



Jet Propulsion Laboratory
California Institute of Technology

1
00:00:37,440 --> 00:00:51,990

so

2
00:00:55,910 --> 00:00:54,069

hello and welcome to nasa's jet

3
00:00:58,549 --> 00:00:55,920

propulsion laboratory in southern

4
00:01:00,790 --> 00:00:58,559

california where we have just landed the

5
00:01:03,189 --> 00:01:00,800

most sophisticated and most capable

6
00:01:04,869 --> 00:01:03,199

rover yet on the surface of mars the

7
00:01:07,350 --> 00:01:04,879

perseverance are over

8
00:01:09,670 --> 00:01:07,360

i'm jari cook of jpl's digital news and

9
00:01:11,670 --> 00:01:09,680

media office and i'll be your host today

10
00:01:13,590 --> 00:01:11,680

as we gather reactions from our key

11
00:01:15,510 --> 00:01:13,600

players from the landing and also give a

12
00:01:17,429 --> 00:01:15,520

glimpse of what's to come

13
00:01:18,469 --> 00:01:17,439

so because of the coronavirus pandemic

14

00:01:20,390 --> 00:01:18,479

everything's going to look a little

15

00:01:22,230 --> 00:01:20,400

different today we have our masks on and

16

00:01:24,870 --> 00:01:22,240

the layout is a little different but i

17

00:01:26,469 --> 00:01:24,880

want to introduce our speakers to you so

18

00:01:29,510 --> 00:01:26,479

standing on the floor of von karman

19

00:01:33,109 --> 00:01:29,520

auditorium we have steve jurissic nasa's

20

00:01:38,310 --> 00:01:35,350

we also have mike watkins the director

21

00:01:44,389 --> 00:01:40,550

and then we also have john mcnamee

22

00:01:47,910 --> 00:01:44,399

perseverances project manager

23

00:01:49,830 --> 00:01:47,920

up on the stage we have thomas zerbukin

24

00:01:52,469 --> 00:01:49,840

nasa's associate administrator for the

25

00:01:54,870 --> 00:01:52,479

science mission directorate

26

00:01:56,950 --> 00:01:54,880

we have lori glaze nasa's planetary

27

00:01:59,109 --> 00:01:56,960

science director

28

00:02:01,670 --> 00:01:59,119

we have matt wallace the perseverance

29

00:02:04,230 --> 00:02:01,680

deputy project manager

30

00:02:05,830 --> 00:02:04,240

and al chen entry descent and landing

31

00:02:08,150 --> 00:02:05,840

lead

32

00:02:09,510 --> 00:02:08,160

ken farley the perseverance project

33

00:02:10,949 --> 00:02:09,520

scientist

34

00:02:13,589 --> 00:02:10,959

and then coming from our surface

35

00:02:15,830 --> 00:02:13,599

operations area we have jennifer trosper

36

00:02:17,830 --> 00:02:15,840

deputy project manager

37

00:02:19,670 --> 00:02:17,840

and over here we have a special group on

38

00:02:24,070 --> 00:02:19,680

our video conference we have a group of

39

00:02:27,270 --> 00:02:25,589

all right so we are going to be taking

40

00:02:28,710 --> 00:02:27,280

questions during this briefing so if

41

00:02:31,110 --> 00:02:28,720

you're a member of the media and you're

42

00:02:32,949 --> 00:02:31,120

on our phone lines press star one

43

00:02:35,270 --> 00:02:32,959

and you'll be put into the queue and if

44

00:02:37,670 --> 00:02:35,280

you're on social media use the hashtag

45

00:02:39,350 --> 00:02:37,680

countdown to mars but before i turn it

46

00:02:41,350 --> 00:02:39,360

over turn over the podium i just wanted

47

00:02:43,990 --> 00:02:41,360

to take one minute to recognize what a

48

00:02:45,830 --> 00:02:44,000

thrilling day today has been we now have

49

00:03:03,030 --> 00:02:45,840

the most ambitious rover yet on the

50

00:03:15,190 --> 00:03:04,630

all right i'm going to turn the podium

51
00:03:21,190 --> 00:03:18,229
wow i mean just just an amazing

52
00:03:24,550 --> 00:03:21,200
incredible day

53
00:03:25,830 --> 00:03:24,560
i could not be uh more proud of the team

54
00:03:27,990 --> 00:03:25,840
and what they've done what they've

55
00:03:29,430 --> 00:03:28,000
accomplished under uh under challenging

56
00:03:31,589 --> 00:03:29,440
circumstances

57
00:03:33,670 --> 00:03:31,599
i also have to tell you that about an

58
00:03:35,990 --> 00:03:33,680
hour after landing i got a phone call

59
00:03:38,390 --> 00:03:36,000
from the president of the united states

60
00:03:40,789 --> 00:03:38,400
and uh and he's his first words were

61
00:03:42,710 --> 00:03:40,799
congratulations man and i knew it was

62
00:03:44,630 --> 00:03:42,720
him i wasn't getting punked i didn't

63
00:03:45,589 --> 00:03:44,640

only only president said congratulations

64

00:03:49,190 --> 00:03:45,599

man

65

00:03:52,470 --> 00:03:49,200

he um he he talked about um

66

00:03:55,270 --> 00:03:52,480

how proud he was of what we accomplished

67

00:03:57,589 --> 00:03:55,280

um and he wanted me to i wanted me to

68

00:03:59,990 --> 00:03:57,599

send my his regards to percy

69

00:04:01,429 --> 00:04:00,000

and he wanted to congratulate the team

70

00:04:03,350 --> 00:04:01,439

he wanted me to congratulate team for

71

00:04:05,589 --> 00:04:03,360

him he does want to congratulate the

72

00:04:07,990 --> 00:04:05,599

team personally and i told him we will

73

00:04:09,830 --> 00:04:08,000

make that happen and so i'm looking

74

00:04:11,429 --> 00:04:09,840

forward to having the

75

00:04:13,270 --> 00:04:11,439

president united states congratulate the

76

00:04:15,990 --> 00:04:13,280

team this week um

77

00:04:19,189 --> 00:04:16,000

you know nine successful landings on

78

00:04:21,509 --> 00:04:19,199

mars um the only nation that's been able

79

00:04:22,550 --> 00:04:21,519

to do that just just incredible

80

00:04:24,870 --> 00:04:22,560

um

81

00:04:26,870 --> 00:04:24,880

thousands of people working on this to

82

00:04:29,189 --> 00:04:26,880

make this happen at the jet propulsion

83

00:04:30,950 --> 00:04:29,199

lab at nasa centers

84

00:04:32,870 --> 00:04:30,960

with our industry partners and our

85

00:04:34,390 --> 00:04:32,880

international partners i want to call

86

00:04:36,469 --> 00:04:34,400

out one of our other government agency

87

00:04:38,550 --> 00:04:36,479

partners the department of energy

88

00:04:40,950 --> 00:04:38,560

develops the radio isotopic thermal

89

00:04:42,790 --> 00:04:40,960

generators first the rtds that power

90

00:04:44,710 --> 00:04:42,800

curiosity and our powering uh

91

00:04:46,870 --> 00:04:44,720

perseverance and it's a great

92

00:04:47,909 --> 00:04:46,880

partnership so thank you to our doe

93

00:04:51,270 --> 00:04:47,919

colleagues

94

00:04:54,230 --> 00:04:51,280

um you know this this this mission is

95

00:04:56,469 --> 00:04:54,240

amazing on its own science technology

96

00:04:58,230 --> 00:04:56,479

and caching samples bring back to earth

97

00:05:01,270 --> 00:04:58,240

but it's also part of our bigger

98

00:05:03,029 --> 00:05:01,280

exploration plans right which involve

99

00:05:05,110 --> 00:05:03,039

really understanding mars and the

100

00:05:06,870 --> 00:05:05,120

evolution of mars and whether there's

101

00:05:09,990 --> 00:05:06,880

life ancient life

102

00:05:13,189 --> 00:05:10,000

but also preparing for eventual human

103

00:05:15,590 --> 00:05:13,199

missions to mars and so this is one step

104

00:05:17,189 --> 00:05:15,600

along the way of our journey to

105

00:05:19,590 --> 00:05:17,199

accomplish that goal

106

00:05:22,070 --> 00:05:19,600

and it's a major step and we've embarked

107

00:05:25,189 --> 00:05:22,080

on that we've taken the first

108

00:05:28,070 --> 00:05:25,199

steps and embarking on that journey um

109

00:05:29,590 --> 00:05:28,080

you know again i just i just

110

00:05:31,189 --> 00:05:29,600

i'm amazed

111

00:05:32,150 --> 00:05:31,199

that um

112

00:05:33,189 --> 00:05:32,160

that

113

00:05:36,150 --> 00:05:33,199

uh

114

00:05:39,270 --> 00:05:36,160

that everything went up you know pretty

115

00:05:42,230 --> 00:05:39,280

much according to plan and

116

00:05:45,270 --> 00:05:42,240

when i heard the touchdown signal come

117

00:05:47,590 --> 00:05:45,280

back and saw the first image

118

00:05:49,909 --> 00:05:47,600

i cannot tell you how

119

00:05:51,830 --> 00:05:49,919

overcome with emotion i was and halfway

120

00:05:52,710 --> 00:05:51,840

was i didn't get a lot of sleep last

121

00:05:54,310 --> 00:05:52,720

night

122

00:05:57,270 --> 00:05:54,320

i think i'm going to get sleep really

123

00:05:59,670 --> 00:05:57,280

well tonight so again just just an

124

00:06:02,309 --> 00:05:59,680

amazing day um with that i would like to

125

00:06:04,710 --> 00:06:02,319

turn it over to my colleague and friend

126

00:06:07,670 --> 00:06:04,720

dr zabukin

127

00:06:10,790 --> 00:06:07,680

well thanks so much steve and uh i want

128

00:06:13,510 --> 00:06:10,800

to share an an event with with you that

129

00:06:15,590 --> 00:06:13,520

usually happens when i'm by myself

130

00:06:18,070 --> 00:06:15,600

and what you should know

131

00:06:21,110 --> 00:06:18,080

is that every time we do a launch or we

132

00:06:23,590 --> 00:06:21,120

do a landing we get two plans

133

00:06:25,189 --> 00:06:23,600

one plan is the one we want to do

134

00:06:26,469 --> 00:06:25,199

and then there's that second plan which

135

00:06:28,870 --> 00:06:26,479

is right here

136

00:06:30,870 --> 00:06:28,880

that's the contingency plan here's for

137

00:06:40,550 --> 00:06:30,880

the contingency plan

138

00:06:44,070 --> 00:06:42,790

just about one and a half hours a little

139

00:06:47,189 --> 00:06:44,080

bit more

140

00:06:49,589 --> 00:06:47,199

history happened right here

141

00:06:51,909 --> 00:06:49,599

uh i want to play a video that the team

142

00:06:54,070 --> 00:06:51,919

put together before i do so

143

00:06:55,110 --> 00:06:54,080

i want to just warn you you may or may

144

00:06:58,469 --> 00:06:55,120

not

145

00:07:01,110 --> 00:06:58,479

in the last row see some

146

00:07:03,350 --> 00:07:01,120

bent coed protocols uh you should just

147

00:07:05,510 --> 00:07:03,360

know that all of us who are involved

148

00:07:07,510 --> 00:07:05,520

back there were doubly masked and

149

00:07:08,710 --> 00:07:07,520

normally had all the distance in the

150

00:07:10,950 --> 00:07:08,720

world but

151

00:07:13,110 --> 00:07:10,960

but uh you know

152

00:07:15,909 --> 00:07:13,120

i will tell you later about my emotions

153

00:07:18,070 --> 00:07:15,919

there but i i had to hug some people uh

154

00:07:20,629 --> 00:07:18,080

sorry for that uh steve and and and

155

00:07:23,430 --> 00:07:20,639

everybody but uh roll the video please

156

00:07:25,189 --> 00:07:23,440

let's lift back that moment we had go

157

00:07:27,029 --> 00:07:25,199

ahead we are starting the straighten up

158

00:07:30,150 --> 00:07:27,039

and fly right maneuver

159

00:07:32,309 --> 00:07:30,160

in preparation for parachute deploy yes

160

00:07:34,070 --> 00:07:32,319

the navigation has confirmed that the

161

00:07:38,070 --> 00:07:34,080

parachute has deployed and we're seeing

162

00:07:42,469 --> 00:07:39,909

skytrain maneuver has started

163

00:07:45,990 --> 00:07:42,479

about 20 meters off the surface

164

00:07:51,110 --> 00:07:48,150

touchdown confirmed

165

00:07:53,029 --> 00:07:51,120

faithfully on the surface of mars

166

00:07:56,070 --> 00:07:53,039

ready to begin thinking

167

00:08:04,629 --> 00:07:58,110

looks like we're getting the first image

168

00:08:07,830 --> 00:08:06,550

uh what an amazing moment i have to tell

169

00:08:10,550 --> 00:08:07,840

you

170

00:08:13,350 --> 00:08:10,560

after i was kind of reacting the first

171

00:08:15,909 --> 00:08:13,360

five seconds or so i was overcome with

172

00:08:17,830 --> 00:08:15,919

emotions frankly in the back there and i

173

00:08:19,830 --> 00:08:17,840

was tearing up and then frankly what i

174

00:08:21,029 --> 00:08:19,840

thought about is a statement that was

175

00:08:22,950 --> 00:08:21,039

made

176
00:08:23,990 --> 00:08:22,960
20 minutes or so before the moments you

177
00:08:25,670 --> 00:08:24,000
just saw

178
00:08:28,150 --> 00:08:25,680
when one of the leaders said this is the

179
00:08:29,749 --> 00:08:28,160
first time for months that we're all in

180
00:08:31,990 --> 00:08:29,759
the same room

181
00:08:33,589 --> 00:08:32,000
and i want to thank you for being here

182
00:08:36,709 --> 00:08:33,599
and being part of the team of course

183
00:08:37,829 --> 00:08:36,719
many individuals on the monitor here and

184
00:08:40,230 --> 00:08:37,839
otherwise

185
00:08:42,149 --> 00:08:40,240
we're not in that room and i just wanted

186
00:08:44,870 --> 00:08:42,159
to tell you how proud

187
00:08:47,269 --> 00:08:44,880
and so moved i was by that team

188
00:08:48,710 --> 00:08:47,279

achieving that amazing success i was

189

00:08:49,829 --> 00:08:48,720

reminded

190

00:08:54,389 --> 00:08:49,839

of

191

00:08:56,630 --> 00:08:54,399

who once was asked what are the three

192

00:08:57,750 --> 00:08:56,640

most important things that create

193

00:08:59,910 --> 00:08:57,760

success

194

00:09:02,310 --> 00:08:59,920

in the game and it turns out the same is

195

00:09:03,269 --> 00:09:02,320

true for nasa and here are the following

196

00:09:06,070 --> 00:09:03,279

three

197

00:09:07,190 --> 00:09:06,080

in the order of priority the team

198

00:09:12,780 --> 00:09:07,200

the team

199

00:09:18,630 --> 00:09:12,790

for that thanks so much

200

00:09:21,269 --> 00:09:18,640

[Applause]

201
00:09:22,470 --> 00:09:21,279
of course for me this is not an end but

202
00:09:24,470 --> 00:09:22,480
a beginning

203
00:09:27,670 --> 00:09:24,480
now the amazing science starts you know

204
00:09:29,750 --> 00:09:27,680
and i just i'm so looking forward to the

205
00:09:30,870 --> 00:09:29,760
science that's coming come down every

206
00:09:32,389 --> 00:09:30,880
yard

207
00:09:33,910 --> 00:09:32,399
on the surface

208
00:09:39,110 --> 00:09:33,920
of mars

209
00:09:41,430 --> 00:09:39,120
to go collect these precious samples and

210
00:09:43,430 --> 00:09:41,440
bring them back to earth and of course

211
00:09:45,509 --> 00:09:43,440
you should know that one of the first

212
00:09:47,750 --> 00:09:45,519
texts i got from the international

213
00:09:50,470 --> 00:09:47,760

community was from my friend david

214

00:09:52,710 --> 00:09:50,480

parker my colleague over in isa who

215

00:09:55,269 --> 00:09:52,720

sent his congratulations i just want to

216

00:09:57,670 --> 00:09:55,279

tell him back how we're excited we are

217

00:10:00,550 --> 00:09:57,680

to continue to work with them on this

218

00:10:02,550 --> 00:10:00,560

amazing joint mission this international

219

00:10:04,870 --> 00:10:02,560

history-making mission that we're now

220

00:10:06,310 --> 00:10:04,880

enduring of course with perseverance

221

00:10:08,230 --> 00:10:06,320

right there but as we're already

222

00:10:10,069 --> 00:10:08,240

starting to develop some of the team

223

00:10:11,110 --> 00:10:10,079

members moving over

224

00:10:12,150 --> 00:10:11,120

towards

225

00:10:14,790 --> 00:10:12,160

mars

226

00:10:16,790 --> 00:10:14,800

sample return and many concrete steps

227

00:10:19,350 --> 00:10:16,800

are also happening of course towards

228

00:10:22,069 --> 00:10:19,360

another horizon goal which is human

229

00:10:23,350 --> 00:10:22,079

exploration of mars as well you know i

230

00:10:25,030 --> 00:10:23,360

always think of it as like there's a

231

00:10:27,750 --> 00:10:25,040

whole bucket of miracles you need to

232

00:10:30,790 --> 00:10:27,760

achieve to do that and we're taking some

233

00:10:33,190 --> 00:10:30,800

miracles off the table both today but

234

00:10:35,430 --> 00:10:33,200

also as we go forward with uh mars

235

00:10:37,670 --> 00:10:35,440

sample return so the future of mars

236

00:10:39,509 --> 00:10:37,680

exploration is just so broad and

237

00:10:41,990 --> 00:10:39,519

exciting and involves

238

00:10:45,110 --> 00:10:42,000

many other nations as well

239

00:10:48,470 --> 00:10:45,120

and uh leaders many of them are still in

240

00:10:50,710 --> 00:10:48,480

school or even in kindergarten or or or

241

00:10:53,750 --> 00:10:50,720

younger and those leaders we're going to

242

00:10:55,509 --> 00:10:53,760

need as we do this amazing achieve those

243

00:10:57,509 --> 00:10:55,519

amazing goals

244

00:10:58,870 --> 00:10:57,519

i want to think of the international

245

00:11:01,509 --> 00:10:58,880

partners of

246

00:11:03,670 --> 00:11:01,519

mars 2020 perseverance and we had

247

00:11:06,389 --> 00:11:03,680

something like 35

248

00:11:08,389 --> 00:11:06,399

vendors from 11 nations that of course

249

00:11:11,030 --> 00:11:08,399

added up to the nearly thousand within

250

00:11:13,110 --> 00:11:11,040

the united states 11 nations that

251
00:11:15,269 --> 00:11:13,120
included a lot of them and i've been in

252
00:11:16,949 --> 00:11:15,279
some of these nations and i know

253
00:11:19,590 --> 00:11:16,959
where these pieces are coming from and

254
00:11:21,190 --> 00:11:19,600
how proud those nations are of course

255
00:11:23,190 --> 00:11:21,200
over and above that we have three

256
00:11:25,190 --> 00:11:23,200
partners that have contributed

257
00:11:27,590 --> 00:11:25,200
instruments france

258
00:11:30,069 --> 00:11:27,600
spain and norway and i had text from our

259
00:11:31,750 --> 00:11:30,079
french colleagues for example where the

260
00:11:34,230 --> 00:11:31,760
prime minister was right there with the

261
00:11:36,150 --> 00:11:34,240
team and celebrating with them just so

262
00:11:37,670 --> 00:11:36,160
glad for the support in each one of

263
00:11:39,110 --> 00:11:37,680

those countries they're receiving from

264

00:11:40,710 --> 00:11:39,120

their governments

265

00:11:43,190 --> 00:11:40,720

and we look forward

266

00:11:45,030 --> 00:11:43,200

but each of our contributions the

267

00:11:47,350 --> 00:11:45,040

contributions internationally and the

268

00:11:50,230 --> 00:11:47,360

ones by the team here

269

00:11:51,590 --> 00:11:50,240

will provide information and tell us

270

00:11:53,430 --> 00:11:51,600

about mars

271

00:11:56,230 --> 00:11:53,440

and also the future collaboration that

272

00:11:59,030 --> 00:11:56,240

will be enabled by the amazing historic

273

00:12:01,590 --> 00:11:59,040

feed today mars is always hard we don't

274

00:12:03,590 --> 00:12:01,600

take this for granted landing on mars

275

00:12:04,870 --> 00:12:03,600

it's one of the toughest things even

276

00:12:07,190 --> 00:12:04,880

though the team

277

00:12:08,949 --> 00:12:07,200

you know is making it look easy i have

278

00:12:11,350 --> 00:12:08,959

to tell you i mean i it's just

279

00:12:13,829 --> 00:12:11,360

incredible to me i've i thought you know

280

00:12:16,310 --> 00:12:13,839

what i told steve this morning you know

281

00:12:18,790 --> 00:12:16,320

i had to get up in the night twice to

282

00:12:21,030 --> 00:12:18,800

replace a sweated through wet t-shirt

283

00:12:22,870 --> 00:12:21,040

with a new one i was telling myself i'm

284

00:12:26,389 --> 00:12:22,880

pretty calm apparently my body did not

285

00:12:28,790 --> 00:12:26,399

say so but this next night i'm sure i

286

00:12:29,910 --> 00:12:28,800

only need one of them as we go forward

287

00:12:32,470 --> 00:12:29,920

and that's

288

00:12:34,550 --> 00:12:32,480

in no small way because of my next

289

00:12:35,910 --> 00:12:34,560

friend i'm going to introduce you to you

290

00:12:37,990 --> 00:12:35,920

which is of course

291

00:12:41,829 --> 00:12:38,000

mike watkins who's the jpl director take

292

00:12:44,710 --> 00:12:43,269

thank you thomas

293

00:12:46,150 --> 00:12:44,720

um i'd like to welcome everyone

294

00:12:49,269 --> 00:12:46,160

virtually to the jet propulsion

295

00:12:50,629 --> 00:12:49,279

laboratory here uh this room

296

00:12:52,389 --> 00:12:50,639

uh many of our journalist colleagues

297

00:12:54,230 --> 00:12:52,399

have been in this room for a landing day

298

00:12:55,910 --> 00:12:54,240

where we've actually celebrated

299

00:12:58,310 --> 00:12:55,920

all of the mars landings ever

300

00:13:00,150 --> 00:12:58,320

accomplished by humankind here in this

301
00:13:01,190 --> 00:13:00,160
room and i miss the fact that you're not

302
00:13:02,949 --> 00:13:01,200
all here

303
00:13:05,190 --> 00:13:02,959
with us today we usually have the lab

304
00:13:06,710 --> 00:13:05,200
buzzing with thousands of folks

305
00:13:08,710 --> 00:13:06,720
and because of covid we're doing this

306
00:13:10,550 --> 00:13:08,720
remotely but i hope you still feel a

307
00:13:12,310 --> 00:13:10,560
part of this and and certainly feel free

308
00:13:13,990 --> 00:13:12,320
to engage us you know with questions and

309
00:13:16,629 --> 00:13:14,000
follow up

310
00:13:19,269 --> 00:13:16,639
on behalf of jpl i have to say we have a

311
00:13:21,350 --> 00:13:19,279
fantastic project team no question about

312
00:13:24,310 --> 00:13:21,360
it and john mcnamee and matt wallace

313
00:13:26,389 --> 00:13:24,320

will talk a lot more about that team

314

00:13:29,670 --> 00:13:26,399

but i want to also notice the rest of

315

00:13:31,670 --> 00:13:29,680

jpl it really took a lot of folks

316

00:13:33,030 --> 00:13:31,680

working together to make this mission

317

00:13:33,830 --> 00:13:33,040

successful and of course we're working

318

00:13:34,949 --> 00:13:33,840

on missions other

319

00:13:37,750 --> 00:13:34,959

[Music]

320

00:13:39,670 --> 00:13:37,760

than mars perseverance as well and we

321

00:13:42,710 --> 00:13:39,680

had to keep those missions going we had

322

00:13:44,629 --> 00:13:42,720

to keep march 2020 going uh we had to

323

00:13:45,670 --> 00:13:44,639

use our cio office to make sure we could

324

00:13:48,069 --> 00:13:45,680

all work

325

00:13:50,069 --> 00:13:48,079

in a virtual sense work remotely and of

326

00:13:52,870 --> 00:13:50,079

course folks keeping everyone safe on

327

00:13:55,269 --> 00:13:52,880

the lab in terms of ppe and facility

328

00:13:56,710 --> 00:13:55,279

changes and you know we sort of had to

329

00:13:59,670 --> 00:13:56,720

change the tires while we're going down

330

00:14:02,710 --> 00:13:59,680

the highway uh starting last year and uh

331

00:14:06,069 --> 00:14:02,720

you know we are very proud of of having

332

00:14:07,910 --> 00:14:06,079

been able to uh to make 2020 a success

333

00:14:09,990 --> 00:14:07,920

and now that perseverance

334

00:14:12,710 --> 00:14:10,000

is on the surface

335

00:14:14,550 --> 00:14:12,720

i hope you are sharing the magic

336

00:14:16,790 --> 00:14:14,560

that i do personally

337

00:14:19,350 --> 00:14:16,800

these first few days on mars i always

338

00:14:21,430 --> 00:14:19,360

think in some sense are the most magical

339

00:14:23,750 --> 00:14:21,440

uh all of the great panoramas and the

340

00:14:25,430 --> 00:14:23,760

color photos and great science and our

341

00:14:26,470 --> 00:14:25,440

sample acquisition and the helicopter

342

00:14:28,710 --> 00:14:26,480

flight

343

00:14:30,629 --> 00:14:28,720

you will follow along with those and see

344

00:14:32,310 --> 00:14:30,639

them in the coming months

345

00:14:33,829 --> 00:14:32,320

uh but there is something special about

346

00:14:35,269 --> 00:14:33,839

the first few days

347

00:14:37,509 --> 00:14:35,279

because we have just landed a

348

00:14:39,509 --> 00:14:37,519

representative of the planet earth uh on

349

00:14:41,350 --> 00:14:39,519

a place on mars

350

00:14:43,509 --> 00:14:41,360

that no one has ever been to no one has

351
00:14:45,590 --> 00:14:43,519
ever seen it except from orbital imagery

352
00:14:46,790 --> 00:14:45,600
from a few hundred miles up uh above

353
00:14:49,189 --> 00:14:46,800
mars

354
00:14:52,069 --> 00:14:49,199
and uh i believe that that

355
00:14:54,069 --> 00:14:52,079
magical sense that we bring is a lot of

356
00:14:57,990 --> 00:14:54,079
the reason that jpl exists and nasa

357
00:15:01,670 --> 00:14:58,000
exists and uh i and everyone at the lab

358
00:15:03,189 --> 00:15:01,680
is very proud to be to be part of that

359
00:15:04,550 --> 00:15:03,199
and now to talk more about what we

360
00:15:07,189 --> 00:15:04,560
expect to do with this mission on the

361
00:15:08,870 --> 00:15:07,199
surface now that we are safely down i'd

362
00:15:11,030 --> 00:15:08,880
like to turn it over to my colleague dr

363
00:15:12,790 --> 00:15:11,040

lori glaze the head of the planetary

364

00:15:14,470 --> 00:15:12,800

science division

365

00:15:15,750 --> 00:15:14,480

at nasa headquarters

366

00:15:19,350 --> 00:15:15,760

thank you

367

00:15:22,069 --> 00:15:19,360

thanks so much mike really appreciate it

368

00:15:24,629 --> 00:15:22,079

yeah i mean i just wow right i there's

369

00:15:27,030 --> 00:15:24,639

just so much uh excitement and and

370

00:15:29,910 --> 00:15:27,040

emotion here today and and i of course

371

00:15:32,629 --> 00:15:29,920

have to extend my thanks as well

372

00:15:34,389 --> 00:15:32,639

um to the entire team who really had to

373

00:15:36,470 --> 00:15:34,399

work under uh

374

00:15:38,710 --> 00:15:36,480

adverse conditions over the last year

375

00:15:40,870 --> 00:15:38,720

but um have worked hard uh for the six

376

00:15:42,710 --> 00:15:40,880

years prior to that as well um and

377

00:15:44,470 --> 00:15:42,720

probably even before that uh

378

00:15:46,710 --> 00:15:44,480

leading up to to the beginning of the

379

00:15:48,949 --> 00:15:46,720

when the project got kicked off um i'd

380

00:15:50,710 --> 00:15:48,959

also like to to make sure i give a

381

00:15:52,629 --> 00:15:50,720

little shout out and some thanks to to

382

00:15:55,110 --> 00:15:52,639

my headquarters staff that support this

383

00:15:57,509 --> 00:15:55,120

as well um you know we we all work

384

00:16:00,150 --> 00:15:57,519

together it's all one one big team and i

385

00:16:02,389 --> 00:16:00,160

wanted to tell the folks here the the

386

00:16:04,550 --> 00:16:02,399

the march 2020 team uh that it was just

387

00:16:06,230 --> 00:16:04,560

such an honor to to be here and be

388

00:16:08,389 --> 00:16:06,240

allowed to sit in the control room with

389

00:16:10,629 --> 00:16:08,399

you guys you y'all are incredible you're

390

00:16:12,150 --> 00:16:10,639

amazing um and i know it wasn't even the

391

00:16:14,310 --> 00:16:12,160

full team there and the full breadth of

392

00:16:16,389 --> 00:16:14,320

that team uh the capabilities are are

393

00:16:17,990 --> 00:16:16,399

just astounding and and so i'm just so

394

00:16:19,749 --> 00:16:18,000

proud of everything you've accomplished

395

00:16:22,790 --> 00:16:19,759

and and you know thank you for letting

396

00:16:25,269 --> 00:16:22,800

me be a part of it here today um

397

00:16:27,749 --> 00:16:25,279

it is really truly exciting you know the

398

00:16:29,990 --> 00:16:27,759

now that we're on the ground um now the

399

00:16:31,670 --> 00:16:30,000

fun really starts and i loved uh you

400

00:16:33,509 --> 00:16:31,680

know you're gonna hear hear from ken in

401
00:16:35,110 --> 00:16:33,519
a little bit um we're talking to him

402
00:16:36,629 --> 00:16:35,120
right after landing and then you know

403
00:16:38,069 --> 00:16:36,639
the science team's already getting

404
00:16:39,990 --> 00:16:38,079
started they're already working you know

405
00:16:41,670 --> 00:16:40,000
ken's in there looking at the pictures

406
00:16:43,990 --> 00:16:41,680
uh the first two that we got down and

407
00:16:45,269 --> 00:16:44,000
he's already uh you know looking at them

408
00:16:47,430 --> 00:16:45,279
and trying to figure out you know what

409
00:16:49,829 --> 00:16:47,440
we're going to do and where we are so

410
00:16:51,910 --> 00:16:49,839
fantastic i can't wait to get all the

411
00:16:54,389 --> 00:16:51,920
instruments turned on over the next uh

412
00:16:56,310 --> 00:16:54,399
several days and weeks and start

413
00:16:58,310 --> 00:16:56,320

collecting data

414

00:17:00,470 --> 00:16:58,320

and in particular over the you know the

415

00:17:02,710 --> 00:17:00,480

next few days as we're we're getting

416

00:17:04,470 --> 00:17:02,720

down all of the the imaging and the

417

00:17:06,390 --> 00:17:04,480

microphone data that were taken during

418

00:17:08,710 --> 00:17:06,400

the descent you know i think it's going

419

00:17:10,230 --> 00:17:08,720

to take us all along on that descent

420

00:17:11,669 --> 00:17:10,240

we're all going to get to experience

421

00:17:13,429 --> 00:17:11,679

just exactly what that was like this

422

00:17:16,390 --> 00:17:13,439

will be the first time we've ever had

423

00:17:18,069 --> 00:17:16,400

that opportunity to not just look at the

424

00:17:20,549 --> 00:17:18,079

the data that came back and said yes the

425

00:17:22,470 --> 00:17:20,559

parachute deployed and yes you know the

426

00:17:24,630 --> 00:17:22,480

the sky crane operated correctly we're

427

00:17:25,829 --> 00:17:24,640

going to get to see it and live it and

428

00:17:27,909 --> 00:17:25,839

participate

429

00:17:29,590 --> 00:17:27,919

every one of us on that way down it's

430

00:17:33,669 --> 00:17:29,600

going to be amazing so

431

00:17:35,430 --> 00:17:33,679

really really looking forward to that

432

00:17:38,630 --> 00:17:35,440

i'd also like to

433

00:17:42,150 --> 00:17:38,640

in my time here give a shout out to the

434

00:17:43,669 --> 00:17:42,160

more than one million students that

435

00:17:46,230 --> 00:17:43,679

joined in

436

00:17:48,549 --> 00:17:46,240

for the mars student challenge and i

437

00:17:49,909 --> 00:17:48,559

want to i want to thank you all for can

438

00:17:55,430 --> 00:17:49,919

we all thank the students that

439

00:18:00,630 --> 00:17:58,310

fantastic we're just so excited that

440

00:18:02,230 --> 00:18:00,640

so many young people around the country

441

00:18:03,990 --> 00:18:02,240

and around the world have have gotten

442

00:18:05,909 --> 00:18:04,000

engaged with this mission uh it's

443

00:18:08,230 --> 00:18:05,919

incredibly inspiring

444

00:18:09,830 --> 00:18:08,240

and as thomas said it's it's your

445

00:18:11,270 --> 00:18:09,840

generation that's going to take us

446

00:18:13,350 --> 00:18:11,280

forward it's your generation that's

447

00:18:15,430 --> 00:18:13,360

going to be uh analyzing these samples

448

00:18:18,789 --> 00:18:15,440

when they come back to earth and we're

449

00:18:19,590 --> 00:18:18,799

just uh so happy to have uh so much of

450

00:18:21,029 --> 00:18:19,600

uh

451

00:18:22,390 --> 00:18:21,039

so much interaction with with the

452

00:18:24,789 --> 00:18:22,400

students and and

453

00:18:26,630 --> 00:18:24,799

the uh the mars challenge the student

454

00:18:29,110 --> 00:18:26,640

challenge is still up there and folks

455

00:18:32,150 --> 00:18:29,120

can still sign up and still participate

456

00:18:34,789 --> 00:18:32,160

in that activity so just continue to

457

00:18:38,390 --> 00:18:34,799

participate so with that

458

00:18:39,270 --> 00:18:38,400

i am going to pass things over uh to

459

00:18:43,909 --> 00:18:39,280

john

460

00:18:46,710 --> 00:18:43,919

our project manager and congratulations

461

00:18:49,190 --> 00:18:46,720

john thank you so much thank you lori

462

00:18:52,070 --> 00:18:49,200

um so i woke up this morning

463

00:18:55,750 --> 00:18:52,080

unlike thomas and steve i slept like a

464

00:18:58,310 --> 00:18:55,760

baby and i'll tell you why in a minute

465

00:18:59,909 --> 00:18:58,320

got a little exercise i had a little

466

00:19:02,310 --> 00:18:59,919

breakfast

467

00:19:05,909 --> 00:19:02,320

landed on mars so all in all pretty good

468

00:19:11,510 --> 00:19:09,029

and the reason i slept so well is i

469

00:19:15,350 --> 00:19:11,520

probably closer knowledge than uh

470

00:19:17,190 --> 00:19:15,360

thomas uh island and steve and lori

471

00:19:19,669 --> 00:19:17,200

of the quality of the team that was

472

00:19:21,669 --> 00:19:19,679

brought to bear on this very very

473

00:19:23,590 --> 00:19:21,679

difficult endeavor

474

00:19:26,230 --> 00:19:23,600

and i'm talking about the

475

00:19:29,029 --> 00:19:26,240

very much extended team

476
00:19:31,029 --> 00:19:29,039
that doesn't just include jpl we got

477
00:19:32,390 --> 00:19:31,039
tremendous support from nasa

478
00:19:34,549 --> 00:19:32,400
headquarters

479
00:19:36,710 --> 00:19:34,559
from jpl management

480
00:19:37,830 --> 00:19:36,720
the technical establishment that exists

481
00:19:40,549 --> 00:19:37,840
here

482
00:19:41,909 --> 00:19:40,559
at jpl in the technical divisions but

483
00:19:44,150 --> 00:19:41,919
also

484
00:19:46,070 --> 00:19:44,160
in industry

485
00:19:48,150 --> 00:19:46,080
at the other nasa centers that were

486
00:19:51,029 --> 00:19:48,160
brought to bear on this project

487
00:19:53,190 --> 00:19:51,039
are international partners and

488
00:19:54,870 --> 00:19:53,200

know a wealth of contractors that

489

00:19:58,070 --> 00:19:54,880

contributed

490

00:20:01,029 --> 00:19:58,080

greatly to the success of this mission

491

00:20:02,070 --> 00:20:01,039

so we all celebrate it together together

492

00:20:05,510 --> 00:20:02,080

for sure

493

00:20:07,190 --> 00:20:05,520

um it was a very difficult task that we

494

00:20:09,830 --> 00:20:07,200

asked people to do

495

00:20:12,390 --> 00:20:09,840

they delivered they tested

496

00:20:13,350 --> 00:20:12,400

and we landed and now we've turned it

497

00:20:14,870 --> 00:20:13,360

over to

498

00:20:17,029 --> 00:20:14,880

the operations team you'll hear from

499

00:20:19,270 --> 00:20:17,039

jennifer trosper here in a minute and

500

00:20:21,029 --> 00:20:19,280

the science team you'll hear from ken

501
00:20:22,630 --> 00:20:21,039
farley in a minute

502
00:20:24,870 --> 00:20:22,640
and they have

503
00:20:27,430 --> 00:20:24,880
now they have a job to do i mean a real

504
00:20:29,270 --> 00:20:27,440
job to do now that we put this down on

505
00:20:30,710 --> 00:20:29,280
on the surface

506
00:20:31,990 --> 00:20:30,720
i know that the

507
00:20:33,590 --> 00:20:32,000
surface team

508
00:20:36,070 --> 00:20:33,600
and the science team

509
00:20:37,830 --> 00:20:36,080
um were anxious for us to get there

510
00:20:39,110 --> 00:20:37,840
and then as we started to get there they

511
00:20:40,230 --> 00:20:39,120
go oh my god they're actually going to

512
00:20:42,310 --> 00:20:40,240
get there

513
00:20:44,630 --> 00:20:42,320

if we need to finish doing what we need

514

00:20:46,549 --> 00:20:44,640

to do to operate this rover well they

515

00:20:49,029 --> 00:20:46,559

did that and they'll start doing in fact

516

00:20:52,310 --> 00:20:49,039

they're doing it as we speak right now

517

00:20:55,190 --> 00:20:52,320

so anyway thanks to all who contributed

518

00:20:57,350 --> 00:20:55,200

i would argue that if you looked up

519

00:20:59,270 --> 00:20:57,360

perseverance

520

00:21:01,590 --> 00:20:59,280

in the dictionary you should see the

521

00:21:03,990 --> 00:21:01,600

faces of all of these people

522

00:21:06,390 --> 00:21:04,000

that are on the screen here and all the

523

00:21:07,909 --> 00:21:06,400

people on this channel so

524

00:21:09,510 --> 00:21:07,919

thank you very much i'm going to turn it

525

00:21:11,669 --> 00:21:09,520

over to

526
00:21:12,950 --> 00:21:11,679
my partner in crime

527
00:21:14,870 --> 00:21:12,960
and

528
00:21:16,549 --> 00:21:14,880
the person i called the conscience of

529
00:21:18,549 --> 00:21:16,559
the project

530
00:21:20,950 --> 00:21:18,559
essentially from the get-go

531
00:21:22,950 --> 00:21:20,960
matt wallace

532
00:21:24,789 --> 00:21:22,960
thank you very much john and thank you

533
00:21:26,630 --> 00:21:24,799
for your your leadership it's been a

534
00:21:29,190 --> 00:21:26,640
pleasure working with you the last eight

535
00:21:31,590 --> 00:21:29,200
years i have to say um

536
00:21:33,669 --> 00:21:31,600
you know you just got a chance to watch

537
00:21:36,149 --> 00:21:33,679
this team do one of the hardest things

538
00:21:38,310 --> 00:21:36,159

we do in our business which is to land a

539

00:21:40,710 --> 00:21:38,320

spacecraft on the planet

540

00:21:44,310 --> 00:21:40,720

mars you know we arrived at mars moving

541

00:21:46,710 --> 00:21:44,320

at about 12 000 miles an hour roughly

542

00:21:48,710 --> 00:21:46,720

and just seven short minutes we had to

543

00:21:51,669 --> 00:21:48,720

slow down and and gently put

544

00:21:54,470 --> 00:21:51,679

perseverance down in jezreel crater

545

00:21:56,230 --> 00:21:54,480

and uh and the the system just performed

546

00:21:59,190 --> 00:21:56,240

uh flawlessly

547

00:22:01,510 --> 00:21:59,200

you know uh get through 10 or 12 g's of

548

00:22:03,029 --> 00:22:01,520

deceleration a supersonic parachute

549

00:22:05,190 --> 00:22:03,039

deployment

550

00:22:06,390 --> 00:22:05,200

uh you know eight big main engines had

551
00:22:08,310 --> 00:22:06,400
to fire

552
00:22:10,310 --> 00:22:08,320
our terrain relative navigation hazard

553
00:22:12,710 --> 00:22:10,320
avoidance system had to perform the way

554
00:22:15,669 --> 00:22:12,720
it was designed and

555
00:22:18,070 --> 00:22:15,679
you know it's just a it's never easy

556
00:22:19,190 --> 00:22:18,080
these things are so complicated we were

557
00:22:20,789 --> 00:22:19,200
running

558
00:22:23,029 --> 00:22:20,799
a couple million lines of flight

559
00:22:24,549 --> 00:22:23,039
software code i think we had something

560
00:22:27,590 --> 00:22:24,559
on the order of thirty thousand

561
00:22:30,230 --> 00:22:27,600
parameters to set and get them all right

562
00:22:33,350 --> 00:22:30,240
uh you know just a it's just a a

563
00:22:35,029 --> 00:22:33,360

difficult thing to do and uh it's it's a

564

00:22:37,510 --> 00:22:35,039

real

565

00:22:40,710 --> 00:22:37,520

very gratifying and quite a relief

566

00:22:42,149 --> 00:22:40,720

to be through it i have to say

567

00:22:45,029 --> 00:22:42,159

and the good news is i think the

568

00:22:46,789 --> 00:22:45,039

spacecraft is in in great shape

569

00:22:49,029 --> 00:22:46,799

we got through edl

570

00:22:51,350 --> 00:22:49,039

uh very well i'll channel give you a

571

00:22:53,430 --> 00:22:51,360

little more information about that

572

00:22:55,830 --> 00:22:53,440

we did transition into our surface mode

573

00:22:57,350 --> 00:22:55,840

as we expected to and

574

00:22:58,950 --> 00:22:57,360

and so we're doing well

575

00:23:00,789 --> 00:22:58,960

we do have a couple images i'm going to

576

00:23:03,990 --> 00:23:00,799

pop these up i think on the screen if

577

00:23:06,310 --> 00:23:04,000

you can bring up our haz cam imagery

578

00:23:08,549 --> 00:23:06,320

these are engineering camera

579

00:23:10,950 --> 00:23:08,559

images that are taken out the front of

580

00:23:12,230 --> 00:23:10,960

the vehicle and the rear of the vehicle

581

00:23:14,230 --> 00:23:12,240

when we land

582

00:23:16,230 --> 00:23:14,240

and that's jezreel crater right there

583

00:23:18,630 --> 00:23:16,240

and you could see the

584

00:23:20,710 --> 00:23:18,640

shadow of the vehicle uh and you can

585

00:23:23,750 --> 00:23:20,720

look out into the horizon

586

00:23:26,070 --> 00:23:23,760

and uh that is uh that is just uh a

587

00:23:28,070 --> 00:23:26,080

great thing to see for the team

588

00:23:30,149 --> 00:23:28,080

so um

589

00:23:32,870 --> 00:23:30,159

so the next thing we're gonna do here is

590

00:23:36,149 --> 00:23:32,880

something we've never tried before uh in

591

00:23:38,149 --> 00:23:36,159

addition to landing at jezreel crater

592

00:23:39,190 --> 00:23:38,159

we have never tried to bring the team

593

00:23:41,750 --> 00:23:39,200

into

594

00:23:44,390 --> 00:23:41,760

our press conference here and we want to

595

00:23:46,710 --> 00:23:44,400

try to do that so are you guys ready out

596

00:23:48,710 --> 00:23:46,720

there coms team ready you guys ready to

597

00:23:50,630 --> 00:23:48,720

try this

598

00:23:52,870 --> 00:23:50,640

okay i think i'm getting some nods up

599

00:23:54,710 --> 00:23:52,880

and down all right here we go we're

600

00:23:59,110 --> 00:23:54,720

gonna try to switch over

601
00:24:01,110 --> 00:23:59,120
uh and introduce you to the uh mars 2020

602
00:24:05,150 --> 00:24:01,120
perseverance team

603
00:24:13,930 --> 00:24:05,160
here you go congratulations team

604
00:24:13,940 --> 00:24:35,830
[Applause]

605
00:24:47,590 --> 00:24:38,530
so

606
00:24:49,990 --> 00:24:47,600
[Applause]

607
00:24:52,390 --> 00:24:50,000
this is the team that built the the

608
00:24:56,230 --> 00:24:52,400
computers they built the structures they

609
00:24:58,390 --> 00:24:56,240
built the radars uh they integrated the

610
00:25:01,430 --> 00:24:58,400
prop tanks and the thrusters and all the

611
00:25:04,549 --> 00:25:01,440
engines uh you know they built actuators

612
00:25:07,510 --> 00:25:04,559
and robot arms and sampling systems

613
00:25:09,669 --> 00:25:07,520

uh these guys just just never never

614

00:25:12,390 --> 00:25:09,679

rested all of our

615

00:25:14,390 --> 00:25:12,400

terrific science instruments our our

616

00:25:17,590 --> 00:25:14,400

technology payloads

617

00:25:19,269 --> 00:25:17,600

uh really a remarkable team

618

00:25:21,750 --> 00:25:19,279

and they did it

619

00:25:23,750 --> 00:25:21,760

they did it you know days they did it

620

00:25:26,310 --> 00:25:23,760

nights they did it weekends they work

621

00:25:28,390 --> 00:25:26,320

through holidays they work first shift

622

00:25:31,430 --> 00:25:28,400

second shift third shift

623

00:25:33,029 --> 00:25:31,440

uh just a remarkable um you know a

624

00:25:35,190 --> 00:25:33,039

remarkable

625

00:25:36,310 --> 00:25:35,200

accomplishment and we're so proud to be

626
00:25:38,310 --> 00:25:36,320

part of

627
00:25:40,230 --> 00:25:38,320

what what they've done here and they

628
00:25:42,149 --> 00:25:40,240

look good they look good on tv i think

629
00:25:45,350 --> 00:25:42,159

you know so i think you hopefully you

630
00:25:46,870 --> 00:25:45,360

got to see some some of the faces and

631
00:25:49,669 --> 00:25:46,880

some of the families

632
00:25:51,269 --> 00:25:49,679

maybe a few signs a couple pets

633
00:25:54,070 --> 00:25:51,279

along the way

634
00:25:55,909 --> 00:25:54,080

but congratulations to the to the whole

635
00:25:57,110 --> 00:25:55,919

team and thank you all for everything

636
00:25:59,110 --> 00:25:57,120

you've done

637
00:26:02,070 --> 00:25:59,120

i'm going to turn it over to al chen he

638
00:26:03,830 --> 00:26:02,080

is the lead of our swashbuckling edl

639

00:26:07,029 --> 00:26:03,840

team and he's going to tell you a little

640

00:26:08,070 --> 00:26:07,039

bit more about entry descent landing

641

00:26:10,230 --> 00:26:08,080

thanks man

642

00:26:12,549 --> 00:26:10,240

you know wow that was uh quite a ride it

643

00:26:14,070 --> 00:26:12,559

never gets old uh landing on mars

644

00:26:15,430 --> 00:26:14,080

and uh you're gonna want to tell the

645

00:26:17,750 --> 00:26:15,440

whole project team thank you and

646

00:26:18,789 --> 00:26:17,760

especially to the uh to the edl family

647

00:26:20,149 --> 00:26:18,799

out there

648

00:26:21,510 --> 00:26:20,159

i'm really proud of you

649

00:26:22,870 --> 00:26:21,520

you guys did it

650

00:26:24,630 --> 00:26:22,880

um i can show you a little bit about

651
00:26:26,070 --> 00:26:24,640
what we know so far uh usually it takes

652
00:26:27,909 --> 00:26:26,080
us a couple days to figure out where we

653
00:26:29,830 --> 00:26:27,919
went but with our side benefit of our

654
00:26:31,830 --> 00:26:29,840
train wealth and navigation system uh we

655
00:26:33,430 --> 00:26:31,840
know pretty well where we went uh if you

656
00:26:35,029 --> 00:26:33,440
bring up the first figure

657
00:26:36,789 --> 00:26:35,039
you can see that we're off the center

658
00:26:39,029 --> 00:26:36,799
just a little bit to the southeast about

659
00:26:40,390 --> 00:26:39,039
a kilometer or 1.7 kilometers or so to

660
00:26:41,750 --> 00:26:40,400
the southeast

661
00:26:43,430 --> 00:26:41,760
um

662
00:26:45,029 --> 00:26:43,440
it's a pretty good area but terrain

663
00:26:47,909 --> 00:26:45,039

relative navigation was pretty important

664

00:26:49,990 --> 00:26:47,919

here if you go to the next figure

665

00:26:51,669 --> 00:26:50,000

and not just for telling us where we are

666

00:26:53,510 --> 00:26:51,679

you can see that we landed in you know

667

00:26:55,750 --> 00:26:53,520

an area that's relatively rugged there

668

00:26:57,190 --> 00:26:55,760

um and i think uh ken will be able to

669

00:26:59,029 --> 00:26:57,200

tell you about the science of what's

670

00:27:00,470 --> 00:26:59,039

there uh but i was just worried about

671

00:27:01,990 --> 00:27:00,480

what would uh what would kill us on

672

00:27:03,029 --> 00:27:02,000

landing so if you go to the next slide

673

00:27:05,350 --> 00:27:03,039

here

674

00:27:07,269 --> 00:27:05,360

red is generally bad um and you can see

675

00:27:09,269 --> 00:27:07,279

that the the system managed to find a

676

00:27:10,230 --> 00:27:09,279

nice blue spot in the midst of all that

677

00:27:11,909 --> 00:27:10,240

red

678

00:27:15,110 --> 00:27:11,919

all that uh all that depth that's out

679

00:27:17,510 --> 00:27:15,120

there for us so we found the parking lot

680

00:27:18,710 --> 00:27:17,520

and uh and hit it so

681

00:27:20,389 --> 00:27:18,720

you know this rain water navigation

682

00:27:21,750 --> 00:27:20,399

system was absolutely essential in

683

00:27:24,710 --> 00:27:21,760

getting us down here and helping us

684

00:27:26,389 --> 00:27:24,720

figure out was where we are right away

685

00:27:29,430 --> 00:27:26,399

we are in a nice flat spot the vehicle

686

00:27:31,990 --> 00:27:29,440

is only tilted by about 1.2 degrees

687

00:27:34,389 --> 00:27:32,000

so we did successfully find that parking

688

00:27:36,310 --> 00:27:34,399

lot and have a safe rover on the ground

689

00:27:37,909 --> 00:27:36,320

and uh i couldn't be more proud of my

690

00:27:42,310 --> 00:27:37,919

team for doing that

691

00:27:46,950 --> 00:27:43,909

i think this is the end of my journey i

692

00:27:48,950 --> 00:27:46,960

guess with uh with perseverance but the

693

00:27:50,710 --> 00:27:48,960

the the adventure really the mission is

694

00:27:51,830 --> 00:27:50,720

really just beginning uh so let me toss

695

00:27:54,470 --> 00:27:51,840

it over to jennifer to talk about the

696

00:27:55,750 --> 00:27:54,480

surface work that we have ahead of us

697

00:27:57,830 --> 00:27:55,760

thanks al

698

00:28:00,950 --> 00:27:57,840

well thank you al i mean you and your

699

00:28:02,549 --> 00:28:00,960

team did a fantastic job and we're so

700

00:28:04,549 --> 00:28:02,559

grateful to be in this position i almost

701
00:28:05,990 --> 00:28:04,559
feel like i'm in a dream

702
00:28:07,269 --> 00:28:06,000
our job is to

703
00:28:09,029 --> 00:28:07,279
think of all the bad things that can

704
00:28:10,549 --> 00:28:09,039
happen and try to avoid those and when

705
00:28:12,149 --> 00:28:10,559
all good things happen you feel like

706
00:28:14,549 --> 00:28:12,159
you're dreaming and i'm happy to feel

707
00:28:16,789 --> 00:28:14,559
like i'm dreaming today and

708
00:28:18,630 --> 00:28:16,799
happy to be here that i want to first i

709
00:28:21,029 --> 00:28:18,640
want to do the most important thing

710
00:28:22,789 --> 00:28:21,039
which is introduce you to another

711
00:28:24,470 --> 00:28:22,799
portion of the team some of these folks

712
00:28:25,909 --> 00:28:24,480
who are downstairs for landing and some

713
00:28:28,389 --> 00:28:25,919

of them are up here

714

00:28:30,549 --> 00:28:28,399

just doing surface operations and so the

715

00:28:32,470 --> 00:28:30,559

team wants to share their excitement

716

00:28:34,870 --> 00:28:32,480

with you about

717

00:28:37,669 --> 00:28:34,880

being on the surface of mars getting

718

00:28:39,029 --> 00:28:37,679

ready for an amazing science mission so

719

00:28:41,510 --> 00:28:39,039

thank you team

720

00:28:43,029 --> 00:28:41,520

this team is awaiting the odyssey

721

00:28:44,789 --> 00:28:43,039

overflight

722

00:28:47,269 --> 00:28:44,799

yeah let's give him a hand thank you

723

00:28:51,430 --> 00:28:49,430

so this team

724

00:28:54,310 --> 00:28:51,440

is awaiting the odyssey overflight which

725

00:28:56,310 --> 00:28:54,320

will happen about 4 or 4 30 p.m it's a

726

00:28:59,669 --> 00:28:56,320

very small data volume so we won't get

727

00:29:02,549 --> 00:28:59,679

very much information but then at 6 30

728

00:29:04,389 --> 00:29:02,559

pm trace gas orbiter will have an

729

00:29:05,909 --> 00:29:04,399

overflight and send down a fair amount

730

00:29:07,590 --> 00:29:05,919

of data and that's i think what

731

00:29:10,149 --> 00:29:07,600

everybody's looking forward to are these

732

00:29:12,149 --> 00:29:10,159

images that mike talked about so the

733

00:29:13,350 --> 00:29:12,159

images we might get in the if everything

734

00:29:15,350 --> 00:29:13,360

goes well

735

00:29:17,110 --> 00:29:15,360

we will likely get the haz cams with the

736

00:29:19,110 --> 00:29:17,120

deployed covers what you were looking at

737

00:29:20,630 --> 00:29:19,120

before was the has cams without the

738

00:29:23,590 --> 00:29:20,640

covers deployed

739

00:29:26,389 --> 00:29:23,600

we hope that we will get some thumbnail

740

00:29:28,789 --> 00:29:26,399

movies of some of the edl camera images

741

00:29:29,830 --> 00:29:28,799

so that front row seat and entry descent

742

00:29:31,590 --> 00:29:29,840

and landing

743

00:29:33,590 --> 00:29:31,600

and then it's possible that we'll get an

744

00:29:35,510 --> 00:29:33,600

actual image from the descent download

745

00:29:37,990 --> 00:29:35,520

camera the last 10 meters before we

746

00:29:39,669 --> 00:29:38,000

landed on the surface so we're all on

747

00:29:41,750 --> 00:29:39,679

the edge of our seats looking forward to

748

00:29:43,830 --> 00:29:41,760

getting those images just a few other

749

00:29:46,230 --> 00:29:43,840

stats about the rover we think we're

750

00:29:48,070 --> 00:29:46,240

facing southeast based on the shadows

751
00:29:50,310 --> 00:29:48,080
about 140 degrees

752
00:29:53,830 --> 00:29:50,320
the tilt as al said is it's flat it's

753
00:29:57,269 --> 00:29:53,840
about 1.2 degrees the the power system

754
00:30:00,310 --> 00:29:57,279
looks good the rtg uh the generator

755
00:30:01,830 --> 00:30:00,320
before we landed was at 105 watts and we

756
00:30:04,389 --> 00:30:01,840
think it'll go a little higher the

757
00:30:07,110 --> 00:30:04,399
batteries are charged at 95 percent and

758
00:30:09,590 --> 00:30:07,120
everything looks great so we are excited

759
00:30:11,909 --> 00:30:09,600
to get the next set of information from

760
00:30:13,510 --> 00:30:11,919
perseverance now the team will get some

761
00:30:15,590 --> 00:30:13,520
images tonight

762
00:30:17,669 --> 00:30:15,600
but then over the next few days we spend

763
00:30:19,430 --> 00:30:17,679

a little bit of time i'll show you with

764

00:30:22,149 --> 00:30:19,440

the model here kind of unwrapping the

765

00:30:24,389 --> 00:30:22,159

rover it's been inside the descent stage

766

00:30:25,909 --> 00:30:24,399

back shell so the mast is not deployed

767

00:30:28,230 --> 00:30:25,919

so we will deploy

768

00:30:30,389 --> 00:30:28,240

the remote sensing mast here and then

769

00:30:31,990 --> 00:30:30,399

we'll also be pointing you can see here

770

00:30:34,310 --> 00:30:32,000

the high gain antenna at earth and

771

00:30:35,909 --> 00:30:34,320

that's how we will communicate right now

772

00:30:38,789 --> 00:30:35,919

the rover's sending data through the

773

00:30:40,230 --> 00:30:38,799

orbiters on an antenna uhf antenna

774

00:30:41,269 --> 00:30:40,240

that's sitting here on the back of the

775

00:30:43,750 --> 00:30:41,279

rover

776

00:30:45,750 --> 00:30:43,760

and we can command it but only through

777

00:30:47,269 --> 00:30:45,760

an omnidirectional low gain antenna here

778

00:30:48,870 --> 00:30:47,279

so we don't get very high data rates

779

00:30:50,470 --> 00:30:48,880

through that so we're excited to be

780

00:30:52,870 --> 00:30:50,480

opening up the rover

781

00:30:55,190 --> 00:30:52,880

over the next few days after that we

782

00:30:57,190 --> 00:30:55,200

will transition the software as john

783

00:30:59,430 --> 00:30:57,200

mentioned we were finishing many of

784

00:31:01,190 --> 00:30:59,440

these people have been working on this

785

00:31:02,950 --> 00:31:01,200

mission for years

786

00:31:05,509 --> 00:31:02,960

and we were finishing the surface flight

787

00:31:07,190 --> 00:31:05,519

software as we were flying to mars it's

788

00:31:08,789 --> 00:31:07,200

on the vehicle but we will spend a

789

00:31:09,909 --> 00:31:08,799

little bit of time transitioning to that

790

00:31:11,909 --> 00:31:09,919

software

791

00:31:13,990 --> 00:31:11,919

then we will finish the checkouts of all

792

00:31:15,909 --> 00:31:14,000

the instruments and we'll drive to our

793

00:31:17,909 --> 00:31:15,919

heli flight demo location wherever that

794

00:31:19,430 --> 00:31:17,919

might be now we're in and i spent a

795

00:31:21,590 --> 00:31:19,440

little time talking to the rover

796

00:31:23,190 --> 00:31:21,600

planners the folks who decide where to

797

00:31:24,549 --> 00:31:23,200

traverse and what's safe and what's not

798

00:31:26,549 --> 00:31:24,559

and there's a ripple field in front of

799

00:31:28,950 --> 00:31:26,559

us between us and the delta

800

00:31:31,110 --> 00:31:28,960

so we might be doing some driving around

801
00:31:32,950 --> 00:31:31,120
the the ripple field we don't like sand

802
00:31:34,950 --> 00:31:32,960
ripples that much but we're going to

803
00:31:37,110 --> 00:31:34,960
spend some time and figure out what the

804
00:31:38,870 --> 00:31:37,120
traverse places are and and where the

805
00:31:40,549 --> 00:31:38,880
helicopter demo

806
00:31:41,669 --> 00:31:40,559
flight should be so that's what we're

807
00:31:44,710 --> 00:31:41,679
working on

808
00:31:47,029 --> 00:31:44,720
uh in in summary i would like to say you

809
00:31:49,509 --> 00:31:47,039
know as i step back it's just it's great

810
00:31:51,669 --> 00:31:49,519
to be able to share this success i'm so

811
00:31:53,909 --> 00:31:51,679
happy for the team who has worked so

812
00:31:54,870 --> 00:31:53,919
hard this is an incredible team and they

813
00:31:57,110 --> 00:31:54,880

have just

814

00:31:58,950 --> 00:31:57,120

pushed through so many challenges but

815

00:32:01,269 --> 00:31:58,960

we're also very excited to be able to

816

00:32:02,950 --> 00:32:01,279

share this success with everybody who is

817

00:32:04,149 --> 00:32:02,960

cheering for us everybody who is

818

00:32:07,350 --> 00:32:04,159

watching

819

00:32:09,750 --> 00:32:07,360

we really are excited for you to join us

820

00:32:10,630 --> 00:32:09,760

on this great mission on mars that we're

821

00:32:12,950 --> 00:32:10,640

gonna

822

00:32:15,830 --> 00:32:12,960

go through in the next several years

823

00:32:17,590 --> 00:32:15,840

learning more about mars and with that

824

00:32:18,870 --> 00:32:17,600

i'm going to hand it over to ken farley

825

00:32:20,710 --> 00:32:18,880

he'll talk more about the science

826
00:32:21,430 --> 00:32:20,720
mission on mars

827
00:32:31,190 --> 00:32:21,440
i

828
00:32:33,430 --> 00:32:31,200
here

829
00:32:36,149 --> 00:32:33,440
and one of the things i would point out

830
00:32:37,909 --> 00:32:36,159
maybe not obvious from the outside but

831
00:32:40,149 --> 00:32:37,919
a mission like this is is a lot like a

832
00:32:42,230 --> 00:32:40,159
decade-long relay race

833
00:32:44,710 --> 00:32:42,240
there was the whole first stage where

834
00:32:45,750 --> 00:32:44,720
the the whole spacecraft was designed

835
00:32:47,509 --> 00:32:45,760
and built

836
00:32:49,269 --> 00:32:47,519
and literally as the pandemic was

837
00:32:50,470 --> 00:32:49,279
closing in was raced off to the cape to

838
00:32:53,269 --> 00:32:50,480

make the launch

839

00:32:55,750 --> 00:32:53,279

the second leg was to get through space

840

00:32:56,789 --> 00:32:55,760

and arrive successfully as we have just

841

00:32:59,029 --> 00:32:56,799

done

842

00:33:01,029 --> 00:32:59,039

and the third leg is the one that we are

843

00:33:02,710 --> 00:33:01,039

about to embark on that's the science

844

00:33:04,549 --> 00:33:02,720

mission and one of the amazing things

845

00:33:07,110 --> 00:33:04,559

about this is there are thousands of

846

00:33:08,070 --> 00:33:07,120

people all along the way and at each

847

00:33:10,149 --> 00:33:08,080

step

848

00:33:11,669 --> 00:33:10,159

those people peel off and move on to new

849

00:33:13,750 --> 00:33:11,679

jobs and so

850

00:33:16,310 --> 00:33:13,760

on behalf of the science team i want to

851

00:33:18,230 --> 00:33:16,320

thank my friends to the right here and

852

00:33:20,870 --> 00:33:18,240

all of the folks that got us to where we

853

00:33:22,630 --> 00:33:20,880

are this is a spectacular place to be so

854

00:33:24,149 --> 00:33:22,640

thank you thank you all so much for that

855

00:33:26,070 --> 00:33:24,159

and we are going to do you proud in the

856

00:33:28,230 --> 00:33:26,080

science mission

857

00:33:30,630 --> 00:33:28,240

i want to start off uh just saying a few

858

00:33:31,909 --> 00:33:30,640

words about where we are and what we

859

00:33:33,669 --> 00:33:31,919

know so far

860

00:33:35,190 --> 00:33:33,679

uh this is obviously not based on very

861

00:33:36,549 --> 00:33:35,200

much information

862

00:33:37,990 --> 00:33:36,559

and my phone is buzzing all the time

863

00:33:39,269 --> 00:33:38,000

with people telling me things so we're

864

00:33:41,269 --> 00:33:39,279

already starting to process the

865

00:33:43,430 --> 00:33:41,279

information that we have but in this

866

00:33:45,669 --> 00:33:43,440

first image you can see that we landed

867

00:33:48,149 --> 00:33:45,679

to the southeast of the delta we are

868

00:33:49,669 --> 00:33:48,159

about two kilometers to the southeast of

869

00:33:51,830 --> 00:33:49,679

the delta

870

00:33:54,470 --> 00:33:51,840

and we are actually right on the

871

00:33:56,149 --> 00:33:54,480

boundary between two different geologic

872

00:33:57,830 --> 00:33:56,159

units there's the kind of smooth area

873

00:34:00,149 --> 00:33:57,840

that we landed on we call that the mafic

874

00:34:01,830 --> 00:34:00,159

floor unit and then there's the rough

875

00:34:02,630 --> 00:34:01,840

area this is actually where the dunes

876

00:34:05,029 --> 00:34:02,640

are

877

00:34:06,789 --> 00:34:05,039

and that's the olivine bearing unit and

878

00:34:08,710 --> 00:34:06,799

this is a great place to be because one

879

00:34:10,790 --> 00:34:08,720

of the things that uh scientists love to

880

00:34:12,550 --> 00:34:10,800

do is look to see how two different

881

00:34:15,109 --> 00:34:12,560

geologic units come together it tells

882

00:34:16,950 --> 00:34:15,119

you a lot about the geologic history

883

00:34:18,710 --> 00:34:16,960

so we're we're really excited to get

884

00:34:21,190 --> 00:34:18,720

going on this um and if i could have the

885

00:34:23,829 --> 00:34:21,200

next image

886

00:34:26,149 --> 00:34:23,839

so these images i i hope everybody

887

00:34:29,109 --> 00:34:26,159

understands these are actually taken in

888

00:34:31,109 --> 00:34:29,119

only one of the color bands this is just

889

00:34:33,030 --> 00:34:31,119

in the red color band and they are

890

00:34:35,270 --> 00:34:33,040

actually taken through the protective

891

00:34:36,950 --> 00:34:35,280

lens cap that is on the camera so these

892

00:34:38,389 --> 00:34:36,960

are these are just amazing things that

893

00:34:39,990 --> 00:34:38,399

we got back in the first few seconds

894

00:34:41,349 --> 00:34:40,000

after we landed

895

00:34:44,790 --> 00:34:41,359

but we can already see some important

896

00:34:46,790 --> 00:34:44,800

things uh there are rocks in this field

897

00:34:49,190 --> 00:34:46,800

of view there we don't know exactly how

898

00:34:50,790 --> 00:34:49,200

big they are but they might be uh

899

00:34:52,790 --> 00:34:50,800

about 10 centimeters would be a

900

00:34:54,149 --> 00:34:52,800

reasonable guess

901
00:34:56,230 --> 00:34:54,159
so those are those are going to be very

902
00:34:58,069 --> 00:34:56,240
interesting they will undoubtedly be

903
00:34:59,109 --> 00:34:58,079
some of the first objects that we

904
00:34:59,990 --> 00:34:59,119
explore

905
00:35:03,990 --> 00:35:00,000
once

906
00:35:06,310 --> 00:35:04,000
the kind of shakedown phase of the

907
00:35:08,230 --> 00:35:06,320
early rover operations completes and

908
00:35:10,870 --> 00:35:08,240
also in the background we believe that

909
00:35:12,390 --> 00:35:10,880
we can see the delta there there are

910
00:35:14,230 --> 00:35:12,400
features in the back that look like the

911
00:35:15,750 --> 00:35:14,240
cliffs of the delta and so when we get

912
00:35:17,190 --> 00:35:15,760
those additional images back that

913
00:35:18,950 --> 00:35:17,200

jennifer was mentioning we should know a

914

00:35:20,950 --> 00:35:18,960

lot more about that

915

00:35:23,910 --> 00:35:20,960

and then we can also see

916

00:35:25,349 --> 00:35:23,920

some sand dunes in there and actually

917

00:35:26,790 --> 00:35:25,359

something of a relief our imaging

918

00:35:28,550 --> 00:35:26,800

scientist told me when i went and talked

919

00:35:31,109 --> 00:35:28,560

to him about this image i asked him what

920

00:35:33,109 --> 00:35:31,119

he saw and he said looks like mars so

921

00:35:34,150 --> 00:35:33,119

i'm glad we have successfully landed on

922

00:35:36,230 --> 00:35:34,160

mars

923

00:35:38,390 --> 00:35:36,240

so science team is uh really excited to

924

00:35:40,870 --> 00:35:38,400

get going here we have uh years of

925

00:35:42,470 --> 00:35:40,880

scientific investigation ahead of us and

926

00:35:43,990 --> 00:35:42,480

i will turn it back to xiaoru for

927

00:35:46,230 --> 00:35:44,000

questions

928

00:35:48,550 --> 00:35:46,240

okay thank you ken um we're about to

929

00:35:50,310 --> 00:35:48,560

start q a so if you're a reporter on our

930

00:35:52,710 --> 00:35:50,320

phone lines uh remember that you can

931

00:35:54,069 --> 00:35:52,720

press star one and get into the queue

932

00:35:56,230 --> 00:35:54,079

and if you're on social media and you

933

00:35:58,790 --> 00:35:56,240

want to ask questions use the hashtag

934

00:36:01,190 --> 00:35:58,800

countdown to mars so our first reporter

935

00:36:04,390 --> 00:36:01,200

question comes from steve futterman of

936

00:36:06,069 --> 00:36:04,400

cbs news go ahead steve

937

00:36:07,670 --> 00:36:06,079

and uh congratulations to everyone

938

00:36:10,870 --> 00:36:07,680

involved in this i'd like to focus my

939

00:36:12,870 --> 00:36:10,880

question to matt wallace and al chen

940

00:36:15,030 --> 00:36:12,880

obviously we see you

941

00:36:17,510 --> 00:36:15,040

through the lenses of the cameras as

942

00:36:18,870 --> 00:36:17,520

this is happening could you take a step

943

00:36:20,470 --> 00:36:18,880

back and maybe

944

00:36:22,150 --> 00:36:20,480

describe for us

945

00:36:25,510 --> 00:36:22,160

what was going through your mind your

946

00:36:27,190 --> 00:36:25,520

hearts what were the emotions as the the

947

00:36:28,710 --> 00:36:27,200

seven minutes of terror were taking

948

00:36:30,550 --> 00:36:28,720

place and the reaction when you knew

949

00:36:34,069 --> 00:36:30,560

that that perseverance had safely

950

00:36:39,030 --> 00:36:36,630

but you know it's hard to really

951
00:36:40,710 --> 00:36:39,040
describe to be honest with you you think

952
00:36:42,470 --> 00:36:40,720
you're prepared

953
00:36:44,870 --> 00:36:42,480
for it it's

954
00:36:46,950 --> 00:36:44,880
part of our business in some ways you

955
00:36:48,550 --> 00:36:46,960
know we're exploring we're going places

956
00:36:50,150 --> 00:36:48,560
we haven't been

957
00:36:52,150 --> 00:36:50,160
we know there's risk we know there's

958
00:36:54,150 --> 00:36:52,160
uncertainty

959
00:36:56,150 --> 00:36:54,160
i was telling somebody the other day i

960
00:36:58,150 --> 00:36:56,160
don't think a single work day went by

961
00:36:59,990 --> 00:36:58,160
for the last eight or nine years where i

962
00:37:01,510 --> 00:37:00,000
didn't think about entry descendant

963
00:37:04,150 --> 00:37:01,520

landing

964

00:37:06,230 --> 00:37:04,160

you know you always worry uh did you

965

00:37:08,790 --> 00:37:06,240

make the right decision did you test the

966

00:37:11,910 --> 00:37:08,800

right things did you put the right

967

00:37:13,829 --> 00:37:11,920

people in charge we clearly did on

968

00:37:16,230 --> 00:37:13,839

perseverance

969

00:37:18,710 --> 00:37:16,240

but it just

970

00:37:20,470 --> 00:37:18,720

it consumes you it becomes part of you

971

00:37:24,150 --> 00:37:20,480

and

972

00:37:26,390 --> 00:37:24,160

in in some ways uh it's hard still to

973

00:37:27,750 --> 00:37:26,400

believe uh that we've finished it and

974

00:37:28,710 --> 00:37:27,760

that we're done

975

00:37:31,190 --> 00:37:28,720

you know

976

00:37:33,349 --> 00:37:31,200

it still feels a little surreal uh

977

00:37:35,589 --> 00:37:33,359

because it just becomes embedded in in

978

00:37:38,069 --> 00:37:35,599

the way you you think

979

00:37:40,470 --> 00:37:38,079

you have to be constantly terrified

980

00:37:42,710 --> 00:37:40,480

of it you have to respect it

981

00:37:43,750 --> 00:37:42,720

at the same time you have to somehow

982

00:37:45,829 --> 00:37:43,760

believe

983

00:37:47,430 --> 00:37:45,839

that you can do it or else you'd never

984

00:37:50,230 --> 00:37:47,440

try to put a car

985

00:37:52,390 --> 00:37:50,240

on the surface of mars right it's crazy

986

00:37:54,630 --> 00:37:52,400

um and so uh

987

00:37:57,589 --> 00:37:54,640

it's part of our it's part of what we do

988

00:37:59,670 --> 00:37:57,599

i guess and at some point um it becomes

989

00:38:02,470 --> 00:37:59,680

part of how you think

990

00:38:05,510 --> 00:38:02,480

but but there really is no good way to

991

00:38:07,829 --> 00:38:05,520

describe that moment when it's over

992

00:38:09,349 --> 00:38:07,839

and you hear those words touchdown

993

00:38:12,550 --> 00:38:09,359

confirmed

994

00:38:15,510 --> 00:38:12,560

it's just a remarkable feeling of

995

00:38:17,349 --> 00:38:15,520

of pride in the team

996

00:38:19,510 --> 00:38:17,359

relief

997

00:38:21,829 --> 00:38:19,520

and um

998

00:38:23,829 --> 00:38:21,839

and really joy thinking forward to this

999

00:38:24,950 --> 00:38:23,839

remarkable surface mission that we have

1000

00:38:27,430 --> 00:38:24,960

coming up

1001

00:38:29,190 --> 00:38:27,440

uh that's the best i can do uh let me

1002

00:38:30,710 --> 00:38:29,200

let me turn it over to al

1003

00:38:33,030 --> 00:38:30,720

i mean those segments are still pretty

1004

00:38:35,030 --> 00:38:33,040

raw for me right now but the uh

1005

00:38:37,589 --> 00:38:35,040

yeah it's you know the vehicle is going

1006

00:38:40,470 --> 00:38:37,599

on a roller coaster ride and you are too

1007

00:38:42,069 --> 00:38:40,480

right the the little pieces of uh

1008

00:38:43,910 --> 00:38:42,079

of data come back things seem to be

1009

00:38:45,829 --> 00:38:43,920

working the way you want to go you know

1010

00:38:47,270 --> 00:38:45,839

you start getting you start feeling good

1011

00:38:48,630 --> 00:38:47,280

and then you know something comes by

1012

00:38:49,910 --> 00:38:48,640

that doesn't quite match what you

1013

00:38:51,349 --> 00:38:49,920

thought it was going to be is that

1014

00:38:53,430 --> 00:38:51,359

really right you should have expected

1015

00:38:55,030 --> 00:38:53,440

that or something comes out of water and

1016

00:38:56,470 --> 00:38:55,040

your stomach drops and then you know

1017

00:38:58,069 --> 00:38:56,480

okay the things are okay again right

1018

00:38:59,510 --> 00:38:58,079

then you pick up that

1019

00:39:01,990 --> 00:38:59,520

next piece of information that says

1020

00:39:03,349 --> 00:39:02,000

things are actually going okay um it's

1021

00:39:05,829 --> 00:39:03,359

an emotional rollercoaster ride all the

1022

00:39:07,190 --> 00:39:05,839

way down uh that way and you're you know

1023

00:39:09,670 --> 00:39:07,200

you're second guessing yourself as you

1024

00:39:12,790 --> 00:39:09,680

go even though it's already happened

1025

00:39:15,430 --> 00:39:12,800

it's kind of crazy um and uh

1026

00:39:17,270 --> 00:39:15,440

yeah i mean it's it's

1027

00:39:19,670 --> 00:39:17,280

a feeling of being very fortunate at the

1028

00:39:22,470 --> 00:39:19,680

end i think for me that uh i get to work

1029

00:39:23,750 --> 00:39:22,480

at a place with uh with with people who

1030

00:39:26,550 --> 00:39:23,760

are both great engineers and great

1031

00:39:30,390 --> 00:39:26,560

people and we still get to dare mighty

1032

00:39:32,790 --> 00:39:30,400

things together so thank you

1033

00:39:35,990 --> 00:39:32,800

great thank you okay our next caller is

1034

00:39:39,829 --> 00:39:36,000

marcia dunn of the ap go ahead marcia

1035

00:39:42,470 --> 00:39:39,839

yes hi uh congratulations for I um all

1036

00:39:44,310 --> 00:39:42,480

those blue dots surround sorry all the

1037

00:39:46,870 --> 00:39:44,320

red dots surrounding the little blue

1038

00:39:48,630 --> 00:39:46,880

platch are those mostly rocks how close

1039

00:39:50,550 --> 00:39:48,640

do you think you came from something

1040

00:39:52,069 --> 00:39:50,560

that could have doomed the mission on

1041

00:39:53,430 --> 00:39:52,079

landing thank you

1042

00:39:55,990 --> 00:39:53,440

we'll have to take a closer look at

1043

00:39:57,670 --> 00:39:56,000

exactly what we had there i will tell

1044

00:39:59,109 --> 00:39:57,680

you that in general we make these maps a

1045

00:40:01,109 --> 00:39:59,119

little scarier because we want to make

1046

00:40:02,870 --> 00:40:01,119

sure that we find the safest spots in

1047

00:40:05,190 --> 00:40:02,880

fact these maps are typically saturated

1048

00:40:07,030 --> 00:40:05,200

at what we consider uh four percent

1049

00:40:08,390 --> 00:40:07,040

hazard so that if you came down there i

1050

00:40:09,990 --> 00:40:08,400

mean some of these places are definitely

1051
00:40:11,589 --> 00:40:10,000
problems but and there's individual

1052
00:40:12,630 --> 00:40:11,599
rocks that are marked there

1053
00:40:14,790 --> 00:40:12,640
so we're gonna have to take a closer

1054
00:40:16,309 --> 00:40:14,800
look to see how close we came uh but we

1055
00:40:18,710 --> 00:40:16,319
definitely you know the system did what

1056
00:40:20,710 --> 00:40:18,720
was supposed to do it found the uh the

1057
00:40:24,470 --> 00:40:20,720
safest area that was available to it and

1058
00:40:31,510 --> 00:40:27,190
great okay thank you next call is from

1059
00:40:34,710 --> 00:40:33,670
hello yes thanks for taking my question

1060
00:40:37,109 --> 00:40:34,720
um

1061
00:40:39,270 --> 00:40:37,119
i'm wondering if someone can uh i

1062
00:40:41,670 --> 00:40:39,280
realize you haven't seen the the descent

1063
00:40:44,069 --> 00:40:41,680

images yet but um to what extent do you

1064

00:40:46,230 --> 00:40:44,079

expect any major changes in uh

1065

00:40:47,670 --> 00:40:46,240

perseverance's uh perseverance is

1066

00:40:50,230 --> 00:40:47,680

planned route

1067

00:40:51,829 --> 00:40:50,240

based on those images and um

1068

00:40:53,030 --> 00:40:51,839

about how much imagery do you think

1069

00:40:55,270 --> 00:40:53,040

you're going to get i mean in terms of

1070

00:40:57,430 --> 00:40:55,280

the number of images or video and um how

1071

00:41:00,470 --> 00:40:57,440

much better will those be than

1072

00:41:02,550 --> 00:41:00,480

than what you have from the orbiters

1073

00:41:04,470 --> 00:41:02,560

uh i don't know if that would be for uh

1074

00:41:07,589 --> 00:41:04,480

lori or uh

1075

00:41:08,950 --> 00:41:07,599

or jennifer go ahead laurie or no you're

1076
00:41:10,870 --> 00:41:08,960
pointing jennifer i think jennifer would

1077
00:41:12,950 --> 00:41:10,880
be okay go ahead jennifer

1078
00:41:15,190 --> 00:41:12,960
well why don't i i i can talk a little

1079
00:41:17,270 --> 00:41:15,200
bit about the images um we think over

1080
00:41:19,589 --> 00:41:17,280
the next few days we'll get all of the

1081
00:41:21,910 --> 00:41:19,599
entry descent and landing

1082
00:41:24,150 --> 00:41:21,920
movies down so that we can see

1083
00:41:26,150 --> 00:41:24,160
basically that front row seat of what

1084
00:41:28,390 --> 00:41:26,160
happened all the different cameras and

1085
00:41:31,910 --> 00:41:28,400
we'll get those movies i think as far as

1086
00:41:33,990 --> 00:41:31,920
the where we might go once we see those

1087
00:41:37,030 --> 00:41:34,000
i can probably toss that over to ken and

1088
00:41:39,589 --> 00:41:37,040

see what he says about that

1089

00:41:41,109 --> 00:41:39,599

yeah i expect that what we will do is we

1090

00:41:42,790 --> 00:41:41,119

will explore that contact that i

1091

00:41:45,510 --> 00:41:42,800

mentioned between the mafic floor unit

1092

00:41:47,750 --> 00:41:45,520

and the and the olivine unit and as

1093

00:41:49,510 --> 00:41:47,760

jennifer mentioned that's a dune field

1094

00:41:52,150 --> 00:41:49,520

and we might have to go around the dune

1095

00:41:54,150 --> 00:41:52,160

field but i suspect we will go around it

1096

00:41:57,349 --> 00:41:54,160

either one direction or the other uh

1097

00:42:01,349 --> 00:41:59,430

great okay thank you we'll take our next

1098

00:42:05,510 --> 00:42:01,359

reporter question from

1099

00:42:06,950 --> 00:42:05,520

sam ahmed of afp go ahead sam

1100

00:42:09,270 --> 00:42:06,960

hi thanks for taking my question

1101

00:42:11,349 --> 00:42:09,280

congratulations um

1102

00:42:13,589 --> 00:42:11,359

we didn't understand we had uh two mikes

1103

00:42:15,589 --> 00:42:13,599

on board when when might we know if we

1104

00:42:16,710 --> 00:42:15,599

are if our perseverance was successful

1105

00:42:20,069 --> 00:42:16,720

in recording

1106

00:42:21,910 --> 00:42:20,079

um the first direct sound from mars

1107

00:42:23,910 --> 00:42:21,920

jennifer you want to take that one

1108

00:42:26,710 --> 00:42:23,920

yeah we should be able to get some of

1109

00:42:28,470 --> 00:42:26,720

that information in the overnight passes

1110

00:42:30,470 --> 00:42:28,480

tonight and tomorrow morning so

1111

00:42:32,710 --> 00:42:30,480

hopefully we'll we'll be able to

1112

00:42:37,270 --> 00:42:32,720

understand whether we got the sounds and

1113

00:42:45,349 --> 00:42:39,990

great okay thank you next reporter is

1114

00:42:48,550 --> 00:42:46,950

yes can you hear me

1115

00:42:51,270 --> 00:42:48,560

yes you can

1116

00:42:53,430 --> 00:42:51,280

wonderful congratulations to the team

1117

00:42:56,790 --> 00:42:53,440

great great job and and my question

1118

00:42:59,270 --> 00:42:56,800

follows on the last two about the uh

1119

00:43:01,990 --> 00:42:59,280

about the imagery from uh from the

1120

00:43:05,030 --> 00:43:02,000

cameras that you've put on to the uh

1121

00:43:07,030 --> 00:43:05,040

descent vehicle and on the rover itself

1122

00:43:09,510 --> 00:43:07,040

uh can you talk a little bit

1123

00:43:12,470 --> 00:43:09,520

you say they're gonna come down uh

1124

00:43:15,430 --> 00:43:12,480

starting tonight and overnight is that

1125

00:43:17,750 --> 00:43:15,440

all of them i know there were some gopro

1126
00:43:19,109 --> 00:43:17,760
types sort of rugged sports cameras that

1127
00:43:22,230 --> 00:43:19,119
you had pointed in all different

1128
00:43:24,309 --> 00:43:22,240
directions and some high-speed uh video

1129
00:43:27,430 --> 00:43:24,319
that you were taking do you expect it

1130
00:43:29,030 --> 00:43:27,440
all to come down in the next uh you know

1131
00:43:30,870 --> 00:43:29,040
a few hours or is that something that's

1132
00:43:33,270 --> 00:43:30,880
going to trickle in over days and when

1133
00:43:35,270 --> 00:43:33,280
do you expect to release it

1134
00:43:37,670 --> 00:43:35,280
so let's let matt take this one go ahead

1135
00:43:40,069 --> 00:43:37,680
matt yeah i can give you a kind of an

1136
00:43:42,230 --> 00:43:40,079
overview there um and you're correct yes

1137
00:43:43,829 --> 00:43:42,240
as i think thomas mentioned or others

1138
00:43:45,270 --> 00:43:43,839

had mentioned for the first time we're

1139

00:43:47,270 --> 00:43:45,280

going to be able to see ourselves in

1140

00:43:49,109 --> 00:43:47,280

high definition video

1141

00:43:52,150 --> 00:43:49,119

land on another planet

1142

00:43:53,990 --> 00:43:52,160

we we put commercial ruggedized cameras

1143

00:43:55,589 --> 00:43:54,000

at various locations on the vehicle

1144

00:43:57,670 --> 00:43:55,599

three of them looking up at that big

1145

00:43:59,430 --> 00:43:57,680

supersonic parachute

1146

00:44:02,069 --> 00:43:59,440

one on the descent stage looking down at

1147

00:44:03,829 --> 00:44:02,079

the rover one on the rover that looks up

1148

00:44:05,030 --> 00:44:03,839

at the descent stage

1149

00:44:07,030 --> 00:44:05,040

and then we have one at the rover

1150

00:44:08,550 --> 00:44:07,040

looking down as well and so we think

1151
00:44:11,430 --> 00:44:08,560
we're going to capture some pretty

1152
00:44:14,710 --> 00:44:11,440
spectacular uh we think we have captured

1153
00:44:17,190 --> 00:44:14,720
hopefully some pretty spectacular video

1154
00:44:18,710 --> 00:44:17,200
and they come with a microphone as well

1155
00:44:20,390 --> 00:44:18,720
and so i think that's what you're asking

1156
00:44:22,790 --> 00:44:20,400
about

1157
00:44:25,109 --> 00:44:22,800
we are in fact hoping that we can bring

1158
00:44:28,950 --> 00:44:25,119
one image one still image from those

1159
00:44:31,030 --> 00:44:28,960
cameras uh uh to the table uh tomorrow

1160
00:44:33,589 --> 00:44:31,040
from the descent stage looking down at

1161
00:44:36,470 --> 00:44:33,599
the rover and and i think that's gonna

1162
00:44:37,910 --> 00:44:36,480
hopefully uh we'll see that and and then

1163
00:44:39,430 --> 00:44:37,920

i'm hoping that that's going to be a

1164

00:44:41,589 --> 00:44:39,440

remarkable image

1165

00:44:43,829 --> 00:44:41,599

but the first video product uh we're

1166

00:44:45,430 --> 00:44:43,839

going to work on over the weekend as the

1167

00:44:48,069 --> 00:44:45,440

imagery comes down

1168

00:44:48,870 --> 00:44:48,079

and we're going to try to bring that

1169

00:44:53,190 --> 00:44:48,880

to

1170

00:44:54,630 --> 00:44:53,200

and i think that's really gonna be uh

1171

00:44:56,710 --> 00:44:54,640

something to see

1172

00:44:59,430 --> 00:44:56,720

yeah it's it's gonna be remarkable i'm

1173

00:45:00,790 --> 00:44:59,440

looking forward to it myself

1174

00:45:05,109 --> 00:45:00,800

thank you

1175

00:45:08,069 --> 00:45:05,119

stephen clark from space flight now go

1176

00:45:11,990 --> 00:45:10,230

hi thank you for taking my question um

1177

00:45:14,069 --> 00:45:12,000

just wondering if maybe jennifer trosper

1178

00:45:15,670 --> 00:45:14,079

can go through the time line over the

1179

00:45:16,630 --> 00:45:15,680

next couple of days in some more detail

1180

00:45:17,510 --> 00:45:16,640

about

1181

00:45:18,950 --> 00:45:17,520

you know

1182

00:45:21,670 --> 00:45:18,960

when the lens covers are going to be

1183

00:45:23,430 --> 00:45:21,680

opened when the high gain antenna will

1184

00:45:26,950 --> 00:45:23,440

have a lock on earth

1185

00:45:28,790 --> 00:45:26,960

um and when the mast will be

1186

00:45:30,550 --> 00:45:28,800

you know deployed and when the first

1187

00:45:32,230 --> 00:45:30,560

drive might be

1188

00:45:34,150 --> 00:45:32,240

just walk me through that for me please

1189

00:45:37,109 --> 00:45:34,160

and maybe for uh

1190

00:45:39,349 --> 00:45:37,119

dr zubrukin or dr glaze um you know the

1191

00:45:40,710 --> 00:45:39,359

mars sample campaign sample return

1192

00:45:42,150 --> 00:45:40,720

campaign was really hindering on the

1193

00:45:44,309 --> 00:45:42,160

outcome of today

1194

00:45:46,950 --> 00:45:44,319

just wanted to get your comments on on

1195

00:45:48,630 --> 00:45:46,960

any relief that you felt that you know

1196

00:45:51,829 --> 00:45:48,640

that your you know your whole mars

1197

00:45:56,390 --> 00:45:51,839

sample return strategy um is reality now

1198

00:46:00,710 --> 00:45:58,630

yeah i'll start with uh what what we're

1199

00:46:02,630 --> 00:46:00,720

doing over the next several saws this is

1200

00:46:04,630 --> 00:46:02,640

sal zero so right after the rover landed

1201
00:46:06,870 --> 00:46:04,640
it actually fired some pyros and did

1202
00:46:09,109 --> 00:46:06,880
release our high gain antenna and also

1203
00:46:11,030 --> 00:46:09,119
release those lens covers which is why

1204
00:46:13,349 --> 00:46:11,040
the images that we expect to see this

1205
00:46:15,670 --> 00:46:13,359
evening will be without the lens covers

1206
00:46:17,349 --> 00:46:15,680
and those will be the has cam images

1207
00:46:18,150 --> 00:46:17,359
along with the other images we talked

1208
00:46:19,910 --> 00:46:18,160
about

1209
00:46:21,829 --> 00:46:19,920
the the first four or five solves what

1210
00:46:23,349 --> 00:46:21,839
we're trying to do is get the power the

1211
00:46:25,990 --> 00:46:23,359
thermal and the communications the

1212
00:46:27,670 --> 00:46:26,000
infrastructure of the rover stabilized

1213
00:46:29,910 --> 00:46:27,680

so that then we can go and load the

1214

00:46:31,430 --> 00:46:29,920

software as i mentioned so the the first

1215

00:46:34,069 --> 00:46:31,440

thing we'll do tomorrow we actually

1216

00:46:36,069 --> 00:46:34,079

gyrocompass today as well to see if we

1217

00:46:38,390 --> 00:46:36,079

can understand our orientation such that

1218

00:46:41,030 --> 00:46:38,400

tomorrow on saw one we can point the

1219

00:46:43,190 --> 00:46:41,040

high gain antenna at earth and then if

1220

00:46:45,030 --> 00:46:43,200

we get good pointing then we'll start

1221

00:46:46,790 --> 00:46:45,040

commanding the vehicle through that

1222

00:46:48,390 --> 00:46:46,800

antenna and that's one of the key things

1223

00:46:50,870 --> 00:46:48,400

we're trying to do in these early days

1224

00:46:52,710 --> 00:46:50,880

is get that communication link working

1225

00:46:54,870 --> 00:46:52,720

we'll also release the remote sensing

1226
00:46:56,630 --> 00:46:54,880
mast and then on saw two will deploy

1227
00:46:58,390 --> 00:46:56,640
that mass now while we're doing these

1228
00:47:01,030 --> 00:46:58,400
things which i call our critical path

1229
00:47:03,109 --> 00:47:01,040
infrastructure things we're also doing

1230
00:47:05,430 --> 00:47:03,119
other health checks of other instruments

1231
00:47:07,190 --> 00:47:05,440
and over the course of the three cells

1232
00:47:08,870 --> 00:47:07,200
or foresaws of the these early

1233
00:47:10,309 --> 00:47:08,880
activities we'll get all the instrument

1234
00:47:12,870 --> 00:47:10,319
health checks done we'll charge the

1235
00:47:14,710 --> 00:47:12,880
rover battery and that's all too once we

1236
00:47:17,510 --> 00:47:14,720
deploy the mast that's when we'll take

1237
00:47:19,270 --> 00:47:17,520
those initial images with our double e

1238
00:47:20,630 --> 00:47:19,280

cams these their camera that they're

1239

00:47:22,309 --> 00:47:20,640

their color this time in the past

1240

00:47:24,549 --> 00:47:22,319

they've been black and white we'll take

1241

00:47:27,270 --> 00:47:24,559

those first panoramas and then the mass

1242

00:47:29,349 --> 00:47:27,280

cam z which is also on the mast we'll

1243

00:47:30,950 --> 00:47:29,359

take those panoramas on sol three and

1244

00:47:33,270 --> 00:47:30,960

then those will be sending that data

1245

00:47:35,270 --> 00:47:33,280

down along with additional data from the

1246

00:47:37,349 --> 00:47:35,280

edl cameras and the other data that we

1247

00:47:39,430 --> 00:47:37,359

talked about over this week it'll take

1248

00:47:42,710 --> 00:47:39,440

us till about solve four and solve for

1249

00:47:46,230 --> 00:47:42,720

we actually start to load um and burn

1250

00:47:48,549 --> 00:47:46,240

into the the rce so our flight computers

1251
00:47:49,910 --> 00:47:48,559
the new software and once we start to do

1252
00:47:51,430 --> 00:47:49,920
that we do about four days of

1253
00:47:53,430 --> 00:47:51,440
transitioning to the new software we do

1254
00:47:55,829 --> 00:47:53,440
it very carefully we toe dip we make

1255
00:47:58,390 --> 00:47:55,839
sure that nothing goes wrong and at the

1256
00:48:00,630 --> 00:47:58,400
end of that is when we start the next

1257
00:48:03,430 --> 00:48:00,640
set of checkouts where we'll deploy the

1258
00:48:05,670 --> 00:48:03,440
arm we'll do our first drive about five

1259
00:48:08,150 --> 00:48:05,680
meters forward and back

1260
00:48:10,309 --> 00:48:08,160
and then once we get that checked out is

1261
00:48:11,910 --> 00:48:10,319
when we'll start to drive towards a heli

1262
00:48:14,230 --> 00:48:11,920
site we'll have figured out where we

1263
00:48:16,549 --> 00:48:14,240

want to fly the heli uh we need there

1264

00:48:18,549 --> 00:48:16,559

are certain requirements of of that site

1265

00:48:20,390 --> 00:48:18,559

in terms of rock sizes and flatness and

1266

00:48:22,549 --> 00:48:20,400

so we're looking for that right now

1267

00:48:24,710 --> 00:48:22,559

that ends up being you know a few weeks

1268

00:48:27,349 --> 00:48:24,720

before we get there but uh

1269

00:48:29,190 --> 00:48:27,359

but we're excited about it all

1270

00:48:31,510 --> 00:48:29,200

wonderful i want to quickly talk about

1271

00:48:33,349 --> 00:48:31,520

your second question stephen and that is

1272

00:48:35,589 --> 00:48:33,359

uh of course

1273

00:48:38,069 --> 00:48:35,599

uh there's a lot of friends all over the

1274

00:48:39,510 --> 00:48:38,079

world who had a sigh of relief and

1275

00:48:41,829 --> 00:48:39,520

everything went well

1276

00:48:43,030 --> 00:48:41,839

with this touchdown the mars sample

1277

00:48:45,190 --> 00:48:43,040

return

1278

00:48:47,349 --> 00:48:45,200

uh colleagues they're all working really

1279

00:48:49,510 --> 00:48:47,359

hard to retire the risks of these new

1280

00:48:51,270 --> 00:48:49,520

technologies and to bring together two

1281

00:48:52,390 --> 00:48:51,280

of the most amazing missions to now

1282

00:48:55,109 --> 00:48:52,400

bring

1283

00:48:57,829 --> 00:48:55,119

the samples back uh that's a work that i

1284

00:49:00,150 --> 00:48:57,839

started years ago technology development

1285

00:49:02,549 --> 00:49:00,160

and and the system development here at

1286

00:49:05,670 --> 00:49:02,559

jpl at the european space agency and

1287

00:49:08,549 --> 00:49:05,680

elsewhere there's two principles we used

1288

00:49:10,470 --> 00:49:08,559

to set the timing the first one is we

1289

00:49:12,630 --> 00:49:10,480

always bet on success

1290

00:49:14,230 --> 00:49:12,640

in our business even if you sweat

1291

00:49:16,710 --> 00:49:14,240

through shirt or not like i learned

1292

00:49:19,030 --> 00:49:16,720

about john you know we bet on success

1293

00:49:20,950 --> 00:49:19,040

because that's what we want to achieve

1294

00:49:23,990 --> 00:49:20,960

that's what we're planning for the

1295

00:49:26,470 --> 00:49:24,000

second one is to go right now and

1296

00:49:29,430 --> 00:49:26,480

develop the more sample return campaign

1297

00:49:32,150 --> 00:49:29,440

not only makes the service mission more

1298

00:49:34,470 --> 00:49:32,160

effective in that regard but also it

1299

00:49:36,150 --> 00:49:34,480

actually saves a lot of money because we

1300

00:49:37,430 --> 00:49:36,160

actually can use the systems that we

1301
00:49:40,309 --> 00:49:37,440
have now

1302
00:49:41,510 --> 00:49:40,319
move towards that return and so for that

1303
00:49:43,910 --> 00:49:41,520
reason i think

1304
00:49:45,829 --> 00:49:43,920
there's a lot of people being excited

1305
00:49:48,069 --> 00:49:45,839
right now all over the world

1306
00:49:50,309 --> 00:49:48,079
but uh lori anything you wanted to add

1307
00:49:51,990 --> 00:49:50,319
that i may have overlooked in this i i

1308
00:49:54,069 --> 00:49:52,000
think you've covered that really well

1309
00:49:57,190 --> 00:49:54,079
the the only thing i would say is that

1310
00:49:59,430 --> 00:49:57,200
you know it's always nerve-wracking to

1311
00:50:02,069 --> 00:49:59,440
as we go through the the edl for a

1312
00:50:03,990 --> 00:50:02,079
lander or a rover um but it was doubly

1313
00:50:06,470 --> 00:50:04,000

so this time because as you say the the

1314

00:50:09,270 --> 00:50:06,480

march sample return uh was also pretty

1315

00:50:11,910 --> 00:50:09,280

you know re is is reliant on the success

1316

00:50:14,230 --> 00:50:11,920

of of perseverance so yeah we all

1317

00:50:16,230 --> 00:50:14,240

definitely heaved a sigh of relief uh in

1318

00:50:18,390 --> 00:50:16,240

thinking forward on on all the work that

1319

00:50:20,549 --> 00:50:18,400

that's to go uh from our sample return

1320

00:50:23,430 --> 00:50:20,559

but really really exciting that we've

1321

00:50:25,670 --> 00:50:23,440

now really embarked on that chapter one

1322

00:50:28,630 --> 00:50:25,680

of mars sample return

1323

00:50:30,790 --> 00:50:28,640

in for real so it's great okay thank you

1324

00:50:32,950 --> 00:50:30,800

lori okay we're gonna do a social media

1325

00:50:36,230 --> 00:50:32,960

question this might also actually be for

1326

00:50:38,630 --> 00:50:36,240

lori pulls to do on instagram asks if

1327

00:50:42,069 --> 00:50:38,640

perseverance finds signs of past or

1328

00:50:44,870 --> 00:50:42,079

present life what would we do next

1329

00:50:47,270 --> 00:50:44,880

oh wow that's a great great question

1330

00:50:48,470 --> 00:50:47,280

because there's still just so much to do

1331

00:50:50,470 --> 00:50:48,480

on mars

1332

00:50:51,990 --> 00:50:50,480

it's a fascinating fascinating place and

1333

00:50:54,470 --> 00:50:52,000

there's there's a

1334

00:50:57,430 --> 00:50:54,480

it's a wonderful laboratory for doing

1335

00:50:59,109 --> 00:50:57,440

incredible science and uh you know

1336

00:51:01,829 --> 00:50:59,119

certainly the big question for us right

1337

00:51:03,670 --> 00:51:01,839

now is this question about uh the

1338

00:51:05,910 --> 00:51:03,680

evolution of mars and the and the

1339

00:51:08,150 --> 00:51:05,920

existence or not of of past life that's

1340

00:51:10,710 --> 00:51:08,160

been preserved at jezreel crater and

1341

00:51:11,829 --> 00:51:10,720

that's our focus right now

1342

00:51:13,510 --> 00:51:11,839

you know but we're always looking

1343

00:51:14,950 --> 00:51:13,520

forward to the additional science that

1344

00:51:18,069 --> 00:51:14,960

we're going to do in the future i'm

1345

00:51:20,069 --> 00:51:18,079

thinking about uh again how planets form

1346

00:51:22,150 --> 00:51:20,079

how they evolve and mars is a great

1347

00:51:24,309 --> 00:51:22,160

great place to to work on all of those

1348

00:51:25,829 --> 00:51:24,319

different science questions

1349

00:51:27,829 --> 00:51:25,839

great thank you okay we're going to go

1350

00:51:33,349 --> 00:51:27,839

back to the reporter phone lines and we

1351

00:51:36,710 --> 00:51:34,870

thank you all and um yeah

1352

00:51:39,190 --> 00:51:36,720

congratulations it was it was a really

1353

00:51:41,430 --> 00:51:39,200

great day for all of us watching too um

1354

00:51:43,190 --> 00:51:41,440

just just to kind of piggyback off of um

1355

00:51:44,870 --> 00:51:43,200

stephen clark's question about what the

1356

00:51:46,630 --> 00:51:44,880

near future holds could you maybe

1357

00:51:47,750 --> 00:51:46,640

jennifer or john or

1358

00:51:50,549 --> 00:51:47,760

or ken

1359

00:51:52,390 --> 00:51:50,559

like um do you go out like

1360

00:51:54,150 --> 00:51:52,400

like another couple weeks or a month or

1361

00:51:56,549 --> 00:51:54,160

so i mean how long do you anticipate

1362

00:51:58,630 --> 00:51:56,559

it'll take to get to the helicopter site

1363

00:52:00,390 --> 00:51:58,640

and how long will those flights take and

1364

00:52:02,870 --> 00:52:00,400

i mean when will the rover be able to

1365

00:52:04,630 --> 00:52:02,880

actually like start doing science and

1366

00:52:06,470 --> 00:52:04,640

like start gathering samples and so on

1367

00:52:07,670 --> 00:52:06,480

and so forth do you think

1368

00:52:09,750 --> 00:52:07,680

thank you

1369

00:52:11,990 --> 00:52:09,760

sure i'll go a little further out i

1370

00:52:13,829 --> 00:52:12,000

talked about we'll have the road once we

1371

00:52:15,589 --> 00:52:13,839

get the robotic arm working and we get

1372

00:52:17,190 --> 00:52:15,599

mobility working we'll go find the heli

1373

00:52:19,270 --> 00:52:17,200

flight demo site so it's about three

1374

00:52:22,150 --> 00:52:19,280

weeks and then depending on how close

1375

00:52:23,910 --> 00:52:22,160

that site is uh we have to traverse to

1376

00:52:26,150 --> 00:52:23,920

it and we still have the helicopter

1377

00:52:28,630 --> 00:52:26,160

underneath the rover so we can't use our

1378

00:52:30,150 --> 00:52:28,640

auto auto navigation we have to be a

1379

00:52:32,390 --> 00:52:30,160

little bit more careful when we're doing

1380

00:52:34,230 --> 00:52:32,400

that so it could take up to 10 so it

1381

00:52:37,589 --> 00:52:34,240

really depends on where we find a heli

1382

00:52:39,910 --> 00:52:37,599

flight demo site then we will spend 30

1383

00:52:41,430 --> 00:52:39,920

solves a saw is a martian day it's 40

1384

00:52:42,790 --> 00:52:41,440

minutes longer than an earth day so we

1385

00:52:44,630 --> 00:52:42,800

speak in solves when we're doing

1386

00:52:45,670 --> 00:52:44,640

operations on mars so we spend about 30

1387

00:52:47,990 --> 00:52:45,680

sols

1388

00:52:50,790 --> 00:52:48,000

for the helicopter demo prior to that

1389

00:52:52,870 --> 00:52:50,800

it'll take us about a ten sols to get

1390

00:52:54,710 --> 00:52:52,880

the helicopter just deployed underneath

1391

00:52:56,069 --> 00:52:54,720

the rover move the rover away we go

1392

00:52:58,549 --> 00:52:56,079

about a hundred meters away before we

1393

00:53:00,630 --> 00:52:58,559

fly it so that's another 40s so i like

1394

00:53:02,630 --> 00:53:00,640

to say it's it's sometimes hard it's

1395

00:53:04,309 --> 00:53:02,640

always hard to estimate exactly when

1396

00:53:06,630 --> 00:53:04,319

things happen but we'll be flying the

1397

00:53:08,390 --> 00:53:06,640

helicopter in the spring here and we'll

1398

00:53:11,109 --> 00:53:08,400

be spending spring fly in the helicopter

1399

00:53:13,349 --> 00:53:11,119

after that we're going to upgrade our

1400

00:53:14,630 --> 00:53:13,359

auto navigation capability on the rover

1401
00:53:16,870 --> 00:53:14,640
meaning we're just going to try it out

1402
00:53:18,870 --> 00:53:16,880
make sure it works then we'll drive

1403
00:53:21,109 --> 00:53:18,880
towards the first science site that ken

1404
00:53:22,630 --> 00:53:21,119
and his team are interested in going to

1405
00:53:24,710 --> 00:53:22,640
again that depends on where they want to

1406
00:53:26,390 --> 00:53:24,720
go how long it takes us to get there and

1407
00:53:28,309 --> 00:53:26,400
that's the point where we where we will

1408
00:53:30,549 --> 00:53:28,319
be doing the first sampling so i like to

1409
00:53:32,150 --> 00:53:30,559
say summer is the time frame when we'll

1410
00:53:34,549 --> 00:53:32,160
be doing the first sampling those things

1411
00:53:36,470 --> 00:53:34,559
can change they might go faster

1412
00:53:38,309 --> 00:53:36,480
or if we have to drive traverse to

1413
00:53:40,549 --> 00:53:38,319

different places that take a longer

1414

00:53:42,549 --> 00:53:40,559

period of time it might go slower that's

1415

00:53:44,470 --> 00:53:42,559

a longer plan and then one thing i'll

1416

00:53:47,190 --> 00:53:44,480

just throw in the end conjunction

1417

00:53:48,950 --> 00:53:47,200

uh is around september where we um do

1418

00:53:50,309 --> 00:53:48,960

not we're not able to communicate with

1419

00:53:52,069 --> 00:53:50,319

the spacecraft because the sun is

1420

00:53:53,910 --> 00:53:52,079

between earth and mars and so during

1421

00:53:56,630 --> 00:53:53,920

that time we'll spend a little bit of

1422

00:53:58,230 --> 00:53:56,640

work uh finishing off some efficiency

1423

00:54:00,309 --> 00:53:58,240

and operability capabilities for the

1424

00:54:02,069 --> 00:54:00,319

vehicle to help it be even smarter and

1425

00:54:03,910 --> 00:54:02,079

even more autonomous and then after

1426
00:54:06,150 --> 00:54:03,920
conjunction we'll upload that new flight

1427
00:54:08,630 --> 00:54:06,160
software build and then that's when we

1428
00:54:12,549 --> 00:54:08,640
can really do things even faster than we

1429
00:54:16,309 --> 00:54:13,750
ken do you want to talk a little bit

1430
00:54:18,470 --> 00:54:16,319
about the science part

1431
00:54:20,390 --> 00:54:18,480
yeah it's a little premature to say very

1432
00:54:23,109 --> 00:54:20,400
much yet i

1433
00:54:25,190 --> 00:54:23,119
i mentioned in a previous discussion

1434
00:54:26,790 --> 00:54:25,200
that there are 450 science team members

1435
00:54:28,309 --> 00:54:26,800
and i i think most of them are sending

1436
00:54:29,349 --> 00:54:28,319
me texts and emails about what we should

1437
00:54:30,790 --> 00:54:29,359
do now

1438
00:54:33,030 --> 00:54:30,800

but we've got to get together and

1439

00:54:35,750 --> 00:54:33,040

actually uh come up with a communal plan

1440

00:54:37,829 --> 00:54:35,760

we're not ready to do that just yet

1441

00:54:39,829 --> 00:54:37,839

okay great thank you okay the next

1442

00:54:42,789 --> 00:54:39,839

reporter question comes from jackie

1443

00:54:45,349 --> 00:54:42,799

goddard of the times of london

1444

00:54:47,670 --> 00:54:45,359

hello and congratulations everyone and

1445

00:54:50,150 --> 00:54:47,680

that includes uh all the folks on those

1446

00:54:51,750 --> 00:54:50,160

screens at your kitchen tables and your

1447

00:54:53,510 --> 00:54:51,760

on your couches with your dogs and your

1448

00:54:55,270 --> 00:54:53,520

cats and your kids

1449

00:54:57,190 --> 00:54:55,280

my question is can one of you on the

1450

00:54:59,829 --> 00:54:57,200

panel please give us some examples of

1451
00:55:01,030 --> 00:54:59,839
the complexity of the challenges that

1452
00:55:02,630 --> 00:55:01,040
you faced

1453
00:55:04,309 --> 00:55:02,640
getting this mission to mars under

1454
00:55:07,270 --> 00:55:04,319
pandemic conditions

1455
00:55:09,190 --> 00:55:07,280
and to what extent will covid continue

1456
00:55:11,349 --> 00:55:09,200
to affect operations for example would

1457
00:55:13,670 --> 00:55:11,359
the rover operations also be at their

1458
00:55:16,069 --> 00:55:13,680
kitchen tables and sofas and pets on

1459
00:55:18,150 --> 00:55:16,079
laps um or does that now change thank

1460
00:55:20,309 --> 00:55:18,160
you

1461
00:55:23,430 --> 00:55:20,319
yeah i can i can uh start us off and say

1462
00:55:25,109 --> 00:55:23,440
a few words um i'll let jennifer say a

1463
00:55:27,349 --> 00:55:25,119

bit about looking out into the future of

1464

00:55:29,349 --> 00:55:27,359

the surface mission uh you know the

1465

00:55:30,549 --> 00:55:29,359

pandemic struck at just about the worst

1466

00:55:32,549 --> 00:55:30,559

time

1467

00:55:34,789 --> 00:55:32,559

uh for this mission and we had just

1468

00:55:35,990 --> 00:55:34,799

shipped the vehicle down to kennedy

1469

00:55:38,549 --> 00:55:36,000

space center

1470

00:55:40,870 --> 00:55:38,559

it was in pieces we still had to put it

1471

00:55:42,630 --> 00:55:40,880

together it's a critical point in time

1472

00:55:44,870 --> 00:55:42,640

for us

1473

00:55:46,710 --> 00:55:44,880

you can't make mistakes there's no

1474

00:55:49,589 --> 00:55:46,720

safety net at that point there's no

1475

00:55:51,270 --> 00:55:49,599

double checks you have to do it right

1476

00:55:55,670 --> 00:55:51,280

we were still finishing some of the

1477

00:55:59,910 --> 00:55:57,750

we had very little schedule margin you

1478

00:56:02,069 --> 00:55:59,920

know the teams were already

1479

00:56:05,190 --> 00:56:02,079

working multiple shifts and i had

1480

00:56:07,270 --> 00:56:05,200

already scheduled out the weekends and

1481

00:56:09,430 --> 00:56:07,280

you know we had to react very quickly

1482

00:56:11,109 --> 00:56:09,440

and and we were

1483

00:56:13,270 --> 00:56:11,119

normally you're just focused on trying

1484

00:56:15,510 --> 00:56:13,280

to do the job do it right

1485

00:56:17,430 --> 00:56:15,520

and get it done in time to make the

1486

00:56:19,109 --> 00:56:17,440

planetary launch window because if you

1487

00:56:21,430 --> 00:56:19,119

miss it you're going to have to wait two

1488

00:56:22,309 --> 00:56:21,440

years

1489

00:56:26,150 --> 00:56:22,319

and

1490

00:56:27,670 --> 00:56:26,160

the we had to start thinking primarily

1491

00:56:29,349 --> 00:56:27,680

about how to keep the team safe and

1492

00:56:31,349 --> 00:56:29,359

their family safe

1493

00:56:33,829 --> 00:56:31,359

and and how to get through all these

1494

00:56:34,950 --> 00:56:33,839

logistical challenges uh you know we

1495

00:56:36,390 --> 00:56:34,960

were

1496

00:56:38,549 --> 00:56:36,400

quickly trying to understand the

1497

00:56:41,190 --> 00:56:38,559

protective equipment we had to bring in

1498

00:56:42,870 --> 00:56:41,200

um what kind of social distancing we had

1499

00:56:45,190 --> 00:56:42,880

to deal with how many people could stand

1500

00:56:47,589 --> 00:56:45,200

around the rover and how close could

1501
00:56:49,190 --> 00:56:47,599
they be inside a clean room you know

1502
00:56:51,349 --> 00:56:49,200
what kind of protection we got from our

1503
00:56:53,829 --> 00:56:51,359
clean room garb

1504
00:56:56,390 --> 00:56:53,839
we were just struggling to

1505
00:56:58,789 --> 00:56:56,400
understand if all of our support

1506
00:57:01,190 --> 00:56:58,799
community the companies that just clean

1507
00:57:03,349 --> 00:57:01,200
the garments you know for our clean room

1508
00:57:05,109 --> 00:57:03,359
or bring the nitrogen in for our thermal

1509
00:57:06,630 --> 00:57:05,119
vacuum chambers whether or not they were

1510
00:57:08,069 --> 00:57:06,640
going to be there and continue to

1511
00:57:09,910 --> 00:57:08,079
deliver

1512
00:57:12,309 --> 00:57:09,920
the things that we needed to keep to

1513
00:57:13,670 --> 00:57:12,319

keep going

1514

00:57:15,910 --> 00:57:13,680

we had people

1515

00:57:17,750 --> 00:57:15,920

here at jpl that had to travel to

1516

00:57:18,549 --> 00:57:17,760

kennedy space center and we couldn't get

1517

00:57:20,549 --> 00:57:18,559

them

1518

00:57:22,390 --> 00:57:20,559

we couldn't travel commercially and so

1519

00:57:25,349 --> 00:57:22,400

we had to ask for some help from nasa

1520

00:57:28,549 --> 00:57:25,359

headquarters our friends at armstrong

1521

00:57:29,750 --> 00:57:28,559

gave us a jet devi uh helped us with the

1522

00:57:32,710 --> 00:57:29,760

transporting

1523

00:57:34,950 --> 00:57:32,720

via an agency jet back and forth our we

1524

00:57:36,950 --> 00:57:34,960

got support out of wallops

1525

00:57:39,109 --> 00:57:36,960

another nasa facility

1526
00:57:40,630 --> 00:57:39,119
to fly some of our flight hardware there

1527
00:57:43,270 --> 00:57:40,640
and back

1528
00:57:45,270 --> 00:57:43,280
so it was a very very challenging uh

1529
00:57:47,670 --> 00:57:45,280
time and and then we had to figure out

1530
00:57:49,349 --> 00:57:47,680
how to actually launch the thing and and

1531
00:57:51,750 --> 00:57:49,359
fly it when

1532
00:57:55,270 --> 00:57:51,760
you know we had all these constraints as

1533
00:57:58,309 --> 00:57:55,280
well we were modifying our processes and

1534
00:57:59,270 --> 00:57:58,319
protocols in our operations facility

1535
00:58:02,549 --> 00:57:59,280
um

1536
00:58:05,030 --> 00:58:02,559
you know very just very very challenging

1537
00:58:08,150 --> 00:58:05,040
um you know and the team

1538
00:58:09,190 --> 00:58:08,160

i think that the team like all of you

1539

00:58:10,710 --> 00:58:09,200

out there

1540

00:58:11,670 --> 00:58:10,720

they're worried you know worried about

1541

00:58:15,030 --> 00:58:11,680

their

1542

00:58:16,390 --> 00:58:15,040

parents or grandparents and and uh

1543

00:58:18,230 --> 00:58:16,400

just worried about

1544

00:58:19,990 --> 00:58:18,240

their kids out of school worried about

1545

00:58:22,549 --> 00:58:20,000

taking care of you know

1546

00:58:25,109 --> 00:58:22,559

kids at home and do doing their work

1547

00:58:27,109 --> 00:58:25,119

um so it was it was a tough time we

1548

00:58:29,670 --> 00:58:27,119

actually um

1549

00:58:30,630 --> 00:58:29,680

we decided to try to market we we put a

1550

00:58:33,349 --> 00:58:30,640

um

1551

00:58:35,829 --> 00:58:33,359

a plate a coveted plate on the port side

1552

00:58:37,670 --> 00:58:35,839

of the rover it's now sitting on jezreel

1553

00:58:39,589 --> 00:58:37,680

crater uh

1554

00:58:40,789 --> 00:58:39,599

with the with the vehicle

1555

00:58:47,430 --> 00:58:40,799

uh

1556

00:58:49,190 --> 00:58:47,440

kennedy space center

1557

00:58:51,430 --> 00:58:49,200

and that plate is really there to

1558

00:58:53,109 --> 00:58:51,440

symbolize the challenge that

1559

00:58:55,270 --> 00:58:53,119

not just our team was facing but

1560

00:58:57,109 --> 00:58:55,280

everybody has been facing

1561

00:58:59,190 --> 00:58:57,119

it's been a tough year it's been tough

1562

00:59:00,630 --> 00:58:59,200

to do this mission

1563

00:59:02,150 --> 00:59:00,640

under these

1564

00:59:04,390 --> 00:59:02,160

in this environment

1565

00:59:06,230 --> 00:59:04,400

but the team uh like they have with

1566

00:59:07,990 --> 00:59:06,240

every other challenge has stepped up to

1567

00:59:10,309 --> 00:59:08,000

it we got a lot of help from the

1568

00:59:12,549 --> 00:59:10,319

institution from the agency

1569

00:59:14,789 --> 00:59:12,559

uh and i think um

1570

00:59:16,150 --> 00:59:14,799

and i think that's gonna continue into

1571

00:59:18,150 --> 00:59:16,160

the future so that we can do this

1572

00:59:20,630 --> 00:59:18,160

surface mission

1573

00:59:22,549 --> 00:59:20,640

jennifer do you want to add anything

1574

00:59:25,109 --> 00:59:22,559

well i'll add that

1575

00:59:28,150 --> 00:59:25,119

we are not all together and that's very

1576

00:59:30,150 --> 00:59:28,160

unusual for a landing and when we start

1577

00:59:32,309 --> 00:59:30,160

a surface operations ken's talking about

1578

00:59:34,549 --> 00:59:32,319

his phone blowing up usually that would

1579

00:59:36,069 --> 00:59:34,559

be a big meeting that's in one of the

1580

00:59:38,390 --> 00:59:36,079

buildings here in the laboratory where

1581

00:59:40,150 --> 00:59:38,400

we all talk about what the

1582

00:59:41,910 --> 00:59:40,160

the science of the mission is and based

1583

00:59:43,829 --> 00:59:41,920

on where we are what we want to do the

1584

00:59:45,030 --> 00:59:43,839

engineering team is largely on site

1585

00:59:47,510 --> 00:59:45,040

right now

1586

00:59:49,270 --> 00:59:47,520

and to finish development was a struggle

1587

00:59:52,230 --> 00:59:49,280

being remote because

1588

00:59:54,870 --> 00:59:52,240

these are complex systems they take a

1589

00:59:55,670 --> 00:59:54,880

lot of individual expertise

1590

00:59:59,589 --> 00:59:55,680

put

1591

01:00:01,829 --> 00:59:59,599

operate a vehicle that we can build

1592

01:00:03,750 --> 01:00:01,839

software that makes that vehicle work

1593

01:00:06,789 --> 01:00:03,760

and doing all of that remotely without

1594

01:00:07,829 --> 01:00:06,799

as much uh interaction has been hard for

1595

01:00:10,309 --> 01:00:07,839

the team

1596

01:00:12,470 --> 01:00:10,319

we have the science team now is fully

1597

01:00:14,470 --> 01:00:12,480

remote and so and you know it's just

1598

01:00:16,309 --> 01:00:14,480

like all of you guys i mean i work from

1599

01:00:18,230 --> 01:00:16,319

my laundry room for the last several

1600

01:00:20,150 --> 01:00:18,240

months right and my kids are in zoom

1601
01:00:21,510 --> 01:00:20,160
school and they'll walk in and then

1602
01:00:23,349 --> 01:00:21,520
people say they can't hear me because

1603
01:00:25,670 --> 01:00:23,359
the washer's going i mean everybody has

1604
01:00:28,230 --> 01:00:25,680
these challenges that are are going on

1605
01:00:31,030 --> 01:00:28,240
because this is not the way we typically

1606
01:00:33,990 --> 01:00:31,040
would design a mars mission

1607
01:00:35,349 --> 01:00:34,000
but the team has been fantastic and just

1608
01:00:38,470 --> 01:00:35,359
overcome every challenge we actually

1609
01:00:40,390 --> 01:00:38,480
have we have now robots on the floor

1610
01:00:42,470 --> 01:00:40,400
where if you're remote but you want to

1611
01:00:43,910 --> 01:00:42,480
go look in a room you can log into one

1612
01:00:45,190 --> 01:00:43,920
of the robots and you can drive it

1613
01:00:47,430 --> 01:00:45,200

around the floor now in surface

1614

01:00:49,670 --> 01:00:47,440

operations and and go talk to the people

1615

01:00:52,549 --> 01:00:49,680

that you want so we we've we've learned

1616

01:00:54,470 --> 01:00:52,559

a lot about how to do things remotely i

1617

01:00:57,270 --> 01:00:54,480

think it has changed how we think about

1618

01:00:59,190 --> 01:00:57,280

the problem but it is it is challenging

1619

01:01:00,870 --> 01:00:59,200

and i look forward to the time i think

1620

01:01:03,109 --> 01:01:00,880

there will be a time

1621

01:01:05,109 --> 01:01:03,119

when we can all be together again and

1622

01:01:06,710 --> 01:01:05,119

not have all the restrictions i'm in a

1623

01:01:08,309 --> 01:01:06,720

room by myself which is the only reason

1624

01:01:10,549 --> 01:01:08,319

i'm not wearing a mask

1625

01:01:11,990 --> 01:01:10,559

and i think that that does make it um

1626

01:01:13,829 --> 01:01:12,000

one of the things i thought the team

1627

01:01:15,670 --> 01:01:13,839

missed out on a little bit was just that

1628

01:01:18,150 --> 01:01:15,680

excitement and energy that comes from

1629

01:01:19,750 --> 01:01:18,160

being all together right before landing

1630

01:01:22,390 --> 01:01:19,760

and so we were together but it was

1631

01:01:24,630 --> 01:01:22,400

remotely uh and so i think it'll be fun

1632

01:01:27,750 --> 01:01:24,640

and great for the team to be able to get

1633

01:01:30,950 --> 01:01:27,760

back together again when we can do that

1634

01:01:34,870 --> 01:01:30,960

okay thanks jennifer uh next call comes

1635

01:01:37,190 --> 01:01:34,880

from amanda khan of the la times

1636

01:01:39,589 --> 01:01:37,200

hi uh thank you so much for taking my

1637

01:01:43,030 --> 01:01:39,599

call can you hear me yes

1638

01:01:46,150 --> 01:01:43,040

okay great um so um i had a couple of

1639

01:01:48,549 --> 01:01:46,160

questions here um congratulations um

1640

01:01:49,990 --> 01:01:48,559

okay to jump off of that that last

1641

01:01:51,430 --> 01:01:50,000

question i'm sort of wondering if all

1642

01:01:52,789 --> 01:01:51,440

these pandemic restrictions will be

1643

01:01:56,309 --> 01:01:52,799

affecting

1644

01:01:57,750 --> 01:01:56,319

um how uh you guys deal with with mars

1645

01:01:59,990 --> 01:01:57,760

time will that be affecting the mars

1646

01:02:01,670 --> 01:02:00,000

town experience and and also will it be

1647

01:02:02,549 --> 01:02:01,680

affecting the experience

1648

01:02:04,950 --> 01:02:02,559

of

1649

01:02:07,910 --> 01:02:04,960

the rover drivers how will that be

1650

01:02:09,829 --> 01:02:07,920

changing because of the pandemic

1651

01:02:10,870 --> 01:02:09,839

yeah well the mars time question is

1652

01:02:13,670 --> 01:02:10,880

great

1653

01:02:15,270 --> 01:02:13,680

we so mars time as you obviously know

1654

01:02:17,990 --> 01:02:15,280

you've asked the question

1655

01:02:19,829 --> 01:02:18,000

is uh we get up in the morning on mars

1656

01:02:20,950 --> 01:02:19,839

and then our clock shifts by 40 minutes

1657

01:02:21,750 --> 01:02:20,960

every day

1658

01:02:24,710 --> 01:02:21,760

so

1659

01:02:26,789 --> 01:02:24,720

when you're all here and you're together

1660

01:02:28,870 --> 01:02:26,799

that kind of works but when you're

1661

01:02:30,470 --> 01:02:28,880

sitting in your living room or you know

1662

01:02:32,230 --> 01:02:30,480

in a small room in your house if you

1663

01:02:34,630 --> 01:02:32,240

need to be on a telecon

1664

01:02:36,630 --> 01:02:34,640

all night long planning the rover's

1665

01:02:38,950 --> 01:02:36,640

sequences for the next day that may not

1666

01:02:41,270 --> 01:02:38,960

work out for your spouse or your family

1667

01:02:43,190 --> 01:02:41,280

or those things so we've had to change

1668

01:02:44,150 --> 01:02:43,200

in some cases we've actually had to

1669

01:02:48,069 --> 01:02:44,160

create

1670

01:02:49,510 --> 01:02:48,079

remote but on-site uh places for people

1671

01:02:51,190 --> 01:02:49,520

to come to we don't want to gather too

1672

01:02:53,190 --> 01:02:51,200

many people together

1673

01:02:55,589 --> 01:02:53,200

we need to have our socially distinct

1674

01:02:58,630 --> 01:02:55,599

facilities but we have several i would

1675

01:03:00,950 --> 01:02:58,640

say we have a couple dozen people who

1676

01:03:03,829 --> 01:03:00,960

are remote but still coming to lab to

1677

01:03:06,069 --> 01:03:03,839

different areas during mars time so that

1678

01:03:08,710 --> 01:03:06,079

they can uh not interfere with their

1679

01:03:10,309 --> 01:03:08,720

family's life which is not on mars time

1680

01:03:13,109 --> 01:03:10,319

and then as far as our rover planters

1681

01:03:15,190 --> 01:03:13,119

they're going to get busy as the they

1682

01:03:16,630 --> 01:03:15,200

already have some meshes where they're

1683

01:03:17,829 --> 01:03:16,640

trying to come up with strategic

1684

01:03:20,789 --> 01:03:17,839

traverses

1685

01:03:23,029 --> 01:03:20,799

with the images we we have but i think

1686

01:03:23,990 --> 01:03:23,039

it's the same for them we they have some

1687

01:03:25,670 --> 01:03:24,000

unique

1688

01:03:27,990 --> 01:03:25,680

equipment they need to use so again

1689

01:03:30,150 --> 01:03:28,000

we've set up some different locations

1690

01:03:32,069 --> 01:03:30,160

where they can come in and use that

1691

01:03:33,589 --> 01:03:32,079

equipment it doesn't have to all be we

1692

01:03:35,029 --> 01:03:33,599

have some over in this building and then

1693

01:03:36,870 --> 01:03:35,039

we've we've set some up in another

1694

01:03:39,349 --> 01:03:36,880

building so rover planners who can't be

1695

01:03:41,029 --> 01:03:39,359

at home on mars time can come in so it

1696

01:03:43,510 --> 01:03:41,039

is it is different and it's different

1697

01:03:46,069 --> 01:03:43,520

for the families and we'll see how we'll

1698

01:03:48,870 --> 01:03:46,079

see how it works um we do have probably

1699

01:03:50,950 --> 01:03:48,880

about 50 people in here that when they

1700

01:03:53,029 --> 01:03:50,960

work mars time they're actually at the

1701
01:03:55,910 --> 01:03:53,039
facility and on console as you see

1702
01:04:03,029 --> 01:03:58,150
great okay thanks jennifer okay the next

1703
01:04:06,549 --> 01:04:03,039
call comes from leo enright of irish tv

1704
01:04:07,510 --> 01:04:06,559
uh thanks very much uh yari

1705
01:04:10,829 --> 01:04:07,520
and

1706
01:04:14,309 --> 01:04:10,839
as we say in the irish language gogordus

1707
01:04:17,430 --> 01:04:14,319
ukri to everybody involved particularly

1708
01:04:19,670 --> 01:04:17,440
the people on the zoom screen

1709
01:04:22,950 --> 01:04:19,680
many congratulations

1710
01:04:26,470 --> 01:04:22,960
i had a very detailed geology question

1711
01:04:30,309 --> 01:04:26,480
ready for ken farley but

1712
01:04:32,710 --> 01:04:30,319
jennifer trosper mentioned a robot that

1713
01:04:34,710 --> 01:04:32,720

they're using

1714

01:04:38,309 --> 01:04:34,720

to communicate

1715

01:04:41,270 --> 01:04:38,319

uh i i wasn't quite clear about that so

1716

01:04:44,549 --> 01:04:41,280

i thought i would ask about that a bit

1717

01:04:46,950 --> 01:04:44,559

more you said you're a robot that can

1718

01:04:49,109 --> 01:04:46,960

move and talk to people

1719

01:04:50,950 --> 01:04:49,119

let me yeah i'll clarify it's a robot

1720

01:04:52,789 --> 01:04:50,960

that you can log into and essentially

1721

01:04:54,390 --> 01:04:52,799

drive it around and your face will be

1722

01:04:56,150 --> 01:04:54,400

there and you can

1723

01:04:57,910 --> 01:04:56,160

zoom up you can drive up next to

1724

01:05:00,069 --> 01:04:57,920

somebody that you want to talk to closer

1725

01:05:04,210 --> 01:05:00,079

than six feet and then you can have a

1726

01:05:10,870 --> 01:05:04,220

conversation with them from your

1727

01:05:16,069 --> 01:05:13,589

i mean is it a rover or what is it no

1728

01:05:17,910 --> 01:05:16,079

it's just a robot that moves around the

1729

01:05:20,150 --> 01:05:17,920

i can't remember the actual

1730

01:05:22,069 --> 01:05:20,160

um maker maybe somebody can help me out

1731

01:05:24,870 --> 01:05:22,079

with that but it's a it's a robot that

1732

01:05:26,470 --> 01:05:24,880

we drive remotely around the floor it's

1733

01:05:27,349 --> 01:05:26,480

it really just has wheels and then a

1734

01:05:33,270 --> 01:05:27,359

screen

1735

01:05:37,990 --> 01:05:35,270

could i do a follow-up

1736

01:05:40,549 --> 01:05:38,000

sure we can do that we'll yeah sure okay

1737

01:05:41,990 --> 01:05:40,559

thanks because i did have a question for

1738

01:05:42,870 --> 01:05:42,000

ken farley

1739

01:05:44,950 --> 01:05:42,880

um

1740

01:05:47,510 --> 01:05:44,960

can i i you know

1741

01:05:50,549 --> 01:05:47,520

this zoom screen is fantastic because

1742

01:05:53,510 --> 01:05:50,559

we're all used to the crowd coming in

1743

01:05:56,390 --> 01:05:53,520

in jpl after a landing

1744

01:05:59,430 --> 01:05:56,400

and the other tradition in jpl after a

1745

01:06:00,950 --> 01:05:59,440

landing is the journalist with the geeky

1746

01:06:04,309 --> 01:06:00,960

question

1747

01:06:06,230 --> 01:06:04,319

uh so i just wanted to ask you could you

1748

01:06:11,589 --> 01:06:06,240

clarify uh

1749

01:06:16,630 --> 01:06:14,549

and if that is where you have landed

1750

01:06:18,950 --> 01:06:16,640

um can you

1751
01:06:20,150 --> 01:06:18,960
tell me whether you've looked at channel

1752
01:06:21,430 --> 01:06:20,160
islands

1753
01:06:25,109 --> 01:06:21,440
and the

1754
01:06:27,190 --> 01:06:25,119
outcrop there that does appear to be a

1755
01:06:31,510 --> 01:06:27,200
delta formation

1756
01:06:34,789 --> 01:06:31,520
and would you consider doing a quick run

1757
01:06:35,750 --> 01:06:34,799
to channel islands rather than a long

1758
01:06:38,710 --> 01:06:35,760
run

1759
01:06:40,470 --> 01:06:38,720
over to the delta

1760
01:06:42,870 --> 01:06:40,480
yeah okay so let's let's uh clarify

1761
01:06:46,549 --> 01:06:42,880
what's going on here so the science team

1762
01:06:48,789 --> 01:06:46,559
has associated specific

1763
01:06:51,349 --> 01:06:48,799

earth locations they happen to be

1764

01:06:54,390 --> 01:06:51,359

national parks and preserves to specific

1765

01:06:56,309 --> 01:06:54,400

regions uh in jezreel crater and it is

1766

01:06:58,470 --> 01:06:56,319

from those quadrangles we call them

1767

01:07:01,349 --> 01:06:58,480

those quadrangles on earth that we will

1768

01:07:02,549 --> 01:07:01,359

draw the names that we informally attach

1769

01:07:04,230 --> 01:07:02,559

to features

1770

01:07:05,589 --> 01:07:04,240

that we look at and we take uh

1771

01:07:07,990 --> 01:07:05,599

observations of

1772

01:07:09,510 --> 01:07:08,000

so we have in fact landed in the canyon

1773

01:07:11,510 --> 01:07:09,520

de shea quad

1774

01:07:12,789 --> 01:07:11,520

um and uh

1775

01:07:15,270 --> 01:07:12,799

the uh

1776

01:07:17,430 --> 01:07:15,280

i'm not sure exactly where the the

1777

01:07:19,510 --> 01:07:17,440

feature that you were referring to is i

1778

01:07:21,349 --> 01:07:19,520

still think that our most likely

1779

01:07:24,950 --> 01:07:21,359

ultimate destination

1780

01:07:26,789 --> 01:07:24,960

uh is going to be to the west northwest

1781

01:07:28,549 --> 01:07:26,799

and that we will very likely go up to

1782

01:07:30,309 --> 01:07:28,559

the delta front that in on the image you

1783

01:07:32,950 --> 01:07:30,319

see right now is in the in the upper

1784

01:07:34,950 --> 01:07:32,960

left-hand corner

1785

01:07:36,390 --> 01:07:34,960

okay we're going to end on a social

1786

01:07:39,270 --> 01:07:36,400

media question

1787

01:07:43,029 --> 01:07:39,280

so vince on youtube asks was the landing

1788

01:07:45,109 --> 01:07:43,039

today the best one so far

1789

01:07:45,910 --> 01:07:45,119

uh i'll ask matt that question first

1790

01:07:48,950 --> 01:07:45,920

yeah

1791

01:07:51,589 --> 01:07:48,960

yes 100 it was the best one so

1792

01:07:54,230 --> 01:07:51,599

um you know i this is my fifth mars

1793

01:07:56,309 --> 01:07:54,240

rover at jennifer and a handful of other

1794

01:07:57,510 --> 01:07:56,319

uh others of us on the project to work

1795

01:08:10,630 --> 01:07:57,520

uh

1796

01:08:13,029 --> 01:08:10,640

right now this is the best landing

1797

01:08:14,630 --> 01:08:13,039

on mars i would have to say

1798

01:08:16,950 --> 01:08:14,640

all right great thank you that's all the

1799

01:08:18,229 --> 01:08:16,960

time that we have for questions today if

1800

01:08:19,749 --> 01:08:18,239

you're a member of the media and you

1801

01:08:22,550 --> 01:08:19,759

still have a question you can contact

1802

01:08:24,309 --> 01:08:22,560

the jpl digital news and media office

1803

01:08:27,269 --> 01:08:24,319

we'll continue to answer some questions

1804

01:08:29,110 --> 01:08:27,279

on social media and tune in to nasa tv

1805

01:08:31,590 --> 01:08:29,120

and online tomorrow we'll have another

1806

01:08:33,269 --> 01:08:31,600

news briefing at 10 a.m pacific time and

1807

01:08:35,430 --> 01:08:33,279

we'll give you an update about the start

1808

01:08:37,430 --> 01:08:35,440

of the surface mission uh you know if

1809

01:08:40,630 --> 01:08:37,440

you want some more updates you can also

1810

01:08:42,910 --> 01:08:40,640

go online to nasa.gov

1811

01:08:45,110 --> 01:08:42,920

perseverance and

1812

01:08:47,269 --> 01:08:45,120

mars.nasa.gov perseverance for

1813

01:08:49,910 --> 01:08:47,279

additional information you can also

1814

01:08:51,110 --> 01:08:49,920

follow us on social media at nasa

1815

01:08:53,110 --> 01:08:51,120

persevere

1816

01:08:55,590 --> 01:08:53,120

now one last thing before we go i just

1817

01:08:58,229 --> 01:08:55,600

wanted to say that if you wanted to

1818

01:09:00,149 --> 01:08:58,239

welcome our latest robotic explorer to

1819

01:09:01,990 --> 01:09:00,159

mars mars will be visible in the night

1820

01:09:03,749 --> 01:09:02,000

sky tonight it'll be right next to the

1821

01:09:05,749 --> 01:09:03,759

moon so have a look

1822

01:09:10,170 --> 01:09:05,759

thank you very much for joining us and

1823

01:09:10,180 --> 01:09:51,969

[Applause]