
CETECH

1
00:00:03,510 --> 00:00:01,589
[Music]

2
00:00:05,110 --> 00:00:03,520
nasa's jet propulsion laboratory

3
00:00:07,749 --> 00:00:05,120
presents

4
00:00:09,830 --> 00:00:07,759
the von carmen lecture a series of talks

5
00:00:13,110 --> 00:00:09,840
by scientists and engineers who are

6
00:00:18,160 --> 00:00:13,120
exploring our planet our solar system

7
00:00:23,109 --> 00:00:21,269
[Music]

8
00:00:25,029 --> 00:00:23,119
hello and a very pleasant good evening

9
00:00:26,630 --> 00:00:25,039
to you wherever you may be i'm brian

10
00:00:29,429 --> 00:00:26,640
white from jpl's office of

11
00:00:31,269 --> 00:00:29,439
communications and education and welcome

12
00:00:32,549 --> 00:00:31,279
to the von carmen series

13
00:00:34,389 --> 00:00:32,559

throughout our series we've taken a

14
00:00:35,990 --> 00:00:34,399
deeper look not just our missions or

15
00:00:39,190 --> 00:00:36,000
objects in space but also some of the

16
00:00:41,590 --> 00:00:39,200
careers at jpl tonight we take a deeper

17
00:00:43,190 --> 00:00:41,600
look at instrument operations engineers

18
00:00:45,830 --> 00:00:43,200
what they do for their mission and how

19
00:00:47,750 --> 00:00:45,840
they do it in doing so we'll be

20
00:00:49,670 --> 00:00:47,760
discussing a wonderful mission called

21
00:00:51,189 --> 00:00:49,680
maya and before we get to our speaker

22
00:00:53,430 --> 00:00:51,199
i'd like to introduce our questions

23
00:00:56,310 --> 00:00:53,440
co-host for tonight public outreach

24
00:00:57,350 --> 00:00:56,320
specialist jason jocelyn argeta hiya

25
00:00:58,709 --> 00:00:57,360
jocelyn

26
00:01:01,270 --> 00:00:58,719
hey brian

27
00:01:03,029 --> 00:01:01,280
super excited for tonight's talk and if

28
00:01:05,270 --> 00:01:03,039
you're watching wherever you're watching

29
00:01:07,510 --> 00:01:05,280
us online we want to remind you that

30
00:01:09,590 --> 00:01:07,520
this is your space program and we want

31
00:01:11,830 --> 00:01:09,600
you to be involved so feel free to add

32
00:01:13,590 --> 00:01:11,840
your questions to the chat box and our

33
00:01:15,830 --> 00:01:13,600
wonderful social media team will get

34
00:01:18,230 --> 00:01:15,840
those to us we'll try to answer as many

35
00:01:19,749 --> 00:01:18,240
of your questions as we can tonight and

36
00:01:21,910 --> 00:01:19,759
if for some reason you can't see the

37
00:01:24,390 --> 00:01:21,920
chat box just hit refresh and it should

38
00:01:27,830 --> 00:01:26,469

thank you very much jocelyn and as a

39
00:01:30,230 --> 00:01:27,840
reminder as she said if we're on a

40
00:01:31,590 --> 00:01:30,240
technical technical difficulties like

41
00:01:33,350 --> 00:01:31,600
i'm having right now with speaking we

42
00:01:35,590 --> 00:01:33,360
ask that you do speak with us as we get

43
00:01:37,350 --> 00:01:35,600
those sorted out now without further ado

44
00:01:39,190 --> 00:01:37,360
let's meet our speaker she is an

45
00:01:41,910 --> 00:01:39,200
instrument operation systems engineer

46
00:01:43,830 --> 00:01:41,920
here at nasa jpl she has worked on

47
00:01:46,389 --> 00:01:43,840
projects from cassini to the upcoming

48
00:01:48,950 --> 00:01:46,399
maya mission please welcome janelle

49
00:01:51,510 --> 00:01:48,960
wellens hiya janelle

50
00:01:52,870 --> 00:01:51,520
hi brian

51
00:01:55,670 --> 00:01:52,880
welcome we're so excited to have you

52
00:01:57,270 --> 00:01:55,680
here tonight um the main thing i wanna i

53
00:01:59,429 --> 00:01:57,280
wanna start off with what's your origin

54
00:02:02,230 --> 00:01:59,439
story all good superheroes have origin

55
00:02:05,109 --> 00:02:02,240
stories how did you get to jpl

56
00:02:06,870 --> 00:02:05,119
that is a great question you know my

57
00:02:08,630 --> 00:02:06,880
origin definitely didn't start with me

58
00:02:11,910 --> 00:02:08,640
thinking that i would actually end up

59
00:02:14,470 --> 00:02:11,920
here one day instead in school i was

60
00:02:16,949 --> 00:02:14,480
more concerned about learning new things

61
00:02:20,070 --> 00:02:16,959
being curious i didn't really have that

62
00:02:22,070 --> 00:02:20,080
path in mind and going back specifically

63
00:02:23,750 --> 00:02:22,080

to junior year is when things really

64
00:02:25,830 --> 00:02:23,760
took a turn for me

65
00:02:28,630 --> 00:02:25,840
because looking around everyone was

66
00:02:30,630 --> 00:02:28,640
thinking about things college what they

67
00:02:32,790 --> 00:02:30,640
wanted to major in where they wanted to

68
00:02:34,550 --> 00:02:32,800
go to school i mean in my mind i was

69
00:02:35,430 --> 00:02:34,560
like oh we have to think about those

70
00:02:37,430 --> 00:02:35,440
things

71
00:02:39,670 --> 00:02:37,440
and so

72
00:02:41,990 --> 00:02:39,680
i actually started to get mail like

73
00:02:44,390 --> 00:02:42,000
addressed in my name to my home which

74
00:02:47,110 --> 00:02:44,400
was not a normal occurrence from

75
00:02:49,190 --> 00:02:47,120
colleges all over the nation

76
00:02:52,070 --> 00:02:49,200
i mean i got school saying look at this

77
00:02:54,390 --> 00:02:52,080
track program i ran track and oh look we

78
00:02:57,110 --> 00:02:54,400
have this great thing in literature it

79
00:02:59,430 --> 00:02:57,120
was amazing but at the same time really

80
00:03:01,430 --> 00:02:59,440
overwhelming to the point where i just

81
00:03:03,350 --> 00:03:01,440
started taking the mail putting it in a

82
00:03:06,390 --> 00:03:03,360
container and storing it underneath my

83
00:03:07,990 --> 00:03:06,400
bed and when i ran out of room there

84
00:03:10,309 --> 00:03:08,000
i actually just started to throw it into

85
00:03:12,149 --> 00:03:10,319
the trash can which by the way you

86
00:03:14,869 --> 00:03:12,159
probably shouldn't do that

87
00:03:17,509 --> 00:03:14,879
so okay i come home one day i got my

88
00:03:20,070 --> 00:03:17,519

sack of mail take a look at it looks

89
00:03:22,070 --> 00:03:20,080
good it's going to the bin but on that

90
00:03:24,789 --> 00:03:22,080
particular day my mom is in the kitchen

91
00:03:27,350 --> 00:03:24,799
and sees me walking this stack over and

92
00:03:29,430 --> 00:03:27,360
notices that the pamphlet on top is from

93
00:03:31,190 --> 00:03:29,440
a school called the massachusetts

94
00:03:33,670 --> 00:03:31,200
institute of technology

95
00:03:36,630 --> 00:03:33,680
school i had never heard of before but

96
00:03:38,470 --> 00:03:36,640
apparently she had she herself is not an

97
00:03:40,789 --> 00:03:38,480
engineer or a scientist and neither is

98
00:03:43,910 --> 00:03:40,799
my dad but my mom worked with engineers

99
00:03:45,830 --> 00:03:43,920
and she recognized that mit was a good

100
00:03:48,390 --> 00:03:45,840
school and we needed to look at this

101
00:03:49,670 --> 00:03:48,400
program right now and so

102
00:03:51,750 --> 00:03:49,680
we did

103
00:03:53,589 --> 00:03:51,760
put it out on the front table looking at

104
00:03:55,509 --> 00:03:53,599
the program oh you're going to come with

105
00:03:57,509 --> 00:03:55,519
other students from around the country

106
00:03:59,509 --> 00:03:57,519
you're going to study math calculus

107
00:04:00,470 --> 00:03:59,519
biochemistry you're going gonna do some

108
00:04:03,110 --> 00:04:00,480
engineering

109
00:04:06,550 --> 00:04:03,120
and if you get in it's totally free of

110
00:04:09,830 --> 00:04:06,560
cost and hey saw that my mom's like oh

111
00:04:11,030 --> 00:04:09,840
you're filling this application out so

112
00:04:13,509 --> 00:04:11,040
okay

113
00:04:15,589 --> 00:04:13,519

and i did night before it was due hit

114
00:04:17,189 --> 00:04:15,599
the final submit button

115
00:04:18,789 --> 00:04:17,199
forgot about it to a classmate was

116
00:04:20,789 --> 00:04:18,799
asking a group of us what are you gonna

117
00:04:22,230 --> 00:04:20,799
do for the summer and i said oh i'm

118
00:04:24,950 --> 00:04:22,240
gonna run cross country then i

119
00:04:26,629 --> 00:04:24,960
remembered oh or i'll go to this program

120
00:04:27,430 --> 00:04:26,639
at a school called mit if you've heard

121
00:04:28,390 --> 00:04:27,440
of it

122
00:04:29,909 --> 00:04:28,400
he's like

123
00:04:32,950 --> 00:04:29,919
heard of it

124
00:04:35,510 --> 00:04:32,960
do you understand how difficult it is to

125
00:04:37,350 --> 00:04:35,520
get into mit

126
00:04:38,550 --> 00:04:37,360
i said uh no

127
00:04:40,870 --> 00:04:38,560
that night

128
00:04:42,390 --> 00:04:40,880
i went home i looked up the statistics

129
00:04:45,030 --> 00:04:42,400
for the first time

130
00:04:47,990 --> 00:04:45,040
over 2 000 students applied the year

131
00:04:50,550 --> 00:04:48,000
before and they only let in one from the

132
00:04:53,670 --> 00:04:50,560
state of new jersey where i'm from

133
00:04:56,230 --> 00:04:53,680
so clearly it was a wrap i'm not getting

134
00:04:57,909 --> 00:04:56,240
into that i mean i'm not even top of my

135
00:05:00,469 --> 00:04:57,919
class here at a high school i mean why

136
00:05:02,550 --> 00:05:00,479
would they choose me there are so many

137
00:05:04,310 --> 00:05:02,560
other people who would be better

138
00:05:05,830 --> 00:05:04,320

so when my mom called me that spring

139
00:05:08,390 --> 00:05:05,840
saying i needed to rush home there's a

140
00:05:10,870 --> 00:05:08,400
package in the mail i'm thinking

141
00:05:13,350 --> 00:05:10,880
what is she we went over this but i got

142
00:05:15,510 --> 00:05:13,360
home and she's there saying take it take

143
00:05:17,670 --> 00:05:15,520
it and i'm like mom don't get your hopes

144
00:05:19,350 --> 00:05:17,680
up and she's like you know do you think

145
00:05:20,550 --> 00:05:19,360
they sent you a package to tell you you

146
00:05:21,510 --> 00:05:20,560
didn't get in

147
00:05:23,110 --> 00:05:21,520
and

148
00:05:25,749 --> 00:05:23,120
whoa

149
00:05:27,510 --> 00:05:25,759
something clicked for the first time i

150
00:05:29,670 --> 00:05:27,520
opened that package saw the word

151
00:05:33,430 --> 00:05:29,680
congratulations

152
00:05:35,670 --> 00:05:33,440
i can't even tell you how exciting that

153
00:05:39,350 --> 00:05:35,680
moment was for me

154
00:05:41,350 --> 00:05:39,360
me going to a school like mit

155
00:05:43,270 --> 00:05:41,360
it just goes to tell you that you don't

156
00:05:45,749 --> 00:05:43,280
know what moment is going to be the life

157
00:05:48,230 --> 00:05:45,759
changer for you for me it was a pamphlet

158
00:05:49,749 --> 00:05:48,240
that my mom forced me to look at i would

159
00:05:52,390 --> 00:05:49,759
have counted myself out if it weren't

160
00:05:55,270 --> 00:05:52,400
for her and so that's how i began my

161
00:05:57,909 --> 00:05:55,280
journey and ended up at mit

162
00:05:59,909 --> 00:05:57,919
and if not you who so if you bring up

163
00:06:01,830 --> 00:05:59,919

image two here we could see you in some

164
00:06:03,990 --> 00:06:01,840
of your mit splendor now how do you get

165
00:06:07,189 --> 00:06:04,000
from mit

166
00:06:10,150 --> 00:06:07,199
to jpl we love those abbreviations here

167
00:06:12,390 --> 00:06:10,160
oh yes tons of abbreviations so i'm at

168
00:06:14,469 --> 00:06:12,400
mit and i'm thinking i'm going to become

169
00:06:16,790 --> 00:06:14,479
a theoretical mathematician

170
00:06:19,270 --> 00:06:16,800
but i start talking to my classmates and

171
00:06:21,189 --> 00:06:19,280
they say try out an engineering class

172
00:06:24,550 --> 00:06:21,199
and so i'm looking at the list and you

173
00:06:26,550 --> 00:06:24,560
got mechanical electrical computer lots

174
00:06:28,309 --> 00:06:26,560
and lots of choices and i really didn't

175
00:06:30,950 --> 00:06:28,319
know where to start but

176
00:06:32,830 --> 00:06:30,960
i came across as one major called

177
00:06:35,830 --> 00:06:32,840
aerospace

178
00:06:38,230 --> 00:06:35,840
engineering space i mean i don't know

179
00:06:40,230 --> 00:06:38,240
about anyone else but to me space has

180
00:06:42,469 --> 00:06:40,240
always been cool like looking up black

181
00:06:45,189 --> 00:06:42,479
holes and all this other stuff

182
00:06:47,670 --> 00:06:45,199
so of course i go to introduction to

183
00:06:49,670 --> 00:06:47,680
aerospace engineering and i'm there on

184
00:06:52,070 --> 00:06:49,680
the first day the professor is going

185
00:06:53,510 --> 00:06:52,080
over the syllabus hey you know this year

186
00:06:55,430 --> 00:06:53,520
we're going to learn about the rocket

187
00:06:57,510 --> 00:06:55,440
equation we're going to learn about how

188
00:06:59,189 --> 00:06:57,520

planes fly and we're also going to learn

189
00:07:00,230 --> 00:06:59,199
a little bit about the history of space

190
00:07:03,029 --> 00:07:00,240
flight

191
00:07:05,670 --> 00:07:03,039
and you know i'm taking all this in and

192
00:07:08,309 --> 00:07:05,680
he shows this image of an astronaut

193
00:07:11,110 --> 00:07:08,319
fixing the hubble telescope

194
00:07:13,189 --> 00:07:11,120
black background you can see the earth

195
00:07:15,430 --> 00:07:13,199
just incredible i'm like wow this is

196
00:07:18,550 --> 00:07:15,440
what aerospace engineers do

197
00:07:21,430 --> 00:07:18,560
and then he says oh by the way

198
00:07:22,469 --> 00:07:21,440
i'm the astronaut in that photo

199
00:07:24,469 --> 00:07:22,479
what

200
00:07:25,510 --> 00:07:24,479
are you did i hear that right look

201
00:07:27,189 --> 00:07:25,520
around

202
00:07:29,749 --> 00:07:27,199
and you know i couldn't turn it down

203
00:07:33,830 --> 00:07:29,759
after that i mean come on this is the

204
00:07:38,070 --> 00:07:37,189
but you may be wondering yeah yeah no

205
00:07:40,550 --> 00:07:38,080
please

206
00:07:42,830 --> 00:07:40,560
you may be wondering then how how did i

207
00:07:45,830 --> 00:07:42,840
get to jpl and really it

208
00:07:47,990 --> 00:07:45,840
started yes

209
00:07:50,150 --> 00:07:48,000
and so you know i continue taking all

210
00:07:52,550 --> 00:07:50,160
these classes and the professors keep on

211
00:07:55,350 --> 00:07:52,560
giving us examples hey we're going to

212
00:07:57,270 --> 00:07:55,360
land something on mars like jpl we're

213
00:07:59,270 --> 00:07:57,280

going to send something to saturn to

214
00:08:01,749 --> 00:07:59,280
jupiter like jpl

215
00:08:03,749 --> 00:08:01,759
jpl was coming up all over the place

216
00:08:06,070 --> 00:08:03,759
this magical theater word

217
00:08:09,430 --> 00:08:06,080
and i knew if i wanted to get into space

218
00:08:12,070 --> 00:08:09,440
exploration jpl was the place to be

219
00:08:14,070 --> 00:08:12,080
i went to the career fair every year i

220
00:08:17,510 --> 00:08:14,080
signed up for the internship

221
00:08:20,309 --> 00:08:17,520
and i never landed it not once despite

222
00:08:22,629 --> 00:08:20,319
trying very hard i'll add

223
00:08:24,950 --> 00:08:22,639
so senior year rolls around it's not an

224
00:08:26,869 --> 00:08:24,960
internship now it's full-time job

225
00:08:28,869 --> 00:08:26,879
and i submitted my application for the

226
00:08:31,909 --> 00:08:28,879
first time i heard back not just from

227
00:08:34,230 --> 00:08:31,919
one supervisor but three

228
00:08:36,230 --> 00:08:34,240
and i remember rushing to the interview

229
00:08:38,310 --> 00:08:36,240
i wanted to get there early ripping my

230
00:08:41,110 --> 00:08:38,320
skirt in the process trying to hide it

231
00:08:42,550 --> 00:08:41,120
when i got in the room but i walked out

232
00:08:44,310 --> 00:08:42,560
of that room

233
00:08:46,710 --> 00:08:44,320
after going and getting called back for

234
00:08:50,630 --> 00:08:46,720
further interviews with an offer to

235
00:08:55,269 --> 00:08:50,640
start at jpl as an instrument operations

236
00:08:58,630 --> 00:08:55,279
engineer and you can show image three

237
00:09:02,310 --> 00:09:00,710
that's you that's and and you're here

238
00:09:04,949 --> 00:09:02,320

with us tonight because you you bring

239
00:09:06,389 --> 00:09:04,959
such intelligence and passion to

240
00:09:08,389 --> 00:09:06,399
everything that you do and you're a

241
00:09:10,870 --> 00:09:08,399
great communicator so let's talk about

242
00:09:13,350 --> 00:09:10,880
what an instrument operations engineer

243
00:09:15,750 --> 00:09:13,360
actually is

244
00:09:18,710 --> 00:09:15,760
yeah i mean i was asking myself the same

245
00:09:21,910 --> 00:09:18,720
question driving into jpl that first day

246
00:09:24,470 --> 00:09:21,920
nasa jp on the exit side what exactly is

247
00:09:26,790 --> 00:09:24,480
an instrument operations engineer but

248
00:09:30,070 --> 00:09:26,800
what i learned is that we basically have

249
00:09:32,070 --> 00:09:30,080
one of the coolest jobs ever

250
00:09:34,150 --> 00:09:32,080
i mean okay let's break it down starting

251
00:09:35,190 --> 00:09:34,160
with the instrument part what is an

252
00:09:37,110 --> 00:09:35,200
instrument

253
00:09:38,870 --> 00:09:37,120
when i think about jpl missions i like

254
00:09:41,350 --> 00:09:38,880
to think of you've got these two

255
00:09:43,750 --> 00:09:41,360
essential parts you got the spacecraft

256
00:09:45,269 --> 00:09:43,760
or the rover which keeps you alive and

257
00:09:47,910 --> 00:09:45,279
gets you to the places that you want to

258
00:09:49,990 --> 00:09:47,920
go and then you have these scientific

259
00:09:51,269 --> 00:09:50,000
instruments that answer all of the

260
00:09:53,190 --> 00:09:51,279
interesting questions that the

261
00:09:54,230 --> 00:09:53,200
scientists come up with

262
00:09:55,110 --> 00:09:54,240
how

263
00:09:56,070 --> 00:09:55,120

why

264
00:09:56,870 --> 00:09:56,080
what

265
00:09:58,870 --> 00:09:56,880
when

266
00:09:59,910 --> 00:09:58,880
the instruments are how we get those

267
00:10:02,470 --> 00:09:59,920
answers

268
00:10:04,870 --> 00:10:02,480
so finishing out the rest of the name is

269
00:10:07,430 --> 00:10:04,880
my job to operate these scientific

270
00:10:10,310 --> 00:10:07,440
instruments when they're actually in

271
00:10:13,509 --> 00:10:10,320
space which is like wild

272
00:10:15,829 --> 00:10:13,519
i still can't believe i do it sometimes

273
00:10:18,069 --> 00:10:15,839
but my job doesn't end there

274
00:10:20,310 --> 00:10:18,079
the other half of my job is actually

275
00:10:23,350 --> 00:10:20,320
making sure what we planned happened

276
00:10:25,350 --> 00:10:23,360
and if you can show image six please

277
00:10:27,030 --> 00:10:25,360
i do this by looking at these pretty

278
00:10:29,350 --> 00:10:27,040
cool screens every morning to make sure

279
00:10:30,949 --> 00:10:29,360
things are going the way they should be

280
00:10:33,269 --> 00:10:30,959
and i kind of like to think of it like

281
00:10:35,110 --> 00:10:33,279
the relationship a doctor and a patient

282
00:10:37,350 --> 00:10:35,120
may have so you can imagine you're

283
00:10:39,190 --> 00:10:37,360
feeling sick you come into the doctor's

284
00:10:41,190 --> 00:10:39,200
office right it's a doctor i'm not

285
00:10:43,269 --> 00:10:41,200
feeling great and so they run tests

286
00:10:44,790 --> 00:10:43,279
maybe look at your blood cholesterol i'm

287
00:10:47,269 --> 00:10:44,800
not a doctor i don't know what else

288
00:10:48,230 --> 00:10:47,279

there is but i know there's stuff

289
00:10:49,990 --> 00:10:48,240
so

290
00:10:52,710 --> 00:10:50,000
they look at this stuff and they're able

291
00:10:54,870 --> 00:10:52,720
to say oh this is the issue or let me

292
00:10:57,269 --> 00:10:54,880
prescribe you medicine for me i'm

293
00:10:59,990 --> 00:10:57,279
looking at screens like this that have

294
00:11:01,430 --> 00:11:00,000
plots that have values currents and

295
00:11:03,829 --> 00:11:01,440
voltages instead of blood and

296
00:11:06,389 --> 00:11:03,839
cholesterol and it tells me if our

297
00:11:07,430 --> 00:11:06,399
instrument is operating healthily and

298
00:11:09,430 --> 00:11:07,440
safely

299
00:11:12,790 --> 00:11:09,440
we kind of describe our robots like

300
00:11:15,110 --> 00:11:12,800
humans at gpl which i love

301
00:11:16,550 --> 00:11:15,120
and so to me things get a little more

302
00:11:17,350 --> 00:11:16,560
interesting

303
00:11:19,350 --> 00:11:17,360
when

304
00:11:21,110 --> 00:11:19,360
you know nothing seems wrong i didn't

305
00:11:22,630 --> 00:11:21,120
get an alert and i didn't get called at

306
00:11:25,110 --> 00:11:22,640
12 in the morning

307
00:11:27,829 --> 00:11:25,120
but i'm looking at the charts and after

308
00:11:29,269 --> 00:11:27,839
doing this for a while months years i

309
00:11:30,710 --> 00:11:29,279
could tell something's not right and

310
00:11:33,990 --> 00:11:30,720
that's when you put your

311
00:11:35,990 --> 00:11:34,000
mystery hat on and you work with others

312
00:11:37,750 --> 00:11:36,000
who built the instrument who designed

313
00:11:39,269 --> 00:11:37,760

the instrument and you come together and

314
00:11:41,430 --> 00:11:39,279
you problem solve

315
00:11:43,430 --> 00:11:41,440
it's just a really really interesting

316
00:11:45,990 --> 00:11:43,440
and cool environment to be in right in

317
00:11:47,829 --> 00:11:46,000
the now when our missions are in flight

318
00:11:49,910 --> 00:11:47,839
and if they're not in flight and the

319
00:11:51,990 --> 00:11:49,920
project is still in development it's my

320
00:11:55,670 --> 00:11:52,000
job to figure out how are we going to

321
00:11:57,269 --> 00:11:55,680
operate it when it gets to space

322
00:11:59,110 --> 00:11:57,279
wonderful um

323
00:12:00,470 --> 00:11:59,120
i want to take a quick moment i want to

324
00:12:01,670 --> 00:12:00,480
bring in some audience questions because

325
00:12:04,069 --> 00:12:01,680
we've covered a lot of ground already in

326
00:12:06,230 --> 00:12:04,079
the first 10 minutes um jocelyn what

327
00:12:08,150 --> 00:12:06,240
what's happening out there in the chats

328
00:12:10,790 --> 00:12:08,160
yeah we have some really great questions

329
00:12:14,150 --> 00:12:10,800
coming in um the first one is from

330
00:12:17,910 --> 00:12:14,160
siencia news on youtube who asks what is

331
00:12:18,949 --> 00:12:17,920
most fascinating about engineering

332
00:12:21,910 --> 00:12:18,959
oh

333
00:12:23,350 --> 00:12:21,920
man that's a great question okay

334
00:12:26,470 --> 00:12:23,360
i have the perfect answer because i

335
00:12:27,670 --> 00:12:26,480
started jpl as an engineer and was

336
00:12:29,670 --> 00:12:27,680
wondering you know like what am i

337
00:12:30,470 --> 00:12:29,680
supposed to do you know i'm here now

338
00:12:32,550 --> 00:12:30,480

what

339
00:12:34,389 --> 00:12:32,560
and i ended up getting to work on a

340
00:12:36,629 --> 00:12:34,399
really really cool project called the

341
00:12:38,790 --> 00:12:36,639
cassini mission saturn

342
00:12:41,590 --> 00:12:38,800
and if you show image seven

343
00:12:43,670 --> 00:12:41,600
this was the result of my work as an

344
00:12:46,150 --> 00:12:43,680
engineer on that project

345
00:12:48,710 --> 00:12:46,160
we were able to operate cameras along

346
00:12:51,350 --> 00:12:48,720
with a whole suite of other instruments

347
00:12:52,949 --> 00:12:51,360
that let us get you know real images

348
00:12:55,430 --> 00:12:52,959
this i remember seeing this when i

349
00:12:57,829 --> 00:12:55,440
started at jpl and thinking oh this is

350
00:13:00,150 --> 00:12:57,839
this is an artist's rendition right

351
00:13:02,710 --> 00:13:00,160
and when they said no oh wait wait a

352
00:13:04,949 --> 00:13:02,720
second are you are you sure i had to

353
00:13:06,870 --> 00:13:04,959
send it to my friends my family like

354
00:13:09,829 --> 00:13:06,880
we're doing this like we're doing this

355
00:13:12,550 --> 00:13:09,839
right now this is happening today we

356
00:13:14,710 --> 00:13:12,560
have something at saturn

357
00:13:17,030 --> 00:13:14,720
it's just like absolutely incredible

358
00:13:19,430 --> 00:13:17,040
what we're able to do when you put your

359
00:13:22,150 --> 00:13:19,440
minds together being an engineer is not

360
00:13:24,790 --> 00:13:22,160
a solo job it's a team job that allows

361
00:13:29,990 --> 00:13:24,800
us to do incredible things like capture

362
00:13:34,949 --> 00:13:32,629
wow that's so amazing and i love hearing

363
00:13:37,829 --> 00:13:34,959

about your origin story and how you got

364
00:13:39,430 --> 00:13:37,839
to jbl and get to experience this and a

365
00:13:41,750 --> 00:13:39,440
follow-up to that is mary on twitter

366
00:13:45,590 --> 00:13:41,760
wants to know what inspired you to go

367
00:13:46,470 --> 00:13:45,600
into stem and science in the first place

368
00:13:49,990 --> 00:13:46,480
so

369
00:13:52,069 --> 00:13:50,000
my mom says that as a kid i always liked

370
00:13:53,910 --> 00:13:52,079
math she's probably right i did say that

371
00:13:56,310 --> 00:13:53,920
i was gonna grow up to be a theoretical

372
00:13:57,430 --> 00:13:56,320
mathematician so i guess that is saying

373
00:13:59,509 --> 00:13:57,440
something

374
00:14:02,150 --> 00:13:59,519
i think i've always just been curious

375
00:14:04,629 --> 00:14:02,160
about how the world works i remember

376
00:14:06,230 --> 00:14:04,639
when my parents uh bought me my first

377
00:14:08,550 --> 00:14:06,240
video game console

378
00:14:10,150 --> 00:14:08,560
and you know they turned around to go do

379
00:14:12,150 --> 00:14:10,160
something and when they turned back i

380
00:14:15,350 --> 00:14:12,160
had already plugged it in had the game

381
00:14:17,590 --> 00:14:15,360
running and i was just fascinated what

382
00:14:20,949 --> 00:14:17,600
kind of technology allows you to take a

383
00:14:23,590 --> 00:14:20,959
disc put it in this machine this black

384
00:14:26,470 --> 00:14:23,600
box and you get an image on the tv and

385
00:14:28,470 --> 00:14:26,480
you can move a character around i mean

386
00:14:31,509 --> 00:14:28,480
to me that was

387
00:14:32,710 --> 00:14:31,519
so cool and i just wanted to know how

388
00:14:35,110 --> 00:14:32,720

does it work

389
00:14:38,389 --> 00:14:35,120
what what is the cd doing what is what

390
00:14:40,550 --> 00:14:38,399
is the console doing i just it sparked

391
00:14:42,949 --> 00:14:40,560
this curiosity in me to figure out how

392
00:14:45,110 --> 00:14:42,959
things work and i think that really

393
00:14:47,990 --> 00:14:45,120
was the groundwork for me

394
00:14:49,509 --> 00:14:48,000
loving stem and continuing with stem

395
00:14:52,150 --> 00:14:49,519
even though i loved other things too

396
00:14:53,990 --> 00:14:52,160
like we all do we're multifaceted people

397
00:14:55,990 --> 00:14:54,000
but i don't think i would have ever let

398
00:14:59,590 --> 00:14:56,000
that part of my life go regardless of

399
00:15:01,269 --> 00:14:59,600
what career i ended up in

400
00:15:03,990 --> 00:15:01,279
i'm glad you were getting your your

401
00:15:05,990 --> 00:15:04,000
console to work right away um let's talk

402
00:15:07,269 --> 00:15:06,000
about what's coming up let's talk about

403
00:15:08,870 --> 00:15:07,279
what you're working on right now and

404
00:15:11,829 --> 00:15:08,880
what's let's

405
00:15:13,350 --> 00:15:11,839
you are a systems engineer for maya so

406
00:15:14,790 --> 00:15:13,360
what specifically is maya and what are

407
00:15:17,110 --> 00:15:14,800
you going to do with what what's your

408
00:15:21,189 --> 00:15:17,120
job with that mission

409
00:15:23,110 --> 00:15:21,199
yeah so maya stands for the multi-angle

410
00:15:25,269 --> 00:15:23,120
imager for aerosols

411
00:15:27,030 --> 00:15:25,279
there goes those acronyms again

412
00:15:28,790 --> 00:15:27,040
and i know it could be a lot

413
00:15:30,710 --> 00:15:28,800

but you know all the words in that

414
00:15:33,189 --> 00:15:30,720
acronym they mean something about this

415
00:15:35,910 --> 00:15:33,199
instrument about this mission

416
00:15:38,870 --> 00:15:35,920
so multi-angle is referring to the fact

417
00:15:41,269 --> 00:15:38,880
that this instrument is able to point at

418
00:15:42,949 --> 00:15:41,279
targets on the ground at multiple

419
00:15:45,829 --> 00:15:42,959
different angles

420
00:15:48,790 --> 00:15:45,839
and it's an imager because we're able to

421
00:15:51,749 --> 00:15:48,800
actually capture digital images of those

422
00:15:54,069 --> 00:15:51,759
targets at those different angles

423
00:15:55,910 --> 00:15:54,079
and then lastly the four aerosols

424
00:15:58,629 --> 00:15:55,920
describes the fact that these digital

425
00:16:01,910 --> 00:15:58,639
images are going to aid us and helping

426
00:16:03,990 --> 00:16:01,920
to characterize these very microscopic

427
00:16:07,430 --> 00:16:04,000
particles i'm talking

428
00:16:09,670 --> 00:16:07,440
150th or smaller the width of a human

429
00:16:12,710 --> 00:16:09,680
hair very very small

430
00:16:15,350 --> 00:16:12,720
that in our day-to-day life we actually

431
00:16:17,350 --> 00:16:15,360
can breathe in and these particles are

432
00:16:20,230 --> 00:16:17,360
so small that they can get deep within

433
00:16:21,590 --> 00:16:20,240
our lungs and spread to our other organs

434
00:16:23,430 --> 00:16:21,600
and the reason why that's not such a

435
00:16:26,069 --> 00:16:23,440
great thing is because

436
00:16:27,749 --> 00:16:26,079
they come from a variety of sources

437
00:16:29,030 --> 00:16:27,759
wildfires

438
00:16:30,629 --> 00:16:29,040

factories

439
00:16:31,509 --> 00:16:30,639
vehicle emissions

440
00:16:33,269 --> 00:16:31,519
and

441
00:16:35,590 --> 00:16:33,279
you know it doesn't really take a rocket

442
00:16:37,189 --> 00:16:35,600
scientist to know that pollution is not

443
00:16:40,230 --> 00:16:37,199
that great for you

444
00:16:43,110 --> 00:16:40,240
in fact it's so not great for you that

445
00:16:45,910 --> 00:16:43,120
it's actually something that can lead to

446
00:16:47,269 --> 00:16:45,920
us having and experiencing health issues

447
00:16:48,790 --> 00:16:47,279
such as

448
00:16:50,870 --> 00:16:48,800
heart problems

449
00:16:52,389 --> 00:16:50,880
respiratory illness

450
00:16:54,710 --> 00:16:52,399
and you know

451
00:16:56,790 --> 00:16:54,720
death even which i know is a scary thing

452
00:16:59,110 --> 00:16:56,800
to think about but it just shows why

453
00:17:01,749 --> 00:16:59,120
it's so important for us to know what's

454
00:17:02,870 --> 00:17:01,759
going on to gather the information

455
00:17:05,590 --> 00:17:02,880
so

456
00:17:06,870 --> 00:17:05,600
you know maya

457
00:17:08,949 --> 00:17:06,880
uh

458
00:17:10,630 --> 00:17:08,959
once we capture those images so once

459
00:17:11,990 --> 00:17:10,640
we're out in space we're in orbit and

460
00:17:13,750 --> 00:17:12,000
we're looking at these targets at

461
00:17:15,909 --> 00:17:13,760
different angles and we're taking those

462
00:17:16,870 --> 00:17:15,919
images that comes back here to the

463
00:17:19,750 --> 00:17:16,880

ground

464
00:17:22,309 --> 00:17:19,760
and with some further processing as well

465
00:17:24,230 --> 00:17:22,319
as with the help of surface monitors

466
00:17:25,750 --> 00:17:24,240
that are here on earth that measure air

467
00:17:26,949 --> 00:17:25,760
pollution in different locations all

468
00:17:29,110 --> 00:17:26,959
around the world

469
00:17:30,310 --> 00:17:29,120
along with atmospheric composition

470
00:17:32,630 --> 00:17:30,320
models

471
00:17:35,750 --> 00:17:32,640
we are able to at the end of that

472
00:17:37,669 --> 00:17:35,760
draw some pretty nice conclusions about

473
00:17:39,350 --> 00:17:37,679
the aerosols or the particulate matter

474
00:17:42,150 --> 00:17:39,360
that we have observed

475
00:17:44,070 --> 00:17:42,160
and this information allows us to learn

476
00:17:46,310 --> 00:17:44,080
about how much is there

477
00:17:48,310 --> 00:17:46,320
you know how big it is what's the size

478
00:17:50,310 --> 00:17:48,320
what is the chemical composition because

479
00:17:53,590 --> 00:17:50,320
it's not just one particle type it's

480
00:17:55,830 --> 00:17:53,600
often many different types and when we

481
00:17:58,390 --> 00:17:55,840
can you know get that data and come to

482
00:18:01,190 --> 00:17:58,400
those conclusions we have scientists who

483
00:18:03,110 --> 00:18:01,200
are able to use that along with health

484
00:18:05,110 --> 00:18:03,120
records that we are getting from these

485
00:18:07,190 --> 00:18:05,120
different locations those targets same

486
00:18:09,070 --> 00:18:07,200
targets i was talking about before

487
00:18:11,830 --> 00:18:09,080
with the health records

488
00:18:13,350 --> 00:18:11,840

epidemiologists which maybe was a term

489
00:18:15,430 --> 00:18:13,360
that people didn't know so much before

490
00:18:17,350 --> 00:18:15,440
but maybe know pretty well now

491
00:18:18,230 --> 00:18:17,360
are able to

492
00:18:21,270 --> 00:18:18,240
uh

493
00:18:23,669 --> 00:18:21,280
figure out the relationship between

494
00:18:25,909 --> 00:18:23,679
these aerosols and health issues

495
00:18:27,750 --> 00:18:25,919
experienced by the people who live here

496
00:18:30,390 --> 00:18:27,760
and this is what makes maya really a

497
00:18:33,830 --> 00:18:30,400
one-of-a-kind mission it's why i'm so

498
00:18:35,909 --> 00:18:33,840
incredibly proud to be on it because

499
00:18:37,510 --> 00:18:35,919
with this data and with this information

500
00:18:38,710 --> 00:18:37,520
and with these studies put out into the

501
00:18:41,110 --> 00:18:38,720
world

502
00:18:43,830 --> 00:18:41,120
people are able to make better choices

503
00:18:45,510 --> 00:18:43,840
about our smarter choices about how we

504
00:18:46,470 --> 00:18:45,520
regulate pollution and things of that

505
00:18:48,789 --> 00:18:46,480
nature

506
00:18:52,070 --> 00:18:48,799
and i know that oftentimes when people

507
00:18:55,990 --> 00:18:52,080
think of nasa jpl they think of things

508
00:18:58,310 --> 00:18:56,000
like mars and jupiter and sending stuff

509
00:19:01,110 --> 00:18:58,320
out the solar system which is like that

510
00:19:03,029 --> 00:19:01,120
is the thing it is cool i got to work on

511
00:19:06,789 --> 00:19:03,039
stuff like that

512
00:19:09,350 --> 00:19:06,799
but we also do so much for our own

513
00:19:11,190 --> 00:19:09,360

planet earth and it's so important for

514
00:19:13,270 --> 00:19:11,200
us humans to know

515
00:19:14,789 --> 00:19:13,280
the state of our home because it's the

516
00:19:18,150 --> 00:19:14,799
only one we have

517
00:19:21,990 --> 00:19:18,160
and so i'm very much looking forward to

518
00:19:23,669 --> 00:19:22,000
this mission for all of those reasons

519
00:19:25,029 --> 00:19:23,679
i always think it's wonderful when we

520
00:19:26,390 --> 00:19:25,039
yes we get to go you show these

521
00:19:28,470 --> 00:19:26,400
beautiful pictures of saturn but

522
00:19:31,350 --> 00:19:28,480
reminding folks that when we say this is

523
00:19:32,950 --> 00:19:31,360
your space program it also means

524
00:19:34,470 --> 00:19:32,960
our home we get to take a good look at

525
00:19:36,470 --> 00:19:34,480
our home and if you want more

526
00:19:37,909 --> 00:19:36,480
information about maya there's actually

527
00:19:39,430 --> 00:19:37,919
they're going to put a link in the chat

528
00:19:41,590 --> 00:19:39,440
we'll also throw a little link across

529
00:19:45,029 --> 00:19:41,600
the screen right now that you can go and

530
00:19:46,870 --> 00:19:45,039
visit that um after after our talk today

531
00:19:48,710 --> 00:19:46,880
but i want to focus stick with kind of

532
00:19:50,789 --> 00:19:48,720
our common theme tonight and talk about

533
00:19:52,630 --> 00:19:50,799
what are you as the opera instrument

534
00:19:55,830 --> 00:19:52,640
operations engineer going to be doing

535
00:19:58,470 --> 00:19:55,840
with this mission in particular

536
00:20:01,270 --> 00:19:58,480
yeah absolutely maybe we can go to image

537
00:20:02,230 --> 00:20:01,280
11 get some nice background for the

538
00:20:03,990 --> 00:20:02,240

topic

539
00:20:06,390 --> 00:20:04,000
you know on this mission as an

540
00:20:08,470 --> 00:20:06,400
instrument operations engineer

541
00:20:10,870 --> 00:20:08,480
it is going to be my job to figure out

542
00:20:13,750 --> 00:20:10,880
how we're going to actually operate this

543
00:20:15,590 --> 00:20:13,760
to make it mission success in the future

544
00:20:17,590 --> 00:20:15,600
and you may be thinking you're like how

545
00:20:20,230 --> 00:20:17,600
where do you start and i was thinking

546
00:20:22,789 --> 00:20:20,240
the same thing where do you start and

547
00:20:25,990 --> 00:20:22,799
you start by defining what you need in

548
00:20:28,630 --> 00:20:26,000
order to get what you want so after

549
00:20:30,230 --> 00:20:28,640
spending some time making requirements

550
00:20:32,710 --> 00:20:30,240
coming up with the design of what we

551
00:20:34,870 --> 00:20:32,720
think is going to work i'm now in this

552
00:20:37,270 --> 00:20:34,880
phase that's very exciting where we're

553
00:20:39,110 --> 00:20:37,280
building the things we are actually

554
00:20:40,390 --> 00:20:39,120
testing this stuff we get to see it for

555
00:20:43,190 --> 00:20:40,400
the first time

556
00:20:46,390 --> 00:20:43,200
and so in this mission in particular i

557
00:20:48,470 --> 00:20:46,400
am heavily focusing on the tools that me

558
00:20:50,230 --> 00:20:48,480
and a future instrument operator is

559
00:20:52,149 --> 00:20:50,240
going to be using once maya gets into

560
00:20:54,230 --> 00:20:52,159
space and these tools are going to do

561
00:20:56,549 --> 00:20:54,240
everything from planning out our

562
00:20:59,110 --> 00:20:56,559
observations because mumbai is going to

563
00:21:01,430 --> 00:20:59,120

be orbiting earth about 15 times a day

564
00:21:03,350 --> 00:21:01,440
100 times a week that's a lot of

565
00:21:06,230 --> 00:21:03,360
opportunities to look at our different

566
00:21:08,950 --> 00:21:06,240
targets you know los angeles rome tel

567
00:21:10,549 --> 00:21:08,960
aviv seoul we have so many

568
00:21:11,669 --> 00:21:10,559
you can get the full list at our website

569
00:21:13,909 --> 00:21:11,679
as well

570
00:21:16,070 --> 00:21:13,919
and in order to figure out when we can

571
00:21:17,590 --> 00:21:16,080
see things and what we need to do in

572
00:21:19,750 --> 00:21:17,600
order to see them what kind of pointing

573
00:21:22,149 --> 00:21:19,760
we need we need a tool to do that and

574
00:21:24,870 --> 00:21:22,159
once that tool gives me that information

575
00:21:27,190 --> 00:21:24,880
we can then process that into commands

576
00:21:28,710 --> 00:21:27,200
and these commands are instructions for

577
00:21:31,110 --> 00:21:28,720
the camera and they're not human

578
00:21:33,510 --> 00:21:31,120
commands they are machine commands so

579
00:21:35,270 --> 00:21:33,520
they're working ones and zeros something

580
00:21:37,350 --> 00:21:35,280
you and i it would probably take us a

581
00:21:39,909 --> 00:21:37,360
long time to decode them ourselves which

582
00:21:41,990 --> 00:21:39,919
is why these tools are so useful

583
00:21:42,789 --> 00:21:42,000
and so i get these commands we send them

584
00:21:44,549 --> 00:21:42,799
up

585
00:21:46,310 --> 00:21:44,559
and then we do that second half of the

586
00:21:48,549 --> 00:21:46,320
job making sure things are going

587
00:21:50,549 --> 00:21:48,559
smoothly and on maya there's quite a few

588
00:21:52,390 --> 00:21:50,559

ways to ensure that the mission is doing

589
00:21:54,470 --> 00:21:52,400
what it should be and one of them will

590
00:21:57,350 --> 00:21:54,480
be actually taking a look at those

591
00:21:59,990 --> 00:21:57,360
digital images we said we wanted to be

592
00:22:01,350 --> 00:22:00,000
observing boston did we observe boston

593
00:22:05,190 --> 00:22:01,360
or are we looking at the ocean you know

594
00:22:10,710 --> 00:22:08,470
and so uh all of that you know including

595
00:22:12,710 --> 00:22:10,720
the training the people is what's going

596
00:22:15,270 --> 00:22:12,720
on and if you show image

597
00:22:16,549 --> 00:22:15,280
uh eight right now

598
00:22:18,470 --> 00:22:16,559
we're actually in this phase where we're

599
00:22:20,549 --> 00:22:18,480
in integration and testing so what i'm

600
00:22:22,630 --> 00:22:20,559
doing at the moment is i'm working on

601
00:22:25,510 --> 00:22:22,640
procedures which you could kind of think

602
00:22:28,070 --> 00:22:25,520
as your step-by-step guide you know if

603
00:22:29,669 --> 00:22:28,080
we wanted to for example power the

604
00:22:31,190 --> 00:22:29,679
instrument on they're not going to say

605
00:22:33,830 --> 00:22:31,200
you know go power on the instrument and

606
00:22:36,149 --> 00:22:33,840
i get on my computer like

607
00:22:39,350 --> 00:22:36,159
i think this is good send

608
00:22:41,669 --> 00:22:39,360
instead we have these guides that i'm

609
00:22:43,430 --> 00:22:41,679
able to make by talking to other

610
00:22:44,950 --> 00:22:43,440
engineers who are on the team as well as

611
00:22:48,070 --> 00:22:44,960
the scientists

612
00:22:49,830 --> 00:22:48,080
and so i know before i do anything i

613
00:22:51,029 --> 00:22:49,840

need to check to make sure the currents

614
00:22:53,110 --> 00:22:51,039
are looking good the voltages are

615
00:22:56,070 --> 00:22:53,120
looking good then i can send the first

616
00:22:57,909 --> 00:22:56,080
command and then stop again let's check

617
00:23:00,149 --> 00:22:57,919
is this looking good is this looking

618
00:23:02,390 --> 00:23:00,159
good so these procedures are great but

619
00:23:05,110 --> 00:23:02,400
before we just you know use them for the

620
00:23:06,870 --> 00:23:05,120
first time in space we use them here in

621
00:23:08,950 --> 00:23:06,880
the lab while the instrument is still

622
00:23:12,470 --> 00:23:08,960
with us so that we can ensure that we

623
00:23:15,750 --> 00:23:12,480
are as prepared as we can be once we get

624
00:23:19,669 --> 00:23:16,470
so

625
00:23:21,110 --> 00:23:19,679
as an engineer you are the

626
00:23:23,110 --> 00:23:21,120
problem solver

627
00:23:24,549 --> 00:23:23,120
you create the list of what to do and

628
00:23:26,310 --> 00:23:24,559
you are the dreamers of dreams you're

629
00:23:28,310 --> 00:23:26,320
the ones that create and make sure that

630
00:23:30,470 --> 00:23:28,320
this is

631
00:23:32,070 --> 00:23:30,480
possible that it's one thing to send a

632
00:23:35,110 --> 00:23:32,080
mission up there

633
00:23:37,110 --> 00:23:35,120
but without the information and the data

634
00:23:39,029 --> 00:23:37,120
there's nothing to do with it

635
00:23:44,950 --> 00:23:39,039
right

636
00:23:47,430 --> 00:23:44,960
i'm here today representing the team

637
00:23:49,029 --> 00:23:47,440
because i'm just one part of it i'm

638
00:23:50,549 --> 00:23:49,039

focusing on the instrument operations

639
00:23:52,390 --> 00:23:50,559
but i couldn't have done it without

640
00:23:54,549 --> 00:23:52,400
working with people on the flight

641
00:23:57,110 --> 00:23:54,559
software side of things people working

642
00:23:59,269 --> 00:23:57,120
on the instrumentation building my

643
00:24:00,950 --> 00:23:59,279
people working with all of our partners

644
00:24:03,190 --> 00:24:00,960
to make it all come together at the end

645
00:24:04,950 --> 00:24:03,200
of the day and so i'm just happy to be

646
00:24:07,350 --> 00:24:04,960
able to share the message of what good

647
00:24:10,230 --> 00:24:07,360
is to come for us

648
00:24:11,669 --> 00:24:10,240
it's a wonderful mission and and you've

649
00:24:13,029 --> 00:24:11,679
you've enlightened us with a lot of

650
00:24:15,110 --> 00:24:13,039
what's going on with it but i know there

651
00:24:16,470 --> 00:24:15,120
are a lot of questions so let's send it

652
00:24:19,430 --> 00:24:16,480
back over to jocelyn and see what

653
00:24:21,990 --> 00:24:19,440
they're thinking out there in the world

654
00:24:25,269 --> 00:24:22,000
hey yeah so priya on linkedin wants to

655
00:24:28,710 --> 00:24:25,279
know is maya targeting specific regions

656
00:24:30,549 --> 00:24:28,720
or just taking random pictures

657
00:24:33,909 --> 00:24:30,559
that's a great question

658
00:24:35,990 --> 00:24:33,919
maya is targeting specific regions uh

659
00:24:37,110 --> 00:24:36,000
the names i threw out earlier like los

660
00:24:38,549 --> 00:24:37,120
angeles

661
00:24:40,470 --> 00:24:38,559
boston

662
00:24:41,510 --> 00:24:40,480
uh rome

663
00:24:43,190 --> 00:24:41,520

soul

664
00:24:45,510 --> 00:24:43,200
those are actual targets that the

665
00:24:46,390 --> 00:24:45,520
scientists chose for a variety of

666
00:24:48,230 --> 00:24:46,400
reasons

667
00:24:50,230 --> 00:24:48,240
you know perhaps it's because their

668
00:24:52,310 --> 00:24:50,240
population is dense enough because we're

669
00:24:54,549 --> 00:24:52,320
trying to do statistics on this data so

670
00:24:56,470 --> 00:24:54,559
we can come back with very confident

671
00:24:58,470 --> 00:24:56,480
conclusions about what we are able to

672
00:25:00,310 --> 00:24:58,480
observe in those regions

673
00:25:01,990 --> 00:25:00,320
uh you also can choose them because

674
00:25:04,310 --> 00:25:02,000
they're interesting maybe they

675
00:25:07,269 --> 00:25:04,320
experience a lot of bad pollution in

676
00:25:10,310 --> 00:25:07,279
that area also you know this is a study

677
00:25:12,310 --> 00:25:10,320
about human health so can we get the

678
00:25:14,390 --> 00:25:12,320
health records from that area

679
00:25:16,549 --> 00:25:14,400
so the scientists spent a lot of time

680
00:25:18,870 --> 00:25:16,559
actually paring down a list and i i love

681
00:25:21,350 --> 00:25:18,880
going to science meetings or like my

682
00:25:23,909 --> 00:25:21,360
target is important because you know

683
00:25:25,830 --> 00:25:23,919
it's super interesting and if you'd like

684
00:25:27,750 --> 00:25:25,840
to see more about the process that went

685
00:25:29,750 --> 00:25:27,760
into that and what the full list of

686
00:25:31,430 --> 00:25:29,760
current targets that we have right now

687
00:25:35,669 --> 00:25:31,440
you can find that information on our

688
00:25:39,430 --> 00:25:37,430

awesome so you've talked a little bit

689
00:25:41,190 --> 00:25:39,440
about like the complexity of the mission

690
00:25:44,230 --> 00:25:41,200
and how many people are involved and

691
00:25:47,510 --> 00:25:44,240
musical wolves on youtube asks how long

692
00:25:49,909 --> 00:25:47,520
does it usually take to go from idea on

693
00:25:53,110 --> 00:25:49,919
the paper to actually making a

694
00:25:57,909 --> 00:25:55,590
that's a great question idea on the

695
00:26:01,110 --> 00:25:57,919
paper to scientific instrument you know

696
00:26:03,750 --> 00:26:01,120
i uh maya is the first project that i've

697
00:26:06,070 --> 00:26:03,760
ever worked on that wasn't in space

698
00:26:08,470 --> 00:26:06,080
before i joined the team so i'm kind of

699
00:26:10,149 --> 00:26:08,480
seeing everything for the first time and

700
00:26:11,350 --> 00:26:10,159
it's really my litmus test for

701
00:26:13,190 --> 00:26:11,360
everything else

702
00:26:15,590 --> 00:26:13,200
but i asked this question i'm answering

703
00:26:17,510 --> 00:26:15,600
based off of what i've seen and i've

704
00:26:20,230 --> 00:26:17,520
been on this project for about three

705
00:26:22,390 --> 00:26:20,240
years and when i first joined

706
00:26:24,470 --> 00:26:22,400
maya was basically at the phase where

707
00:26:27,110 --> 00:26:24,480
all those initial requirements of what

708
00:26:29,350 --> 00:26:27,120
we needed to make this a reality have

709
00:26:32,470 --> 00:26:29,360
been done and now we're going to move

710
00:26:34,710 --> 00:26:32,480
into design so three years has passed

711
00:26:36,149 --> 00:26:34,720
we're in integration and test right now

712
00:26:39,350 --> 00:26:36,159
and we'll be launching in a couple of

713
00:26:41,350 --> 00:26:39,360

years and so to me it's

714
00:26:43,510 --> 00:26:41,360
it's like a whirlwind because i think

715
00:26:45,830 --> 00:26:43,520
last year and the year before that and i

716
00:26:47,029 --> 00:26:45,840
can remember when these things were just

717
00:26:49,510 --> 00:26:47,039
ideas

718
00:26:52,710 --> 00:26:49,520
and when i went into the lab for the

719
00:26:55,909 --> 00:26:52,720
first time and i actually got to see

720
00:26:58,950 --> 00:26:55,919
part of maya in the vacuum chamber for a

721
00:27:00,630 --> 00:26:58,960
test i got to see it move i got to see

722
00:27:03,590 --> 00:27:00,640
us command it

723
00:27:05,669 --> 00:27:03,600
it was such a magical

724
00:27:07,190 --> 00:27:05,679
moment to see it come together something

725
00:27:09,510 --> 00:27:07,200
that i had just been imagining in my

726
00:27:10,950 --> 00:27:09,520
head conceptually was now physically

727
00:27:13,350 --> 00:27:10,960
materializing

728
00:27:13,760 --> 00:27:13,360
material did i say that right you know

729
00:27:15,669 --> 00:27:13,770
what i meant

730
00:27:18,230 --> 00:27:15,679
[Laughter]

731
00:27:19,510 --> 00:27:18,240
and so you know it it's it's a whirlwind

732
00:27:22,070 --> 00:27:19,520
and it depends on the mission that

733
00:27:25,669 --> 00:27:22,080
you're doing maya is simply just the

734
00:27:27,750 --> 00:27:25,679
instrument itself but uh

735
00:27:29,750 --> 00:27:27,760
yeah i'm sure that there are others out

736
00:27:31,909 --> 00:27:29,760
there who can give their thoughts on

737
00:27:35,990 --> 00:27:31,919
that too since we do such a wide variety

738
00:27:40,789 --> 00:27:38,310

awesome and going back to a little bit

739
00:27:43,830 --> 00:27:40,799
more on the specifics of maya deborah on

740
00:27:46,470 --> 00:27:43,840
facebook asks will the imager provide

741
00:27:49,510 --> 00:27:46,480
close to real-time data on particulates

742
00:27:51,909 --> 00:27:49,520
in our atmosphere is it pure data and

743
00:27:54,789 --> 00:27:51,919
will it be tied to every country's

744
00:27:58,470 --> 00:27:56,870
ah i'm not sure if i understand the full

745
00:27:59,990 --> 00:27:58,480
question but i'm going to try and answer

746
00:28:02,310 --> 00:28:00,000
as best as i can

747
00:28:04,710 --> 00:28:02,320
so when you say real-time data i'm like

748
00:28:08,230 --> 00:28:04,720
kind of glad you said that because i

749
00:28:10,310 --> 00:28:08,240
this is like my area so because this is

750
00:28:13,669 --> 00:28:10,320
a mission that is orbiting our own

751
00:28:15,750 --> 00:28:13,679
planet it's very close compared to you

752
00:28:17,990 --> 00:28:15,760
know the mission cassini at saturn i

753
00:28:20,310 --> 00:28:18,000
mentioned earlier when we set commands

754
00:28:22,549 --> 00:28:20,320
there it could take an hour and a half

755
00:28:24,630 --> 00:28:22,559
for the commands just to reach the

756
00:28:27,269 --> 00:28:24,640
instrument then another hour and a half

757
00:28:28,230 --> 00:28:27,279
for us to know that it got there very

758
00:28:30,710 --> 00:28:28,240
different

759
00:28:33,990 --> 00:28:30,720
with maya we actually do have the

760
00:28:34,950 --> 00:28:34,000
capability to command it in near real

761
00:28:35,990 --> 00:28:34,960
time

762
00:28:37,909 --> 00:28:36,000
uh

763
00:28:39,430 --> 00:28:37,919

when it comes to like

764
00:28:41,669 --> 00:28:39,440
i'm not exactly sure what you're

765
00:28:43,510 --> 00:28:41,679
imagining but if you are meaning you

766
00:28:45,830 --> 00:28:43,520
know do we send the command and on the

767
00:28:48,310 --> 00:28:45,840
ground we see the images right away

768
00:28:51,029 --> 00:28:48,320
it's not that fast it's not quite that

769
00:28:53,990 --> 00:28:51,039
fast we plan our activities for about a

770
00:28:56,470 --> 00:28:54,000
week long and then throughout that week

771
00:28:58,310 --> 00:28:56,480
we gradually get data every time we have

772
00:29:00,950 --> 00:28:58,320
the opportunity to send it back to an

773
00:29:03,029 --> 00:29:00,960
antenna that's here on earth and then

774
00:29:05,909 --> 00:29:03,039
after some processing because what we

775
00:29:07,909 --> 00:29:05,919
get back is raw data in those images

776
00:29:10,149 --> 00:29:07,919
after some processing then we can get to

777
00:29:12,149 --> 00:29:10,159
the point where we've got something to

778
00:29:13,990 --> 00:29:12,159
to look at as well as other kinds of

779
00:29:15,190 --> 00:29:14,000
data that the scientists will be using

780
00:29:16,710 --> 00:29:15,200
as well

781
00:29:19,510 --> 00:29:16,720
and so i hope that answered your

782
00:29:21,269 --> 00:29:19,520
question or at least part of it

783
00:29:24,070 --> 00:29:21,279
yeah definitely i think that provides a

784
00:29:27,269 --> 00:29:24,080
lot of insight and as you've mentioned

785
00:29:29,510 --> 00:29:27,279
there's a big team behind this mission

786
00:29:31,430 --> 00:29:29,520
and james williams on youtube wants to

787
00:29:33,669 --> 00:29:31,440
know what's your opinion about the

788
00:29:36,470 --> 00:29:33,679

importance of working on a team when

789
00:29:39,190 --> 00:29:36,480
you're an engineer

790
00:29:40,470 --> 00:29:39,200
it there's nothing that compares to it i

791
00:29:44,389 --> 00:29:40,480
love to show

792
00:29:48,870 --> 00:29:46,470
uh this is an image of one of the teams

793
00:29:50,789 --> 00:29:48,880
that i worked on uh the cassini mission

794
00:29:52,549 --> 00:29:50,799
in the top left you've got the people

795
00:29:55,750 --> 00:29:52,559
who basically trained me to be an

796
00:29:58,070 --> 00:29:55,760
instrument ops engineer and i never

797
00:30:00,149 --> 00:29:58,080
would have been able to bring that skill

798
00:30:02,710 --> 00:30:00,159
and knowledge to maya

799
00:30:03,669 --> 00:30:02,720
without them being there

800
00:30:05,430 --> 00:30:03,679
and

801
00:30:08,149 --> 00:30:05,440
think about it now oh actually let's

802
00:30:10,149 --> 00:30:08,159
show image 14 as well talking about

803
00:30:12,070 --> 00:30:10,159
teams i mean teams are not just the

804
00:30:13,430 --> 00:30:12,080
people who work with you immediately on

805
00:30:16,070 --> 00:30:13,440
your projects

806
00:30:18,789 --> 00:30:16,080
teams are about everyone around you jpl

807
00:30:22,230 --> 00:30:18,799
is a place that's full with people who

808
00:30:24,789 --> 00:30:22,240
have amazing ideas and even though your

809
00:30:26,389 --> 00:30:24,799
work may never having you crossing paths

810
00:30:29,430 --> 00:30:26,399
it doesn't mean that you don't get to

811
00:30:31,990 --> 00:30:29,440
meet each other and this is my mit team

812
00:30:33,750 --> 00:30:32,000
at jpl first arriving and wondering wow

813
00:30:37,029 --> 00:30:33,760

what's going on here

814
00:30:39,269 --> 00:30:37,039
and this is all very new i had a team

815
00:30:40,870 --> 00:30:39,279
supporters people i could reach out to

816
00:30:43,909 --> 00:30:40,880
you know i've never written this kind of

817
00:30:46,149 --> 00:30:43,919
document before have any of you and same

818
00:30:48,630 --> 00:30:46,159
thing with an employee resource group

819
00:30:51,190 --> 00:30:48,640
that i helped to revitalize at jpl

820
00:30:53,669 --> 00:30:51,200
called the black employee resource group

821
00:30:56,549 --> 00:30:53,679
sorry black excellent strategic team

822
00:30:58,470 --> 00:30:56,559
how can i mess that up i'm the president

823
00:31:00,389 --> 00:30:58,480
and so you know that's a photo of us

824
00:31:02,549 --> 00:31:00,399
coming together to build this

825
00:31:04,710 --> 00:31:02,559
inclusiveness that shows that it's the

826
00:31:06,789 --> 00:31:04,720
people that make the missions great we

827
00:31:09,029 --> 00:31:06,799
are the ones the force behind these

828
00:31:18,470 --> 00:31:09,039
incredible ideas and daring mighty

829
00:31:23,750 --> 00:31:20,710
so we've got time for one last question

830
00:31:28,549 --> 00:31:25,990
great i i think we have a great question

831
00:31:30,389 --> 00:31:28,559
looking to the future and future teams

832
00:31:32,470 --> 00:31:30,399
that will build other instruments amy

833
00:31:34,230 --> 00:31:32,480
zwolle on youtube wants to know i'm a

834
00:31:36,710 --> 00:31:34,240
high school student who's passionate

835
00:31:39,269 --> 00:31:36,720
about aerospace engineering what advice

836
00:31:41,750 --> 00:31:39,279
do you have on next steps for someone

837
00:31:47,509 --> 00:31:45,190
you are already ahead of the game kudos

838
00:31:50,549 --> 00:31:47,519

to you i didn't even know what aerospace

839
00:31:52,710 --> 00:31:50,559
engineering was when i was in your shoes

840
00:31:54,630 --> 00:31:52,720
now that you've got that goal in mind to

841
00:31:56,149 --> 00:31:54,640
me the most important thing for you to

842
00:31:59,190 --> 00:31:56,159
do at this point

843
00:32:03,190 --> 00:31:59,200
is don't be your worst enemy

844
00:32:05,350 --> 00:32:03,200
it is so easy for us to be the downers

845
00:32:07,029 --> 00:32:05,360
you know we go into this application

846
00:32:08,789 --> 00:32:07,039
thinking well i know they're not going

847
00:32:11,350 --> 00:32:08,799
to choose me like

848
00:32:14,310 --> 00:32:11,360
it's i'm not getting in or i might as

849
00:32:16,549 --> 00:32:14,320
well not even try it's so easy to feel

850
00:32:18,789 --> 00:32:16,559
that way about yourself i mean i would

851
00:32:21,110 --> 00:32:18,799
know i i kind of went through that

852
00:32:23,269 --> 00:32:21,120
before this talk right here i'm an

853
00:32:25,509 --> 00:32:23,279
engineer but i don't think of myself as

854
00:32:28,630 --> 00:32:25,519
an expert i think of myself as a person

855
00:32:31,990 --> 00:32:28,640
who still has lots and lots to learn

856
00:32:34,630 --> 00:32:32,000
and so as long as you never stop being

857
00:32:36,710 --> 00:32:34,640
your best advocate in other words you

858
00:32:37,750 --> 00:32:36,720
have to be confident enough to make it

859
00:32:39,830 --> 00:32:37,760
reality

860
00:32:42,310 --> 00:32:39,840
i can't go around telling people that

861
00:32:43,509 --> 00:32:42,320
they can do it if i don't believe it

862
00:32:46,389 --> 00:32:43,519
myself

863
00:32:47,830 --> 00:32:46,399

so as long as you have that mentality

864
00:32:49,669 --> 00:32:47,840
it's more important than you'd ever

865
00:32:51,590 --> 00:32:49,679
imagine a lot of people think the grades

866
00:32:53,590 --> 00:32:51,600
and the numbers are what's most

867
00:32:55,669 --> 00:32:53,600
important but at the end of the day is

868
00:32:56,630 --> 00:32:55,679
what kind of person you are

869
00:33:00,789 --> 00:32:56,640
be

870
00:33:02,870 --> 00:33:00,799
yourself having that confidence never

871
00:33:05,190 --> 00:33:02,880
letting go of your dreams that is

872
00:33:09,029 --> 00:33:05,200
absolutely key if you want to get into a

873
00:33:12,789 --> 00:33:10,870
every time i talk to you janelle i feel

874
00:33:13,909 --> 00:33:12,799
more inspired to go out there and and

875
00:33:15,110 --> 00:33:13,919
and

876
00:33:17,110 --> 00:33:15,120
do the thing

877
00:33:19,029 --> 00:33:17,120
um that's all the time that we have for

878
00:33:20,789 --> 00:33:19,039
questions but before we go i just want

879
00:33:22,549 --> 00:33:20,799
to check in and and see if there's any

880
00:33:24,870 --> 00:33:22,559
last asked words that you that was

881
00:33:26,870 --> 00:33:24,880
pretty good right there but any last

882
00:33:28,470 --> 00:33:26,880
words that you want the audience

883
00:33:31,269 --> 00:33:28,480
everybody watching at home to to walk

884
00:33:35,669 --> 00:33:33,590
you know i guess if there were any last

885
00:33:38,710 --> 00:33:35,679
thoughts especially on a talk right here

886
00:33:40,149 --> 00:33:38,720
that's all about maya multi-angle imager

887
00:33:42,789 --> 00:33:40,159
for aerosols

888
00:33:46,070 --> 00:33:42,799

it just goes to show that you know we as

889
00:33:48,710 --> 00:33:46,080
people we have to come together in order

890
00:33:52,950 --> 00:33:48,720
to bring about good change and this

891
00:33:55,350 --> 00:33:52,960
mission is the example of that i

892
00:33:57,110 --> 00:33:55,360
absolutely can't wait to be able to say

893
00:33:59,430 --> 00:33:57,120
look at what we've done and look at what

894
00:34:01,190 --> 00:33:59,440
good we can do for the world when maya's

895
00:34:03,590 --> 00:34:01,200
out there orbiting making these

896
00:34:05,269 --> 00:34:03,600
observations these papers start coming

897
00:34:07,190 --> 00:34:05,279
out i mean

898
00:34:09,589 --> 00:34:07,200
it really doesn't get better than that

899
00:34:10,470 --> 00:34:09,599
doing something that benefits humanity

900
00:34:12,629 --> 00:34:10,480
and

901
00:34:14,950 --> 00:34:12,639
even though we all may not have the

902
00:34:17,030 --> 00:34:14,960
opportunity to work on maya right now i

903
00:34:19,909 --> 00:34:17,040
do strongly believe that we all have the

904
00:34:23,510 --> 00:34:19,919
capability to do good and so if you

905
00:34:25,589 --> 00:34:23,520
leave anything it's that

906
00:34:27,750 --> 00:34:25,599
that is all the time that we have for

907
00:34:30,069 --> 00:34:27,760
tonight but please join us next month

908
00:34:32,230 --> 00:34:30,079
for our talk the warm glow of the cool

909
00:34:34,550 --> 00:34:32,240
universe with dita markovic and phil

910
00:34:36,470 --> 00:34:34,560
corngut remember folks that all of our

911
00:34:38,869 --> 00:34:36,480
past von carmen talks are available

912
00:34:41,270 --> 00:34:38,879
online and i would like to thank our

913
00:34:43,669 --> 00:34:41,280

terrific speaker janelle wellins for

914
00:34:45,349 --> 00:34:43,679
taking the time to join us tonight i

915
00:34:47,669 --> 00:34:45,359
also want to thank our co-host jocelyn

916
00:34:50,230 --> 00:34:47,679
argeta and everyone behind the scenes

917
00:34:52,310 --> 00:34:50,240
that make these talks possible and the

918
00:34:53,030 --> 00:34:52,320
last thank you always goes out to all of

919
00:34:54,790 --> 00:34:53,040
you

920
00:34:56,869 --> 00:34:54,800
watching at home

921
00:34:58,870 --> 00:34:56,879
this is your space program and we're so

922
00:35:01,670 --> 00:34:58,880
happy that you join us every single

923
00:35:02,470 --> 00:35:01,680
month so please join us in october stay

924
00:35:05,880 --> 00:35:02,480
safe

925
00:35:32,390 --> 00:35:05,890
stay kind and stay curious