
NASA AT HOME
SPACEPORT SERIES
NASA
ARTEMIS

1
00:00:50,530 --> 00:00:20,230
[Music]

2
00:00:59,890 --> 00:00:50,540
you

3
00:00:59,900 --> 00:01:10,749
[Music]

4
00:01:16,160 --> 00:01:13,760
all right welcome back to the final day

5
00:01:17,810 --> 00:01:16,170
in our artemis week i am so glad to be

6
00:01:19,670 --> 00:01:17,820
coming to you live from the Kennedy

7
00:01:22,039 --> 00:01:19,680
Space Center sort of I'm Joshua Santora

8
00:01:25,490 --> 00:01:22,049
bringing you two amazing ladies who are

9
00:01:27,800 --> 00:01:25,500
working to do what needs to be done once

10
00:01:31,249 --> 00:01:27,810
we get to the moon Artemis is getting to

11
00:01:33,319 --> 00:01:31,259
the moon with our eyes on Mars but it's

12
00:01:34,999 --> 00:01:33,329
only step one and it's a big step but I

13
00:01:37,310 --> 00:01:35,009

have with me today Jackie Quinn the EM

14
00:01:40,100 --> 00:01:37,320
solo project manager Jackie thanks for

15
00:01:41,960 --> 00:01:40,110
being here oh it's great to be with you

16
00:01:44,480 --> 00:01:41,970
thanks yeah and then also joined by

17
00:01:47,440 --> 00:01:44,490
Janeane captain both ladies applied

18
00:01:55,190 --> 00:01:47,450
chemists I think is that correct

19
00:01:56,839 --> 00:01:55,200
hi yes very cool yes amazing skills and

20
00:01:59,029 --> 00:01:56,849
talents chemistry definitely not my

21
00:02:00,889 --> 00:01:59,039
forte so I appreciate ladies like you

22
00:02:03,320 --> 00:02:00,899
who are conquering the difficult stuff

23
00:02:05,690 --> 00:02:03,330
in my mind so let's jump right in can

24
00:02:08,600 --> 00:02:05,700
you give me both a snapshot of what you

25
00:02:10,789 --> 00:02:08,610
do obviously we saw job titles principal

26
00:02:11,390 --> 00:02:10,799
investigator and project manager what do

27
00:02:15,199 --> 00:02:11,400
those things mean

28
00:02:17,539 --> 00:02:15,209
I'm Jackie we'll start with you okay so

29
00:02:21,259 --> 00:02:17,549
I'm the project manager for in solo and

30
00:02:24,770 --> 00:02:21,269
I work alongside Jenny basically my

31
00:02:26,690 --> 00:02:24,780
functions are to deal with the overall

32
00:02:28,250 --> 00:02:26,700
management of the project like schedule

33
00:02:30,410 --> 00:02:28,260
adherence ensuring that we have enough

34
00:02:32,270 --> 00:02:30,420
budget um I also make sure we have the

35
00:02:33,949 --> 00:02:32,280
the staff available with the right skill

36
00:02:35,569 --> 00:02:33,959
set to work on the project and then you

37
00:02:37,099 --> 00:02:35,579
know occasionally I get to put in a few

38
00:02:38,960 --> 00:02:37,109

tidbits based on my technical background

39
00:02:40,520 --> 00:02:38,970
so that's what I do

40
00:02:42,199 --> 00:02:40,530
and I think that's a really important

41
00:02:45,319 --> 00:02:42,209
note of just the fact that there's a lot

42
00:02:47,479 --> 00:02:45,329
of things that are not technical that go

43
00:02:50,300 --> 00:02:47,489
into this world so definitely a diverse

44
00:02:51,590 --> 00:02:50,310
skill set required so I'm sure that's

45
00:02:53,030 --> 00:02:51,600
again not actually your favorite thing

46
00:02:56,030 --> 00:02:53,040
to do but very important aspects to the

47
00:02:58,699 --> 00:02:56,040
job well Jeanine as a principal

48
00:03:00,530 --> 00:02:58,709
investigator what that sounds really

49
00:03:04,250 --> 00:03:00,540
important so for EM so but what does

50
00:03:06,289 --> 00:03:04,260
that mean so as the principal

51
00:03:08,180 --> 00:03:06,299
investigator for ENSO I'm responsible

52
00:03:11,059 --> 00:03:08,190
for the science and the instrument

53
00:03:13,550 --> 00:03:11,069
performance but you know I'm not the

54
00:03:16,460 --> 00:03:13,560
most important thing at all we work with

55
00:03:18,289 --> 00:03:16,470
an amazing team of folks at KSC and

56
00:03:18,820 --> 00:03:18,299
different NASA centers and our

57
00:03:20,590 --> 00:03:18,830
commercial

58
00:03:25,180 --> 00:03:20,600
and we're ready to get this instrument

59
00:03:26,530 --> 00:03:25,190
to go to the mom so we got to take a

60
00:03:29,170 --> 00:03:26,540
step back for a second because we didn't

61
00:03:30,730 --> 00:03:29,180
actually talk about what M solo is so we

62
00:03:32,380 --> 00:03:30,740
kind of know what you do for this this

63
00:03:33,850 --> 00:03:32,390

mission or payload or I'm not exactly

64
00:03:35,140 --> 00:03:33,860
sure the right way to describe it we

65
00:03:37,300 --> 00:03:35,150
have very interesting terms for things

66
00:03:42,400 --> 00:03:37,310
like this can you tell us more about

67
00:03:45,160 --> 00:03:42,410
what is M solo yeah sure so I'm solo

68
00:03:47,590 --> 00:03:45,170
stands for mass spectrometer observing

69
00:03:50,320 --> 00:03:47,600
lunar operations you know NASA loves the

70
00:03:51,820 --> 00:03:50,330
acronyms so this is a modified

71
00:03:55,000 --> 00:03:51,830
commercial instrument that measures

72
00:03:57,880 --> 00:03:55,010
gases so we're partnering with infocon a

73
00:04:00,310 --> 00:03:57,890
company in Syracuse New York here on

74
00:04:02,440 --> 00:04:00,320
earth this instrument is used in the

75
00:04:04,449 --> 00:04:02,450
semiconductor industry but we're

76
00:04:07,470 --> 00:04:04,459
actually going to use it to detect water

77
00:04:12,550 --> 00:04:07,480
and other volatiles on the lunar surface

78
00:04:15,040 --> 00:04:12,560
and can you can you give me kind of a

79
00:04:16,360 --> 00:04:15,050
picture of what does that mean exactly

80
00:04:19,750 --> 00:04:16,370
you use an interesting term they're a

81
00:04:22,180 --> 00:04:19,760
volatile obviously it's a research

82
00:04:25,570 --> 00:04:22,190
mission can you tell me a little more

83
00:04:27,430 --> 00:04:25,580
about that yeah so you know in planetary

84
00:04:29,409 --> 00:04:27,440
science when we talk about volatiles

85
00:04:31,360 --> 00:04:29,419
we're talking about compounds that have

86
00:04:33,640 --> 00:04:31,370
low boiling point so things that are

87
00:04:35,530 --> 00:04:33,650
typically found in the atmosphere so

88
00:04:37,630 --> 00:04:35,540

things you know oxygen nitrogen and

89
00:04:40,270 --> 00:04:37,640
water are all considered volatiles and

90
00:04:42,550 --> 00:04:40,280
so we're looking at measuring things

91
00:04:44,500 --> 00:04:42,560
that we can use as resources on the

92
00:04:46,030 --> 00:04:44,510
lunar surface and I think we have a

93
00:04:48,780 --> 00:04:46,040
video if you want to play the video no

94
00:04:52,870 --> 00:04:48,790
fur I'm so long yeah let's take a look

95
00:04:56,980 --> 00:04:52,880
I'm solo stands for mass spectrometer

96
00:04:58,990 --> 00:04:56,990
observing lunar operations we took an

97
00:05:00,970 --> 00:04:59,000
off-the-shelf mass spectrometer and

98
00:05:02,740 --> 00:05:00,980
worked with Ethicon to ruggedized the

99
00:05:05,170 --> 00:05:02,750
design to withstand the harshness of

100
00:05:07,480 --> 00:05:05,180
space we bolstered the glass instrument

101
00:05:08,920 --> 00:05:07,490
detector redesigned the avionics boards

102
00:05:10,990 --> 00:05:08,930
for better heat flow and increased

103
00:05:12,940 --> 00:05:11,000
radiation tolerance and applied other

104
00:05:16,090 --> 00:05:12,950
standard space flight practices into the

105
00:05:18,130 --> 00:05:16,100
design on the lunar surface M solo can

106
00:05:20,200 --> 00:05:18,140
measure resources like water crucial to

107
00:05:21,940 --> 00:05:20,210
deep-space exploration and it can

108
00:05:24,280 --> 00:05:21,950
measure the gases coming off a lander

109
00:05:25,900 --> 00:05:24,290
during touchdown this is important so we

110
00:05:27,670 --> 00:05:25,910
know what is truly coming from the moon

111
00:05:29,770 --> 00:05:27,680
and what we brought with us being able

112
00:05:31,350 --> 00:05:29,780
to identify the lander signature will

113
00:05:33,659 --> 00:05:31,360

ensure we are only measuring

114
00:05:35,790 --> 00:05:33,669
what was already on the lunar surface M

115
00:05:37,559 --> 00:05:35,800
solo will be sent to the moon as part of

116
00:05:39,629 --> 00:05:37,569
the commercial lunar payload services

117
00:05:41,369 --> 00:05:39,639
contract essentially commercial

118
00:05:43,260 --> 00:05:41,379
companies are building lunar landers and

119
00:05:44,399 --> 00:05:43,270
technology like ours is hitching a ride

120
00:05:46,200 --> 00:05:44,409
down to the surface

121
00:05:47,999 --> 00:05:46,210
not only will M so it will help us learn

122
00:05:49,290 --> 00:05:48,009
more about the moon and ultimately

123
00:05:51,420 --> 00:05:49,300
change the way we explore our solar

124
00:05:53,040 --> 00:05:51,430
system but the new rugged designed we

125
00:05:55,320 --> 00:05:53,050
helped create is changing things down

126
00:05:57,570 --> 00:05:55,330
here on earth too by modifying an

127
00:05:59,820 --> 00:05:57,580
off-the-shelf mass spectrometer NASA

128
00:06:01,439 --> 00:05:59,830
helped M pecan identify ways they could

129
00:06:03,450 --> 00:06:01,449
improve their product that would also

130
00:06:05,189 --> 00:06:03,460
help universities and other researchers

131
00:06:08,670 --> 00:06:05,199
using their equipment in harsh

132
00:06:10,499 --> 00:06:08,680
environments here on earth in Costa Rica

133
00:06:12,510 --> 00:06:10,509
investigators are flying a commercial

134
00:06:15,119 --> 00:06:12,520
mass spectrometer on drones over

135
00:06:17,339 --> 00:06:15,129
volcanoes safely detecting what gases

136
00:06:19,170 --> 00:06:17,349
are being emitted information from

137
00:06:20,779 --> 00:06:19,180
volcanic plumes provides insight into

138
00:06:23,189 --> 00:06:20,789

what is happening inside the volcano

139
00:06:24,379 --> 00:06:23,199
alerting researchers if a major eruption

140
00:06:27,689 --> 00:06:24,389
is imminent

141
00:06:30,540 --> 00:06:27,699
we are proud of em so of capabilities in

142
00:06:32,700 --> 00:06:30,550
space and right here on earth and now

143
00:06:35,899 --> 00:06:32,710
we're headed to the moon from Kennedy

144
00:06:38,490 --> 00:06:35,909
Space Center I'm Patricia Valentine

145
00:06:39,990 --> 00:06:38,500
alright so one of the many things in

146
00:06:41,969 --> 00:06:40,000
that video was I heard them mentioned

147
00:06:44,519 --> 00:06:41,979
the I think it's the commercial lunar

148
00:06:46,140 --> 00:06:44,529
payload services which I believe we

149
00:06:48,240 --> 00:06:46,150
affectionately call clips

150
00:06:51,149 --> 00:06:48,250
what is Clips it sounds really important

151
00:06:53,100 --> 00:06:51,159
for our future on the moon yeah it is so

152
00:06:55,260 --> 00:06:53,110
you know as you mentioned the commercial

153
00:06:57,450 --> 00:06:55,270
inner payload services program is NASA's

154
00:06:59,760 --> 00:06:57,460
way of partnering with the commercial

155
00:07:01,950 --> 00:06:59,770
lunar market using emerging lander

156
00:07:04,019 --> 00:07:01,960
technologies to deliver NASA's ready to

157
00:07:07,619 --> 00:07:04,029
fly payloads to the surface of the Moon

158
00:07:09,839 --> 00:07:07,629
so M solo 1 is set to fly on the

159
00:07:11,519 --> 00:07:09,849
Astrobotic lander and that was awarded

160
00:07:13,950 --> 00:07:11,529
during the first round of the clips

161
00:07:15,959 --> 00:07:13,960
opportunities so that mission is going

162
00:07:17,969 --> 00:07:15,969
to be going to the equatorial region of

163
00:07:19,920 --> 00:07:17,979

the moon and so while we don't expect to

164
00:07:21,540 --> 00:07:19,930
find water there you know as was

165
00:07:23,820 --> 00:07:21,550
mentioned in the video it's important

166
00:07:26,309 --> 00:07:23,830
for us to understand what we brought

167
00:07:28,769 --> 00:07:26,319
with us and really establish a baseline

168
00:07:30,360 --> 00:07:28,779
of what our environment is going to look

169
00:07:33,209 --> 00:07:30,370
like when we land with these commercial

170
00:07:34,260 --> 00:07:33,219
partners and so from there we're also

171
00:07:36,570 --> 00:07:34,270
going to look for some science

172
00:07:38,850 --> 00:07:36,580
opportunities and trying to understand

173
00:07:40,969 --> 00:07:38,860
how the thermal cycling influences the

174
00:07:43,999 --> 00:07:40,979
abundance of gasses on the moon as well

175
00:07:46,730 --> 00:07:44,009
and that mission is set to fly in 20

176
00:07:48,859 --> 00:07:46,740
twenty-one so we're really excited to

177
00:07:52,010 --> 00:07:48,869
have an instrument on the lunar surface

178
00:07:53,659 --> 00:07:52,020
next year and then a second M solo

179
00:07:55,489 --> 00:07:53,669
instrument is actually going to fly and

180
00:07:57,679 --> 00:07:55,499
the recently awarded Mastiff Lander and

181
00:07:59,389 --> 00:07:57,689
that is actually going to land near the

182
00:08:02,409 --> 00:07:59,399
lunar South Pole and that's gonna land

183
00:08:05,749 --> 00:08:02,419
on the next year in 2022

184
00:08:07,579 --> 00:08:05,759
so you mentioned I think you mentioned

185
00:08:09,879 --> 00:08:07,589
water ice as being something different

186
00:08:12,290 --> 00:08:09,889
about these two regions is that really

187
00:08:13,850 --> 00:08:12,300
the big difference there and why you go

188
00:08:17,899 --> 00:08:13,860

to the pole versus go to the the

189
00:08:21,079 --> 00:08:17,909
equatorial region yeah and that is one

190
00:08:22,939 --> 00:08:21,089
of the big differences the the water is

191
00:08:25,159 --> 00:08:22,949
such a resource that we really need it's

192
00:08:26,989 --> 00:08:25,169
the easiest resource for us to use and

193
00:08:28,730 --> 00:08:26,999
so that's why we want to go to these

194
00:08:33,319 --> 00:08:28,740
polar areas where we think there is

195
00:08:35,959 --> 00:08:33,329
stable water is awesome and can you give

196
00:08:37,759 --> 00:08:35,969
me kind of a snapshot of what are your

197
00:08:39,949 --> 00:08:37,769
backgrounds and obviously mentioned

198
00:08:40,939 --> 00:08:39,959
engineer and applied chemist but how do

199
00:08:43,759 --> 00:08:40,949
you get to the point where you're

200
00:08:46,819 --> 00:08:43,769
working on a science instrument to go to

201
00:08:49,280 --> 00:08:46,829
the moon to use water ice like that's

202
00:08:54,769 --> 00:08:49,290
just that that's a really amazing NASA

203
00:08:56,960 --> 00:08:54,779
II kind of thing to do yeah so so

204
00:08:59,990 --> 00:08:56,970
actually when I got my graduate degree

205
00:09:02,540 --> 00:09:00,000
working in a little chemistry and I

206
00:09:05,629 --> 00:09:02,550
worked on building vacuum chambers and

207
00:09:07,550 --> 00:09:05,639
operating doing you know vacuums kind of

208
00:09:09,920 --> 00:09:07,560
science and so I was able to take that

209
00:09:11,210 --> 00:09:09,930
experience and apply it to what we were

210
00:09:13,759 --> 00:09:11,220
doing here

211
00:09:16,670 --> 00:09:13,769
so having that hands-on experience for

212
00:09:18,199 --> 00:09:16,680
me really allowed me to jump in and do

213
00:09:21,290 --> 00:09:18,209

some technology development and really

214
00:09:24,500 --> 00:09:21,300
focus on you know going to the moon and

215
00:09:30,170 --> 00:09:24,510
you know simulating that environment of

216
00:09:32,030 --> 00:09:30,180
the moon here on earth very cool and we

217
00:09:33,530 --> 00:09:32,040
are wrapping up here bat-time

218
00:09:34,699 --> 00:09:33,540
Jackie I wanted to let you answer that

219
00:09:38,120 --> 00:09:34,709
question if you had more thoughts and

220
00:09:39,590 --> 00:09:38,130
also just ask you as well what's it like

221
00:09:42,170 --> 00:09:39,600
to be a part of the Artemis program

222
00:09:44,269 --> 00:09:42,180
obviously this is a huge flagship moment

223
00:09:46,550 --> 00:09:44,279
for the agency as we're returning to the

224
00:09:48,319 --> 00:09:46,560
moon 50 years after the first time

225
00:09:51,949 --> 00:09:48,329
around so just curious to hear from you

226
00:09:53,389 --> 00:09:51,959
what that's been like well it's really

227
00:09:56,150 --> 00:09:53,399
cool to be part of the Artemis program

228
00:09:56,680 --> 00:09:56,160
because you know it's it's it's the next

229
00:09:57,940 --> 00:09:56,690
step

230
00:09:59,920 --> 00:09:57,950
that were taken where we're gonna send

231
00:10:01,840 --> 00:09:59,930
the first woman and the next man back to

232
00:10:05,320 --> 00:10:01,850
the moon and and I know you're talking

233
00:10:06,670 --> 00:10:05,330
to two PhD women engineer and scientists

234
00:10:09,100 --> 00:10:06,680
and that's you know especially

235
00:10:11,620 --> 00:10:09,110
meaningful for us you know we do have

236
00:10:13,720 --> 00:10:11,630
another another mission the NASA Viper

237
00:10:15,220 --> 00:10:13,730
mission is also planned to be delivered

238
00:10:18,280 --> 00:10:15,230

to the surface of Moon by a klipse

239
00:10:20,680 --> 00:10:18,290
provider Viper it stands for the vault

240
00:10:23,410 --> 00:10:20,690
holes investigating polar exploration

241
00:10:26,170 --> 00:10:23,420
rover and then just to give you a little

242
00:10:30,010 --> 00:10:26,180
preview that that Viper mission is like

243
00:10:31,840 --> 00:10:30,020
a golf sized mobile robot that we're

244
00:10:33,790 --> 00:10:31,850
sending to the South Poles moon to get a

245
00:10:36,520 --> 00:10:33,800
close-up view of the location and the

246
00:10:39,340 --> 00:10:36,530
concentration of water ice and that is

247
00:10:43,330 --> 00:10:39,350
where we plan to the humans will land on

248
00:10:46,270 --> 00:10:43,340
the Artemis program in 2024 just just a

249
00:10:49,240 --> 00:10:46,280
viper is that the first resource mapping

250
00:10:51,250 --> 00:10:49,250
mission on another celestial body that

251
00:10:53,890 --> 00:10:51,260
resource being water and water you see

252
00:10:55,630 --> 00:10:53,900
can be turn into oxygen or turn you

253
00:10:58,320 --> 00:10:55,640
could turn the oxygen in from the water

254
00:11:02,020 --> 00:10:58,330
into breathing air and also into fuel

255
00:11:04,840 --> 00:11:02,030
the Viper Rover in particular carries a

256
00:11:08,110 --> 00:11:04,850
suite of scientific instruments that

257
00:11:11,110 --> 00:11:08,120
includes neutron spectrometer a near

258
00:11:13,690 --> 00:11:11,120
infrared spectrometer and also in solo

259
00:11:16,180 --> 00:11:13,700
in addition to a drill that'll take a

260
00:11:18,760 --> 00:11:16,190
meter deep sample and carry the lunar

261
00:11:21,010 --> 00:11:18,770
soil to the surface for evaluation of

262
00:11:22,990 --> 00:11:21,020
its volatiles and collectively that

263
00:11:24,760 --> 00:11:23,000

those instruments will determine the

264
00:11:27,850 --> 00:11:24,770
composition and the concentration of the

265
00:11:30,550 --> 00:11:27,860
resources at the South Pole including

266
00:11:32,380 --> 00:11:30,560
water so we believe that the Viper

267
00:11:34,330 --> 00:11:32,390
robotic mission will bring us closer to

268
00:11:36,430 --> 00:11:34,340
NASA's ultimate goal of a sustainable

269
00:11:38,140 --> 00:11:36,440
long-term presence on the moon and

270
00:11:40,780 --> 00:11:38,150
making it possible to explore even

271
00:11:43,030 --> 00:11:40,790
further on to Mars and beyond so as you

272
00:11:44,770 --> 00:11:43,040
note our first step being part of that

273
00:11:47,380 --> 00:11:44,780
Artemis mission and really making it

274
00:11:49,390 --> 00:11:47,390
being part of it is just just super

275
00:11:52,810 --> 00:11:49,400
foundational and I know we're all super

276
00:11:55,240 --> 00:11:52,820
excited as far as the solo team I give a

277
00:11:56,680 --> 00:11:55,250
shout out to the team we have an amazing

278
00:11:58,120 --> 00:11:56,690
group of engineers and scientists that

279
00:12:00,160 --> 00:11:58,130
we work with and denene and I are truly

280
00:12:01,720 --> 00:12:00,170
privileged to to be part of that in a

281
00:12:05,530 --> 00:12:01,730
solo team and also to be part of the

282
00:12:07,760 --> 00:12:05,540
Viper team so appreciate it yeah

283
00:12:09,620 --> 00:12:07,770
Jackie Jeanine appreciate you joining us

284
00:12:11,950 --> 00:12:09,630
cannot wait to see you guys with science

285
00:12:14,780 --> 00:12:11,960
on the moon again very very soon

286
00:12:15,860 --> 00:12:14,790
absolutely thank you all right and for

287
00:12:18,050 --> 00:12:15,870
all of our viewers out there that's

288
00:12:19,700 --> 00:12:18,060

gonna do it for today we want to give

289
00:12:21,260 --> 00:12:19,710
everybody a clue we're taking a break

290
00:12:22,880 --> 00:12:21,270
from this program we're getting ready

291
00:12:23,510 --> 00:12:22,890
for demo2 mission coming up in just a

292
00:12:25,400 --> 00:12:23,520
week and a half

293
00:12:27,020 --> 00:12:25,410
very exciting as humans take flight from

294
00:12:28,790 --> 00:12:27,030
America to the space station once again

295
00:12:31,520 --> 00:12:28,800
but that's going to do it from all all