

Surface Water and Ocean Topography Mission

PRELAUNCH NEWS CONFERENCE
Wednesday, Dec. 14, 12pm PT / 3pm ET



1
00:01:09,890 --> 00:01:03,310

[Music]

2
00:01:14,330 --> 00:01:12,350

hello and welcome to Vandenberg space

3
00:01:16,730 --> 00:01:14,340

force base on the Central Coast of

4
00:01:18,230 --> 00:01:16,740

California I'm NASA's Megan Cruz and you

5
00:01:21,350 --> 00:01:18,240

are watching the pre-launch news

6
00:01:23,690 --> 00:01:21,360

conference for SWAT SWAT is the surface

7
00:01:26,270 --> 00:01:23,700

water and ocean topography satellite

8
00:01:30,410 --> 00:01:26,280

targeted to lift off tomorrow December

9
00:01:33,649 --> 00:01:30,420

15th at 3 46 a.m Pacific Time Atop A

10
00:01:36,230 --> 00:01:33,659

spell SpaceX Falcon 9 rocket from launch

11
00:01:37,910 --> 00:01:36,240

pad 4 East here at Vandenberg the launch

12
00:01:39,350 --> 00:01:37,920

will be managed by NASA's launch

13
00:01:41,990 --> 00:01:39,360

Services Program

14

00:01:43,609 --> 00:01:42,000

SWAT will survey nearly all water on our

15

00:01:46,670 --> 00:01:43,619

planet's surface for the first time ever

16

00:01:49,190 --> 00:01:46,680

This Global inventory of our water will

17

00:01:51,530 --> 00:01:49,200

help scientists better understand where

18

00:01:54,230 --> 00:01:51,540

the water is where it's coming from and

19

00:01:55,969 --> 00:01:54,240

where it's going these observations will

20

00:01:58,910 --> 00:01:55,979

provide insights into how the ocean

21

00:02:01,370 --> 00:01:58,920

influences climate change how a warming

22

00:02:03,590 --> 00:02:01,380

World affects lakes rivers and

23

00:02:06,410 --> 00:02:03,600

reservoirs and how communities can help

24

00:02:08,809 --> 00:02:06,420

better plan for disasters like floods

25

00:02:11,089 --> 00:02:08,819

SWAT is a joint Mission between NASA and

26

00:02:13,309 --> 00:02:11,099

France's space agency kness with

27

00:02:15,470 --> 00:02:13,319

contributions from the UK and Canadian

28

00:02:17,210 --> 00:02:15,480

space agencies to tell us more about

29

00:02:19,309 --> 00:02:17,220

this Mission we have a distinguished

30

00:02:21,010 --> 00:02:19,319

panel gathered here for you to my far

31

00:02:23,930 --> 00:02:21,020

right over there we have Karen

32

00:02:25,309 --> 00:02:23,940

Saint-Germain she's NASA's director of

33

00:02:28,150 --> 00:02:25,319

earth science

34

00:02:31,070 --> 00:02:28,160

next to her Tim Dunn launch director

35

00:02:34,010 --> 00:02:31,080

NASA's launch Services Program

36

00:02:37,570 --> 00:02:34,020

Julianna shiman director of spacex's

37

00:02:40,729 --> 00:02:37,580

civil satellite missions

38

00:02:42,949 --> 00:02:40,739

SWAT project manager NASA's jet

39

00:02:46,070 --> 00:02:42,959

propulsion Laboratory

40

00:02:49,250 --> 00:02:46,080

Fieri La phone SWAT project manager of

41

00:02:51,949 --> 00:02:49,260

with canes and Captain Max Rush launch

42

00:02:53,630 --> 00:02:51,959

weather officer U.S Air Force

43

00:02:54,770 --> 00:02:53,640

now each will deliver some opening

44

00:02:57,589 --> 00:02:54,780

remarks and then we're going to take

45

00:02:59,690 --> 00:02:57,599

questions from reporters anyone in the

46

00:03:02,449 --> 00:02:59,700

room here can raise their hands and

47

00:03:04,970 --> 00:03:02,459

those on the phone they can get into the

48

00:03:07,030 --> 00:03:04,980

question queue by dialing star one those

49

00:03:10,850 --> 00:03:07,040

on social media can post their questions

50

00:03:13,130 --> 00:03:10,860

using ask NASA okay so with that Karen

51
00:03:15,410 --> 00:03:13,140
go ahead and kick us off great thank you

52
00:03:15,949 --> 00:03:15,420
Megan

53
00:03:18,530 --> 00:03:15,959
um

54
00:03:21,170 --> 00:03:18,540
so many people don't know that the

55
00:03:24,649 --> 00:03:21,180
planet that NASA studies the most is our

56
00:03:26,330 --> 00:03:24,659
home planet the Earth and uh and in the

57
00:03:27,850 --> 00:03:26,340
video I think we're going to show here

58
00:03:31,670 --> 00:03:27,860
in just a minute

59
00:03:33,589 --> 00:03:31,680
we have a fleet of 25 missions that

60
00:03:35,809 --> 00:03:33,599
today are looking down at the Earth

61
00:03:39,290 --> 00:03:35,819
trying to understand how the earth works

62
00:03:41,750 --> 00:03:39,300
as a system and and observing ice and

63
00:03:45,110 --> 00:03:41,760

water and land in the atmosphere

64

00:03:48,710 --> 00:03:45,120

so we're anxiously awaiting the latest

65

00:03:51,830 --> 00:03:48,720

addition to our earth science Fleet this

66

00:03:53,630 --> 00:03:51,840

will be the swap mission that that will

67

00:03:58,369 --> 00:03:53,640

be launching tomorrow morning

68

00:04:01,490 --> 00:03:58,379

so Earth is a water planet and SWAT will

69

00:04:03,589 --> 00:04:01,500

bring us a revolutionary uh a

70

00:04:07,070 --> 00:04:03,599

revolutionary advance in our

71

00:04:10,910 --> 00:04:07,080

understanding of how water moves around

72

00:04:12,949 --> 00:04:10,920

our planet and uh you know it starts in

73

00:04:14,750 --> 00:04:12,959

the oceans it gets delivered to land

74

00:04:16,729 --> 00:04:14,760

through the atmosphere and eventually

75

00:04:20,330 --> 00:04:16,739

returns to the oceans that's the water

76

00:04:24,170 --> 00:04:20,340

cycle and as our climate is changing

77

00:04:27,409 --> 00:04:24,180

the water cycle is Amplified so SWAT is

78

00:04:29,990 --> 00:04:27,419

going to give us a a very high fidelity

79

00:04:31,969 --> 00:04:30,000

understanding of how water is moving

80

00:04:34,670 --> 00:04:31,979

around the planet we're building of

81

00:04:38,870 --> 00:04:34,680

course on a 40-year partnership with

82

00:04:40,969 --> 00:04:38,880

kness in advancing the Technologies and

83

00:04:43,550 --> 00:04:40,979

again with uh with contributions from

84

00:04:45,830 --> 00:04:43,560

the UK and Canadian space agencies and

85

00:04:48,469 --> 00:04:45,840

this new technology will give us 10

86

00:04:49,990 --> 00:04:48,479

times Improvement in the Fidelity the

87

00:04:55,010 --> 00:04:50,000

spatial resolution

88

00:04:57,230 --> 00:04:55,020

in in our measurements of water height

89

00:05:01,010 --> 00:04:57,240

this is important because as the climate

90

00:05:03,530 --> 00:05:01,020

warms oceans are rising our coastlines

91

00:05:06,050 --> 00:05:03,540

are changing and we're seeing large

92

00:05:11,629 --> 00:05:06,060

fluctuations in Inland water bodies

93

00:05:14,270 --> 00:05:11,639

Lakes reservoirs and uh and rivers

94

00:05:17,030 --> 00:05:14,280

from a scientific perspective the

95

00:05:20,210 --> 00:05:17,040

measurements from SWAT will help us

96

00:05:22,490 --> 00:05:20,220

really understand how this water cycle

97

00:05:26,689 --> 00:05:22,500

is changing and the role the critical

98

00:05:28,909 --> 00:05:26,699

role the oceans play in climate change

99

00:05:30,650 --> 00:05:28,919

from a user perspective and this is one

100

00:05:34,610 --> 00:05:30,660

of the things that we're most excited

101
00:05:37,790 --> 00:05:34,620
about the data from SWOT will inform

102
00:05:40,129 --> 00:05:37,800
communities around the world from water

103
00:05:42,890 --> 00:05:40,139
managers and agriculture producers

104
00:05:45,710 --> 00:05:42,900
Inland to Coastal communities who are

105
00:05:48,770 --> 00:05:45,720
dealing with increased risk of flooding

106
00:05:51,710 --> 00:05:48,780
and disaster planning and preparedness

107
00:05:53,629 --> 00:05:51,720
another exciting thing about SWAT is not

108
00:05:55,850 --> 00:05:53,639
just what we're doing but how we're

109
00:05:59,629 --> 00:05:55,860
doing it we will be sharing the data

110
00:06:02,150 --> 00:05:59,639
from SWOT broadly and freely to people

111
00:06:04,129 --> 00:06:02,160
around the globe who can use it to

112
00:06:07,010 --> 00:06:04,139
inform their decisions and this will

113
00:06:09,350 --> 00:06:07,020

happen just a few months after we

114

00:06:12,890 --> 00:06:09,360

we're also building tools to help people

115

00:06:14,650 --> 00:06:12,900

make most use best use of the data so a

116

00:06:17,390 --> 00:06:14,660

really exciting Mission

117

00:06:19,330 --> 00:06:17,400

incredible advances in science and we

118

00:06:21,710 --> 00:06:19,340

just can't wait

119

00:06:23,029 --> 00:06:21,720

to accomplish a lot so we can't wait to

120

00:06:25,610 --> 00:06:23,039

see it launch and with that why don't we

121

00:06:26,990 --> 00:06:25,620

go to Tim all right thank you Megan

122

00:06:29,689 --> 00:06:27,000

so I'm proud to be here today

123

00:06:31,610 --> 00:06:29,699

representing the women and men of NASA's

124

00:06:33,590 --> 00:06:31,620

launch Services Program

125

00:06:35,450 --> 00:06:33,600

and I'm also very proud to be the NASA

126
00:06:37,490 --> 00:06:35,460
launch director for this incredible

127
00:06:40,370 --> 00:06:37,500
Mission SWAT

128
00:06:41,990 --> 00:06:40,380
I'm very excited to be a small part of a

129
00:06:43,550 --> 00:06:42,000
very amazing team that's represented

130
00:06:46,370 --> 00:06:43,560
here today

131
00:06:49,189 --> 00:06:46,380
SWAT is the sixth NASA science mission

132
00:06:51,529 --> 00:06:49,199
that we will launch on a Falcon 9 rocket

133
00:06:53,930 --> 00:06:51,539
and it will depart Earth from historic

134
00:06:55,249 --> 00:06:53,940
slick 4 here at Vandenberg space Force

135
00:06:57,770 --> 00:06:55,259
Base

136
00:07:03,409 --> 00:06:57,780
I would like to recognize nine SWAT

137
00:07:05,689 --> 00:07:03,419
launch Team SpaceX NASA canes Talus and

138
00:07:06,650 --> 00:07:05,699

the U.S space forces space launch Delta

139

00:07:09,110 --> 00:07:06,660

30.

140

00:07:11,330 --> 00:07:09,120

this assembled group of professionals is

141

00:07:13,430 --> 00:07:11,340

exceptional and I would like to take a

142

00:07:16,909 --> 00:07:13,440

moment to give you guys a peek behind

143

00:07:19,249 --> 00:07:16,919

the curtain so we represent each of our

144

00:07:22,010 --> 00:07:19,259

organs but if you guys could see what

145

00:07:24,110 --> 00:07:22,020

goes on behind the scenes with the

146

00:07:26,809 --> 00:07:24,120

teamwork involved with working with

147

00:07:29,629 --> 00:07:26,819

Karen's team at headquarters and perog's

148

00:07:32,089 --> 00:07:29,639

team at JPL and then obviously Juliana

149

00:07:35,870 --> 00:07:32,099

represents an incredible launch vehicle

150

00:07:38,990 --> 00:07:35,880

team at SpaceX it's just amazing how

151
00:07:42,710 --> 00:07:39,000
we're able to bring all of this together

152
00:07:46,309 --> 00:07:42,720
this SWAT capability to to all of us

153
00:07:48,950 --> 00:07:46,319
here on Earth so uh we we get to see

154
00:07:50,689 --> 00:07:48,960
that every day in what we do but I just

155
00:07:52,610 --> 00:07:50,699
wanted to have a moment to share that

156
00:07:55,670 --> 00:07:52,620
with you guys and one other personal

157
00:07:58,370 --> 00:07:55,680
item uh I'm the launch director for this

158
00:08:00,350 --> 00:07:58,380
Mission but uh I by far don't do it

159
00:08:02,510 --> 00:08:00,360
alone I have an incredible team from LSP

160
00:08:05,270 --> 00:08:02,520
but there's one individual that this

161
00:08:08,629 --> 00:08:05,280
will be his last LSP Mission and that's

162
00:08:11,510 --> 00:08:08,639
our LSP senior launch director Omar Baez

163
00:08:14,210 --> 00:08:11,520

and Omar I know you may be out there

164

00:08:17,029 --> 00:08:14,220

watching uh you've meant so much to me

165

00:08:21,650 --> 00:08:17,039

uh you brought me into this role over

166

00:08:23,510 --> 00:08:21,660

the past decade plus and uh if many

167

00:08:26,029 --> 00:08:23,520

people have worked with Omar and know

168

00:08:29,270 --> 00:08:26,039

him he's incredible to what he's brought

169

00:08:31,309 --> 00:08:29,280

to LSP and how he has steadied our

170

00:08:32,870 --> 00:08:31,319

launch Team for so many years we're

171

00:08:35,870 --> 00:08:32,880

going to miss him when he retires in

172

00:08:39,350 --> 00:08:35,880

February but don't go far I'll be

173

00:08:42,709 --> 00:08:39,360

picking up the phone to call you often

174

00:08:44,510 --> 00:08:42,719

all right uh so the integrated Falcon 9

175

00:08:46,550 --> 00:08:44,520

team has been busy with final launch

176
00:08:48,889 --> 00:08:46,560
preparations last week we encapsulated

177
00:08:50,570 --> 00:08:48,899
the SWAT spacecraft inside the payload

178
00:08:52,250 --> 00:08:50,580
Fairing and we performed a successful

179
00:08:54,350 --> 00:08:52,260
Mission dress rehearsal

180
00:08:56,269 --> 00:08:54,360
just last Friday the combined launch

181
00:08:59,090 --> 00:08:56,279
Team held our flight Readiness review

182
00:09:01,670 --> 00:08:59,100
and then later that same day performed a

183
00:09:04,670 --> 00:09:01,680
static fire with a successful seven

184
00:09:07,490 --> 00:09:04,680
second static fire lighting of all nine

185
00:09:09,650 --> 00:09:07,500
of the Falcon 9 engines

186
00:09:11,930 --> 00:09:09,660
subsequently the rocket was returned to

187
00:09:14,329 --> 00:09:11,940
the Slick 4 Hangar where the SWAT

188
00:09:15,050 --> 00:09:14,339

spacecraft was mated on Monday of this

189

00:09:17,210 --> 00:09:15,060

week

190

00:09:19,130 --> 00:09:17,220

now I'd like to show a video of the

191

00:09:21,710 --> 00:09:19,140

launch team's efforts here at Vandenberg

192

00:09:23,389 --> 00:09:21,720

to get us ready for this launch please

193

00:09:27,230 --> 00:09:23,399

roll the video

194

00:09:29,630 --> 00:09:27,240

okay here you see a 747 bringing a lot

195

00:09:32,509 --> 00:09:29,640

of ground support equipment for the SWAT

196

00:09:35,329 --> 00:09:32,519

spacecraft from Europe where it was

197

00:09:37,250 --> 00:09:35,339

manufactured and so this all occurred a

198

00:09:39,230 --> 00:09:37,260

couple of months ago in October right

199

00:09:42,650 --> 00:09:39,240

here at Vandenberg

200

00:09:45,070 --> 00:09:42,660

and there is an Air Force C5 bringing

201
00:09:48,110 --> 00:09:45,080
the actual SWAT spacecraft

202
00:09:50,930 --> 00:09:48,120
there's SWAT in its shipping container

203
00:09:53,329 --> 00:09:50,940
coming off of that C5 aircraft many

204
00:09:55,910 --> 00:09:53,339
thanks to the Air Force for allowing us

205
00:09:58,670 --> 00:09:55,920
to use that aircraft to transport and

206
00:10:01,490 --> 00:09:58,680
here is SWAT unveiled in the astrotech

207
00:10:04,070 --> 00:10:01,500
facility on North Vandenberg it's just a

208
00:10:05,870 --> 00:10:04,080
gorgeous spacecraft and then after we

209
00:10:07,910 --> 00:10:05,880
processed on North Vandenberg we put it

210
00:10:10,430 --> 00:10:07,920
back in its shipping container and

211
00:10:13,730 --> 00:10:10,440
brought it to South Vandenberg to Slick

212
00:10:17,150 --> 00:10:13,740
four and there it is going into a

213
00:10:18,650 --> 00:10:17,160

spacex's payload processing facility at

214

00:10:22,370 --> 00:10:18,660

slick four

215

00:10:25,009 --> 00:10:22,380

uh there's a great still photo of SWAT

216

00:10:26,810 --> 00:10:25,019

unveiled in the ppf at slick four and

217

00:10:30,470 --> 00:10:26,820

there it is about to be encapsulated

218

00:10:32,990 --> 00:10:30,480

with the payload fairings on either side

219

00:10:35,630 --> 00:10:33,000

okay so here is some uh some footage

220

00:10:37,730 --> 00:10:35,640

from the past this is a couple of years

221

00:10:40,190 --> 00:10:37,740

ago when we rolled out Sentinel but this

222

00:10:42,590 --> 00:10:40,200

is what it looked like yesterday as we

223

00:10:45,829 --> 00:10:42,600

rolled to the pad to get ready we went

224

00:10:49,190 --> 00:10:45,839

vertical overnight and uh we're sitting

225

00:10:51,889 --> 00:10:49,200

out on the pad getting ready so uh

226

00:10:53,990 --> 00:10:51,899

yesterday we did also hold the space

227

00:10:56,210 --> 00:10:54,000

launch Delta 30 launch Readiness review

228

00:10:59,630 --> 00:10:56,220

and we followed that with the joint

229

00:11:03,170 --> 00:10:59,640

SpaceX NASA lrr where we received

230

00:11:05,150 --> 00:11:03,180

approval from senior NASA JPL SpaceX and

231

00:11:07,850 --> 00:11:05,160

U.S space force leadership to continue

232

00:11:10,190 --> 00:11:07,860

processing toward launch countdown

233

00:11:13,610 --> 00:11:10,200

you saw in the video uh representative

234

00:11:15,350 --> 00:11:13,620

rollout that did occur uh yesterday and

235

00:11:18,350 --> 00:11:15,360

we are now vertical on the Slick 4

236

00:11:20,389 --> 00:11:18,360

launch Mount we are performing a few

237

00:11:22,670 --> 00:11:20,399

additional inspections of the rocket

238

00:11:24,350 --> 00:11:22,680

today that Juliana will tell you a

239

00:11:26,030 --> 00:11:24,360

little more about

240

00:11:27,829 --> 00:11:26,040

so early tomorrow morning the launch

241

00:11:29,870 --> 00:11:27,839

team will arrive on Console to perform

242

00:11:32,389 --> 00:11:29,880

final pressurization and launch vehicle

243

00:11:34,850 --> 00:11:32,399

checkouts the launch team will be polled

244

00:11:36,470 --> 00:11:34,860

around 3 A.M Pacific time for

245

00:11:39,590 --> 00:11:36,480

concurrence to load the Falcon 9

246

00:11:42,410 --> 00:11:39,600

propellants rp1 kerosene and also

247

00:11:44,690 --> 00:11:42,420

densified liquid oxygen into the stage

248

00:11:46,790 --> 00:11:44,700

one and stage two tanks

249

00:11:48,829 --> 00:11:46,800

after a series of final launch vehicle

250

00:11:54,769 --> 00:11:48,839

checks we will be ready for our targeted

251
00:11:57,889 --> 00:11:54,779
to and launch at 3 46 and 47 seconds am

252
00:12:00,290 --> 00:11:57,899
Pacific time Thursday morning

253
00:12:02,509 --> 00:12:00,300
to summarize the Falcon 9 rocket and

254
00:12:04,550 --> 00:12:02,519
SWAT spacecraft are ready and the launch

255
00:12:07,790 --> 00:12:04,560
team is prepared to launch this very

256
00:12:09,710 --> 00:12:07,800
important Global Water Survey mission

257
00:12:11,269 --> 00:12:09,720
back to you Megan Tim thank you so much

258
00:12:14,269 --> 00:12:11,279
okay Juliana

259
00:12:16,790 --> 00:12:14,279
thank you and thank you all first I want

260
00:12:19,910 --> 00:12:16,800
to start by thanking the whole team here

261
00:12:22,009 --> 00:12:19,920
similar to Tim it's an honor to be here

262
00:12:23,930 --> 00:12:22,019
today with the NASA headquarters team

263
00:12:26,930 --> 00:12:23,940

the NASA launch Services Program team

264

00:12:29,210 --> 00:12:26,940

the NASA JPL team the French base age

265

00:12:30,889 --> 00:12:29,220

the canes team and space launch Delta 30

266

00:12:32,210 --> 00:12:30,899

so it's an honor to be here today with

267

00:12:34,069 --> 00:12:32,220

all of you

268

00:12:36,590 --> 00:12:34,079

as Tim mentioned we successfully

269

00:12:39,590 --> 00:12:36,600

completed a static fire test on Friday

270

00:12:41,030 --> 00:12:39,600

evening after that static fire test many

271

00:12:43,030 --> 00:12:41,040

of you may have seen there was a bit of

272

00:12:45,410 --> 00:12:43,040

some weather in California

273

00:12:47,750 --> 00:12:45,420

people often think about rain in Florida

274

00:12:49,190 --> 00:12:47,760

but not so much rain in California but

275

00:12:50,329 --> 00:12:49,200

here we are in Californians we're happy

276
00:12:52,370 --> 00:12:50,339
with it

277
00:12:54,889 --> 00:12:52,380
um but as part of the standard checkouts

278
00:12:56,870 --> 00:12:54,899
we do on the launch vehicle we check to

279
00:12:58,910 --> 00:12:56,880
confirm there isn't any moisture

280
00:13:00,949 --> 00:12:58,920
intrusion in the in the engines on our

281
00:13:03,110 --> 00:13:00,959
vehicle as part of those standard checks

282
00:13:04,730 --> 00:13:03,120
we did see on two of our engines a

283
00:13:07,129 --> 00:13:04,740
signature that there is some moisture

284
00:13:08,750 --> 00:13:07,139
into those engines what we're doing with

285
00:13:12,170 --> 00:13:08,760
in partnership with the nasalant service

286
00:13:14,389 --> 00:13:12,180
program team we are working to confirm

287
00:13:17,870 --> 00:13:14,399
what fluid is in those engines if it's

288
00:13:19,790 --> 00:13:17,880

water from the storm or or another fluid

289

00:13:21,829 --> 00:13:19,800

so if it is water from the storm we will

290

00:13:25,069 --> 00:13:21,839

work in partnership with NASA to prepare

291

00:13:28,009 --> 00:13:25,079

for launch when we're in a position to

292

00:13:30,350 --> 00:13:28,019

do so tomorrow morning at 3 46 a.m

293

00:13:32,030 --> 00:13:30,360

likely if it is something other than

294

00:13:33,889 --> 00:13:32,040

water we would need to stand down on the

295

00:13:36,230 --> 00:13:33,899

launch and remove and replace those

296

00:13:37,930 --> 00:13:36,240

engines to ensure that we launch

297

00:13:40,310 --> 00:13:37,940

reliably

298

00:13:43,250 --> 00:13:40,320

so that's a little bit on the issue that

299

00:13:45,590 --> 00:13:43,260

Tim mentioned after a successful liftoff

300

00:13:48,350 --> 00:13:45,600

of the SWAT Mission we will be

301

00:13:50,870 --> 00:13:48,360

recovering the first stage booster so

302

00:13:52,730 --> 00:13:50,880

for the Lo those local on the Central

303

00:13:54,530 --> 00:13:52,740

Coast I did want to let you know that

304

00:13:57,650 --> 00:13:54,540

you might hear a couple Sonic booms

305

00:13:59,389 --> 00:13:57,660

quite early in the morning so yeah

306

00:14:01,490 --> 00:13:59,399

excited excited about that hopefully it

307

00:14:03,590 --> 00:14:01,500

doesn't wake you guys up too much and

308

00:14:05,629 --> 00:14:03,600

yeah I just wanted to say on behalf of

309

00:14:07,610 --> 00:14:05,639

all the SpaceX team we're really really

310

00:14:09,710 --> 00:14:07,620

proud to support so many of the NASA

311

00:14:12,710 --> 00:14:09,720

science missions especially SWAT we have

312

00:14:14,629 --> 00:14:12,720

such a long partnership with the JPL the

313

00:14:15,949 --> 00:14:14,639

kness and the NASA team and we're really

314

00:14:18,290 --> 00:14:15,959

proud to support such a cool science

315

00:14:20,810 --> 00:14:18,300

Mission like SWAT so thank you very much

316

00:14:22,310 --> 00:14:20,820

Juliana thank you so much uh we will now

317

00:14:23,810 --> 00:14:22,320

transition to the spacecraft team as

318

00:14:27,170 --> 00:14:23,820

Juliana had said so far why don't you

319

00:14:29,030 --> 00:14:27,180

take it away sure thanks um so I'm parag

320

00:14:31,250 --> 00:14:29,040

vase I'm with JPL I'm the project

321

00:14:34,790 --> 00:14:31,260

manager for SWAT and have been the

322

00:14:36,889 --> 00:14:34,800

project manager since day one uh it's a

323

00:14:38,930 --> 00:14:36,899

a long time coming I think we've been

324

00:14:41,389 --> 00:14:38,940

developing and working on the concept

325

00:14:44,030 --> 00:14:41,399

for almost 20 years

326

00:14:46,670 --> 00:14:44,040

um and and NASA is as Karen describes

327

00:14:48,769 --> 00:14:46,680

takes on challenging missions we take on

328

00:14:51,470 --> 00:14:48,779

challenging missions to solve Global

329

00:14:54,530 --> 00:14:51,480

problems and water is one of those

330

00:14:58,189 --> 00:14:54,540

global problems uh and and water unites

331

00:15:00,590 --> 00:14:58,199

all of us and between the U.S and and

332

00:15:01,670 --> 00:15:00,600

Europe we have been working on this

333

00:15:05,509 --> 00:15:01,680

concept

334

00:15:08,509 --> 00:15:05,519

for more than 20 30 40 years as as Karen

335

00:15:10,670 --> 00:15:08,519

said so SWAT is the culmination of all

336

00:15:13,370 --> 00:15:10,680

those uh those efforts from our

337

00:15:15,170 --> 00:15:13,380

scientists engineers uh and and

338

00:15:18,290 --> 00:15:15,180

management teams really working together

339

00:15:20,449 --> 00:15:18,300

to to be able to form this Mission and

340

00:15:22,629 --> 00:15:20,459

bring it to reality so it's it's a it's

341

00:15:26,210 --> 00:15:22,639

a long journey that that we come up

342

00:15:28,310 --> 00:15:26,220

against and uh now the the last part of

343

00:15:30,710 --> 00:15:28,320

it frankly is actually the development

344

00:15:33,769 --> 00:15:30,720

preparation of the satellite although

345

00:15:35,569 --> 00:15:33,779

that has had its uh share of challenges

346

00:15:38,449 --> 00:15:35,579

which we have worked together between

347

00:15:40,430 --> 00:15:38,459

the U.S and and French team to solve

348

00:15:42,590 --> 00:15:40,440

every step of the way to get to this

349

00:15:44,569 --> 00:15:42,600

point today so I want to show you kind

350

00:15:47,329 --> 00:15:44,579

of illustrate a little bit of that maybe

351

00:15:50,509 --> 00:15:47,339

if you can put up the first graphic of

352

00:15:53,930 --> 00:15:50,519

our of our more recent Journey you can

353

00:15:56,509 --> 00:15:53,940

see that we started the development of

354

00:15:58,550 --> 00:15:56,519

the of the I would say core part of the

355

00:16:02,269 --> 00:15:58,560

scientific portion of the spacecraft

356

00:16:04,250 --> 00:16:02,279

which we call the payload module uh in

357

00:16:08,810 --> 00:16:04,260

in the U.S with again with contributions

358

00:16:11,030 --> 00:16:08,820

from uh the the kness and UK space

359

00:16:14,090 --> 00:16:11,040

agency and the Canadian space agency and

360

00:16:17,329 --> 00:16:14,100

at JPL where we integrated uh the full

361

00:16:20,689 --> 00:16:17,339

payload but that was the start of its

362

00:16:21,470 --> 00:16:20,699

Journey we we developed it tested it and

363

00:16:24,350 --> 00:16:21,480

then

364

00:16:26,689 --> 00:16:24,360

um we actually packaged it up shipped it

365

00:16:28,250 --> 00:16:26,699

to France uh and then continued its

366

00:16:30,590 --> 00:16:28,260

Journey you can see in this graphic on

367

00:16:34,189 --> 00:16:30,600

the on the bottom left Tim showed us

368

00:16:37,189 --> 00:16:34,199

arriving but even well before that we we

369

00:16:40,850 --> 00:16:37,199

made our journey uh to to Europe first

370

00:16:44,150 --> 00:16:40,860

uh and uh and then spent about 14 months

371

00:16:47,449 --> 00:16:44,160

in in Europe uh in in at the facilities

372

00:16:50,749 --> 00:16:47,459

of Talis Linea space actually putting

373

00:16:53,030 --> 00:16:50,759

together our contributions and and uh

374

00:16:54,889 --> 00:16:53,040

kness has thankfully contributed the

375

00:16:57,350 --> 00:16:54,899

what we call the spacecraft bus or

376

00:17:00,170 --> 00:16:57,360

spacecraft platform that was put

377

00:17:01,970 --> 00:17:00,180

together and then as we we went through

378

00:17:05,569 --> 00:17:01,980

a series a long series

379

00:17:08,630 --> 00:17:05,579

of tests and checkouts of the satellite

380

00:17:10,970 --> 00:17:08,640

eventually brought that back uh here to

381

00:17:14,329 --> 00:17:10,980

the United States for a beautiful launch

382

00:17:17,750 --> 00:17:14,339

on a SpaceX Falcon 9 rocket and that

383

00:17:20,049 --> 00:17:17,760

itself was was challenging in putting

384

00:17:22,909 --> 00:17:20,059

together all of the teams the logistics

385

00:17:25,250 --> 00:17:22,919

uh Transportation et cetera to get to

386

00:17:27,309 --> 00:17:25,260

this point and and Tim showed a a

387

00:17:29,750 --> 00:17:27,319

beautiful shot I think of us arriving

388

00:17:32,530 --> 00:17:29,760

here and bottom left

389

00:17:36,470 --> 00:17:32,540

um is uh is a shot of us arriving on the

390

00:17:39,950 --> 00:17:36,480

U.S Air Force C5 that that NASA supplied

391

00:17:42,049 --> 00:17:39,960

to get this pretty large spacecraft and

392

00:17:45,049 --> 00:17:42,059

all of the support equipment over to

393

00:17:47,510 --> 00:17:45,059

Vandenberg space Force Base here uh that

394

00:17:49,430 --> 00:17:47,520

that we now have started over the last

395

00:17:52,310 --> 00:17:49,440

two months done our our final campaign

396

00:17:53,990 --> 00:17:52,320

to check out the spacecraft and get it

397

00:17:55,490 --> 00:17:54,000

ready for launch so you can see on the

398

00:17:58,610 --> 00:17:55,500

next page I think Tim already showed

399

00:18:00,049 --> 00:17:58,620

this maybe on the next graphic are the

400

00:18:01,909 --> 00:18:00,059

the satellite and its final

401
00:18:05,330 --> 00:18:01,919
configuration just before we set our

402
00:18:08,750 --> 00:18:05,340
goodbyes and and wishing it well in in

403
00:18:10,909 --> 00:18:08,760
the in the encapsulated fairing of the

404
00:18:12,890 --> 00:18:10,919
of the Falcon 9

405
00:18:15,650 --> 00:18:12,900
UM the spacecraft is has been checked

406
00:18:16,370 --> 00:18:15,660
it's it's in good health and we we just

407
00:18:18,730 --> 00:18:16,380
finished

408
00:18:22,029 --> 00:18:18,740
um some last checks um during the night

409
00:18:25,250 --> 00:18:22,039
and uh we're really looking forward to

410
00:18:28,370 --> 00:18:25,260
continuing its Journey uh off into space

411
00:18:30,650 --> 00:18:28,380
and really making the first part of of

412
00:18:33,470 --> 00:18:30,660
the realization of SWAT which is really

413
00:18:35,450 --> 00:18:33,480

getting up into launch uh in orbit and

414

00:18:37,190 --> 00:18:35,460

starting to produce that important data

415

00:18:39,230 --> 00:18:37,200

which we expect is going to be

416

00:18:42,529 --> 00:18:39,240

transformational in in many different

417

00:18:45,470 --> 00:18:42,539

fields and really develop that next

418

00:18:47,750 --> 00:18:45,480

generation of measurements and

419

00:18:50,570 --> 00:18:47,760

information ultimately to to help solve

420

00:18:53,270 --> 00:18:50,580

our Global societal problems that I know

421

00:18:56,510 --> 00:18:53,280

Karen is is dedicated towards helping

422

00:18:58,549 --> 00:18:56,520

support so I'm going to continue maybe

423

00:19:00,490 --> 00:18:58,559

and hand it off to my partner Terry

424

00:19:03,710 --> 00:19:00,500

lafon and he'll talk a bit more about

425

00:19:06,409 --> 00:19:03,720

that journey and and more details on the

426

00:19:09,010 --> 00:19:06,419

spacecraft

427

00:19:11,930 --> 00:19:09,020

okay thank you perag

428

00:19:14,690 --> 00:19:11,940

same as perag I've been working and I've

429

00:19:15,890 --> 00:19:14,700

been lucky to work on this Mission since

430

00:19:19,789 --> 00:19:15,900

day one

431

00:19:23,510 --> 00:19:19,799

that's unique and perag and I we pretty

432

00:19:27,049 --> 00:19:23,520

well know every detail of that mission

433

00:19:30,770 --> 00:19:27,059

the hardware the mission the uh the the

434

00:19:34,130 --> 00:19:30,780

operations and so on so let me give you

435

00:19:36,230 --> 00:19:34,140

some information about about the payload

436

00:19:39,890 --> 00:19:36,240

the first slide will show some of the

437

00:19:42,770 --> 00:19:39,900

instrument on board the satellite so the

438

00:19:45,529 --> 00:19:42,780

payload basically is is comprised of two

439

00:19:48,770 --> 00:19:45,539

parts the one is the what we call the

440

00:19:51,289 --> 00:19:48,780

nadio Palio which is a classical nadir

441

00:19:53,270 --> 00:19:51,299

Suite of instrument that have been

442

00:19:56,630 --> 00:19:53,280

already flown on other ultimate

443

00:20:00,110 --> 00:19:56,640

remission but comprising a radar

444

00:20:03,190 --> 00:20:00,120

altimeter we see here we see some

445

00:20:06,110 --> 00:20:03,200

pictures the Dory system which provides

446

00:20:08,570 --> 00:20:06,120

accurate information about the satellite

447

00:20:11,029 --> 00:20:08,580

position in space which is of prime

448

00:20:12,190 --> 00:20:11,039

importance of course to determine the

449

00:20:14,870 --> 00:20:12,200

water height

450

00:20:17,330 --> 00:20:14,880

and and the main instrument of the

451
00:20:18,950 --> 00:20:17,340
mission which is of course the caring

452
00:20:22,930 --> 00:20:18,960
instrument breaks through instrument

453
00:20:26,350 --> 00:20:22,940
that will help providing these brand new

454
00:20:30,289 --> 00:20:26,360
data that all uh we are all expecting

455
00:20:33,350 --> 00:20:30,299
carrying is a unique instrument is white

456
00:20:35,390 --> 00:20:33,360
swath radar interferometer and it's

457
00:20:38,570 --> 00:20:35,400
probably the flagship for a new

458
00:20:43,909 --> 00:20:38,580
generation of altimeters in space

459
00:20:46,730 --> 00:20:43,919
so this payload was built by um JPL and

460
00:20:51,890 --> 00:20:46,740
delivered in France

461
00:20:55,850 --> 00:20:51,900
uh in in June 21 then we integrate as I

462
00:20:59,810 --> 00:20:55,860
have prepared some Patchwork of of views

463
00:21:01,970 --> 00:20:59,820

of the integration of the of the of the

464

00:21:08,210 --> 00:21:01,980

satellite so uh the satellite

465

00:21:11,150 --> 00:21:08,220

integration began in August 21 it was a

466

00:21:14,570 --> 00:21:11,160

14 months effort complicated F4 because

467

00:21:17,270 --> 00:21:14,580

this payload is unique we have a very

468

00:21:19,730 --> 00:21:17,280

big spacecraft with new procedures and

469

00:21:23,150 --> 00:21:19,740

so on but we went through and I would

470

00:21:25,909 --> 00:21:23,160

like to emphasize also that we had to

471

00:21:30,350 --> 00:21:25,919

face the covert period that was something

472

00:21:34,270 --> 00:21:30,360

we didn't expect of course and we had to

473

00:21:38,270 --> 00:21:34,280

manage that very specific

474

00:21:41,810 --> 00:21:38,280

period again as I said thinks of the

475

00:21:44,330 --> 00:21:41,820

close corporation the resilience efforts

476
00:21:47,390 --> 00:21:44,340
of everybody who were able

477
00:21:50,149 --> 00:21:47,400
to recover to resume the activities in

478
00:21:53,870 --> 00:21:50,159
time and not jeopardize the schedule so

479
00:21:57,409 --> 00:21:53,880
that was a unique way to show how these

480
00:22:00,289 --> 00:21:57,419
teams are working close together

481
00:22:03,770 --> 00:22:00,299
um the the satellite which is actually

482
00:22:06,010 --> 00:22:03,780
uh was which which was built by Tales

483
00:22:09,830 --> 00:22:06,020
Alina space

484
00:22:12,169 --> 00:22:09,840
provided the platform and tales are in a

485
00:22:15,789 --> 00:22:12,179
space performed all the integration and

486
00:22:18,590 --> 00:22:15,799
test activities in their premises in can

487
00:22:22,549 --> 00:22:18,600
for 14 months effort

488
00:22:26,270 --> 00:22:22,559

without major anomalies so after that

489

00:22:28,730 --> 00:22:26,280

who were able to ship things to NASA

490

00:22:31,010 --> 00:22:28,740

providing a C5 because we had another

491

00:22:34,250 --> 00:22:31,020

problem to fix which was the

492

00:22:39,289 --> 00:22:34,260

unavailability of the standard Antonov

493

00:22:40,789 --> 00:22:39,299

uh planes that we use uh generally that

494

00:22:43,370 --> 00:22:40,799

were not available because of the

495

00:22:45,470 --> 00:22:43,380

Ukrainian crisis so we had a solution

496

00:22:48,710 --> 00:22:45,480

that helped us meet meet the schedule

497

00:22:50,950 --> 00:22:48,720

that was also another problem we we

498

00:22:53,870 --> 00:22:50,960

didn't thought we had to we had to face

499

00:22:57,169 --> 00:22:53,880

after that we came to the of course to

500

00:22:59,330 --> 00:22:57,179

to the bad and do all our own activities

501
00:23:02,029 --> 00:22:59,340
everything went okay we did all the

502
00:23:04,970 --> 00:23:02,039
checks and the spacecraft is is ready to

503
00:23:07,310 --> 00:23:04,980
go today and at this point I'd like to

504
00:23:08,990 --> 00:23:07,320
emphasize also that okay we'll send the

505
00:23:13,490 --> 00:23:09,000
spacecraft in space it would be a small

506
00:23:16,250 --> 00:23:13,500
Journey for for it and then uh we have

507
00:23:19,549 --> 00:23:16,260
all the teams in Toulouse that will take

508
00:23:24,049 --> 00:23:19,559
over the responsibility of that baby a

509
00:23:26,149 --> 00:23:24,059
newborn baby in space and I'm sure the

510
00:23:28,190 --> 00:23:26,159
hundreds of people that have worked as

511
00:23:31,250 --> 00:23:28,200
you can see on the on the next slide

512
00:23:35,149 --> 00:23:31,260
people in the main control room are

513
00:23:39,350 --> 00:23:35,159

working day after day to make things of

514

00:23:42,110 --> 00:23:39,360

course the smoother it is possible for

515

00:23:44,990 --> 00:23:42,120

the next seven days we have this first

516

00:23:48,830 --> 00:23:45,000

seven days that are very critical to get

517

00:23:51,110 --> 00:23:48,840

everything set in place and of course

518

00:23:53,990 --> 00:23:51,120

we're starting for three and a half

519

00:23:58,310 --> 00:23:54,000

years of operations and providing the

520

00:24:00,770 --> 00:23:58,320

wool World a new set of unique data for

521

00:24:02,510 --> 00:24:00,780

a better understanding of our climate

522

00:24:04,370 --> 00:24:02,520

change impacts

523

00:24:05,690 --> 00:24:04,380

anything so much it's exciting to see

524

00:24:07,850 --> 00:24:05,700

what you guys will hopefully soon

525

00:24:09,350 --> 00:24:07,860

accomplish so that's wonderful okay and

526

00:24:11,330 --> 00:24:09,360

last but not least Captain rush you know

527

00:24:12,649 --> 00:24:11,340

we had some stormy weather uh this past

528

00:24:14,390 --> 00:24:12,659

weekend how are we looking for launch

529

00:24:16,549 --> 00:24:14,400

yeah we're looking great uh as you

530

00:24:18,350 --> 00:24:16,559

mentioned the the weather was pretty bad

531

00:24:20,930 --> 00:24:18,360

this past weekend and after that we've

532

00:24:22,610 --> 00:24:20,940

seen a nice coal this uh this mission in

533

00:24:25,010 --> 00:24:22,620

particular it obviously affects my

534

00:24:27,470 --> 00:24:25,020

career field directly so we're really

535

00:24:31,010 --> 00:24:27,480

excited to be here and to help this

536

00:24:32,570 --> 00:24:31,020

Mission along and into space so

537

00:24:33,710 --> 00:24:32,580

um if we can bring up the satellite shot

538

00:24:37,909 --> 00:24:33,720

I can show you what we're looking at

539

00:24:40,669 --> 00:24:37,919

right now as we as that storm has moved

540

00:24:42,590 --> 00:24:40,679

past we are pretty clear looking out

541

00:24:45,950 --> 00:24:42,600

there right now we do see a little bit

542

00:24:47,330 --> 00:24:45,960

of cirrus clouds over the water and if

543

00:24:49,850 --> 00:24:47,340

anything that's going to make the launch

544

00:24:51,529 --> 00:24:49,860

look pretty cool because the rocket

545

00:24:53,690 --> 00:24:51,539

punching through the thin the thin

546

00:24:55,610 --> 00:24:53,700

cirrus clouds it could create like an

547

00:24:56,450 --> 00:24:55,620

O-ring and then it looks pretty nice I

548

00:24:58,430 --> 00:24:56,460

know a lot of people are going to be

549

00:25:00,590 --> 00:24:58,440

launching or watching this launch and

550

00:25:02,510 --> 00:25:00,600

then the landing as well of course so

551
00:25:05,930 --> 00:25:02,520
that's going to be a great show

552
00:25:07,490 --> 00:25:05,940
hopefully for us this morning

553
00:25:09,529 --> 00:25:07,500
um if we go to the next chart I can show

554
00:25:12,470 --> 00:25:09,539
you the official forecast that we have

555
00:25:14,510 --> 00:25:12,480
for launch we're pretty clear we're just

556
00:25:18,710 --> 00:25:14,520
looking at the serious clouds that are

557
00:25:20,090 --> 00:25:18,720
up at around 19 000 feet visibility is

558
00:25:22,190 --> 00:25:20,100
going to be great as I mentioned so

559
00:25:24,590 --> 00:25:22,200
we're going to be able to see the launch

560
00:25:26,690 --> 00:25:24,600
and Landing well

561
00:25:30,169 --> 00:25:26,700
um if we could bring up the primary day

562
00:25:31,669 --> 00:25:30,179
and the next chart and temperature it's

563
00:25:33,230 --> 00:25:31,679

gonna it's a little cold out there I

564

00:25:34,850 --> 00:25:33,240

don't know it's California but we're

565

00:25:36,470 --> 00:25:34,860

seeing that it's it's pretty cold here

566

00:25:38,210 --> 00:25:36,480

in December too so this is the Central

567

00:25:40,909 --> 00:25:38,220

Coast it's a little bit different

568

00:25:43,010 --> 00:25:40,919

uh winds are going to be super light and

569

00:25:46,310 --> 00:25:43,020

we're looking at a go percentage of 100

570

00:25:49,130 --> 00:25:46,320

for weather and backup day is looking

571

00:25:52,130 --> 00:25:49,140

very very similar with the upper level

572

00:25:55,549 --> 00:25:52,140

cirrus clouds visibility is going to be

573

00:25:57,830 --> 00:25:55,559

fairly well as fairly good as well and a

574

00:26:00,470 --> 00:25:57,840

wind's going to be light 100 go for

575

00:26:02,330 --> 00:26:00,480

backup day as well and that's all I have

576

00:26:04,310 --> 00:26:02,340

we're excited to be here so

577

00:26:06,710 --> 00:26:04,320

thanks Megan you had some great news uh

578

00:26:08,630 --> 00:26:06,720

two days 100 go yeah that's wonderful

579

00:26:10,250 --> 00:26:08,640

okay so thank you everyone for those

580

00:26:12,169 --> 00:26:10,260

opening remarks we're now going to take

581

00:26:13,730 --> 00:26:12,179

questions from reporters and please keep

582

00:26:16,430 --> 00:26:13,740

it to one question and try to address

583

00:26:17,930 --> 00:26:16,440

who you want to answer that question for

584

00:26:19,190 --> 00:26:17,940

those those who just joined us in the

585

00:26:21,470 --> 00:26:19,200

room raise your hand whenever you're

586

00:26:23,450 --> 00:26:21,480

ready to ask a question those on the

587

00:26:26,149 --> 00:26:23,460

phone remember you have to get into the

588

00:26:28,070 --> 00:26:26,159

question queue by dialing star one and

589

00:26:31,909 --> 00:26:28,080

then those on social media your hashtag

590

00:26:33,470 --> 00:26:31,919

to use is a hashtag asknasa okay so

591

00:26:41,029 --> 00:26:33,480

let's start with one on the phone we

592

00:26:45,230 --> 00:26:43,130

been done um

593

00:26:46,789 --> 00:26:45,240

curious about the target orbit for this

594

00:26:49,669 --> 00:26:46,799

position for the insertion what's the

595

00:26:52,370 --> 00:26:49,679

altitude of inclination for insertion of

596

00:26:55,250 --> 00:26:52,380

what uh at deployment from the Falcon 9.

597

00:26:56,510 --> 00:26:55,260

and that's the question maybe a little

598

00:26:59,810 --> 00:26:56,520

bit in the weeds but there's a launch

599

00:27:01,610 --> 00:26:59,820

category notice that shows a kind of a

600

00:27:03,049 --> 00:27:01,620

trajectory out towards the Southwest it

601
00:27:05,930 --> 00:27:03,059
doesn't really match with what I think

602
00:27:08,210 --> 00:27:05,940
the inclination is 78 degrees for this

603
00:27:11,090 --> 00:27:08,220
mission is that's an error or is there

604
00:27:13,850 --> 00:27:11,100
some major dog leg maneuver in it so why

605
00:27:18,529 --> 00:27:16,190
thank you Stephen uh yes so you are

606
00:27:20,930 --> 00:27:18,539
correct there is a significant dog leg

607
00:27:22,789 --> 00:27:20,940
so we are our initial trajectory out of

608
00:27:25,370 --> 00:27:22,799
Vandenberg is going to be southwesterly

609
00:27:28,190 --> 00:27:25,380
but we will be turning uh making that

610
00:27:31,130 --> 00:27:28,200
dog leg a little bit left after that as

611
00:27:33,590 --> 00:27:31,140
far as the uh the orbital parameters

612
00:27:36,529 --> 00:27:33,600
Prague do you know your orbital altitude

613
00:27:38,090 --> 00:27:36,539

850 kilometers 78 degrees inclination

614

00:27:39,710 --> 00:27:38,100

yep

615

00:27:43,310 --> 00:27:39,720

did you get that Stephen

616

00:27:44,990 --> 00:27:43,320

850 kilometers 78 degrees 78 degrees

617

00:27:48,890 --> 00:27:45,000

Yeah you were correct on the inclination

618

00:27:51,350 --> 00:27:48,900

of the once inserted into orbit

619

00:27:54,169 --> 00:27:51,360

and thanks then why why is that dog's

620

00:27:57,169 --> 00:27:54,179

leg there for this mission

621

00:27:59,269 --> 00:27:57,179

uh I think uh Juliana do you know

622

00:28:01,070 --> 00:27:59,279

specifically I can get back with you

623

00:28:03,649 --> 00:28:01,080

Stephen on the specifics but I think

624

00:28:05,930 --> 00:28:03,659

that helps us uh clear some concerns

625

00:28:08,350 --> 00:28:05,940

about when we when we depart uh

626

00:28:11,630 --> 00:28:08,360

Vandenberg we do have excess performance

627

00:28:13,789 --> 00:28:11,640

uh using Falcon 9 with the SWAT payload

628

00:28:16,130 --> 00:28:13,799

and we're probably using that to make

629

00:28:17,990 --> 00:28:16,140

our launch probabilities better in

630

00:28:21,350 --> 00:28:18,000

regards to things like launch day debris

631

00:28:23,930 --> 00:28:21,360

risk and the flyback

632

00:28:29,510 --> 00:28:23,940

thank you the next person on the phone

633

00:28:33,350 --> 00:28:31,490

thank you all for doing this um this

634

00:28:35,510 --> 00:28:33,360

would probably be for for Karen could

635

00:28:37,370 --> 00:28:35,520

you just talk about what are like are

636

00:28:39,470 --> 00:28:37,380

there any kind of satellites in in

637

00:28:41,630 --> 00:28:39,480

massive stable of Earth observation

638

00:28:43,730 --> 00:28:41,640

missions that have a similar capability

639

00:28:46,370 --> 00:28:43,740

to this of what wat can do or is this

640

00:28:48,049 --> 00:28:46,380

something that's really brand new and is

641

00:28:51,110 --> 00:28:48,059

going to provide like an entirely new

642

00:28:53,210 --> 00:28:51,120

data set for you guys thank you

643

00:28:55,909 --> 00:28:53,220

yeah thank you for that question so

644

00:28:58,850 --> 00:28:55,919

we've been doing satellite altimetry

645

00:29:02,090 --> 00:28:58,860

measuring sea surface height for 30

646

00:29:05,330 --> 00:29:02,100

years and that's a big part of the

647

00:29:07,130 --> 00:29:05,340

record we rely on to understand climate

648

00:29:11,510 --> 00:29:07,140

change for example

649

00:29:16,430 --> 00:29:11,520

but what SWAT will do is uh is is give

650

00:29:20,090 --> 00:29:16,440

us a tenfold Improvement in the Fidelity

651
00:29:23,149 --> 00:29:20,100
the the spatial resolution of our

652
00:29:26,029 --> 00:29:23,159
measurements of water height so excuse

653
00:29:28,789 --> 00:29:26,039
me if you think of normal satellite

654
00:29:31,490 --> 00:29:28,799
imagery tells us where the water is and

655
00:29:34,570 --> 00:29:31,500
altimeter tells us how high it is and so

656
00:29:38,149 --> 00:29:34,580
we know how much water is there well

657
00:29:41,330 --> 00:29:38,159
with SWAT with this increased spatial

658
00:29:43,669 --> 00:29:41,340
resolution what that really means is a

659
00:29:45,830 --> 00:29:43,679
few important things the first one is

660
00:29:49,310 --> 00:29:45,840
we'll be able to see

661
00:29:50,870 --> 00:29:49,320
detail in Eddies and currents and

662
00:29:53,510 --> 00:29:50,880
circulation in the oceans that we've

663
00:29:56,330 --> 00:29:53,520

never been able to see before

664

00:29:58,310 --> 00:29:56,340

along our coastlines because we have

665

00:30:01,250 --> 00:29:58,320

that fine spatial resolution will be

666

00:30:03,409 --> 00:30:01,260

able to see changes along our Coastline

667

00:30:04,370 --> 00:30:03,419

that are happening because of rising

668

00:30:08,510 --> 00:30:04,380

Seas

669

00:30:11,269 --> 00:30:08,520

and then Inland with reservoirs lakes

670

00:30:13,250 --> 00:30:11,279

and rivers we'll be able to see water

671

00:30:16,370 --> 00:30:13,260

bodies that we've never been able to see

672

00:30:19,669 --> 00:30:16,380

before so think about putting on glasses

673

00:30:22,130 --> 00:30:19,679

you know we will have a crisp picture of

674

00:30:26,690 --> 00:30:22,140

these Inland water bodies and how much

675

00:30:28,789 --> 00:30:26,700

water is there so globally we'll go from

676
00:30:31,850 --> 00:30:28,799
being able to see

677
00:30:36,169 --> 00:30:31,860
a couple thousand Inland water bodies

678
00:30:40,070 --> 00:30:36,179
lakes and reservoirs two millions

679
00:30:43,130 --> 00:30:40,080
so an enormous positive impact for those

680
00:30:46,250 --> 00:30:43,140
who rely on knowledge of water levels

681
00:30:50,930 --> 00:30:46,260
Inland to manage water for everything

682
00:30:53,090 --> 00:30:50,940
from agriculture to to human consumption

683
00:30:55,070 --> 00:30:53,100
very impressive and thank you Mike for

684
00:30:58,490 --> 00:30:55,080
that question next person on the phone

685
00:31:00,169 --> 00:30:58,500
Jeff Faust with space news

686
00:31:02,450 --> 00:31:00,179
good afternoon a question for uh

687
00:31:05,450 --> 00:31:02,460
Julianna you mentioned that if the

688
00:31:07,669 --> 00:31:05,460

moisture is not water the disease and

689

00:31:10,190 --> 00:31:07,679

you have to replace them I was just

690

00:31:12,830 --> 00:31:10,200

curious what other possibilities are

691

00:31:15,169 --> 00:31:12,840

there for that moisture and if you have

692

00:31:18,649 --> 00:31:15,179

to remove and replace those engines

693

00:31:21,230 --> 00:31:18,659

um what sort of delay are we looking at

694

00:31:23,389 --> 00:31:21,240

okay thank you Jeff and I think I caught

695

00:31:25,730 --> 00:31:23,399

the end of your question so I'll see you

696

00:31:27,169 --> 00:31:25,740

to address both aspects uh first when we

697

00:31:28,070 --> 00:31:27,179

look at what fluid might be in the

698

00:31:29,570 --> 00:31:28,080

engines

699

00:31:32,029 --> 00:31:29,580

um in addition to the potential of water

700

00:31:34,850 --> 00:31:32,039

we could see rp1 or rocket-grade

701
00:31:36,350 --> 00:31:34,860
kerosene or isopar which is one of the

702
00:31:38,930 --> 00:31:36,360
fluids we use in during the

703
00:31:39,889 --> 00:31:38,940
refurbishment process on our engines

704
00:31:42,649 --> 00:31:39,899
um

705
00:31:45,110 --> 00:31:42,659
so that's the first part as far as what

706
00:31:46,730 --> 00:31:45,120
schedule impact we would see for engine

707
00:31:49,130 --> 00:31:46,740
removal replace I can't give any

708
00:31:50,630 --> 00:31:49,140
specifics at this at this time but we

709
00:31:52,490 --> 00:31:50,640
are looking on the order of many days

710
00:31:54,049 --> 00:31:52,500
it's not something that would be a quick

711
00:31:56,269 --> 00:31:54,059
you know on the hour fix something we

712
00:31:58,610 --> 00:31:56,279
could make our current primary or backup

713
00:32:00,889 --> 00:31:58,620

launch date

714

00:32:03,110 --> 00:32:00,899

Joanne we have some questions from

715

00:32:08,389 --> 00:32:03,120

social now can we get a mike over to

716

00:32:12,950 --> 00:32:10,430

uh Troy from Twitter has a two-part

717

00:32:15,110 --> 00:32:12,960

question the first part is when is first

718

00:32:17,510 --> 00:32:15,120

light and then when will data be

719

00:32:19,430 --> 00:32:17,520

available to the public

720

00:32:22,370 --> 00:32:19,440

maybe I can take that yeah

721

00:32:25,930 --> 00:32:22,380

so um you know as we as actually Terry

722

00:32:28,789 --> 00:32:25,940

was describing the SWAT science payload

723

00:32:32,389 --> 00:32:28,799

has has our brand new Karen instrument

724

00:32:34,730 --> 00:32:32,399

but is also has other traditional

725

00:32:37,490 --> 00:32:34,740

altimetry instruments that that we've

726

00:32:40,310 --> 00:32:37,500

flown on past satellites as as Karen

727

00:32:42,289 --> 00:32:40,320

mentioned so there's an Heritage portion

728

00:32:44,210 --> 00:32:42,299

that's that we know quite well and we

729

00:32:46,970 --> 00:32:44,220

know how to commission it well we know

730

00:32:48,950 --> 00:32:46,980

how to produce the data pretty well so

731

00:32:51,889 --> 00:32:48,960

that portion of the payload we should

732

00:32:55,250 --> 00:32:51,899

start and have it activated by the end

733

00:32:59,029 --> 00:32:55,260

of January and start having some I would

734

00:33:02,630 --> 00:32:59,039

say first light results uh you know by

735

00:33:05,210 --> 00:33:02,640

middle of February time frame in terms

736

00:33:06,370 --> 00:33:05,220

of getting that data out you know SWAT

737

00:33:09,830 --> 00:33:06,380

has um

738

00:33:11,870 --> 00:33:09,840

a unique uh operational plan so the

739

00:33:14,389 --> 00:33:11,880

first six months of the mission from

740

00:33:16,970 --> 00:33:14,399

launch we're actually launching into a

741

00:33:20,090 --> 00:33:16,980

unique calibration validation orbit it's

742

00:33:21,549 --> 00:33:20,100

it's it's specifically designed so that

743

00:33:24,049 --> 00:33:21,559

we're able to

744

00:33:26,509 --> 00:33:24,059

commission and understand the the

745

00:33:29,450 --> 00:33:26,519

behavior of the instrumentation and then

746

00:33:31,909 --> 00:33:29,460

move into our science orbit which is a

747

00:33:34,370 --> 00:33:31,919

little bit higher 891 kilometers same

748

00:33:38,149 --> 00:33:34,380

inclination where we'll start a more

749

00:33:41,269 --> 00:33:38,159

consistent repeat of the of the globe

750

00:33:43,190 --> 00:33:41,279

every 21 days collecting data the reason

751
00:33:46,009 --> 00:33:43,200
I mentioned all of that is because we'll

752
00:33:48,649 --> 00:33:46,019
actually start our science Mission about

753
00:33:50,750 --> 00:33:48,659
six months after launch and we'll start

754
00:33:52,690 --> 00:33:50,760
producing products from from those

755
00:33:56,269 --> 00:33:52,700
Mission from those

756
00:33:57,769 --> 00:33:56,279
from that period forward the Nader

757
00:34:00,490 --> 00:33:57,779
payload products will start getting

758
00:34:04,370 --> 00:34:00,500
released to the public I think around

759
00:34:07,070 --> 00:34:04,380
launch plus nine nine ten months in that

760
00:34:11,089 --> 00:34:07,080
in that time order and we're looking

761
00:34:12,829 --> 00:34:11,099
towards a similar Target for our new

762
00:34:15,950 --> 00:34:12,839
payload which is which is the Karen

763
00:34:18,589 --> 00:34:15,960

instrument with more I would say checked

764

00:34:19,669 --> 00:34:18,599

and validated products uh in the in the

765

00:34:22,250 --> 00:34:19,679

launch Plus

766

00:34:25,730 --> 00:34:22,260

14 months period

767

00:34:29,570 --> 00:34:27,530

another social question

768

00:34:31,190 --> 00:34:29,580

all right Betty from Twitter wants to

769

00:34:33,530 --> 00:34:31,200

know what are the benefits of tracking

770

00:34:41,030 --> 00:34:37,190

well there are so many there are so many

771

00:34:43,369 --> 00:34:41,040

important benefits but

772

00:34:47,030 --> 00:34:43,379

um I'll mention just a few

773

00:34:49,730 --> 00:34:47,040

in our Coastal communities actually let

774

00:34:51,829 --> 00:34:49,740

me back up a step so one of the things

775

00:34:54,470 --> 00:34:51,839

that we're seeing with the warming

776

00:34:57,349 --> 00:34:54,480

climate is an enhancement of the water

777

00:34:59,990 --> 00:34:57,359

cycle and that generally means that in

778

00:35:03,470 --> 00:35:00,000

many places that have water they're

779

00:35:08,450 --> 00:35:03,480

seeing even more and in many places that

780

00:35:10,450 --> 00:35:08,460

are drier it's getting even drier so in

781

00:35:14,270 --> 00:35:10,460

those areas where

782

00:35:16,670 --> 00:35:14,280

too much water is a problem SWAT will

783

00:35:17,630 --> 00:35:16,680

help us understand

784

00:35:22,130 --> 00:35:17,640

um

785

00:35:24,770 --> 00:35:22,140

how that water is is moving and get

786

00:35:28,069 --> 00:35:24,780

better at predicting when there may be

787

00:35:30,890 --> 00:35:28,079

inundation whether it's flooding in a

788

00:35:34,250 --> 00:35:30,900

Coastal Community from a storm surge or

789

00:35:36,650 --> 00:35:34,260

or vulnerability to flooding due to

790

00:35:40,069 --> 00:35:36,660

severe weather inland

791

00:35:44,569 --> 00:35:40,079

in areas where the climate is getting

792

00:35:48,170 --> 00:35:44,579

drier there managing water is a resource

793

00:35:50,810 --> 00:35:48,180

is the challenge and so so these very

794

00:35:53,630 --> 00:35:50,820

high fidelity measurements of how much

795

00:35:57,170 --> 00:35:53,640

water is in the reservoirs and lakes and

796

00:35:59,690 --> 00:35:57,180

rivers can be a really critical piece of

797

00:36:02,589 --> 00:35:59,700

information for smart management of

798

00:36:05,270 --> 00:36:02,599

water whether that's for food production

799

00:36:06,829 --> 00:36:05,280

or again just to support local

800

00:36:08,690 --> 00:36:06,839

communities

801
00:36:10,550 --> 00:36:08,700
is an ever-changing resource and it's

802
00:36:12,230 --> 00:36:10,560
one of our most important resources so

803
00:36:13,730 --> 00:36:12,240
it's important to track

804
00:36:15,290 --> 00:36:13,740
go back on the phone now

805
00:36:19,010 --> 00:36:15,300
and Clark again he has a follow-up

806
00:36:22,970 --> 00:36:21,950
I think my questions for Prague I think

807
00:36:23,810 --> 00:36:22,980
you answered some of it about the

808
00:36:25,670 --> 00:36:23,820
conditioning but can you talk

809
00:36:27,530 --> 00:36:25,680
specifically about

810
00:36:29,210 --> 00:36:27,540
um the early days of the mission uh how

811
00:36:31,910 --> 00:36:29,220
that timeline will play out

812
00:36:33,710 --> 00:36:31,920
um with first acquisition of the signal

813
00:36:37,609 --> 00:36:33,720

and then also critically the deployment

814

00:36:42,349 --> 00:36:40,310

but maybe what was your question you

815

00:36:48,550 --> 00:36:42,359

want to know more about those first few

816

00:36:54,470 --> 00:36:52,550

yeah so um so first of all after we we

817

00:36:56,870 --> 00:36:54,480

have our beautiful separation from the

818

00:36:58,430 --> 00:36:56,880

from the rocket uh you know we'll go

819

00:37:00,170 --> 00:36:58,440

through basically

820

00:37:03,410 --> 00:37:00,180

um about a three hour period let's say

821

00:37:05,150 --> 00:37:03,420

uh in in an automatic mode so that uh we

822

00:37:07,670 --> 00:37:05,160

can first acquire Telemetry from the

823

00:37:10,430 --> 00:37:07,680

satellite and then importantly

824

00:37:13,250 --> 00:37:10,440

um have the uh solar race deployed so

825

00:37:16,010 --> 00:37:13,260

that we can check that the basic health

826
00:37:17,690 --> 00:37:16,020
and safety of the satellite uh look good

827
00:37:20,270 --> 00:37:17,700
and that we're power positive so we

828
00:37:21,530 --> 00:37:20,280
expect to do that roughly uh in about

829
00:37:23,810 --> 00:37:21,540
three hours

830
00:37:26,089 --> 00:37:23,820
um and then and then you know as Terry

831
00:37:28,970 --> 00:37:26,099
described the satellite controllers in

832
00:37:31,190 --> 00:37:28,980
in France will really be continuing the

833
00:37:34,609 --> 00:37:31,200
process of checking out the basic

834
00:37:37,069 --> 00:37:34,619
functions of of the of the satellite and

835
00:37:38,710 --> 00:37:37,079
particularly the the platform uh in

836
00:37:42,050 --> 00:37:38,720
terms of the basic

837
00:37:44,089 --> 00:37:42,060
capabilities of of the platform and then

838
00:37:47,150 --> 00:37:44,099

we kind of move uh starting right from

839

00:37:49,790 --> 00:37:47,160

about day four into an important period

840

00:37:52,250 --> 00:37:49,800

for our new instrument the Karen

841

00:37:55,069 --> 00:37:52,260

instrument where we'll start the antenna

842

00:37:57,470 --> 00:37:55,079

deployment and the antenna deployment is

843

00:38:00,410 --> 00:37:57,480

a multi-part deployment it's it's a

844

00:38:03,109 --> 00:38:00,420

first of a Kind design that we have

845

00:38:06,470 --> 00:38:03,119

that'll take place over the course of of

846

00:38:10,069 --> 00:38:06,480

about four days so we plan to do it step

847

00:38:13,609 --> 00:38:10,079

by step carefully uh one and and but

848

00:38:16,310 --> 00:38:13,619

roughly about launch plus eight days

849

00:38:19,010 --> 00:38:16,320

maybe eight nine days we we expect to

850

00:38:21,050 --> 00:38:19,020

finish this important activity and then

851

00:38:23,510 --> 00:38:21,060

move back towards our our nominal

852

00:38:26,089 --> 00:38:23,520

orientation towards the Sun and then

853

00:38:28,370 --> 00:38:26,099

start the rest of the of the turn on and

854

00:38:37,069 --> 00:38:28,380

commissioning of the spacecraft

855

00:38:43,069 --> 00:38:39,950

yeah we have a um an interesting uh

856

00:38:44,569 --> 00:38:43,079

let's say add-on which is a set of

857

00:38:47,870 --> 00:38:44,579

cameras that we have we have four

858

00:38:50,690 --> 00:38:47,880

cameras mounted on the payload module

859

00:38:52,970 --> 00:38:50,700

um they are available to us although we

860

00:38:54,950 --> 00:38:52,980

have plenty of other instrumentation to

861

00:38:58,010 --> 00:38:54,960

actually monitor the health safety and

862

00:39:01,970 --> 00:38:58,020

status of the of the spacecraft and the

863

00:39:04,190 --> 00:39:01,980

deployment but we do have cameras that

864

00:39:06,349 --> 00:39:04,200

are should be able to image the solar

865

00:39:09,050 --> 00:39:06,359

rays on one side and and also the

866

00:39:11,510 --> 00:39:09,060

antenna deployment after that so we're

867

00:39:15,829 --> 00:39:11,520

we're expecting to have some beautiful

868

00:39:17,990 --> 00:39:15,839

imagery and and also a movie of the

869

00:39:20,230 --> 00:39:18,000

antenna deployment in particular and and

870

00:39:22,609 --> 00:39:20,240

are expecting it to be a nice

871

00:39:25,310 --> 00:39:22,619

end-of-year present for all of us yeah

872

00:39:28,670 --> 00:39:25,320

that's a nice present very unique

873

00:39:31,370 --> 00:39:28,680

present okay we also have Lucy from AFP

874

00:39:37,730 --> 00:39:34,670

hi and thanks for for doing this and my

875

00:39:40,250 --> 00:39:37,740

question is for uh I think you mentioned

876

00:39:43,790 --> 00:39:40,260

the lifetime of three and a half years

877

00:39:46,910 --> 00:39:43,800

uh it's just the the requirement or and

878

00:39:49,010 --> 00:39:46,920

are you hoping for for more than that

879

00:39:51,530 --> 00:39:49,020

um and also if I may I have a second

880

00:39:53,990 --> 00:39:51,540

question could you maybe extend a little

881

00:39:55,910 --> 00:39:54,000

bit on the main uh scientific instrument

882

00:39:57,770 --> 00:39:55,920

carrying

883

00:40:00,770 --> 00:39:57,780

um could you explain a little bit for

884

00:40:03,770 --> 00:40:00,780

for the broad public uh General audience

885

00:40:07,670 --> 00:40:03,780

uh how it works thank you

886

00:40:10,490 --> 00:40:07,680

okay so for Mission duration of course

887

00:40:13,370 --> 00:40:10,500

every time we launch a mission we have a

888

00:40:17,050 --> 00:40:13,380

we have to specify a mission duration

889

00:40:20,089 --> 00:40:17,060

here it's 42 months of course but

890

00:40:23,270 --> 00:40:20,099

everything on board has been really

891

00:40:25,790 --> 00:40:23,280

taken care of and I can give you an

892

00:40:28,609 --> 00:40:25,800

example the uh the platform that has

893

00:40:33,230 --> 00:40:28,619

been designed by Taylor salinia space is

894

00:40:37,870 --> 00:40:33,240

built against 10 years at least on orbit

895

00:40:42,710 --> 00:40:37,880

so of course our system will not limit

896

00:40:45,290 --> 00:40:42,720

the the lifetime of SWOT and if

897

00:40:47,390 --> 00:40:45,300

everything is okay on board certainly

898

00:40:49,750 --> 00:40:47,400

there will be an extension of the

899

00:40:52,430 --> 00:40:49,760

mission five years is completely

900

00:40:54,650 --> 00:40:52,440

reachable and and many more years as

901
00:40:58,190 --> 00:40:54,660
we've been doing since 30 years on our

902
00:41:01,910 --> 00:40:58,200
mission that achieved more than around

903
00:41:04,910 --> 00:41:01,920
10 years every time so I can guarantee

904
00:41:07,130 --> 00:41:04,920
that we'll be able to to make a long

905
00:41:08,109 --> 00:41:07,140
Mission because we need this data for a

906
00:41:12,170 --> 00:41:08,119
long time

907
00:41:15,609 --> 00:41:12,180
with regard to the to the payload uh as

908
00:41:18,290 --> 00:41:15,619
as we said before we have a classical

909
00:41:22,010 --> 00:41:18,300
nadir Suite of instrument which is the

910
00:41:24,890 --> 00:41:22,020
same as we use on the Json series on

911
00:41:28,510 --> 00:41:24,900
Santi nails and the various Sentinels

912
00:41:31,550 --> 00:41:28,520
that provide the same measurement

913
00:41:34,030 --> 00:41:31,560

like the Doris instrument precise orbit

914

00:41:38,990 --> 00:41:34,040

determination the radial radial matter

915

00:41:41,690 --> 00:41:39,000

which provide Corrections of the water

916

00:41:44,089 --> 00:41:41,700

contents of the atmosphere so that we

917

00:41:46,490 --> 00:41:44,099

can correct the radar signal that is

918

00:41:48,470 --> 00:41:46,500

sent to the ground and of course the

919

00:41:52,069 --> 00:41:48,480

Karen instrument which is the brand new

920

00:41:55,970 --> 00:41:52,079

instrument it's also a a radar basically

921

00:41:58,849 --> 00:41:55,980

a radar is a an instrument that sends a

922

00:42:01,609 --> 00:41:58,859

signal to the ground and we receive back

923

00:42:04,010 --> 00:42:01,619

the echo in this case the particularity

924

00:42:07,550 --> 00:42:04,020

with caring is that the

925

00:42:09,069 --> 00:42:07,560

signal is sent by you've seen all these

926
00:42:14,690 --> 00:42:09,079
antennas

927
00:42:17,150 --> 00:42:14,700
by a 10 meter base so one of the

928
00:42:20,510 --> 00:42:17,160
antennas send the radar signal to the

929
00:42:23,270 --> 00:42:20,520
ground and the echo reflected by the

930
00:42:26,210 --> 00:42:23,280
water surface is then received by the

931
00:42:28,970 --> 00:42:26,220
two antennas at the same moment or or

932
00:42:32,630 --> 00:42:28,980
slightly deferred and this is this

933
00:42:35,089 --> 00:42:32,640
measurement uh with the same signal

934
00:42:37,849 --> 00:42:35,099
received by the two antennas that

935
00:42:40,630 --> 00:42:37,859
provides such an accuracy for water

936
00:42:44,270 --> 00:42:40,640
detection and resolution

937
00:42:46,250 --> 00:42:44,280
the other feature of this white swath is

938
00:42:51,130 --> 00:42:46,260

that with these two antennas who are

939

00:42:54,290 --> 00:42:51,140

able to cover a swath of 120 kilometers

940

00:42:57,650 --> 00:42:54,300

on on the surface of the planet which

941

00:42:59,450 --> 00:42:57,660

help us to cover the entirety of the

942

00:43:01,309 --> 00:42:59,460

wool surface of the planet which is

943

00:43:04,730 --> 00:43:01,319

unique with regard to our past missions

944

00:43:08,390 --> 00:43:04,740

which allow only to measure under under

945

00:43:10,670 --> 00:43:08,400

the trace of the of the altimeter on

946

00:43:14,390 --> 00:43:11,890

well that was the last

947

00:43:15,829 --> 00:43:14,400

[Music]

948

00:43:17,569 --> 00:43:15,839

the last year in the

949

00:43:19,670 --> 00:43:17,579

uh we're going to wrap up today's news

950

00:43:21,230 --> 00:43:19,680

conference thank you to everyone who

951
00:43:22,490 --> 00:43:21,240
asked questions for your interests also

952
00:43:24,829 --> 00:43:22,500
for those who took time out of their day

953
00:43:27,410 --> 00:43:24,839
today to answer those questions

954
00:43:30,829 --> 00:43:27,420
um again liftoff is targeted for 3 A.M

955
00:43:33,770 --> 00:43:30,839
uh Pacific time uh tomorrow uh December

956
00:43:38,089 --> 00:43:33,780
15th uh and a live coverage will begin

957
00:43:40,250 --> 00:43:38,099
on nasa.gov live at 3 A.M Pacific time

958
00:43:42,470 --> 00:43:40,260
and you can also watch on NASA's YouTube

959
00:43:44,390 --> 00:43:42,480
and social media channels and for

960
00:43:47,530 --> 00:43:44,400
Mission updates before and after launch

961
00:43:51,970 --> 00:43:47,540
you can go to this website it's

962
00:43:55,309 --> 00:43:51,980
blogs.nasa.gov SWOT again