
SWOT

1
00:00:07,490 --> 00:00:05,329
hey everyone I'm Marina jurika and I am

2
00:00:09,830 --> 00:00:07,500
joining you live from NASA's jet

3
00:00:11,810 --> 00:00:09,840
propulsion laboratory here in Southern

4
00:00:14,930 --> 00:00:11,820
California we're going to talk to you a

5
00:00:17,090 --> 00:00:14,940
little bit today about the SWAT Mission

6
00:00:19,670 --> 00:00:17,100
which launched from Vandenberg space

7
00:00:22,130 --> 00:00:19,680
Force Base last month now the swap

8
00:00:25,429 --> 00:00:22,140
mission is a joint Mission between NASA

9
00:00:27,710 --> 00:00:25,439
and the French space agency kness and it

10
00:00:30,769 --> 00:00:27,720
is going to track water on the Earth's

11
00:00:33,590 --> 00:00:30,779
surface at over 90 percent which is

12
00:00:36,889 --> 00:00:33,600
pretty amazing now joining me in just a

13
00:00:39,410 --> 00:00:36,899

few moments is Christine Jabara who is a

14
00:00:41,150 --> 00:00:39,420
test and integration engineer here at

15
00:00:43,069 --> 00:00:41,160
JPL and she's going to tell us a little

16
00:00:44,810 --> 00:00:43,079
bit about basically what SWAT has been

17
00:00:46,970 --> 00:00:44,820
doing since launch she's going to give

18
00:00:49,729 --> 00:00:46,980
us an update and we're going to be just

19
00:00:51,229 --> 00:00:49,739
eagerly awaiting all of this SWAT

20
00:00:53,569 --> 00:00:51,239
science data that's going to be coming

21
00:00:54,830 --> 00:00:53,579
down here in the next few months we're

22
00:00:56,750 --> 00:00:54,840
also going to be answering some

23
00:00:59,930 --> 00:00:56,760
questions from you that have come in

24
00:01:02,450 --> 00:00:59,940
over the last couple of weeks and we're

25
00:01:04,910 --> 00:01:02,460
going to be discussing lot with

26
00:01:06,649 --> 00:01:04,920
Christine here in just a few seconds so

27
00:01:10,130 --> 00:01:06,659
just bear with me because I'm going to

28
00:01:13,490 --> 00:01:10,140
invite her in here to our chat from our

29
00:01:19,730 --> 00:01:13,500
sister station which is at Nasa Earth

30
00:01:25,070 --> 00:01:23,510
to come alive and be able to tell us all

31
00:01:27,950 --> 00:01:25,080
these really interesting things about

32
00:01:29,570 --> 00:01:27,960
what it's doing orbiting the Earth right

33
00:01:31,249 --> 00:01:29,580
now so we've just invited her in and

34
00:01:33,890 --> 00:01:31,259
there she is

35
00:01:36,469 --> 00:01:33,900
hi Christine how are you good how are

36
00:01:39,530 --> 00:01:36,479
you I'm doing great well I've got a

37
00:01:41,270 --> 00:01:39,540
one-third scale model of SWAT behind me

38
00:01:43,130 --> 00:01:41,280

here so you're going to be able to talk

39
00:01:45,289 --> 00:01:43,140
a little bit about that but you're in a

40
00:01:46,789 --> 00:01:45,299
really interesting cool location on Labs

41
00:01:49,249 --> 00:01:46,799
so tell us where you're joining us from

42
00:01:51,230 --> 00:01:49,259
yeah I am at the top of the hill here at

43
00:01:53,149 --> 00:01:51,240
NASA JPL in the advanced Deployable

44
00:01:55,310 --> 00:01:53,159
structures lab this is actually where

45
00:01:57,469 --> 00:01:55,320
the Deployable antennas on SWAT were

46
00:01:59,210 --> 00:01:57,479
first prototyped and tested but we test

47
00:02:01,789 --> 00:01:59,220
all sort of Deployable space structures

48
00:02:04,910 --> 00:02:01,799
up here so right here is a little paper

49
00:02:05,990 --> 00:02:04,920
concept kind of origami of a technology

50
00:02:07,789 --> 00:02:06,000
we're developing in here called

51
00:02:09,589 --> 00:02:07,799
starshade and what we do for all our

52
00:02:11,690 --> 00:02:09,599
projects here is we start with small

53
00:02:18,770 --> 00:02:11,700
prototypes and we make them bigger like

54
00:02:24,290 --> 00:02:21,229
so it's like it's like a flower waking

55
00:02:25,910 --> 00:02:24,300
up absolutely so I just closed it but in

56
00:02:27,530 --> 00:02:25,920
reality it's meant to deploy in space

57
00:02:29,930 --> 00:02:27,540
and then over here on the right is an

58
00:02:32,089 --> 00:02:29,940
even higher Fidelity more mature

59
00:02:34,670 --> 00:02:32,099
technology uh prototype that we have

60
00:02:35,630 --> 00:02:34,680
here and so uh yeah that's what we do in

61
00:02:37,850 --> 00:02:35,640
this building

62
00:02:40,369 --> 00:02:37,860
and and when you say it's on the top of

63
00:02:41,869 --> 00:02:40,379

lab it really is a it's a really you

64
00:02:43,490 --> 00:02:41,879
know hundreds of acres here and you have

65
00:02:45,410 --> 00:02:43,500
to hook it all the way to the top of the

66
00:02:48,170 --> 00:02:45,420
hill to get where you are so you're in

67
00:02:49,910 --> 00:02:48,180
super shape absolutely we call it the

68
00:02:51,890 --> 00:02:49,920
Alps the advanced large Precision

69
00:02:53,809 --> 00:02:51,900
structures lab and it's a it's a it's a

70
00:02:56,150 --> 00:02:53,819
pot but absolutely

71
00:02:57,710 --> 00:02:56,160
climbing up the Alps for sure and that's

72
00:02:59,930 --> 00:02:57,720
also where the Karen instrument was born

73
00:03:02,930 --> 00:02:59,940
right absolutely so the Karen instrument

74
00:03:05,809 --> 00:03:02,940
is a radar interferometer that that uses

75
00:03:07,670 --> 00:03:05,819
two Deployable antennas and the antennas

76
00:03:09,410 --> 00:03:07,680
kind of are one on each side of the

77
00:03:11,390 --> 00:03:09,420
satellite and deploy out you can see one

78
00:03:15,350 --> 00:03:11,400
kind of behind your head poking towards

79
00:03:17,089 --> 00:03:15,360
you yeah yeah and this building has a

80
00:03:18,949 --> 00:03:17,099
grid of structure on the ceiling and we

81
00:03:21,830 --> 00:03:18,959
can hang things off of it to simulate

82
00:03:24,290 --> 00:03:21,840
the microgravity of space or of orbiting

83
00:03:26,270 --> 00:03:24,300
Earth and we'll test the deployments

84
00:03:28,130 --> 00:03:26,280
using that grid so we actually built a

85
00:03:29,990 --> 00:03:28,140
prototype of the booms in this building

86
00:03:31,970 --> 00:03:30,000
and made sure that we could deploy it

87
00:03:33,830 --> 00:03:31,980
before before we actually built the real

88
00:03:36,710 --> 00:03:33,840

thing to send a space

89
00:03:38,930 --> 00:03:36,720
now SWAT stands for surface water and

90
00:03:41,750 --> 00:03:38,940
ocean topography so tell us a little bit

91
00:03:44,390 --> 00:03:41,760
Christine about what it is and what your

92
00:03:46,670 --> 00:03:44,400
role was in this mission absolutely so

93
00:03:48,649 --> 00:03:46,680
SWAT is an Earth orbiting satellite and

94
00:03:50,390 --> 00:03:48,659
it'll do the first Global survey of our

95
00:03:52,850 --> 00:03:50,400
surface water and so what that means

96
00:03:55,070 --> 00:03:52,860
it'll tell us to a level of precision

97
00:03:57,890 --> 00:03:55,080
and accuracy that we haven't had before

98
00:03:59,930 --> 00:03:57,900
where the water is moving how much water

99
00:04:01,910 --> 00:03:59,940
is where and how that water may be

100
00:04:04,789 --> 00:04:01,920
ebbing and flowing in our Lakes River

101
00:04:06,410 --> 00:04:04,799
seas and oceans and what I did on the

102
00:04:09,289 --> 00:04:06,420
project I've I've been working on a

103
00:04:11,690 --> 00:04:09,299
great team of American and French

104
00:04:13,610 --> 00:04:11,700
Engineers along with many other partners

105
00:04:16,129 --> 00:04:13,620
to help integrate and test the satellite

106
00:04:17,629 --> 00:04:16,139
what that means is I helped assemble the

107
00:04:20,090 --> 00:04:17,639
mechanisms when they were tiny piece

108
00:04:22,850 --> 00:04:20,100
parts and starting with like a Lego kit

109
00:04:24,530 --> 00:04:22,860
all the way up to a giant satellite we

110
00:04:25,909 --> 00:04:24,540
would assemble something then test it

111
00:04:28,790 --> 00:04:25,919
then it would get bigger go to the next

112
00:04:30,469 --> 00:04:28,800
level and assemble it and test it until

113
00:04:31,490 --> 00:04:30,479

we have the entire satellite and what we

114
00:04:32,990 --> 00:04:31,500
would do is we would put it through

115
00:04:35,270 --> 00:04:33,000
Environmental Testing which means

116
00:04:37,189 --> 00:04:35,280
putting it in a thermal vacuum chamber

117
00:04:39,110 --> 00:04:37,199
to simulate space or putting it on a

118
00:04:40,550 --> 00:04:39,120
vibration table to shake it to simulate

119
00:04:42,770 --> 00:04:40,560
the rocket and make sure nothing would

120
00:04:45,050 --> 00:04:42,780
break so when we send it to space we

121
00:04:47,390 --> 00:04:45,060
were confident it would work

122
00:04:48,710 --> 00:04:47,400
and that's what it is doing right now

123
00:04:51,290 --> 00:04:48,720
yeah absolutely

124
00:04:53,210 --> 00:04:51,300
so tell me a little bit about where SWAT

125
00:04:55,010 --> 00:04:53,220
is right now and and what are the next

126
00:04:56,810 --> 00:04:55,020
steps that have to be taken absolutely

127
00:04:59,030 --> 00:04:56,820
so we launched SWAT a little over a

128
00:05:00,650 --> 00:04:59,040
month ago and since then we've deployed

129
00:05:03,050 --> 00:05:00,660
the solar panels we've deployed the

130
00:05:04,430 --> 00:05:03,060
antennas and or some of the antennas

131
00:05:06,950 --> 00:05:04,440
there's lots of antennas on Swap that

132
00:05:08,749 --> 00:05:06,960
don't deploy and they uh the team in

133
00:05:10,430 --> 00:05:08,759
Mission operations in Toulouse France

134
00:05:12,050 --> 00:05:10,440
has actually been slowly turning on the

135
00:05:13,189 --> 00:05:12,060
satellite making sure all the

136
00:05:15,290 --> 00:05:13,199
temperatures are reading right making

137
00:05:17,270 --> 00:05:15,300
sure all the instruments are behaving

138
00:05:19,129 --> 00:05:17,280

the way we expect them to and kind of

139
00:05:20,689 --> 00:05:19,139
learning how the satellite operates in

140
00:05:23,689 --> 00:05:20,699
space because it's in a new environment

141
00:05:25,490 --> 00:05:23,699
and it's been really exciting to get the

142
00:05:26,930 --> 00:05:25,500
updates and say oh this instrument's on

143
00:05:29,090 --> 00:05:26,940
this instrument's on here's the first

144
00:05:31,010 --> 00:05:29,100
little bit of data and seeing something

145
00:05:33,409 --> 00:05:31,020
that we've worked on the ground for

146
00:05:34,670 --> 00:05:33,419
years doing its job and outside of a

147
00:05:36,590 --> 00:05:34,680
cleaner

148
00:05:38,629 --> 00:05:36,600
and for folks who are just joining us

149
00:05:40,310 --> 00:05:38,639
we're with Christine Jabara and we're

150
00:05:42,110 --> 00:05:40,320
talking about the swap Mission which is

151
00:05:44,270 --> 00:05:42,120
a satellite that we just launched over a

152
00:05:46,129 --> 00:05:44,280
month ago and Folks at home they don't

153
00:05:47,990 --> 00:05:46,139
realize this is a pretty lengthy process

154
00:05:49,610 --> 00:05:48,000
to turn this thing on and get it working

155
00:05:52,070 --> 00:05:49,620
and then make sure that it's working

156
00:05:54,350 --> 00:05:52,080
properly and correctly yeah absolutely

157
00:05:56,270 --> 00:05:54,360
so SWAT actually is kind of in the

158
00:05:58,010 --> 00:05:56,280
commissioning phase and will be in a

159
00:05:59,570 --> 00:05:58,020
calibration orbit for almost six months

160
00:06:01,189 --> 00:05:59,580
where it's kind of going over the same

161
00:06:03,230 --> 00:06:01,199
part of Earth over and over again and

162
00:06:05,150 --> 00:06:03,240
calibrating itself to known Targets on

163
00:06:07,790 --> 00:06:05,160

the ground and so that when it finally

164
00:06:10,070 --> 00:06:07,800
starts doing data for all over the world

165
00:06:11,810 --> 00:06:10,080
we really know that that data is good

166
00:06:14,510 --> 00:06:11,820
data and true science

167
00:06:16,850 --> 00:06:14,520
and as you mentioned we have a video

168
00:06:18,830 --> 00:06:16,860
camera at launch which was pretty cool

169
00:06:20,450 --> 00:06:18,840
and as it was getting deployed and you

170
00:06:21,890 --> 00:06:20,460
can see a bit of the solar panels right

171
00:06:23,390 --> 00:06:21,900
here behind me as you pointed out

172
00:06:24,710 --> 00:06:23,400
Christine and a bit of the Karen

173
00:06:27,469 --> 00:06:24,720
instrument which is the main science

174
00:06:28,850 --> 00:06:27,479
instrument on board tell me a little bit

175
00:06:30,650 --> 00:06:28,860
about and if you didn't get to see the

176
00:06:31,969 --> 00:06:30,660
video head back to our social media

177
00:06:33,050 --> 00:06:31,979
accounts and watch it because it was it

178
00:06:34,610 --> 00:06:33,060
was really cool it's the first time

179
00:06:36,890 --> 00:06:34,620
we've had the video on an Earth

180
00:06:39,469 --> 00:06:36,900
satellite which was awesome but tell me

181
00:06:41,809 --> 00:06:39,479
a little bit about how these instruments

182
00:06:43,430 --> 00:06:41,819
deploy and tell me a little bit about

183
00:06:44,990 --> 00:06:43,440
the instruments themselves on the

184
00:06:47,090 --> 00:06:45,000
spacecraft and why they are Next

185
00:06:48,469 --> 00:06:47,100
Generation so I'm going to talk about

186
00:06:50,029 --> 00:06:48,479
the deployments and I'll talk about the

187
00:06:52,490 --> 00:06:50,039
instruments a little bit our French

188
00:06:54,469 --> 00:06:52,500

partners and atkiness actually built the

189
00:06:55,850 --> 00:06:54,479
solar panels that deployed out and those

190
00:06:58,610 --> 00:06:55,860
provide the power and those are actually

191
00:07:00,469 --> 00:06:58,620
huge they're about the width of a tennis

192
00:07:01,909 --> 00:07:00,479
court and so they deploy out and when

193
00:07:03,650 --> 00:07:01,919
you see that you know the satellite's

194
00:07:05,809 --> 00:07:03,660
gonna get power it's gonna stay warm and

195
00:07:08,510 --> 00:07:05,819
it's always like a you're like okay game

196
00:07:11,749 --> 00:07:08,520
on a little bit and the karat antennas

197
00:07:14,090 --> 00:07:11,759
deploy and those allow us to do the good

198
00:07:15,890 --> 00:07:14,100
science the new novel science that the

199
00:07:18,469 --> 00:07:15,900
Karen instrument will do and actually

200
00:07:20,150 --> 00:07:18,479
those antennas are so big that we can't

201
00:07:21,770 --> 00:07:20,160
fully test them on the ground we test

202
00:07:25,070 --> 00:07:21,780
them kind of in segments on the ground

203
00:07:27,529 --> 00:07:25,080
and so seeing the cameras uh on orbit

204
00:07:30,110 --> 00:07:27,539
and seeing them deploy was amazing

205
00:07:32,570 --> 00:07:30,120
because that antenna hadn't fully been

206
00:07:34,070 --> 00:07:32,580
tested on the ground as one giant

207
00:07:36,290 --> 00:07:34,080
assembly it had been tested very

208
00:07:38,330 --> 00:07:36,300
deliberately very carefully very

209
00:07:40,249 --> 00:07:38,340
intentionally on the ground we were sure

210
00:07:43,070 --> 00:07:40,259
it's going to work but seeing it kind of

211
00:07:45,890 --> 00:07:43,080
in space altogether was really wonderful

212
00:07:47,930 --> 00:07:45,900
and and on that same topic how

213
00:07:50,990 --> 00:07:47,940

fulfilling has it been to see something

214
00:07:52,730 --> 00:07:51,000
like literally spread its wings for you

215
00:07:54,950 --> 00:07:52,740
after all those years of work that you

216
00:07:56,990 --> 00:07:54,960
put into it oh yeah so personally I'm

217
00:07:58,129 --> 00:07:57,000
very used to seeing the satellite in a

218
00:08:00,290 --> 00:07:58,139
clean room in a very controlled

219
00:08:02,749 --> 00:08:00,300
environment we're all wearing hair nets

220
00:08:04,430 --> 00:08:02,759
and gowns and gloves and we're cleaning

221
00:08:07,490 --> 00:08:04,440
it and making sure that everything we

222
00:08:10,189 --> 00:08:07,500
add is very documented and perfect or as

223
00:08:12,469 --> 00:08:10,199
perfect as can be and uh seeing it in

224
00:08:14,210 --> 00:08:12,479
space it's very gratifying but part of

225
00:08:15,650 --> 00:08:14,220
me is also like who who let this happen

226
00:08:17,570 --> 00:08:15,660
why is it outside of a clean room

227
00:08:19,309 --> 00:08:17,580
because to me I'm so used to seeing it

228
00:08:21,110 --> 00:08:19,319
in a clean room but it's so exciting to

229
00:08:23,749 --> 00:08:21,120
see it doing what it was meant to do

230
00:08:25,850 --> 00:08:23,759
right it's gonna be doing science

231
00:08:27,230 --> 00:08:25,860
that'll help us understand our home so

232
00:08:29,629 --> 00:08:27,240
that'll be great

233
00:08:31,490 --> 00:08:29,639
home is where the heart is for sure and

234
00:08:33,769 --> 00:08:31,500
Christine you've had some many exciting

235
00:08:35,389 --> 00:08:33,779
adventures and also the SWAT team had a

236
00:08:37,550 --> 00:08:35,399
lot of hurdles because covet happened

237
00:08:40,250 --> 00:08:37,560
right in the middle uh really your

238
00:08:41,570 --> 00:08:40,260

processing yeah so SWAT has gone through

239
00:08:43,310 --> 00:08:41,580
lots of phases of integration and

240
00:08:46,070 --> 00:08:43,320
testing and kind of in the middle of all

241
00:08:48,290 --> 00:08:46,080
of it uh the pandemic hit and our

242
00:08:50,509 --> 00:08:48,300
partners half of the satellite was built

243
00:08:52,009 --> 00:08:50,519
in France and so it added some new

244
00:08:54,170 --> 00:08:52,019
challenges of how do you build a

245
00:08:55,970 --> 00:08:54,180
satellite with our partners who can't

246
00:08:57,710 --> 00:08:55,980
travel to us and we can't necessarily

247
00:09:00,110 --> 00:08:57,720
travel to them and we figured it out

248
00:09:02,810 --> 00:09:00,120
over time but at first it took a lot of

249
00:09:04,550 --> 00:09:02,820
flexibility we learned how to video

250
00:09:06,410 --> 00:09:04,560
conference in the clean room so our

251
00:09:08,329 --> 00:09:06,420
French Partners would watch us assemble

252
00:09:11,449 --> 00:09:08,339
various parts of the satellite that they

253
00:09:13,130 --> 00:09:11,459
had uh they had some authority over and

254
00:09:15,290 --> 00:09:13,140
it was really exciting but it was

255
00:09:17,210 --> 00:09:15,300
sometimes difficult to be like oh this

256
00:09:18,350 --> 00:09:17,220
team in France is the one or the experts

257
00:09:20,990 --> 00:09:18,360
on this thing but we need to be doing

258
00:09:22,970 --> 00:09:21,000
this here in LA or in Pasadena and hat

259
00:09:25,070 --> 00:09:22,980
and they just caused some flexibility

260
00:09:27,490 --> 00:09:25,080
but it was definitely an adventure

261
00:09:29,690 --> 00:09:27,500
yes an adventure worth taking for sure

262
00:09:31,370 --> 00:09:29,700
and now we're just starting to see the

263
00:09:33,290 --> 00:09:31,380

results and we got some really great

264
00:09:35,389 --> 00:09:33,300
questions over the last couple of weeks

265
00:09:36,769 --> 00:09:35,399
from our viewers and you would just be

266
00:09:38,269 --> 00:09:36,779
the perfect person to answer some of

267
00:09:40,310 --> 00:09:38,279
these are you up for it yeah let's do it

268
00:09:42,490 --> 00:09:40,320
all right okay great first question

269
00:09:45,650 --> 00:09:42,500
comes from Muhammad on Twitter

270
00:09:48,410 --> 00:09:45,660
congratulations on a successful in-orbit

271
00:09:51,350 --> 00:09:48,420
deployment of SWAT how long does it take

272
00:09:53,930 --> 00:09:51,360
to fully deploy the solar arrays is this

273
00:09:56,630 --> 00:09:53,940
spring back effect normal in solar array

274
00:09:58,190 --> 00:09:56,640
deployment but I have to say I'm not an

275
00:09:59,570 --> 00:09:58,200
expert on these solar panels because

276
00:10:01,550 --> 00:09:59,580
they were built by our French Partners

277
00:10:03,050 --> 00:10:01,560
but the solar panels opponent does have

278
00:10:05,329 --> 00:10:03,060
about two phases there's like an initial

279
00:10:07,250 --> 00:10:05,339
kickoff so the solar panels are kind of

280
00:10:09,710 --> 00:10:07,260
kick off and then there's like a

281
00:10:11,329 --> 00:10:09,720
spooling like a wire that gets spooled

282
00:10:13,490 --> 00:10:11,339
in and that deploys the solar panels

283
00:10:15,829 --> 00:10:13,500
fully it takes like 20 to 30 minutes

284
00:10:18,410 --> 00:10:15,839
about in that order of magnitude to

285
00:10:19,910 --> 00:10:18,420
deploy but that uh is relatively quick

286
00:10:21,769 --> 00:10:19,920
when you want to be very careful in

287
00:10:23,269 --> 00:10:21,779
space and make sure these work but our

288
00:10:24,710 --> 00:10:23,279

partners have done this many times so

289
00:10:26,930 --> 00:10:24,720
it's exciting to see that they

290
00:10:28,490 --> 00:10:26,940
successfully deploy and it takes a

291
00:10:30,590 --> 00:10:28,500
little while doesn't it Christine it's

292
00:10:32,389 --> 00:10:30,600
not you know just automatic in 60

293
00:10:33,650 --> 00:10:32,399
seconds they're deployed I mean it just

294
00:10:36,230 --> 00:10:33,660
actually takes some time and even

295
00:10:38,090 --> 00:10:36,240
sometime over the course of days yeah so

296
00:10:40,070 --> 00:10:38,100
we don't always have communication with

297
00:10:42,050 --> 00:10:40,080
the satellite and so you carefully plan

298
00:10:43,850 --> 00:10:42,060
activities so that you know that you're

299
00:10:45,350 --> 00:10:43,860
going to do really big activities like

300
00:10:47,090 --> 00:10:45,360
that one like deploying a solar panel

301
00:10:49,130 --> 00:10:47,100
you do a lot you can do preparation for

302
00:10:52,150 --> 00:10:49,140
weeks just to do it for like 30 minutes

303
00:10:54,470 --> 00:10:52,160
to deploy and the other part of it is

304
00:10:55,910 --> 00:10:54,480
you don't want to break anything or you

305
00:10:58,009 --> 00:10:55,920
don't want anything to snack with

306
00:11:00,590 --> 00:10:58,019
Deployable snagging is always a concern

307
00:11:02,150 --> 00:11:00,600
and so we design a way the chance of

308
00:11:03,290 --> 00:11:02,160
snagging but the faster you should

309
00:11:05,750 --> 00:11:03,300
deploy something the more likely

310
00:11:07,730 --> 00:11:05,760
something is to crack or snag or

311
00:11:09,590 --> 00:11:07,740
something so you want to kind of do it

312
00:11:11,389 --> 00:11:09,600
in a controlled way as much as possible

313
00:11:13,190 --> 00:11:11,399

but that initial kickoff is important

314
00:11:16,250 --> 00:11:13,200
because you kind of want to get away

315
00:11:18,350 --> 00:11:16,260
from the body as quick as possible

316
00:11:21,949 --> 00:11:18,360
awesome okay so next question comes from

317
00:11:23,690 --> 00:11:21,959
Travis Ramirez on YouTube asking if you

318
00:11:26,750 --> 00:11:23,700
could have included one more instrument

319
00:11:29,269 --> 00:11:26,760
or experiment to do with SWAT what would

320
00:11:30,949 --> 00:11:29,279
it be okay so I'm an engineer I like

321
00:11:32,329 --> 00:11:30,959
engineering and Building Things I'm not

322
00:11:33,829 --> 00:11:32,339
a scientist so I don't have a good

323
00:11:35,750 --> 00:11:33,839
understanding of what sort of climate

324
00:11:38,150 --> 00:11:35,760
science might be the most valuable but

325
00:11:39,530 --> 00:11:38,160
SWAT creates a lot of data and that data

326
00:11:41,810 --> 00:11:39,540
is hard to get to the ground because we

327
00:11:43,670 --> 00:11:41,820
only have can only talk to swat during

328
00:11:45,710 --> 00:11:43,680
some time we can't we don't have live

329
00:11:47,150 --> 00:11:45,720
streaming from SWOT all the time and so

330
00:11:49,250 --> 00:11:47,160
what I would do is actually add another

331
00:11:51,530 --> 00:11:49,260
technology called Optical communication

332
00:11:53,210 --> 00:11:51,540
SWOT which is essentially using lasers

333
00:11:55,850 --> 00:11:53,220
to communicate data back to the ground

334
00:11:58,009 --> 00:11:55,860
and that helps us get a higher bandwidth

335
00:11:59,870 --> 00:11:58,019
of data to the ground so I think it'd be

336
00:12:01,190 --> 00:11:59,880
really cool to communicate have SWAT

337
00:12:02,930 --> 00:12:01,200
communicate with lasers back to the

338
00:12:05,210 --> 00:12:02,940

ground space lasers are always kind of

339
00:12:06,769 --> 00:12:05,220
fun to think about but that's what I

340
00:12:08,509 --> 00:12:06,779
would add but I'm not a science expert

341
00:12:09,949 --> 00:12:08,519
I'm just an engineer who wants as much

342
00:12:12,530 --> 00:12:09,959
data as possible

343
00:12:15,050 --> 00:12:12,540
I think lasers in any capacity sounds

344
00:12:16,610 --> 00:12:15,060
really cool absolutely and it's a

345
00:12:18,290 --> 00:12:16,620
technology that JPL is going to launch

346
00:12:20,269 --> 00:12:18,300
on the psyche Mission soon so that's

347
00:12:23,090 --> 00:12:20,279
it's coming it just didn't make it on

348
00:12:25,430 --> 00:12:23,100
the Spot Great next question comes from

349
00:12:27,110 --> 00:12:25,440
Rachel on Instagram what made you want

350
00:12:29,389 --> 00:12:27,120
to become an engineer and do you have

351
00:12:32,150 --> 00:12:29,399
any advice for anyone out there who is

352
00:12:35,569 --> 00:12:32,160
interested in this field yeah so I was

353
00:12:37,069 --> 00:12:35,579
super super lucky to be uh a student in

354
00:12:38,630 --> 00:12:37,079
the Girl Scout sailing program in

355
00:12:40,850 --> 00:12:38,640
Houston Texas as well as a first

356
00:12:43,430 --> 00:12:40,860
robotics student and those two programs

357
00:12:45,889 --> 00:12:43,440
well sailing taught me aerodynamics and

358
00:12:48,170 --> 00:12:45,899
like mechanics of a sailboat and the

359
00:12:50,269 --> 00:12:48,180
robotics taught me engineering and a

360
00:12:52,129 --> 00:12:50,279
little bit of that and so I got exposed

361
00:12:54,110 --> 00:12:52,139
to a lot of stem Concepts without even

362
00:12:55,850 --> 00:12:54,120
knowing I was being exposed to it I just

363
00:12:58,970 --> 00:12:55,860

thought I was sailing and I didn't know

364
00:13:00,769 --> 00:12:58,980
I was learning stem and uh through those

365
00:13:02,870 --> 00:13:00,779
programs I slowly learned that I wanted

366
00:13:04,370 --> 00:13:02,880
to be an engineer now the advice I would

367
00:13:06,769 --> 00:13:04,380
give to someone is to follow your

368
00:13:08,269 --> 00:13:06,779
curiosity I was really privileged to

369
00:13:09,829 --> 00:13:08,279
have access to those programs but if

370
00:13:12,530 --> 00:13:09,839
you're curious about something follow

371
00:13:14,870 --> 00:13:12,540
that Curiosity and don't let a lack of

372
00:13:17,269 --> 00:13:14,880
skills away stop you there's plenty of

373
00:13:18,769 --> 00:13:17,279
resources online on YouTube on all sorts

374
00:13:21,050 --> 00:13:18,779
of places where you can learn something

375
00:13:22,970 --> 00:13:21,060
and don't be intimidated that you might

376
00:13:24,769 --> 00:13:22,980
not know how to use a tool someone is

377
00:13:27,050 --> 00:13:24,779
always willing to teach you or you can

378
00:13:28,430 --> 00:13:27,060
maybe find a resource in your library to

379
00:13:30,889 --> 00:13:28,440
follow your curiosity and learn the

380
00:13:34,190 --> 00:13:30,899
tools you need to follow your curiosity

381
00:13:36,290 --> 00:13:34,200
and so brilliant Christine I was a girl

382
00:13:37,610 --> 00:13:36,300
guide in Canada as well and so I

383
00:13:39,889 --> 00:13:37,620
absolutely loved even just going on

384
00:13:41,990 --> 00:13:39,899
nature walks and and just just getting

385
00:13:43,850 --> 00:13:42,000
out there and figuring out what it is

386
00:13:45,829 --> 00:13:43,860
that you're passionate about and what

387
00:13:48,590 --> 00:13:45,839
you love yeah all right we've got some

388
00:13:51,710 --> 00:13:48,600

more questions coming in so how far from

389
00:13:54,470 --> 00:13:51,720
Earth is SWAT and that's from akawi

390
00:13:56,810 --> 00:13:54,480
Returns on Instagram yeah so swats as

391
00:13:59,090 --> 00:13:56,820
you said is about 550 miles above Earth

392
00:14:00,829 --> 00:13:59,100
it's kind of in a low earth orbit which

393
00:14:03,050 --> 00:14:00,839
allows us to collect that really good

394
00:14:05,410 --> 00:14:03,060
science data without being too far away

395
00:14:08,150 --> 00:14:05,420
and is always going to stay at 550 miles

396
00:14:10,009 --> 00:14:08,160
uh it'll be about there for the rest of

397
00:14:12,050 --> 00:14:10,019
its life but it will switch from like a

398
00:14:13,610 --> 00:14:12,060
holding orbit for calibration to a

399
00:14:16,910 --> 00:14:13,620
slightly different orbit that lets it

400
00:14:18,410 --> 00:14:16,920
see all of our surface water okay and

401
00:14:21,170 --> 00:14:18,420
then we've got another question coming

402
00:14:24,050 --> 00:14:21,180
in from Jeremy on Instagram it's hard to

403
00:14:26,389 --> 00:14:24,060
tell from photos how big SWAT is can you

404
00:14:27,710 --> 00:14:26,399
help us better understand how big this

405
00:14:29,990 --> 00:14:27,720
thing is and it's hard too because this

406
00:14:31,310 --> 00:14:30,000
is the one-third model behind me you

407
00:14:33,410 --> 00:14:31,320
can't even hardly see it because

408
00:14:34,610 --> 00:14:33,420
basically it's it's just the center part

409
00:14:37,670 --> 00:14:34,620
of it and it's not everything that's

410
00:14:40,610 --> 00:14:37,680
included yeah so a lot of people will

411
00:14:42,530 --> 00:14:40,620
compare it to an SUV before it deploys

412
00:14:45,290 --> 00:14:42,540
so it's about the size of like a really

413
00:14:46,730 --> 00:14:45,300

large SUV before it deploys I when I

414
00:14:49,490 --> 00:14:46,740
think about it I think of it more of as

415
00:14:51,530 --> 00:14:49,500
like a small school bus

416
00:14:52,850 --> 00:14:51,540
um so that's about how it is when it's

417
00:14:54,829 --> 00:14:52,860
on the top of the rocket and then when

418
00:14:56,810 --> 00:14:54,839
it goes to space the solar panels and

419
00:14:58,670 --> 00:14:56,820
the antennas the Karen antennas deploy

420
00:15:01,009 --> 00:14:58,680
and it ends up being about the size of a

421
00:15:03,170 --> 00:15:01,019
half tennis score so it becomes quite

422
00:15:04,970 --> 00:15:03,180
large like it has a large footprint once

423
00:15:06,530 --> 00:15:04,980
it's in space but that doesn't fit in

424
00:15:08,569 --> 00:15:06,540
the rocket so it has to kind of go up

425
00:15:10,550 --> 00:15:08,579
all package together

426
00:15:12,230 --> 00:15:10,560
and then everything slowly surely as

427
00:15:14,629 --> 00:15:12,240
it's been doing over the last 40 days

428
00:15:17,030 --> 00:15:14,639
starts to unfold yeah absolutely piece

429
00:15:20,449 --> 00:15:17,040
by piece all right so now I know that

430
00:15:22,490 --> 00:15:20,459
you are a big advocate of women in stem

431
00:15:24,769 --> 00:15:22,500
and I heard you talk a lot about your

432
00:15:26,269 --> 00:15:24,779
you're in France uh we got to spend a

433
00:15:28,610 --> 00:15:26,279
lot of time on Instagram together and I

434
00:15:30,530 --> 00:15:28,620
love seeing all of your posts so tell me

435
00:15:32,509 --> 00:15:30,540
a little bit about how that experience

436
00:15:35,210 --> 00:15:32,519
was spending the year in France working

437
00:15:37,250 --> 00:15:35,220
on SWAT with that team and it was a team

438
00:15:39,050 --> 00:15:37,260

the mechanical team was made up of women

439
00:15:41,509 --> 00:15:39,060
which you also said was just fascinating

440
00:15:42,769 --> 00:15:41,519
yeah absolutely so me along with some of

441
00:15:45,290 --> 00:15:42,779
my colleagues we actually moved to

442
00:15:46,790 --> 00:15:45,300
France for a year to help integrate the

443
00:15:48,889 --> 00:15:46,800
American half of the satellite with the

444
00:15:50,389 --> 00:15:48,899
French half of the satellite and that

445
00:15:51,889 --> 00:15:50,399
was an incredible experience we had

446
00:15:53,389 --> 00:15:51,899
worked with our French Partners remotely

447
00:15:56,150 --> 00:15:53,399
over the pandemic and meeting them in

448
00:15:57,470 --> 00:15:56,160
person was really exciting and uh

449
00:15:59,210 --> 00:15:57,480
personally it was really exciting

450
00:16:01,189 --> 00:15:59,220
because I got to explore France and I

451
00:16:02,810 --> 00:16:01,199
got to work in a new facility and see

452
00:16:04,970 --> 00:16:02,820
how they built satellites and kind of

453
00:16:07,730 --> 00:16:04,980
mesh jpl's

454
00:16:10,189 --> 00:16:07,740
processes with our partners processes at

455
00:16:12,170 --> 00:16:10,199
kness so that was exciting and then the

456
00:16:13,970 --> 00:16:12,180
JPL mechanical team is mostly women and

457
00:16:15,530 --> 00:16:13,980
we actually got to go to France and meet

458
00:16:17,689 --> 00:16:15,540
many of our counterparts who were also

459
00:16:20,810 --> 00:16:17,699
women and stem is a male-dominated field

460
00:16:23,269 --> 00:16:20,820
but it was exciting to see like that

461
00:16:25,790 --> 00:16:23,279
some of the kness project was managed by

462
00:16:27,470 --> 00:16:25,800
an awesome woman and I love rock

463
00:16:30,050 --> 00:16:27,480

climbing and I actually talked to her

464
00:16:31,670 --> 00:16:30,060
and she's a manager high up in her

465
00:16:33,170 --> 00:16:31,680
career and she had grown up rock

466
00:16:35,569 --> 00:16:33,180
climbing in France and we got to bond

467
00:16:37,550 --> 00:16:35,579
over that and just learning and seeing

468
00:16:39,410 --> 00:16:37,560
all of our colleagues on the French side

469
00:16:41,329 --> 00:16:39,420
and the American side kind of merge

470
00:16:43,970 --> 00:16:41,339
cultures and work together in various

471
00:16:45,650 --> 00:16:43,980
ways was really exciting and science has

472
00:16:47,509 --> 00:16:45,660
no boundaries and that's what's so

473
00:16:49,730 --> 00:16:47,519
amazing about projects like these

474
00:16:52,610 --> 00:16:49,740
absolutely especially earth science we

475
00:16:54,829 --> 00:16:52,620
all care about uh making sure that Earth

476
00:16:57,110 --> 00:16:54,839
we know as much as we can about the

477
00:16:59,569 --> 00:16:57,120
climate and so our partners are as

478
00:17:01,730 --> 00:16:59,579
invested in that as we are well thank

479
00:17:03,710 --> 00:17:01,740
you so much for joining us here today

480
00:17:05,090 --> 00:17:03,720
Christine it's been such a pleasure

481
00:17:06,710 --> 00:17:05,100
working with you and I know that you

482
00:17:08,150 --> 00:17:06,720
can't wait for that data to come down

483
00:17:10,130 --> 00:17:08,160
every little piece that comes down is

484
00:17:11,569 --> 00:17:10,140
just as exciting yeah we've gotten the

485
00:17:13,370 --> 00:17:11,579
first little bits of data but I can't

486
00:17:15,110 --> 00:17:13,380
wait for this the satellite to be

487
00:17:16,370 --> 00:17:15,120
calibrated and we'll get real data and

488
00:17:18,110 --> 00:17:16,380

it's been an honor and a pleasure to

489
00:17:21,049 --> 00:17:18,120
work on SWAT with the entire team here

490
00:17:23,210 --> 00:17:21,059
at JPL and across the ocean

491
00:17:25,250 --> 00:17:23,220
well thank you so much Christy and

492
00:17:26,990 --> 00:17:25,260
thanks to all of you guys for being here

493
00:17:29,510 --> 00:17:27,000
with us today if you want to learn more

494
00:17:32,330 --> 00:17:29,520
about the swap Mission you can follow us

495
00:17:34,730 --> 00:17:32,340
here at NASA JPL and also at our sister

496
00:17:37,070 --> 00:17:34,740
station at Nasa Earth that Christine has

497
00:17:38,630 --> 00:17:37,080
been on today and it's a really great

498
00:17:41,270 --> 00:17:38,640
Mission so I hope you have the chance to

499
00:17:43,370 --> 00:17:41,280
go back and and forward with us as we

500
00:17:45,890 --> 00:17:43,380
look forward to that first science data

501
00:17:48,890 --> 00:17:45,900
coming down here in just a few months

502
00:17:51,409 --> 00:17:48,900
and remember at Nasa earth science your

503
00:17:53,330 --> 00:17:51,419
home is our mission thank you so much