of year and changes

1635
01:10:11,510 --> 01:10:10,320
with the big oscillations of the earth's

1636
01:10:13,830 --> 01:10:11,520
atmosphere

1637
01:10:15,110 --> 01:10:13,840
and it helps us understand a little bit

1638
01:10:18,070 --> 01:10:15,120

about how things are

1639
01:10:20,870 --> 01:10:18,080
going to change as the climate changes

1640
01:10:22,550 --> 01:10:20,880
now why is this so important well these

1641
01:10:24,310 --> 01:10:22,560
precipitation measurements this is where

1642
01:10:27,110 --> 01:10:24,320
we get the water for

1643
01:10:28,950 --> 01:10:27,120
uh plants and animals to live we humans

1644
01:10:31,189 --> 01:10:28,960
depend on this

1645
01:10:33,830 --> 01:10:31,199
and by knowing this the the amount of

1646
01:10:36,070 --> 01:10:33,840
precipitation we can calculate things

1647
01:10:37,910 --> 01:10:36,080
such we calculate certain applications

1648
01:10:40,550 --> 01:10:37,920
products that have to do with flooding

1649
01:10:43,270 --> 01:10:40,560
that's been uh mentioned before

1650
01:10:45,510 --> 01:10:43,280
we can also talk from coupling that with

1651
01:10:48,149 --> 01:10:45,520
other instruments we make we can make

1652
01:10:50,550 --> 01:10:48,159
measurements of the health of crops

1653
01:10:53,110 --> 01:10:50,560
and by knowing how the crop healthy the

1654
01:10:56,630 --> 01:10:53,120
crops are and where the flooding is we

1655
01:10:59,750 --> 01:10:56,640
actually create a a famine forecast

1656
01:11:02,950 --> 01:10:59,760
product that we give out to

1657
01:11:05,990 --> 01:11:02,960
usaid and other government agencies and

1658
01:11:08,229 --> 01:11:06,000
that's used to reposition food supplies

1659
01:11:10,229 --> 01:11:08,239
to places famines are going to happen

1660
01:11:11,990 --> 01:11:10,239
but haven't quite happened yet and it's

1661
01:11:15,270 --> 01:11:12,000
all because of things we've learned

1662
01:11:16,630 --> 01:11:15,280
starting with trim and moving on to gpm

1663
01:11:18,229 --> 01:11:16,640

so there's a whole bunch of really

1664
01:11:21,510 --> 01:11:18,239
important stuff that starts with the

1665
01:11:23,510 --> 01:11:21,520
science and moves all the way through to

1666
01:11:24,790 --> 01:11:23,520
these applications products that are

1667
01:11:27,030 --> 01:11:24,800
things that we

1668
01:11:31,910 --> 01:11:27,040
in nasa deliver to the nation in the

1669
01:11:33,510 --> 01:11:31,920
world that are of use to human society

1670
01:11:35,189 --> 01:11:33,520
but to get back to the international

1671
01:11:36,149 --> 01:11:35,199
collaboration this thing wouldn't have

1672
01:11:37,910 --> 01:11:36,159
happened

1673
01:11:39,830 --> 01:11:37,920
without the collaboration that's gone on

1674
01:11:42,070 --> 01:11:39,840
for so many years

1675
01:11:45,510 --> 01:11:42,080
between

1676
01:11:47,270 --> 01:11:45,520
japan jaxa and the japanese scientists

1677
01:11:49,510 --> 01:11:47,280
and the united states nasa and the

1678
01:11:52,070 --> 01:11:49,520
united states scientists

1679
01:11:53,990 --> 01:11:52,080
this is a so to you know disclose this

1680
01:11:57,030 --> 01:11:54,000
is something that's been going on now

1681
01:11:58,149 --> 01:11:57,040
for about 20 years this this project and

1682
01:12:00,550 --> 01:11:58,159
it's gone

1683
01:12:02,870 --> 01:12:00,560
to make trim happen

1684
01:12:05,750 --> 01:12:02,880
now gpm which is going to be bigger and

1685
01:12:07,189 --> 01:12:05,760
better and answer more questions and you

1686
01:12:08,870 --> 01:12:07,199
know it could easily go on into the

1687
01:12:10,870 --> 01:12:08,880
future i can't imagine the the

1688
01:12:13,430 --> 01:12:10,880

international collaboration will be over

1689
01:12:15,270 --> 01:12:13,440
at the end of gpm and no one knows how

1690
01:12:17,590 --> 01:12:15,280
long that will last i think a lot little

1691
01:12:20,070 --> 01:12:17,600
longer than the planned minimum how many

1692
01:12:25,270 --> 01:12:20,080
years art what's the the minimum

1693
01:12:29,189 --> 01:12:27,270
minimum seven years i think it might go

1694
01:12:36,149 --> 01:12:29,199
a little longer anyway thank you very

1695
01:12:39,270 --> 01:12:37,510
wonderful then so we're going to go

1696
01:12:40,870 --> 01:12:39,280
ahead and move into some question and

1697
01:12:42,790 --> 01:12:40,880
answer sessions um for our online

1698
01:12:44,630 --> 01:12:42,800
audience at home just one more reminder

1699
01:12:46,630 --> 01:12:44,640
for you all if you have questions please

1700
01:12:48,630 --> 01:12:46,640
ask them using pound ask nasa as the

1701
01:12:50,310 --> 01:12:48,640
hashtag if you have a question here in

1702
01:12:51,270 --> 01:12:50,320
the room uh if you can step on out to

1703
01:12:53,030 --> 01:12:51,280
one of the aisles to either the

1704
01:12:56,070 --> 01:12:53,040
microphones and we'll go ahead and take

1705
01:12:57,750 --> 01:12:56,080
our first question over here on the left

1706
01:13:01,990 --> 01:12:57,760
hi uh what's the biggest difference

1707
01:13:04,390 --> 01:13:02,000
between the trim mission and the gpm

1708
01:13:06,310 --> 01:13:04,400
and from a measurement perspective

1709
01:13:08,630 --> 01:13:06,320
two two major measures two major

1710
01:13:09,510 --> 01:13:08,640
differences one is trim

1711
01:13:10,790 --> 01:13:09,520
uh

1712
01:13:14,310 --> 01:13:10,800
only went

1713
01:13:15,910 --> 01:13:14,320

35 degrees north and south so we

1714
01:13:16,709 --> 01:13:15,920
basically were getting

1715
01:13:19,510 --> 01:13:16,719
uh

1716
01:13:20,950 --> 01:13:19,520
equatorial and subtropical measurements

1717
01:13:22,870 --> 01:13:20,960
up to just in the beginning of the

1718
01:13:24,790 --> 01:13:22,880
temperate zone whereas gpm is going to

1719
01:13:27,910 --> 01:13:24,800
go up to 65 degrees

1720
01:13:30,229 --> 01:13:27,920
so that gets us up into areas where uh

1721
01:13:33,110 --> 01:13:30,239
gail's graphonic jackson's expertise

1722
01:13:35,590 --> 01:13:33,120
kicks in and measuring snow which is so

1723
01:13:37,590 --> 01:13:35,600
important for so many parts of the world

1724
01:13:40,149 --> 01:13:37,600
including the deposition of snow and the

1725
01:13:41,350 --> 01:13:40,159
buildup of snowpack to run off down the

1726
01:13:44,229 --> 01:13:41,360
rivers

1727
01:13:46,709 --> 01:13:44,239
for water resource so a major thing

1728
01:13:48,709 --> 01:13:46,719
there the other thing that's different

1729
01:13:50,310 --> 01:13:48,719
is that it's a dual frequency radar

1730
01:13:52,390 --> 01:13:50,320
which tells us a whole lot more about

1731
01:13:55,430 --> 01:13:52,400
the drop size distributions hence how

1732
01:14:01,750 --> 01:13:55,440
much water is really there in the clouds

1733
01:14:04,630 --> 01:14:03,430
actually there is one more difference

1734
01:14:05,510 --> 01:14:04,640
and that is

1735
01:14:09,030 --> 01:14:05,520
the

1736
01:14:12,390 --> 01:14:09,040
radiometer has high frequency channels

1737
01:14:14,390 --> 01:14:12,400
183 gigahertz channels

1738
01:14:17,189 --> 01:14:14,400

which are very important again for

1739
01:14:18,550 --> 01:14:17,199
measurement of

1740
01:14:20,310 --> 01:14:18,560
snow

1741
01:14:23,110 --> 01:14:20,320
now um

1742
01:14:24,310 --> 01:14:23,120
also the antenna is much larger so we

1743
01:14:25,189 --> 01:14:24,320
have a

1744
01:14:27,830 --> 01:14:25,199
much

1745
01:14:30,390 --> 01:14:27,840
smaller footprint and that is very

1746
01:14:33,590 --> 01:14:30,400
important because

1747
01:14:34,950 --> 01:14:33,600
when we do it passive microwave

1748
01:14:36,470 --> 01:14:34,960
we need to

1749
01:14:37,350 --> 01:14:36,480
have a

1750
01:14:42,149 --> 01:14:37,360
beam

1751
01:14:43,910 --> 01:14:42,159
the bigger antenna is also so that's the

1752
01:14:46,550 --> 01:14:43,920
big difference thanks ramesh those are

1753
01:14:49,750 --> 01:14:46,560
some of gail's most favorite instruments

1754
01:14:53,030 --> 01:14:51,350
wonderful then we have another question

1755
01:14:56,550 --> 01:14:53,040
over on the right over here

1756
01:15:00,310 --> 01:14:56,560
yes um my name is katie preston and my

1757
01:15:01,430 --> 01:15:00,320
twitter is rva green rev

1758
01:15:03,270 --> 01:15:01,440
and

1759
01:15:06,870 --> 01:15:03,280
my question is not necessarily

1760
01:15:09,750 --> 01:15:06,880
particular to the the gsm and trim

1761
01:15:11,189 --> 01:15:09,760
or gpm and trim missions but more

1762
01:15:14,310 --> 01:15:11,199
generally about the earth sciences

1763
01:15:16,950 --> 01:15:14,320

division of nasa and their importance in

1764
01:15:18,950 --> 01:15:16,960
um true science-based knowledge about

1765
01:15:20,229 --> 01:15:18,960
climate change and the impacts i work

1766
01:15:22,470 --> 01:15:20,239
with the faith communities on

1767
01:15:23,830 --> 01:15:22,480
environmental issues and

1768
01:15:26,229 --> 01:15:23,840
there's a lot of

1769
01:15:27,990 --> 01:15:26,239
unfortunate debate about

1770
01:15:30,950 --> 01:15:28,000
the realness of climate change but i

1771
01:15:34,550 --> 01:15:30,960
think the value of being here today is

1772
01:15:36,310 --> 01:15:34,560
um learning more about how nasa is using

1773
01:15:39,430 --> 01:15:36,320
missions like this and other programs

1774
01:15:41,270 --> 01:15:39,440
within air sciences to give us the the

1775
01:15:42,470 --> 01:15:41,280
science behind climate change and so i'm

1776
01:15:45,270 --> 01:15:42,480
wondering if you can talk a little bit

1777
01:15:47,430 --> 01:15:45,280
about how these missions will feed into

1778
01:15:49,750 --> 01:15:47,440
um helping us better understand the

1779
01:15:52,229 --> 01:15:49,760
impacts of climate change particularly

1780
01:15:53,189 --> 01:15:52,239
when it comes to precipitation events

1781
01:15:55,350 --> 01:15:53,199
and

1782
01:15:58,390 --> 01:15:55,360
like we talked about earlier the the

1783
01:16:00,310 --> 01:15:58,400
flooding that comes from precipitation

1784
01:16:02,229 --> 01:16:00,320
um and all of the

1785
01:16:03,990 --> 01:16:02,239
the detrimental impacts of

1786
01:16:06,870 --> 01:16:04,000
of the ravages of water

1787
01:16:11,189 --> 01:16:06,880
oh thank you great question um

1788
01:16:13,830 --> 01:16:11,199

first about the agency uh nasa is uh

1789
01:16:18,310 --> 01:16:13,840
is a model for how agencies should treat

1790
01:16:20,870 --> 01:16:18,320
its scientists we were told very clearly

1791
01:16:23,110 --> 01:16:20,880
when the climate change debate

1792
01:16:25,750 --> 01:16:23,120
started heating up that our job was to

1793
01:16:27,990 --> 01:16:25,760
communicate what we knew honestly to the

1794
01:16:30,709 --> 01:16:28,000
public and we're not here to talk about

1795
01:16:32,390 --> 01:16:30,719
policy we all have personal ideas about

1796
01:16:34,390 --> 01:16:32,400
the policy but we are here to

1797
01:16:36,550 --> 01:16:34,400
communicate what we know about

1798
01:16:37,590 --> 01:16:36,560
climate change and the measurements we

1799
01:16:38,790 --> 01:16:37,600
make

1800
01:16:40,950 --> 01:16:38,800
so

1801
01:16:43,110 --> 01:16:40,960
that's what we do and

1802
01:16:44,709 --> 01:16:43,120
there's no question about

1803
01:16:47,590 --> 01:16:44,719
climate change from our point of view of

1804
01:16:49,990 --> 01:16:47,600
scientists or about human causation

1805
01:16:52,229 --> 01:16:50,000
and we unabashedly say that as nice as

1806
01:16:54,310 --> 01:16:52,239
scientists and just the way it is that's

1807
01:16:57,270 --> 01:16:54,320
that's what we measure

1808
01:16:59,669 --> 01:16:57,280
the importance of of gpm and trim though

1809
01:17:01,510 --> 01:16:59,679
is the the ability to develop all these

1810
01:17:03,270 --> 01:17:01,520
human applications products that are

1811
01:17:05,510 --> 01:17:03,280
that are so important and are delivered

1812
01:17:08,550 --> 01:17:05,520
all over the place that have to do with

1813
01:17:11,270 --> 01:17:08,560

flooding have to do with drought had to

1814
01:17:12,229 --> 01:17:11,280
do with changes in ecosystems

1815
01:17:14,070 --> 01:17:12,239
and

1816
01:17:15,350 --> 01:17:14,080
the ability to grow crops in different

1817
01:17:17,110 --> 01:17:15,360
places

1818
01:17:19,270 --> 01:17:17,120
knowing where crops are healthy and

1819
01:17:20,470 --> 01:17:19,280
things like that so gpm is a very

1820
01:17:22,790 --> 01:17:20,480
important part of that and it's

1821
01:17:25,430 --> 01:17:22,800
something we communicate as best we can

1822
01:17:29,030 --> 01:17:27,110
wonderful then do we have another

1823
01:17:31,350 --> 01:17:29,040
question over here

1824
01:17:32,870 --> 01:17:31,360
hi from chrishaver.com

1825
01:17:34,950 --> 01:17:32,880
and i was asking

1826
01:17:36,709 --> 01:17:34,960
something along the same lines i was

1827
01:17:39,110 --> 01:17:36,719
wondering if

1828
01:17:41,669 --> 01:17:39,120
another spacecraft of

1829
01:17:42,950 --> 01:17:41,679
similar design and construction could be

1830
01:17:44,630 --> 01:17:42,960
used to fly

1831
01:17:46,229 --> 01:17:44,640
north to south

1832
01:17:47,510 --> 01:17:46,239
and

1833
01:17:50,470 --> 01:17:47,520
to gather

1834
01:17:51,910 --> 01:17:50,480
information on the polar areas for

1835
01:17:53,590 --> 01:17:51,920
climate change

1836
01:17:55,990 --> 01:17:53,600
a great question could

1837
01:17:59,270 --> 01:17:56,000
being could you have a polar orbiter so

1838
01:18:01,110 --> 01:17:59,280

you actually get the whole earth and

1839
01:18:03,910 --> 01:18:01,120
the answer is that the design of the

1840
01:18:06,470 --> 01:18:03,920
orbit for any uh satellite and actually

1841
01:18:07,430 --> 01:18:06,480
you'll see some polar orbiters there

1842
01:18:10,870 --> 01:18:07,440
is

1843
01:18:13,430 --> 01:18:10,880
satellite to be

1844
01:18:15,830 --> 01:18:13,440
and how off how you want its

1845
01:18:18,149 --> 01:18:15,840
measurements to be made uh versus time

1846
01:18:20,149 --> 01:18:18,159
of day one of the problems with uh the

1847
01:18:22,149 --> 01:18:20,159
set the um

1848
01:18:24,470 --> 01:18:22,159
the gps the precipitation measurements

1849
01:18:26,390 --> 01:18:24,480
is you want updates on a three hourly

1850
01:18:27,590 --> 01:18:26,400
basis or even better

1851
01:18:29,990 --> 01:18:27,600
and so

1852
01:18:31,910 --> 01:18:30,000
you choose an orbit that has the some

1853
01:18:33,430 --> 01:18:31,920
precession around the earth that is the

1854
01:18:35,590 --> 01:18:33,440
satellite has to move with respect to

1855
01:18:37,110 --> 01:18:35,600
the spot below it on the earth and if

1856
01:18:38,709 --> 01:18:37,120
you choose some polar orbits it always

1857
01:18:40,630 --> 01:18:38,719
goes around the same spot all the time

1858
01:18:42,709 --> 01:18:40,640
so you see the same time of day and we

1859
01:18:46,390 --> 01:18:42,719
don't want to do that so the orbit

1860
01:18:47,990 --> 01:18:46,400
design is a rather complicated aspect of

1861
01:18:49,189 --> 01:18:48,000
of

1862
01:18:51,270 --> 01:18:49,199
what you want to measure and how you

1863
01:18:52,470 --> 01:18:51,280

want to measure it a good question well

1864
01:18:54,870 --> 01:18:52,480
i guess

1865
01:18:57,830 --> 01:18:54,880
more of the point of what i meant to by

1866
01:19:02,149 --> 01:18:59,350
could it be used

1867
01:19:05,350 --> 01:19:02,159
could a device such as uh this as this

1868
01:19:08,149 --> 01:19:05,360
one be used to monitor the precipitation

1869
01:19:10,630 --> 01:19:08,159
or in the polar regions to gather data

1870
01:19:12,470 --> 01:19:10,640
on climate change

1871
01:19:14,630 --> 01:19:12,480
the answer is yes if you had a polar

1872
01:19:16,149 --> 01:19:14,640
orbiter with these measurements you

1873
01:19:18,630 --> 01:19:16,159
could make measurements over the polar

1874
01:19:20,390 --> 01:19:18,640
region but you might then not be able to

1875
01:19:22,630 --> 01:19:20,400
make measurements other places at

1876
01:19:24,550 --> 01:19:22,640
different times of day so that's part of

1877
01:19:25,669 --> 01:19:24,560
the trade-off and i think the art might

1878
01:19:27,750 --> 01:19:25,679
have

1879
01:19:29,510 --> 01:19:27,760
a comment i just want to

1880
01:19:33,110 --> 01:19:29,520
just point out one thing you asked about

1881
01:19:37,990 --> 01:19:35,189
well the constellation has many polar

1882
01:19:41,430 --> 01:19:38,000
orbiting so we get that data as well the

1883
01:19:44,070 --> 01:19:41,440
reason the 65 degree was this was

1884
01:19:45,750 --> 01:19:44,080
sighted versus 35 or trim

1885
01:19:48,070 --> 01:19:45,760
if you look in the in the map of the

1886
01:19:51,110 --> 01:19:48,080
earth there's not much land coverage

1887
01:19:53,830 --> 01:19:51,120
rain over land was not covered so by

1888
01:19:57,350 --> 01:19:53,840

going 65 degrees we serve two purposes

1889
01:19:59,189 --> 01:19:57,360
one is that we can cross calibrate

1890
01:20:01,590 --> 01:19:59,199
all the polar orbiters because we go

1891
01:20:02,470 --> 01:20:01,600
over the track all the time and that's

1892
01:20:04,149 --> 01:20:02,480
how we

1893
01:20:05,830 --> 01:20:04,159
bring the calibration and adjust the

1894
01:20:06,950 --> 01:20:05,840
data and make sure their data is

1895
01:20:07,910 --> 01:20:06,960
adjusted

1896
01:20:09,669 --> 01:20:07,920
uh

1897
01:20:11,910 --> 01:20:09,679
so it's more accurate

1898
01:20:15,189 --> 01:20:11,920
and then we also can collect if you if

1899
01:20:18,790 --> 01:20:15,199
you go look at the map and look where 65

1900
01:20:20,390 --> 01:20:18,800
degree crosses all the continents

1901
01:20:21,990 --> 01:20:20,400
you see that we now we're going to be

1902
01:20:25,270 --> 01:20:22,000
covering more

1903
01:20:27,270 --> 01:20:25,280
land and more coastal areas

1904
01:20:29,590 --> 01:20:27,280
of where the rain is going to occur

1905
01:20:31,110 --> 01:20:29,600
which where the most important part is

1906
01:20:36,149 --> 01:20:31,120
where you know where all the hurricanes

1907
01:20:40,070 --> 01:20:37,990
wonderful um just a reminder for our

1908
01:20:41,510 --> 01:20:40,080
online audience at home if you have a

1909
01:20:43,830 --> 01:20:41,520
question you're welcome to ask it using

1910
01:20:44,950 --> 01:20:43,840
the hashtag poundasknasa so i think

1911
01:20:47,189 --> 01:20:44,960
we're gonna go ahead and take an online

1912
01:20:48,950 --> 01:20:47,199
question so aries okay this question's

1913
01:20:50,790 --> 01:20:48,960

for peter

1914
01:20:52,629 --> 01:20:50,800
and uh it's gonna make you groan a

1915
01:20:55,270 --> 01:20:52,639
little bit so sorry

1916
01:20:57,030 --> 01:20:55,280
but why is nasa studying earth science

1917
01:21:01,830 --> 01:20:57,040
we should be looking at other

1918
01:21:05,270 --> 01:21:03,510
well there are all sorts of opinions

1919
01:21:06,550 --> 01:21:05,280
about what nasa should be doing and

1920
01:21:08,390 --> 01:21:06,560
shouldn't doing

1921
01:21:10,229 --> 01:21:08,400
i happen to be an earth scientist i

1922
01:21:12,629 --> 01:21:10,239
study the earth as a system

1923
01:21:13,510 --> 01:21:12,639
uh so you know that's our that's our

1924
01:21:16,390 --> 01:21:13,520
thing

1925
01:21:17,910 --> 01:21:16,400
um nasa also though is doing a lot of

1926
01:21:21,669 --> 01:21:17,920
study of

1927
01:21:24,790 --> 01:21:21,679
other things there's uh a heliospheric

1928
01:21:28,070 --> 01:21:24,800
uh science division that studies the sun

1929
01:21:30,870 --> 01:21:28,080
and how the sun varies and and radiation

1930
01:21:33,830 --> 01:21:30,880
episodes from the sun there's an aster

1931
01:21:36,950 --> 01:21:33,840
astrophysics division that uh built the

1932
01:21:39,350 --> 01:21:36,960
hubble space telescope and is is going

1933
01:21:41,270 --> 01:21:39,360
to build other space has other space

1934
01:21:43,510 --> 01:21:41,280
telescopes studying all sorts of things

1935
01:21:46,149 --> 01:21:43,520
about the origins of the universe

1936
01:21:49,270 --> 01:21:46,159
and things like that and there's also a

1937
01:21:51,590 --> 01:21:49,280
planetary division that studies the

1938
01:21:53,990 --> 01:21:51,600

other planets in the solar system

1939
01:21:56,950 --> 01:21:54,000
we in earth science actually collaborate

1940
01:21:59,510 --> 01:21:56,960
with them and the astrophysics folks on

1941
01:22:00,950 --> 01:21:59,520
looking at uh other finding other

1942
01:22:03,350 --> 01:22:00,960
planets and

1943
01:22:05,270 --> 01:22:03,360
the search for life elsewhere that's a

1944
01:22:07,030 --> 01:22:05,280
big thing so we're kind of all over the

1945
01:22:09,350 --> 01:22:07,040
place when it comes to science and using

1946
01:22:12,149 --> 01:22:09,360
space to understand science it's really

1947
01:22:13,669 --> 01:22:12,159
a neat place to be

1948
01:22:15,510 --> 01:22:13,679
wonderful we have another question over

1949
01:22:17,669 --> 01:22:15,520
on the side here

1950
01:22:19,669 --> 01:22:17,679
hi my name is jim acker and i'm actually

1951
01:22:22,629 --> 01:22:19,679
both a tour guide and a

1952
01:22:25,430 --> 01:22:22,639
i work with data of several types in the

1953
01:22:27,430 --> 01:22:25,440
goddard debt information service center

1954
01:22:29,510 --> 01:22:27,440
and one thing i have a comment and a

1955
01:22:31,669 --> 01:22:29,520
question because trim data even though

1956
01:22:32,790 --> 01:22:31,679
the trim orbit only goes to about 35

1957
01:22:34,870 --> 01:22:32,800
degrees

1958
01:22:37,350 --> 01:22:34,880
because the swath extends beyond that

1959
01:22:39,430 --> 01:22:37,360
you can get data to about 45 degrees

1960
01:22:41,750 --> 01:22:39,440
like up to about the north america the

1961
01:22:43,350 --> 01:22:41,760
u.s canadian border my question was

1962
01:22:46,629 --> 01:22:43,360
related to the polar

1963
01:22:48,629 --> 01:22:46,639

is the if gpm orbit goes to 65 is the

1964
01:22:50,470 --> 01:22:48,639
orbit is the swath actually going to go

1965
01:22:51,910 --> 01:22:50,480
further north and further south by

1966
01:22:54,229 --> 01:22:51,920
several degrees or is it actually going

1967
01:22:55,750 --> 01:22:54,239
to stop there

1968
01:22:57,669 --> 01:22:55,760
a little bit

1969
01:23:00,070 --> 01:22:57,679
but ramesh

1970
01:23:01,990 --> 01:23:00,080
well that is the point of the cross

1971
01:23:04,149 --> 01:23:02,000
calibration you know we

1972
01:23:07,110 --> 01:23:04,159
spend a lot of energy in cross

1973
01:23:08,950 --> 01:23:07,120
calibrating the polar arbiters against

1974
01:23:09,990 --> 01:23:08,960
the gpm core

1975
01:23:13,189 --> 01:23:10,000
so

1976
01:23:14,629 --> 01:23:13,199
even though the gpm core is not able to

1977
01:23:16,870 --> 01:23:14,639
go to the poles

1978
01:23:19,750 --> 01:23:16,880
the polar orbiters are but they are

1979
01:23:21,870 --> 01:23:19,760
tuned against gpm so we are essentially

1980
01:23:24,470 --> 01:23:21,880
getting the data of

1981
01:23:27,430 --> 01:23:24,480
approximately same precision with the

1982
01:23:29,830 --> 01:23:27,440
polar arbiters who can get there but gpm

1983
01:23:32,709 --> 01:23:29,840
core cannot so will the gpm swath go a

1984
01:23:35,270 --> 01:23:32,719
little bit further north than 65 a

1985
01:23:38,629 --> 01:23:35,280
little bit for not for the radar but for

1986
01:23:41,270 --> 01:23:38,639
the radiometer a little bit okay but not

1987
01:23:41,990 --> 01:23:41,280
uh to make a big difference

1988
01:23:43,750 --> 01:23:42,000

but

1989
01:23:45,510 --> 01:23:43,760
our reliance that's the whole point of

1990
01:23:50,070 --> 01:23:45,520
the constellations

1991
01:23:50,950 --> 01:23:50,080
is see even now we are able to

1992
01:23:53,350 --> 01:23:50,960
uh

1993
01:23:57,430 --> 01:23:53,360
get a coverage of

1994
01:24:00,149 --> 01:23:57,440
uh 0.25 by 0.25 degrees by what we call

1995
01:24:02,870 --> 01:24:00,159
a multi-satellite analysis right we are

1996
01:24:05,030 --> 01:24:02,880
you know even though trim is uh takes

1997
01:24:08,470 --> 01:24:05,040
about 17

1998
01:24:10,950 --> 01:24:08,480
you know it takes a long time to

1999
01:24:13,590 --> 01:24:10,960
get total coverage from trim

2000
01:24:15,750 --> 01:24:13,600
we are able to get that by cross

2001
01:24:17,830 --> 01:24:15,760
calibrating a large number of satellites

2002
01:24:20,390 --> 01:24:17,840
which are designed for other purposes

2003
01:24:22,310 --> 01:24:20,400
but we are able to cross calibrate for

2004
01:24:23,669 --> 01:24:22,320
measuring precipitation so that's yeah

2005
01:24:25,910 --> 01:24:23,679
i'll just i'll point out we have that

2006
01:24:29,189 --> 01:24:25,920
multi-satellite data and giovanni so

2007
01:24:32,149 --> 01:24:30,470
wonderful then do we have an additional

2008
01:24:33,270 --> 01:24:32,159
online question plugging your own

2009
01:24:36,070 --> 01:24:33,280
project

2010
01:24:39,030 --> 01:24:38,070
okay i'm clearly the queen of the odd

2011
01:24:40,870 --> 01:24:39,040
questions

2012
01:24:46,149 --> 01:24:40,880
how will this mission help us control

2013
01:24:51,669 --> 01:24:49,270

you know the first the first

2014
01:24:52,870 --> 01:24:51,679
science job i had as an atmospheric

2015
01:24:54,950 --> 01:24:52,880
scientist

2016
01:24:56,470 --> 01:24:54,960
was working on a weather modification

2017
01:24:59,270 --> 01:24:56,480
project

2018
01:25:02,470 --> 01:24:59,280
and that went on that was a big

2019
01:25:04,950 --> 01:25:02,480
uh area of research back

2020
01:25:06,790 --> 01:25:04,960
uh way back when before my hair was this

2021
01:25:09,910 --> 01:25:06,800
color

2022
01:25:12,310 --> 01:25:09,920
that's pretty much stopped because we've

2023
01:25:14,709 --> 01:25:12,320
found that there's just so much water up

2024
01:25:16,310 --> 01:25:14,719
there and you can move the precipitation

2025
01:25:18,390 --> 01:25:16,320
a little bit by doing weather

2026
01:25:20,870 --> 01:25:18,400
modification but you really can't

2027
01:25:21,750 --> 01:25:20,880
control the rain

2028
01:25:23,430 --> 01:25:21,760
so

2029
01:25:25,030 --> 01:25:23,440
great question but

2030
01:25:26,470 --> 01:25:25,040
unfortunately i don't think we're going

2031
01:25:28,310 --> 01:25:26,480
to do that

2032
01:25:29,990 --> 01:25:28,320
thank you all right wonderful that was

2033
01:25:38,870 --> 01:25:30,000
our last question thank you very much

2034
01:25:41,750 --> 01:25:40,149
so on behalf of all of us here at the

2035
01:25:43,910 --> 01:25:41,760
goddard space flight center and at nasa

2036
01:25:45,510 --> 01:25:43,920
overall um as well as our partners at

2037
01:25:47,430 --> 01:25:45,520
jaxa we want to thank you guys for

2038
01:25:49,990 --> 01:25:47,440

tuning in for today's broadcast uh this

2039
01:25:51,510 --> 01:25:50,000
ends our show here um before we go just

2040
01:25:53,830 --> 01:25:51,520
a reminder that uh if you want to learn

2041
01:25:56,070 --> 01:25:53,840
more about gpm you can follow it on

2042
01:25:58,070 --> 01:25:56,080
social media on twitter it's at nasa

2043
01:26:00,790 --> 01:25:58,080
underscore rain and on facebook it's

2044
01:26:02,310 --> 01:26:00,800
available on at nasa rain if you are

2045
01:26:03,990 --> 01:26:02,320
looking to follow along with everything

2046
01:26:05,830 --> 01:26:04,000
else that nasa has going on uh please

2047
01:26:07,270 --> 01:26:05,840
follow us on nasa

2048
01:26:10,070 --> 01:26:07,280
if you're looking for us on facebook you

2049
01:26:13,110 --> 01:26:10,080
can find us at facebook.com nasa or you

2050
01:26:15,430 --> 01:26:13,120
can also find us on nasa at google plus

2051
01:26:16,870 --> 01:26:15,440
um beyond that if you have any other

2052
01:26:18,149 --> 01:26:16,880
questions or anything please feel free

2053
01:26:19,510 --> 01:26:18,159
to tweet them into any of the accounts

2054
01:26:21,270 --> 01:26:19,520
that are there post them as a comment

2055
01:26:23,030 --> 01:26:21,280
and we'll be looking for those and to

2056
01:26:24,629 --> 01:26:23,040
get you guys answers if you want to find

2057
01:26:25,910 --> 01:26:24,639
out about an additional nasa social

2058
01:26:27,669 --> 01:26:25,920
events that are happening in the future

2059
01:26:30,390 --> 01:26:27,679
you can always follow us at

2060
01:26:32,070 --> 01:26:30,400
nasa.gov social or at nasa social on

2061
01:26:34,470 --> 01:26:32,080
twitter so thank you very much for

2062
01:26:36,070 --> 01:26:34,480
tuning in today uh as we close out

2063
01:26:38,070 --> 01:26:36,080

today's broadcast we do have one last

2064
01:26:46,950 --> 01:26:38,080
little video talking about um

2065
01:26:50,709 --> 01:26:48,950
we plan our lives around rain

2066
01:26:51,910 --> 01:26:50,719
we always want to know when and where

2067
01:26:54,070 --> 01:26:51,920
and how much

2068
01:26:55,910 --> 01:26:54,080
not just for our weekend plans but for

2069
01:26:57,430 --> 01:26:55,920
how we make decisions about our safety

2070
01:27:02,830 --> 01:26:57,440
and transportation

2071
01:27:06,950 --> 01:27:05,110
economy well apparently we were talking

2072
01:27:18,070 --> 01:27:06,960
out of sync with our lips so it's

2073
01:27:21,350 --> 01:27:19,990
all right then well at this point in

2074
01:27:23,830 --> 01:27:21,360
time then we're going to go ahead and

2075
01:27:25,430 --> 01:27:23,840
wrap up our broadcast um

2076
01:27:27,350 --> 01:27:25,440
if there's anything else that you guys

2077
01:27:28,709 --> 01:27:27,360
have questions on uh our panel of

2078
01:27:29,990 --> 01:27:28,719
experts will remain here for a little

2079
01:27:31,910 --> 01:27:30,000
bit longer and you guys are welcome to

2080
01:27:34,390 --> 01:27:31,920
ask them um we also are going to

2081
01:27:35,830 --> 01:27:34,400
continue on this afternoon with a tour

2082
01:27:37,430 --> 01:27:35,840
of the testing facilities here at

2083
01:27:39,990 --> 01:27:37,440
goddard we're also going to be able to

2084
01:27:41,750 --> 01:27:40,000
see the spacecraft in the clean room or

2085
01:27:43,350 --> 01:27:41,760
excuse me in some of the test facilities

2086
01:27:44,870 --> 01:27:43,360
a little bit later today

2087
01:27:46,790 --> 01:27:44,880
for those who are on so if you follow

2088
01:27:48,950 --> 01:27:46,800

along on all of the uh social media

2089
01:27:51,430 --> 01:27:48,960
postings from our attendees today we'll

2090
01:27:53,189 --> 01:27:51,440
be able to really um you know give you

2091
01:27:54,470 --> 01:27:53,199
guys that in-depth experience looking at

2092
01:27:55,910 --> 01:27:54,480
the spacecraft and everything so look

2093
01:27:58,629 --> 01:27:55,920
out for more of those social media

2094
01:28:02,470 --> 01:28:00,390
all right then thank you all for tuning

2095
01:28:04,310 --> 01:28:02,480
in very much today and uh look forward