
COUNTDOWN TO
MARS
A story of
PERSEVERANCE

1
00:00:01,101 --> 00:00:07,107
[exciting music]

2
00:00:16,383 --> 00:00:19,019
- Well here we are
at the Kennedy Space Center,

3
00:00:19,052 --> 00:00:21,288
literally four days away from launching

4
00:00:21,321 --> 00:00:22,856
Perseverance to Mars.

5
00:00:22,890 --> 00:00:25,359
But we're also gonna have
Ingenuity with it.

6
00:00:25,392 --> 00:00:27,961
We're gonna fly a helicopter
on another world

7
00:00:27,995 --> 00:00:29,630
for the first time in human history.

8
00:00:29,663 --> 00:00:31,665
So many exciting things happening.

9
00:00:31,698 --> 00:00:34,368
And we want you to come
with us on this experience,

10
00:00:34,401 --> 00:00:35,802
not just for the launch,

11
00:00:35,836 --> 00:00:37,638
but for the entire mission,

12
00:00:37,671 --> 00:00:40,240

because there is so much
discovery ahead of us.

13
00:00:49,216 --> 00:00:50,384
[intriguing music]

14
00:00:50,417 --> 00:00:53,253
So you can see
the launchpad over there

15
00:00:53,287 --> 00:00:54,821
that looks like an upside-down L.

16
00:00:54,855 --> 00:00:56,390
That's the launchpad that we use

17
00:00:56,423 --> 00:00:59,826
for our Atlas V launches.

18
00:00:59,860 --> 00:01:02,296
And it's a--it's the same launchpad

19
00:01:02,329 --> 00:01:04,031
that we use for Starliner.

20
00:01:04,064 --> 00:01:06,967
And of course, now we're gonna
launch Mars Perseverance

21
00:01:07,000 --> 00:01:08,468
from the same launchpad.

22
00:01:08,502 --> 00:01:10,237
The thing that I'm most excited about

23
00:01:10,270 --> 00:01:14,208
is that this is the first mission
we've ever done

24
00:01:14,241 --> 00:01:16,710
that is designated for astrobiology.

25
00:01:16,743 --> 00:01:17,845
- Yeah.

26
00:01:17,878 --> 00:01:20,247
- The idea that
we are, no kidding,

27
00:01:20,280 --> 00:01:22,416
designating a rover

28
00:01:22,449 --> 00:01:26,320
to look for signs of past life on Mars.

29
00:01:26,353 --> 00:01:28,856
- And as you said,
it's our first astrobiology mission.

30
00:01:28,889 --> 00:01:30,290
We really wanna go after

31
00:01:30,324 --> 00:01:32,559
and identify if there were actually

32
00:01:32,593 --> 00:01:34,761
these early fossils of microbes.

33
00:01:34,795 --> 00:01:36,830
We wanna look for those--
where we wanna drill,

34
00:01:36,864 --> 00:01:39,233
the most likely places
to get those samples,

35
00:01:39,266 --> 00:01:41,201

so we can bring 'em back to Earth

36
00:01:41,235 --> 00:01:43,637
because we've got
the best instruments on Earth,

37
00:01:43,670 --> 00:01:45,939
where we can do incredible analyses
on those rocks

38
00:01:45,973 --> 00:01:47,274
when we get them back here.

39
00:01:47,307 --> 00:01:50,477
- So it's really
our first return trip adventure

40
00:01:50,511 --> 00:01:51,712
to another planet.

41
00:01:51,745 --> 00:01:53,313
- It'll be the first time
we've ever done

42
00:01:53,347 --> 00:01:55,315
a complete round trip to another planet.

43
00:01:55,349 --> 00:01:57,217
It'll be the first time that we launch

44
00:01:57,251 --> 00:01:59,486
a rocket from the surface
of another planet.

45
00:01:59,520 --> 00:02:01,788
- And all of those things
conspire to say that

46
00:02:01,822 --> 00:02:05,526

maybe at one time,
Mars could have hosted life.

47
00:02:05,559 --> 00:02:07,794
And now we're actually gonna go

48
00:02:07,828 --> 00:02:09,930
and try to make those discoveries.

49
00:02:09,963 --> 00:02:12,432
You're the head planetary scientist
at NASA.

50
00:02:12,466 --> 00:02:14,368
What is it that has you the most excited

51
00:02:14,401 --> 00:02:15,903
about this mission?

52
00:02:15,936 --> 00:02:18,272
- I am so excited

53
00:02:18,305 --> 00:02:21,074
to start exploring
that river delta in Jezero.

54
00:02:21,108 --> 00:02:22,910
I cannot wait to get there,

55
00:02:22,943 --> 00:02:25,245
and drive up to that delta,

56
00:02:25,279 --> 00:02:26,747
and taking our first look at it,

57
00:02:26,780 --> 00:02:29,416
and seeing what's in there,
what's in those rocks.

58
00:02:29,449 --> 00:02:30,851
I think that's gonna be phenomenal.

59
00:02:30,884 --> 00:02:32,719
- So there's so many things
that are exciting

60
00:02:32,753 --> 00:02:34,721
about this mission, but, you know,

61
00:02:34,755 --> 00:02:36,523
there's a helicopter
involved in this mission,

62
00:02:36,557 --> 00:02:38,258
which is the first time we've ever

63
00:02:38,292 --> 00:02:40,794
tried to fly a helicopter
on another world.

64
00:02:40,827 --> 00:02:43,597
But what does the helicopter give us?

65
00:02:43,630 --> 00:02:46,900
- I think the helicopter
is just amazing technology,

66
00:02:46,934 --> 00:02:50,070
amazing ingenuity, which is its name.

67
00:02:50,103 --> 00:02:53,140
A very appropriate name
for the helicopter.

68
00:02:53,173 --> 00:02:54,942
It's really incredible.

69

00:02:54,975 --> 00:02:57,845
And you, as a pilot, I know understand

70
00:02:57,878 --> 00:03:01,014
just how hard it is
to achieve flight on Mars.

71
00:03:01,048 --> 00:03:02,749
And what's really cool about that

72
00:03:02,783 --> 00:03:04,852
is it's gonna give us
insight into the future

73
00:03:04,885 --> 00:03:06,253
of what we could do.

74
00:03:06,286 --> 00:03:08,889
So I think the powered flight
is gonna be something

75
00:03:08,922 --> 00:03:10,357
that changes the way we think

76
00:03:10,390 --> 00:03:12,359
about doing exploration on Mars.

77
00:03:12,392 --> 00:03:15,229
- We have all witnessed COVID.

78
00:03:15,262 --> 00:03:17,497
And...

79
00:03:17,531 --> 00:03:20,167
we watched the world stop.

80
00:03:20,200 --> 00:03:22,002
Jim and I both just so amazed

81
00:03:22,035 --> 00:03:23,937
at your workforce,

82
00:03:23,971 --> 00:03:25,439
our workforce.

83
00:03:25,472 --> 00:03:27,307
And to continue during COVID.

84
00:03:27,341 --> 00:03:28,842
- And they have worked

85
00:03:28,876 --> 00:03:30,911
and been so incredibly dedicated,

86
00:03:30,944 --> 00:03:32,713
really done an amazing job,

87
00:03:32,746 --> 00:03:34,681
and it's inspirational.

88
00:03:34,715 --> 00:03:36,817
- It is inspirational.
It's aspirational.

89
00:03:36,850 --> 00:03:37,818
- Yeah.

90
00:03:37,851 --> 00:03:39,853
- And as a team,
we came together.

91
00:03:39,887 --> 00:03:42,856
And here we are
in the middle of a pandemic,

92
00:03:42,890 --> 00:03:45,192
the worst in 100 years,

93
00:03:45,225 --> 00:03:47,261
and we're still going,
"We're gonna do it!"

94
00:03:47,294 --> 00:03:49,363
- [chuckles]
- That's so exciting to me.

95
00:03:49,396 --> 00:03:51,398
This has been great.
I've learned so much.

96
00:03:51,431 --> 00:03:52,466
- Good.
- And I appreciate

97
00:03:52,499 --> 00:03:54,434
both Jim and Lori.
Thank you.

98
00:03:54,468 --> 00:03:55,636
- Well, awesome.

99
00:03:55,669 --> 00:03:56,803
Lori, thank you for all your time today.

100
00:03:56,837 --> 00:03:58,805
- Thanks, Jim.

101
00:03:58,839 --> 00:04:00,140
- Hi!
- Hi, how are you?

102
00:04:00,174 --> 00:04:01,275
- Good.
How are you?

103
00:04:01,308 --> 00:04:02,910

- [indistinct]
- Same here!

104
00:04:02,943 --> 00:04:04,011
Elbow bump?
Yeah!

105
00:04:04,044 --> 00:04:05,012
[laughs]
- There you go.

106
00:04:05,045 --> 00:04:06,813
What I love about NASA

107
00:04:06,847 --> 00:04:09,016
is that it--it's one of those things

108
00:04:09,049 --> 00:04:11,285
that unites people.
It brings people together.

109
00:04:11,318 --> 00:04:13,487
When you look at the team
that put this robot together

110
00:04:13,520 --> 00:04:16,590
and the team that put
this launch vehicle together,

111
00:04:16,623 --> 00:04:17,824
that's what they've done.

112
00:04:17,858 --> 00:04:19,126
They've persevered.
- So, yeah.

113
00:04:19,159 --> 00:04:20,694
This is where the magic happens.

114

00:04:20,727 --> 00:04:21,929
- Fantastic.
- Yeah.

115
00:04:21,962 --> 00:04:23,230
- So tell me what
you're working on here.

116
00:04:23,263 --> 00:04:26,033
- So we've taken over

117
00:04:26,066 --> 00:04:28,836
15,000 samples
of the spacecraft over time.

118
00:04:28,869 --> 00:04:29,937
- Okay.

119
00:04:29,970 --> 00:04:31,805
- Each sample is taken.

120
00:04:31,839 --> 00:04:33,373
It's sonicated.

121
00:04:33,407 --> 00:04:35,042
It's heat shocked in a water bath

122
00:04:35,075 --> 00:04:36,510
at 80 degrees Celsius.

123
00:04:36,543 --> 00:04:38,946
And we search for specific endospores,

124
00:04:38,979 --> 00:04:40,480
bacterial endospores,

125
00:04:40,514 --> 00:04:42,516
because those are the things
that have the highest potential

126
00:04:42,549 --> 00:04:44,551
of surviving the journey
from here to Mars.

127
00:04:44,585 --> 00:04:45,552
- Right.

128
00:04:45,586 --> 00:04:46,787
- And the reason why we do that

129
00:04:46,820 --> 00:04:48,689
is because we don't wanna
contaminate Mars...

130
00:04:48,722 --> 00:04:50,290
- Right.
- With our Earth bacteria.

131
00:04:50,324 --> 00:04:52,659
- So a lot of people hear
"planetary protection."

132
00:04:52,693 --> 00:04:53,794
- Yeah.

133
00:04:53,827 --> 00:04:55,529
- But your word there,
"contamination."

134
00:04:55,562 --> 00:04:57,231
That's really what we're
trying to prevent.

135
00:04:57,264 --> 00:04:59,366
Planetary protection is all about

136
00:04:59,399 --> 00:05:02,102
keeping the science as pure as possible...

137
00:05:02,135 --> 00:05:03,203
- Mm-hmm.

138
00:05:03,237 --> 00:05:04,838
- So that when we do
make discoveries,

139
00:05:04,872 --> 00:05:07,107
we know that they are,
in fact, discoveries.

140
00:05:07,140 --> 00:05:08,342
- Exactly.
Wow.

141
00:05:08,375 --> 00:05:09,977
You can just take over this job.

142
00:05:10,010 --> 00:05:11,245
[both laughing]

143
00:05:11,278 --> 00:05:13,780
- I'll leave
the science to you.

144
00:05:13,814 --> 00:05:15,282
- So these are actually samples

145
00:05:15,315 --> 00:05:17,818
from the Windbreaker
that goes over the MMRTG

146
00:05:17,851 --> 00:05:18,919
on the back of the rover.

147
00:05:18,952 --> 00:05:20,153
So that was just a few days ago.

148
00:05:20,187 --> 00:05:21,522
- Right, right.
- Yeah.

149
00:05:21,555 --> 00:05:23,323
- MMRTG, that's in essence,

150
00:05:23,357 --> 00:05:25,659
the fuel for the rover.

151
00:05:25,692 --> 00:05:27,427
- Exactly.
So we were in there

152
00:05:27,461 --> 00:05:29,830
by the radiation source,
taking those samples,

153
00:05:29,863 --> 00:05:31,532
and it came out really, really clean.

154
00:05:31,565 --> 00:05:32,833
- Awesome.
- We actually have--

155
00:05:32,866 --> 00:05:35,035
we're far, far below the requirements

156
00:05:35,068 --> 00:05:36,236
for the entire vehicle.

157
00:05:36,270 --> 00:05:37,504
- Awesome.
Good, good, good.

158
00:05:37,538 --> 00:05:38,639
- So yeah.

159

00:05:38,672 --> 00:05:40,707
This is our next-to-last set of samples.

160
00:05:40,741 --> 00:05:42,743
We have our final set in the incubator.

161
00:05:42,776 --> 00:05:44,845
It's from
the payload launch fairing doors.

162
00:05:44,878 --> 00:05:46,380
- Okay.
- And that's it.

163
00:05:46,413 --> 00:05:48,048
The doors are on and it's ready to launch.

164
00:05:48,081 --> 00:05:49,583
- Awesome.
- It's pretty exciting.

165
00:05:49,616 --> 00:05:52,119
- These are all very important things
that you're working on.

166
00:05:52,152 --> 00:05:53,754
- I actually have
a 3D printed model...

167
00:05:53,787 --> 00:05:54,988
- Oh, wonderful.
- Of the tube assembly

168
00:05:55,022 --> 00:05:56,590
if you wanna see.
- Let's go look at it.

169
00:05:56,623 --> 00:05:59,126
- It's what the robotic arm
on the inside of the rover uses

170
00:05:59,159 --> 00:06:00,460
to manipulate the tubes.

171
00:06:00,494 --> 00:06:01,828
And the tube itself.

172
00:06:01,862 --> 00:06:03,730
- The sample that we collect
on Mars...

173
00:06:03,764 --> 00:06:05,098
- Uh-huh.
- Goes in where?

174
00:06:05,132 --> 00:06:06,967
- Goes in here.
- In this side here.

175
00:06:07,000 --> 00:06:08,902
So we have the sample in here.
- Mm-hmm.

176
00:06:08,936 --> 00:06:10,137
- And it could be a rock.

177
00:06:10,170 --> 00:06:12,206
It could be some kind of soil.
- Yes.

178
00:06:12,239 --> 00:06:13,407
- It could be whatever it is.

179
00:06:13,440 --> 00:06:15,142
And then you leave this...
- Yeah.

180
00:06:15,175 --> 00:06:17,344
- On the surface of Mars...

- Yeah.

181
00:06:17,377 --> 00:06:20,547
- For our 2026 mission...
- Exactly.

182
00:06:20,581 --> 00:06:22,482
- Which is gonna go
pick this up...

183
00:06:22,516 --> 00:06:23,483
- Yes.
- And bring it back to Earth.

184
00:06:23,517 --> 00:06:24,484
- Yeah.

185
00:06:24,518 --> 00:06:25,886
- And just make sure we don't

186
00:06:25,919 --> 00:06:27,187
bring any microbes back

187
00:06:27,221 --> 00:06:28,589
that are gonna hurt us, all right?

188
00:06:28,622 --> 00:06:29,590
- Got it.
- All right.

189
00:06:29,623 --> 00:06:30,791
- You got my word.
[laughs]

190
00:06:30,824 --> 00:06:32,626
- Thank you so much.
- Oh, thank you!

191
00:06:32,659 --> 00:06:34,294

- All right.
- Thank you.

192
00:06:34,328 --> 00:06:40,167
[dramatic music]

193
00:06:42,569 --> 00:06:44,671
[gentle music]

194
00:06:44,705 --> 00:06:47,274
- 30 seconds.
- Hey, how are you?

195
00:06:47,307 --> 00:06:50,110
- So we just had
the launch readiness review,

196
00:06:50,143 --> 00:06:52,546
and we are, in fact, go for launch.

197
00:06:52,579 --> 00:06:54,448
So it's a very exciting time,

198
00:06:54,481 --> 00:06:56,316
and the press conference
should be a lot of fun.

199
00:06:56,350 --> 00:06:58,218
But we are in fact gonna launch

200
00:06:58,252 --> 00:07:00,787
what we now call Mars Perseverance

201
00:07:00,821 --> 00:07:02,356
in the year 2020.

202
00:07:02,389 --> 00:07:04,191
And we are in
extraordinary times right now

203
00:07:04,224 --> 00:07:06,960
with the coronavirus pandemic.

204
00:07:06,994 --> 00:07:09,563
And yet, we have in fact persevered.

205
00:07:09,596 --> 00:07:12,032
- The most important thing
that happens in these missions

206
00:07:12,065 --> 00:07:13,400
are the things we did not plan.

207
00:07:13,433 --> 00:07:15,035
- Really for the first time,
we're looking

208
00:07:15,068 --> 00:07:16,236
for signs of life

209
00:07:16,270 --> 00:07:17,471
on another planet.

210
00:07:17,504 --> 00:07:19,806
- And we are literally
chomping at the bit

211
00:07:19,840 --> 00:07:22,276
to take this nuclear-powered dune buggy

212
00:07:22,309 --> 00:07:23,577
out to Mars.

213
00:07:23,610 --> 00:07:25,946
- Suppose we get
to the Mars sample return

214

00:07:25,979 --> 00:07:29,183
and in fact we find irrefutable evidence

215
00:07:29,216 --> 00:07:31,185
of life existing on Mars.

216
00:07:31,218 --> 00:07:32,586
How will that change the Earth?

217
00:07:32,619 --> 00:07:35,822
- It'll transform how we think
about exploration.

218
00:07:35,856 --> 00:07:38,158
What comes next?
What else can we discover?

219
00:07:38,192 --> 00:07:40,894
- And all the likelihoods
that relate to life

220
00:07:40,928 --> 00:07:42,629
all went up.
- Right.

221
00:07:42,663 --> 00:07:43,764
- There was no water there.

222
00:07:43,797 --> 00:07:45,232
There's water everywhere, right?

223
00:07:45,265 --> 00:07:47,167
- So the more discoveries
we make,

224
00:07:47,201 --> 00:07:49,770
the more we understand
how much we don't know.

225

00:07:49,803 --> 00:07:50,971
- Mm-hmm.

226
00:07:51,004 --> 00:07:52,706
- And how much more work
there is to be done.

227
00:07:52,739 --> 00:07:54,041
- And the exciting part,
of course,

228
00:07:54,074 --> 00:07:55,843
is to get humans there too.
- Absolutely.

229
00:07:55,876 --> 00:07:58,145
- I mean, that will be
a huge accelerator of research.

230
00:07:58,178 --> 00:07:59,279
Right?
I mean--

231
00:07:59,313 --> 00:08:01,548
- But if we wanna do even more science,

232
00:08:01,582 --> 00:08:03,817
we need to have human exploration
partner with us.

233
00:08:03,851 --> 00:08:06,620
- The exploration could be
your body, could be human.

234
00:08:06,653 --> 00:08:08,455
But it's exploration, right?
- Right.

235
00:08:08,488 --> 00:08:10,290
- And we need to find

the right ways.

236
00:08:10,324 --> 00:08:12,693
Thanks to you
and for everything you've done.

237
00:08:12,726 --> 00:08:14,361
Especially during this COVID time.

238
00:08:14,394 --> 00:08:15,696
And we said it together.

239
00:08:15,729 --> 00:08:18,332
"Yes, we will make this 2020 launch."

240
00:08:18,365 --> 00:08:21,201
We will put everything we can
behind this team.

241
00:08:21,235 --> 00:08:22,402
And we did, you know?

242
00:08:22,436 --> 00:08:23,737
- Well, thank you
for all your leadership,

243
00:08:23,770 --> 00:08:25,305
and we'll look forward to a good launch.

244
00:08:25,339 --> 00:08:27,274
- Well, thanks to you.

245
00:08:27,307 --> 00:08:28,375
- Howdy.

246
00:08:28,408 --> 00:08:29,743
- Welcome to the RPSF.

247

00:08:29,776 --> 00:08:32,079
We're gonna go through--
go in those side doors.

248
00:08:33,280 --> 00:08:36,149
- When humanity
is multiplanetary,

249
00:08:36,183 --> 00:08:38,252
that's kind of, I think, the vision

250
00:08:38,285 --> 00:08:40,988
that all of us who are interested
in exploring space,

251
00:08:41,021 --> 00:08:43,090
that's what we would like to see.

252
00:08:43,123 --> 00:08:44,591
What we do right now today

253
00:08:44,625 --> 00:08:47,895
is either going to enable
or prevent that future.

254
00:08:47,928 --> 00:08:49,396
- We're very proud
to be a part of this.

255
00:08:49,429 --> 00:08:50,597
- Good.

256
00:08:50,631 --> 00:08:52,099
- These are all three programs
coming together,

257
00:08:52,132 --> 00:08:53,667
all working every single day together.

258

00:08:53,700 --> 00:08:55,469
- As we put
this rocket together,

259
00:08:55,502 --> 00:08:57,571
these are the solid rocket boosters

260
00:08:57,604 --> 00:09:00,874
that are gonna be attached to
the Space Launch System, SLS,

261
00:09:00,908 --> 00:09:03,010
with the Orion capsule on top.

262
00:09:03,043 --> 00:09:05,279
- The solid rocket fuel
is in there right now?

263
00:09:05,312 --> 00:09:06,313
- Yes, sir.

264
00:09:06,346 --> 00:09:07,915
- We're gonna take
that first woman

265
00:09:07,948 --> 00:09:09,449
and next man to the Moon.

266
00:09:09,483 --> 00:09:10,450
- How you doing, sir?
- Hey!

267
00:09:10,484 --> 00:09:11,552
Good.
How are you?

268
00:09:11,585 --> 00:09:12,553
- Pretty good.
How about yourself, man?

269
00:09:12,586 --> 00:09:13,654
- I'm doing excellent.

270
00:09:13,687 --> 00:09:14,888
- That is one segment
right there.

271
00:09:14,922 --> 00:09:16,456
There's five segments.
- Right.

272
00:09:16,490 --> 00:09:19,293
- And we'll stack
these rocket segments

273
00:09:19,326 --> 00:09:20,360
that you see here, these solid segments,

274
00:09:20,394 --> 00:09:21,428
on the mobile launcher.

275
00:09:21,461 --> 00:09:23,063
- Now--which is amazing.
- It is!

276
00:09:23,096 --> 00:09:24,765
- You know, what's so cool is,

277
00:09:24,798 --> 00:09:27,301
we're here because we're gonna launch

278
00:09:27,334 --> 00:09:30,604
Perseverance going to Mars.

279
00:09:30,637 --> 00:09:32,739
- Precursor for sending humans.
- Exactly.

280

00:09:32,773 --> 00:09:34,641
- We're building
a sustainable architecture.

281
00:09:34,675 --> 00:09:36,109
The rover--Perseverance rover--

282
00:09:36,143 --> 00:09:37,911
Mars 2020 rover Perseverance,

283
00:09:37,945 --> 00:09:39,179
that is really hard.

284
00:09:39,213 --> 00:09:41,782
That is a huge challenge to get that

285
00:09:41,815 --> 00:09:43,951
onto the surface of Mars

286
00:09:43,984 --> 00:09:45,352
and have everything work,

287
00:09:45,385 --> 00:09:48,255
but that is nothing compared
to putting humans down,

288
00:09:48,288 --> 00:09:50,657
'cause humans--you gotta
give 'em air to breathe.

289
00:09:50,691 --> 00:09:52,626
You gotta scrub the CO2.

290
00:09:52,659 --> 00:09:54,361
You gotta provide
a pressurized environment.

291
00:09:54,394 --> 00:09:55,562
You gotta take care of all their waste.

292
00:09:55,596 --> 00:09:57,397
You gotta give 'em food to eat.

293
00:09:57,431 --> 00:09:59,833
- People ask us, you know,
why are you doing this?

294
00:09:59,867 --> 00:10:01,301
Why is this so important?

295
00:10:01,335 --> 00:10:03,470
- It's about learning,
about exploring,

296
00:10:03,504 --> 00:10:05,472
about going beyond what we currently know

297
00:10:05,506 --> 00:10:06,607
to make us even better.

298
00:10:06,640 --> 00:10:08,809
And I truly believe we as a species

299
00:10:08,842 --> 00:10:10,644
have to be able to live
off our home planet.

300
00:10:10,677 --> 00:10:13,146
Huge challenge,
but we've got an awesome team.

301
00:10:13,180 --> 00:10:14,648
- Thank you, Bob.
- Thank you, sir.

302
00:10:14,681 --> 00:10:15,883
- All right.

303
00:10:19,920 --> 00:10:22,756
[dramatic boom]

304
00:10:22,789 --> 00:10:25,192
[dramatic music]

305
00:10:25,225 --> 00:10:28,462
- So today we're gonna watch
this big rocket behind us,

306
00:10:28,495 --> 00:10:32,666
the Atlas V with the Mars Perseverance
on top inside the fairing,

307
00:10:32,699 --> 00:10:34,368
roll out to the launchpad.

308
00:10:34,401 --> 00:10:37,404
- I've launched
almost 400 rockets over my career,

309
00:10:37,437 --> 00:10:39,239
but I still get butterflies.

310
00:10:39,273 --> 00:10:40,941
Everything has to go right.

311
00:10:40,974 --> 00:10:42,176
Nothing can go wrong.

312
00:10:42,209 --> 00:10:43,677
- This particular rocket--

313
00:10:43,710 --> 00:10:45,312
it's an Atlas V, of course,

314
00:10:45,345 --> 00:10:47,681
but there's different versions

of the Atlas V.

315
00:10:47,714 --> 00:10:50,083
This one is one
of the more powerful versions.

316
00:10:50,117 --> 00:10:53,654
- So it has four massive
solid rocket motors

317
00:10:53,687 --> 00:10:57,257
augmenting the already 860,000 pounds

318
00:10:57,291 --> 00:10:59,259
of thrust from the center core.

319
00:10:59,293 --> 00:11:01,361
And we call this one The Dominator.

320
00:11:01,395 --> 00:11:02,462
- [chuckles]

321
00:11:02,496 --> 00:11:04,264
So, you know, the payload is big.

322
00:11:04,298 --> 00:11:06,366
But it's not that big.

323
00:11:06,400 --> 00:11:08,302
Why do we need that much power?

324
00:11:08,335 --> 00:11:11,805
- We have to escape not just
the gravity well of the Earth,

325
00:11:11,839 --> 00:11:15,142
but entirely escape
its gravitational influence.

326
00:11:15,175 --> 00:11:16,510
- So right now,
we're witnessing

327
00:11:16,543 --> 00:11:19,379
this powerful Atlas V rocket

328
00:11:19,413 --> 00:11:23,250
come out of the
Vertical Integration Facility, the VIF.

329
00:11:23,283 --> 00:11:24,484
- It is moving.

330
00:11:24,518 --> 00:11:27,521
This rocket is 20 stories high
fully assembled.

331
00:11:27,554 --> 00:11:30,290
So the VIF allows it
to assemble the rocket,

332
00:11:30,324 --> 00:11:31,892
integrate the spacecraft

333
00:11:31,925 --> 00:11:34,494
all in a protected, enclosed environment,

334
00:11:34,528 --> 00:11:37,497
and when it's all ready, which it is now,

335
00:11:37,531 --> 00:11:40,300
we open the doors, and it's rolling at us.

336
00:11:40,334 --> 00:11:41,568
In fact, we better be careful.

337
00:11:41,602 --> 00:11:43,937

It's a blistering 3 1/2 miles per hour,

338
00:11:43,971 --> 00:11:45,472
so we don't wanna get surprised.

339
00:11:45,506 --> 00:11:46,540
- Right.

340
00:11:46,573 --> 00:11:48,208
- But in about 45 minutes,

341
00:11:48,242 --> 00:11:50,544
it will traverse
this several hundred yards

342
00:11:50,577 --> 00:11:52,346
out to the launchpad

343
00:11:52,379 --> 00:11:53,981
and then be ready to go to Mars

344
00:11:54,014 --> 00:11:56,250
in just about 48 hours.

345
00:11:56,283 --> 00:11:58,752
- It's a lot bigger when
it comes out of the VIF, huh?

346
00:11:58,785 --> 00:11:59,753
- Yeah, it is.

347
00:11:59,786 --> 00:12:00,821
[dramatic music]

348
00:12:00,854 --> 00:12:03,156
- Here you go, Tory.
- All right.

349

00:12:22,709 --> 00:12:24,678
- And I'll tell you.
The rocket looks big

350
00:12:24,711 --> 00:12:27,681
when it's
in the Vertical Integration Facility,

351
00:12:27,714 --> 00:12:30,684
but when it's standing alone
outside the building,

352
00:12:30,717 --> 00:12:33,587
that thing is massive when
you're right there next to it.

353
00:12:33,620 --> 00:12:36,123
Man, it's pretty...

354
00:12:37,491 --> 00:12:39,493
it's pretty inspiring.

355
00:12:39,526 --> 00:12:41,295
It's loud as well.

356
00:12:41,328 --> 00:12:44,131
Yeah, so we're heading over

357
00:12:44,164 --> 00:12:47,100
to do a brief

358
00:12:47,134 --> 00:12:49,870
for members of Congress, bipartisan brief.

359
00:12:49,903 --> 00:12:52,439
You know, in each one of these,
we're talking about

360
00:12:52,472 --> 00:12:54,641

billions of dollars of investments.

361
00:12:54,675 --> 00:12:56,910
We're coming up on a few moments in time

362
00:12:56,944 --> 00:13:00,280
that are literally seconds long,

363
00:13:00,314 --> 00:13:02,416
but each one of those moments
carries with it

364
00:13:02,449 --> 00:13:03,650
a good bit of risk.

365
00:13:03,684 --> 00:13:05,485
Yeah, people talk about how exciting it is

366
00:13:05,519 --> 00:13:07,321
to watch a rocket launch.

367
00:13:07,354 --> 00:13:08,722
Well...
[chuckles]

368
00:13:08,755 --> 00:13:10,591
You know, when you're in charge

369
00:13:10,624 --> 00:13:13,260
of an agency that just spent
$2 1/2 billion

370
00:13:13,293 --> 00:13:14,928
of taxpayer money

371
00:13:14,962 --> 00:13:17,364
on a robot, and a helicopter,

372

00:13:17,397 --> 00:13:19,600
and scientific experiments,

373
00:13:19,633 --> 00:13:22,703
and technology demonstrators
that are going to Mars,

374
00:13:22,736 --> 00:13:25,172
it is...

375
00:13:25,205 --> 00:13:27,107
it makes it even more exciting

376
00:13:27,140 --> 00:13:30,577
just from a--a, you know,

377
00:13:30,611 --> 00:13:32,112
personal pride, you know?

378
00:13:32,145 --> 00:13:34,815
I wanna make sure that
the missions that we do are--

379
00:13:34,848 --> 00:13:38,318
we're doing everything
we can to make them safe

380
00:13:38,352 --> 00:13:40,120
and, of course, successful.

381
00:13:40,153 --> 00:13:42,623
We've invested a lot into this project.

382
00:13:42,656 --> 00:13:45,058
The science is gonna be
absolutely remarkable

383
00:13:45,092 --> 00:13:46,627
that we get from it.

384
00:13:46,660 --> 00:13:49,296
And that we're very grateful
for all the support we've had

385
00:13:49,329 --> 00:13:51,899
from bipartisan members of Congress.

386
00:13:51,932 --> 00:13:54,701
And I look forward to the results of this.

387
00:13:54,735 --> 00:13:56,436
[soft piano music]

388
00:13:56,470 --> 00:13:58,472
We're not struggling to survive.

389
00:13:58,505 --> 00:14:00,641
What we're struggling to do is strive.

390
00:14:00,674 --> 00:14:02,776
Perseverance is how you achieve.

391
00:14:02,809 --> 00:14:03,911
It's how you move forward.

392
00:14:03,944 --> 00:14:06,513
It's how you make your life

393
00:14:06,547 --> 00:14:09,049
and the lives of others better.

394
00:14:09,082 --> 00:14:11,118
- Hello, Mr. Bridenstine.

395
00:14:11,151 --> 00:14:13,687
- Alex, Vaneeza, how are you?
- Good.

396
00:14:13,720 --> 00:14:15,455
- Good. How are you?
- Good.

397
00:14:15,489 --> 00:14:17,024
Well I just wanna tell both of you

398
00:14:17,057 --> 00:14:18,592
that we are so grateful

399
00:14:18,625 --> 00:14:20,160
that you are this excited

400
00:14:20,194 --> 00:14:21,562
about what NASA is doing

401
00:14:21,595 --> 00:14:23,664
that you decided to put forward names

402
00:14:23,697 --> 00:14:26,934
for our rover and our helicopter.

403
00:14:26,967 --> 00:14:29,336
There will be science books
and history books

404
00:14:29,369 --> 00:14:31,972
written about Perseverance

405
00:14:32,005 --> 00:14:33,574
and Ingenuity.

406
00:14:33,607 --> 00:14:35,242
And for the rest of your lives,

407
00:14:35,275 --> 00:14:38,245
you will know that those are the names

408
00:14:38,278 --> 00:14:40,080
that you two gave.

409
00:14:40,113 --> 00:14:42,950
- So my goal was to answer
the question of how,

410
00:14:42,983 --> 00:14:45,252
like how is it possible
to do something as incredible

411
00:14:45,285 --> 00:14:47,487
as do science on another planet?

412
00:14:47,521 --> 00:14:49,590
And I thought ingenuity
was a quality that represented

413
00:14:49,623 --> 00:14:51,792
that intelligence and creativity best.

414
00:14:51,825 --> 00:14:53,493
- I was just thinking about

415
00:14:53,527 --> 00:14:55,229
what makes space possible

416
00:14:55,262 --> 00:14:57,698
and what makes space human.

417
00:14:57,731 --> 00:14:59,633
And not just space,

418
00:14:59,666 --> 00:15:01,568
but all aspects of human life.

419
00:15:01,602 --> 00:15:03,637

What just sums up our species?

420
00:15:03,670 --> 00:15:05,839
And when I thought of perseverance,

421
00:15:05,873 --> 00:15:07,274
it just--it fit.

422
00:15:07,307 --> 00:15:08,775
- Well what was amazing is,

423
00:15:08,809 --> 00:15:10,511
you came up with the name Perseverance

424
00:15:10,544 --> 00:15:12,613
even before the pandemic.

425
00:15:12,646 --> 00:15:14,414
It's a remarkable name in itself,

426
00:15:14,448 --> 00:15:15,716
and even more appropriate

427
00:15:15,749 --> 00:15:19,086
now that we are
in these very difficult times.

428
00:15:19,119 --> 00:15:21,288
- And the fact that we're looking
for signs of life,

429
00:15:21,321 --> 00:15:23,190
I think that's really exciting.

430
00:15:23,223 --> 00:15:24,558
And that a new technology that's like,

431
00:15:24,591 --> 00:15:26,593

never been tried before
is gonna be tested,

432
00:15:26,627 --> 00:15:28,529
I think it's going to be really impressive

433
00:15:28,562 --> 00:15:30,430
if flight can be pulled off
on another world.

434
00:15:30,464 --> 00:15:32,466
- Now, do you think
we'll find life?

435
00:15:32,499 --> 00:15:34,201
- Maybe.
I'm going with strong maybe.

436
00:15:34,234 --> 00:15:36,236
- You're going
with strong maybe?

437
00:15:36,270 --> 00:15:38,505
Cautiously optimistic?
- Yeah.

438
00:15:38,539 --> 00:15:40,440
- Personally,
I'm really into the whole

439
00:15:40,474 --> 00:15:41,975
sample return system.

440
00:15:42,009 --> 00:15:43,343
It looks like a bunch of satellites

441
00:15:43,377 --> 00:15:44,845
playing catch in space.

442

00:15:44,878 --> 00:15:45,946
- [chuckles]

443
00:15:45,979 --> 00:15:47,347
- And that'll be fun
to see happen.

444
00:15:47,381 --> 00:15:48,382
- Yeah.

445
00:15:48,415 --> 00:15:49,950
And of course, after sample return,

446
00:15:49,983 --> 00:15:51,218
what's the next thing we need to do?

447
00:15:51,251 --> 00:15:53,187
- Get us some humans on Mars.

448
00:15:53,220 --> 00:15:54,454
- Okay.

449
00:15:54,488 --> 00:15:56,089
- Being able to see people
on another planet

450
00:15:56,123 --> 00:15:57,491
would be incredible.

451
00:15:57,524 --> 00:16:00,327
- So how exciting is it
for you to be here,

452
00:16:00,360 --> 00:16:02,996
to experience this launch,
and what are you expecting?

453
00:16:03,030 --> 00:16:05,365
- I'm expecting something big,

454
00:16:05,399 --> 00:16:07,067
something loud,

455
00:16:07,100 --> 00:16:08,402
something bright,

456
00:16:08,435 --> 00:16:12,039
but most of all,
something that is beautiful.

457
00:16:12,072 --> 00:16:18,078
[soft piano music]

458
00:16:22,082 --> 00:16:25,085
[electronic tones]

459
00:16:27,020 --> 00:16:32,226
[sparse piano music]

460
00:16:32,259 --> 00:16:34,361
- It is fantastic to be here

461
00:16:34,394 --> 00:16:36,163
at the Kennedy Space Center.

462
00:16:36,196 --> 00:16:38,532
We are less than 24 hours away

463
00:16:38,565 --> 00:16:40,834
from a launch to Mars.

464
00:16:40,868 --> 00:16:42,903
- Our workforce
has done an amazing job.

465
00:16:42,936 --> 00:16:45,205
Here we are.

We're launching to Mars

466
00:16:45,239 --> 00:16:46,907
in the middle of a pandemic.

467
00:16:46,940 --> 00:16:48,709
- So this is the first time
in history

468
00:16:48,742 --> 00:16:50,277
where we're gonna go to Mars

469
00:16:50,310 --> 00:16:52,880
with an explicit mission

470
00:16:52,913 --> 00:16:55,582
to find life on another world.

471
00:16:55,616 --> 00:16:58,719
- I can think of maybe
no more profound question

472
00:16:58,752 --> 00:17:00,554
than the question of

473
00:17:00,587 --> 00:17:02,523
whether there's life on another planet.

474
00:17:02,556 --> 00:17:04,691
And, you know, this, when it touches down,

475
00:17:04,725 --> 00:17:06,860
is going to be the best scientist

476
00:17:06,894 --> 00:17:08,195
we've ever sent to the planet

477
00:17:08,228 --> 00:17:09,796

to answer exactly those questions.

478
00:17:09,830 --> 00:17:12,032
- The big screen behind me--
that's the countdown clock.

479
00:17:12,065 --> 00:17:14,168
Everything is good.
The spacecraft is a go.

480
00:17:14,201 --> 00:17:17,037
The rocket is a go.
The weather is a go.

481
00:17:17,070 --> 00:17:19,306
And as the NASA administrator,
I'm thrilled

482
00:17:19,339 --> 00:17:20,841
that we are able to come to this point

483
00:17:20,874 --> 00:17:22,442
where we're ready to launch it.

484
00:17:22,476 --> 00:17:23,644
[exciting string music]

485
00:17:23,677 --> 00:17:24,912
If we're not letting people know

486
00:17:24,945 --> 00:17:26,547
why we're doing what we're doing,

487
00:17:26,580 --> 00:17:28,182
we'll miss out on the opportunity

488
00:17:28,215 --> 00:17:30,017
to continue to stun the world

489
00:17:30,050 --> 00:17:31,752
with these amazing achievements.

490
00:17:31,785 --> 00:17:34,254
I mean, this is the stuff
of science fiction books.

491
00:17:34,288 --> 00:17:37,257
People have been speculating
what Mars was like

492
00:17:37,291 --> 00:17:39,560
now since the beginning of time.

493
00:17:39,593 --> 00:17:41,495
But if you look at the Mars missions

494
00:17:41,528 --> 00:17:42,763
that we've done in the past,

495
00:17:42,796 --> 00:17:44,765
one builds upon the other.

496
00:17:44,798 --> 00:17:47,568
This will be the ninth robot
that we land on Mars.

497
00:17:47,601 --> 00:17:50,604
We do know that Mars,
at one point in its history,

498
00:17:50,637 --> 00:17:51,738
was habitable.

499
00:17:51,772 --> 00:17:53,540
It looked a lot like Earth

500
00:17:53,574 --> 00:17:55,709

about 3 billion years ago.

501
00:17:55,742 --> 00:17:58,245
So these are questions
that I think are fundamental

502
00:17:58,278 --> 00:17:59,880
that we need to have answered.

503
00:17:59,913 --> 00:18:01,548
We're gonna cache those samples,

504
00:18:01,582 --> 00:18:05,419
and we're eventually gonna do
a Mars sample return mission.

505
00:18:05,452 --> 00:18:07,487
We're gonna bring those samples
back to Earth.

506
00:18:07,521 --> 00:18:09,690
But there's so much more going on here.

507
00:18:09,723 --> 00:18:10,958
- We're just getting started.

508
00:18:10,991 --> 00:18:13,093
- The stage adaptor
is on that barge.

509
00:18:13,126 --> 00:18:14,561
That's gonna be the rocket that takes

510
00:18:14,595 --> 00:18:16,029
our astronauts to the Moon.

511
00:18:16,063 --> 00:18:18,932
We're putting together
the most ambitious Moon project

512
00:18:18,966 --> 00:18:20,434
in the history of the world.

513
00:18:20,467 --> 00:18:22,936
This generation is the Artemis generation.

514
00:18:22,970 --> 00:18:25,105
- We as a species
are explorers.

515
00:18:25,138 --> 00:18:27,541
- So the answer is yes,
we can do it.

516
00:18:27,574 --> 00:18:29,743
We're gonna prove on this mission

517
00:18:29,776 --> 00:18:32,713
that we can take
the carbon dioxide of Mars

518
00:18:32,746 --> 00:18:35,983
and turn it into pure oxygen
for life support.

519
00:18:36,016 --> 00:18:38,385
And the capabilities that
we're building on the Moon,

520
00:18:38,418 --> 00:18:41,221
we're building with an intent
to send humans to Mars.

521
00:18:41,255 --> 00:18:42,689
So as much as possible,

522
00:18:42,723 --> 00:18:45,559
we're building capabilities

that are replicable at Mars.

523
00:18:45,592 --> 00:18:47,227
- To bring hope and inspiration

524
00:18:47,261 --> 00:18:49,496
to the country and to the world.

525
00:18:49,530 --> 00:18:50,864
And we're gonna continue to do that,

526
00:18:50,898 --> 00:18:52,466
because that's what NASA's here for.

527
00:18:52,499 --> 00:18:55,269
- And this is the thing
that has me the most excited.

528
00:18:55,302 --> 00:18:57,638
Is the idea that we are gonna fly

529
00:18:57,671 --> 00:18:59,606
a helicopter on Mars.

530
00:18:59,640 --> 00:19:02,276
- Tomorrow, God willing,
we're gonna launch this rocket.

531
00:19:02,309 --> 00:19:04,077
- This is gonna be
an inspirational moment,

532
00:19:04,111 --> 00:19:05,479
so stay tuned,

533
00:19:05,512 --> 00:19:06,513
and we will see you all

534

00:19:06,547 --> 00:19:07,881
tomorrow morning for the launch.

535
00:19:07,915 --> 00:19:09,049
Thank you so much.

536
00:19:09,082 --> 00:19:10,117
Thank you.

537
00:19:10,150 --> 00:19:11,285
- All right.
Thank you, you guys.

538
00:19:11,318 --> 00:19:12,319
- Thanks, everybody.

539
00:19:12,352 --> 00:19:13,587
all: Thank you!

540
00:19:13,620 --> 00:19:19,626
[inspirational music]

541
00:19:21,595 --> 00:19:23,564
[dramatic boom]

542
00:19:23,597 --> 00:19:28,035
[suspenseful music]

543
00:19:28,068 --> 00:19:29,636
- In less than an hour,

544
00:19:29,670 --> 00:19:32,773
NASA's 300 million-mile journey

545
00:19:32,806 --> 00:19:36,076
from America's shore
to Jezero Crater on Mars

546

00:19:36,109 --> 00:19:37,778
will begin with the launch

547
00:19:37,811 --> 00:19:40,147
of this Atlas V rocket.

548
00:19:40,180 --> 00:19:43,150
- You're talking about taking
a $2 1/2 billion payload

549
00:19:43,183 --> 00:19:44,985
that represents not just

550
00:19:45,018 --> 00:19:46,954
the treasure of the American taxpayer,

551
00:19:46,987 --> 00:19:49,556
but also thousands of people

552
00:19:49,590 --> 00:19:52,793
that have worked a big chunk
of their lives.

553
00:19:52,826 --> 00:19:54,361
- This has been seven years
in the making,

554
00:19:54,394 --> 00:19:56,864
and I'm so excited to share
this moment with you

555
00:19:56,897 --> 00:19:58,632
and with those that are viewing today.

556
00:19:58,665 --> 00:20:01,435
- Every time we launch
into space,

557
00:20:01,468 --> 00:20:02,936

it is nerve-wracking.

558
00:20:02,970 --> 00:20:05,239
There's nothing at that point
you're gonna do to stop it.

559
00:20:05,272 --> 00:20:06,740
That rocket goes, it's going.

560
00:20:06,773 --> 00:20:08,609
- Go, Atlas.
Go, Centaur.

561
00:20:08,642 --> 00:20:09,910
Go, Mars 2020.

562
00:20:09,943 --> 00:20:10,978
- Here it comes.

563
00:20:11,011 --> 00:20:13,247
- Ten, nine, eight,

564
00:20:13,280 --> 00:20:16,016
seven, six, five,

565
00:20:16,049 --> 00:20:17,851
four, engine ignition,

566
00:20:17,885 --> 00:20:20,521
two, one, zero.

567
00:20:20,554 --> 00:20:22,122
[rocket roaring]

568
00:20:22,155 --> 00:20:24,558
And liftoff.

569
00:20:24,591 --> 00:20:26,994

As the Countdown to Mars continues,

570
00:20:27,027 --> 00:20:28,495
the Perseverance of humanity

571
00:20:28,529 --> 00:20:30,898
launching the next generation
of robotic explorers

572
00:20:30,931 --> 00:20:32,332
to the Red Planet.

573
00:20:32,366 --> 00:20:33,400
- Oh, man.

574
00:20:33,433 --> 00:20:34,401
[inspirational music]

575
00:20:34,434 --> 00:20:36,003
- Here comes the noise.

576
00:20:37,604 --> 00:20:40,374
[indistinct radio chatter]

577
00:20:44,645 --> 00:20:46,480
Can you feel it inside?

578
00:20:48,882 --> 00:20:51,318
[indistinct radio chatter]

579
00:20:51,351 --> 00:20:55,589
[inspirational music]

580
00:20:55,622 --> 00:20:59,092
The solid rocket motors
are gonna fall off.

581
00:21:00,861 --> 00:21:02,763

- And we have good indication

582
00:21:02,796 --> 00:21:04,898
of SRB jettison
of all four SRBs.

583
00:21:04,932 --> 00:21:06,366
- [laughing]

584
00:21:06,400 --> 00:21:08,235
- And the vehicle has gone to closed-loop guidance.

585
00:21:08,268 --> 00:21:10,804
[cheers and applause]

586
00:21:11,972 --> 00:21:13,607
- Thank you.

587
00:21:13,640 --> 00:21:14,675
Did you feel it?

588
00:21:14,708 --> 00:21:15,976
- Congratulations.
- Thank you.

589
00:21:16,009 --> 00:21:18,712
Congratulations so far.

590
00:21:18,745 --> 00:21:19,880
Good work.

591
00:21:19,913 --> 00:21:21,849
So first of all, it was an amazing launch.

592
00:21:21,882 --> 00:21:23,317
Very successful.
[chuckles]

593

00:21:23,350 --> 00:21:25,085
Can you be above nominal?

594
00:21:25,118 --> 00:21:26,820
- Right, so you know, this is
the actual telemetry

595
00:21:26,854 --> 00:21:27,688
going into the model.

596
00:21:27,721 --> 00:21:29,623
- This launch
of Perseverance today

597
00:21:29,656 --> 00:21:30,824
was just the beginning.

598
00:21:30,858 --> 00:21:32,125
There is so much more.

599
00:21:32,159 --> 00:21:33,427
Congratulations and good work

600
00:21:33,460 --> 00:21:34,761
to everybody that made it happen.

601
00:21:34,795 --> 00:21:36,196
The launch is over.

602
00:21:36,230 --> 00:21:37,798
But this mission is gonna go on

603
00:21:37,831 --> 00:21:40,367
for years and years and years.

604
00:21:40,400 --> 00:21:42,336
When we land, it's gonna be magnificent.

605

00:21:42,369 --> 00:21:44,605
- This mission
has more cameras on it

606
00:21:44,638 --> 00:21:46,540
than any mission
we've ever sent before it.

607
00:21:46,573 --> 00:21:49,209
- Those videos are gonna be
absolutely stunning.

608
00:21:49,243 --> 00:21:50,878
- It's a space mission now,
right?

609
00:21:50,911 --> 00:21:52,279
And it's on the way to Mars.

610
00:21:52,312 --> 00:21:54,147
- Stay tuned.
February 18th.

611
00:21:54,181 --> 00:21:57,518
Watch this spacecraft
enter, descend, and land

612
00:21:57,551 --> 00:21:58,752
on the surface of Mars.

613
00:21:58,785 --> 00:22:00,220
And then ultimately, you know,

614
00:22:00,254 --> 00:22:01,488
we're gonna do the science

615
00:22:01,522 --> 00:22:04,291
to make the discoveries
as to whether or not

616
00:22:04,324 --> 00:22:06,093
there might have been life on Mars

617
00:22:06,126 --> 00:22:07,294
in its ancient past.