



1
00:00:19,029 --> 00:00:16,550
oh i guess

2
00:00:25,429 --> 00:00:19,039
i guess we just do it like this

3
00:00:25,439 --> 00:00:31,109
let's bring them all in

4
00:00:36,950 --> 00:00:33,510
so apollo set a huge standard for what

5
00:00:38,470 --> 00:00:36,960
we were capable of and uh now nasa is

6
00:00:40,389 --> 00:00:38,480
looking to make the next giant leap

7
00:00:42,389 --> 00:00:40,399
deeper into the solar system and putting

8
00:00:43,510 --> 00:00:42,399
people on mars

9
00:00:44,790 --> 00:00:43,520
you know

10
00:00:46,229 --> 00:00:44,800
it's a ways away there's a lot that

11
00:00:47,750 --> 00:00:46,239
needs to be done between now and then i

12
00:00:49,270 --> 00:00:47,760
know we're all in a hurry everybody's

13
00:00:52,869 --> 00:00:49,280

already tweeting wanted to get selfies

14

00:00:54,150 --> 00:00:52,879

hashtag spring break on mars but

15

00:00:56,950 --> 00:00:54,160

it's gonna take a minute and that's and

16

00:00:59,910 --> 00:00:56,960

that's what we want to talk about so um

17

00:01:02,150 --> 00:00:59,920

gosh where do i want to start here

18

00:01:03,189 --> 00:01:02,160

hey jim i've got a question for you

19

00:01:04,630 --> 00:01:03,199

what have we learned what have we

20

00:01:06,230 --> 00:01:04,640

learned about mars so far we've said a

21

00:01:08,710 --> 00:01:06,240

bunch of robotic spacecraft there what

22

00:01:10,390 --> 00:01:08,720

what have we learned is our life there

23

00:01:12,710 --> 00:01:10,400

how soon can humans get there not not

24

00:01:14,630 --> 00:01:12,720

technologically but like from a healthy

25

00:01:15,590 --> 00:01:14,640

bio stand standpoint when can we get

26

00:01:17,109 --> 00:01:15,600

there

27

00:01:19,350 --> 00:01:17,119

well you know from the science fiction

28

00:01:23,749 --> 00:01:19,360

oh wait get into that microphone

29

00:01:27,510 --> 00:01:25,670

what we've been doing scientifically

30

00:01:29,109 --> 00:01:27,520

with our three

31

00:01:31,350 --> 00:01:29,119

orbiters we're sharing one with the

32

00:01:33,109 --> 00:01:31,360

european space agency and and the two

33

00:01:35,830 --> 00:01:33,119

live rovers right now which is

34

00:01:37,910 --> 00:01:35,840

opportunity and curiosity is learning

35

00:01:39,109 --> 00:01:37,920

about mars and its resources and what

36

00:01:41,190 --> 00:01:39,119

we're finding

37

00:01:43,830 --> 00:01:41,200

is mars in its past went through an

38

00:01:45,830 --> 00:01:43,840

enormous global change it had a huge

39

00:01:48,230 --> 00:01:45,840

amount of water it's lost most of that

40

00:01:49,429 --> 00:01:48,240

water but a significant amount of it is

41

00:01:51,429 --> 00:01:49,439

underground

42

00:01:52,950 --> 00:01:51,439

so from a resource perspective when the

43

00:01:54,950 --> 00:01:52,960

astronauts go and they want to bring

44

00:01:56,550 --> 00:01:54,960

their water we're going to tell them

45

00:01:58,469 --> 00:01:56,560

bring a straw because we know where to

46

00:02:04,389 --> 00:01:58,479

go

47

00:02:08,309 --> 00:02:06,230

so from a scientific point of view we're

48

00:02:10,309 --> 00:02:08,319

also looking at the history of mars

49

00:02:12,470 --> 00:02:10,319

we're also looking for resources for

50

00:02:14,550 --> 00:02:12,480

which humans then would be able to live

51
00:02:16,390 --> 00:02:14,560
off the land and we've made enormous

52
00:02:18,229 --> 00:02:16,400
progress in that area

53
00:02:20,630 --> 00:02:18,239
and we have to do that

54
00:02:22,790 --> 00:02:20,640
planetary scientists are the tour guides

55
00:02:23,990 --> 00:02:22,800
so to speak are the pioneers that go out

56
00:02:25,910 --> 00:02:24,000
first

57
00:02:28,229 --> 00:02:25,920
unfortunately going to mars is not like

58
00:02:30,390 --> 00:02:28,239
star trek it's not like go where no

59
00:02:31,750 --> 00:02:30,400
human has gone before the scientists

60
00:02:34,150 --> 00:02:31,760
have to be there we have to learn

61
00:02:36,790 --> 00:02:34,160
everything because we're planning to go

62
00:02:41,270 --> 00:02:36,800
to stay yeah

63
00:02:45,110 --> 00:02:43,990

um so mike i'm pretty excited to talk to

64

00:02:48,869 --> 00:02:45,120

you man

65

00:02:51,030 --> 00:02:48,879

so mike is a uh um uh he was on the

66

00:02:53,589 --> 00:02:51,040

space station a bunch of times twice

67

00:02:54,869 --> 00:02:53,599

once as a commander and he also uh flew

68

00:02:57,589 --> 00:02:54,879

on the final space shuttle flight

69

00:03:02,830 --> 00:02:57,599

endeavor the last the last one before

70

00:03:10,309 --> 00:03:07,110

so 381 days in space

71

00:03:13,509 --> 00:03:10,319

48 hours 37 minutes nine space walks

72

00:03:14,869 --> 00:03:13,519

crushing it just crushing it

73

00:03:18,070 --> 00:03:14,879

what do you think

74

00:03:19,509 --> 00:03:18,080

that like i know i want to spend time on

75

00:03:21,509 --> 00:03:19,519

the iss but what do you think is so

76

00:03:23,509 --> 00:03:21,519

important about us going up there and

77

00:03:25,830 --> 00:03:23,519

doing science what's the value of that

78

00:03:27,750 --> 00:03:25,840

oh man so uh first off i'd like to say

79

00:03:37,509 --> 00:03:27,760

that uh this is the first time nasa's

80

00:03:41,509 --> 00:03:39,430

and and we're all and we're all big fans

81

00:03:43,509 --> 00:03:41,519

like uh like you guys are and and this

82

00:03:47,030 --> 00:03:43,519

is what's really neat about uh comic con

83

00:03:49,350 --> 00:03:47,040

and and uh and nasa it's a natural fit

84

00:03:51,750 --> 00:03:49,360

because we actually you know there's a

85

00:03:54,390 --> 00:03:51,760

lot of fantasy and fiction and and and

86

00:03:57,270 --> 00:03:54,400

inspiration and all the good parts of

87

00:03:59,509 --> 00:03:57,280

humanity using our minds to imagine a

88

00:04:00,949 --> 00:03:59,519

brilliant different awesome future and

89

00:04:02,630 --> 00:04:00,959

that's what we do at nasa we try to

90

00:04:04,789 --> 00:04:02,640

bring that home all right and that's

91

00:04:07,110 --> 00:04:04,799

what we did we uh we had this uh uh

92

00:04:09,429 --> 00:04:07,120

imaginary space station and the movie

93

00:04:12,070 --> 00:04:09,439

2001 and there's other imaginary space

94

00:04:13,990 --> 00:04:12,080

stations out there and then we we we

95

00:04:15,830 --> 00:04:14,000

like we believed it like we fell for it

96

00:04:17,509 --> 00:04:15,840

and it's like we can build one of those

97

00:04:19,270 --> 00:04:17,519

and we did we built we've built this

98

00:04:21,349 --> 00:04:19,280

international space station it's an

99

00:04:23,110 --> 00:04:21,359

orbit around a beautiful planet earth

100

00:04:25,670 --> 00:04:23,120

and uh one of the coolest planets in the

101
00:04:28,310 --> 00:04:25,680
solar system uh mars is awesome not the

102
00:04:30,790 --> 00:04:28,320
just saying planet earth is really cool

103
00:04:32,790 --> 00:04:30,800
we go around planet earth at 17 500

104
00:04:34,150 --> 00:04:32,800
miles an hour once every 90 minutes and

105
00:04:35,909 --> 00:04:34,160
when you take gravity out of a

106
00:04:37,749 --> 00:04:35,919
scientific equation because it's so

107
00:04:39,430 --> 00:04:37,759
dominant all of a sudden you learn a

108
00:04:41,749 --> 00:04:39,440
whole bunch of other things we learn

109
00:04:44,790 --> 00:04:41,759
about the human body we learn about uh

110
00:04:46,550 --> 00:04:44,800
combustion uh already we're making more

111
00:04:48,550 --> 00:04:46,560
and better

112
00:04:50,390 --> 00:04:48,560
efficient engines like gasoline engines

113
00:04:52,070 --> 00:04:50,400

and stuff because we we understood it

114

00:04:54,230 --> 00:04:52,080

aboard we learned about it aboard space

115

00:04:55,270 --> 00:04:54,240

station we have uh other instruments

116

00:04:56,710 --> 00:04:55,280

that are looking out to the whole

117

00:04:59,189 --> 00:04:56,720

universe and we're learning about dark

118

00:05:00,950 --> 00:04:59,199

matter and every time the human beings

119

00:05:02,550 --> 00:05:00,960

have learned more about our universe

120

00:05:04,629 --> 00:05:02,560

we've made life here better on planet

121

00:05:09,670 --> 00:05:04,639

earth i love electricity well those guys

122

00:05:14,390 --> 00:05:11,670

so we uh every time so it makes us

123

00:05:16,950 --> 00:05:14,400

better uh and makes life here better on

124

00:05:18,790 --> 00:05:16,960

planet earth and space station is is is

125

00:05:19,670 --> 00:05:18,800

one first step we have we have a home

126
00:05:21,510 --> 00:05:19,680
base

127
00:05:22,790 --> 00:05:21,520
right around here about our own planet

128
00:05:25,350 --> 00:05:22,800
it's easy enough

129
00:05:27,430 --> 00:05:25,360
easy enough to get up there you know

130
00:05:29,189 --> 00:05:27,440
in a day and come back in a day those

131
00:05:31,909 --> 00:05:29,199
kind of things and so it's great to have

132
00:05:33,990 --> 00:05:31,919
a home base as we get ready to explore

133
00:05:34,870 --> 00:05:34,000
the rest of the universe

134
00:05:45,189 --> 00:05:34,880
yes

135
00:05:52,629 --> 00:05:48,710
earth rules guys are you kidding me well

136
00:05:54,870 --> 00:05:52,639
pluto used to be the coolest planet

137
00:05:56,870 --> 00:05:54,880
no no pluto pluto blew it guys pluto

138
00:05:58,870 --> 00:05:56,880

blew it wait babak i have to ask you

139

00:06:01,749 --> 00:05:58,880

because you're probably one of the few

140

00:06:03,749 --> 00:06:01,759

humans that has landed a car on mars and

141

00:06:05,590 --> 00:06:03,759

i'm just curious because i remember when

142

00:06:07,510 --> 00:06:05,600

i was trying to get my permit to drive

143

00:06:09,990 --> 00:06:07,520

they made me do all kinds of parallel

144

00:06:11,670 --> 00:06:10,000

parking and just non-stop lessons and

145

00:06:13,189 --> 00:06:11,680

what which way is the yielding thing so

146

00:06:14,469 --> 00:06:13,199

did you

147

00:06:16,150 --> 00:06:14,479

was that just the coolest man when you

148

00:06:17,590 --> 00:06:16,160

drop that car it's pretty cool actually

149

00:06:20,710 --> 00:06:17,600

i got my driver's license the same time

150

00:06:22,230 --> 00:06:20,720

i started working at jpl yeah so

151

00:06:24,150 --> 00:06:22,240

yeah i now have two driver's licenses

152

00:06:25,189 --> 00:06:24,160

one for mars and one for earth stop it

153

00:06:27,029 --> 00:06:25,199

that would because i would because i

154

00:06:28,870 --> 00:06:27,039

would have to i'd want one really badly

155

00:06:30,950 --> 00:06:28,880

wait so but tell me because curiosity's

156

00:06:32,150 --> 00:06:30,960

been on mars two years now we've learned

157

00:06:33,510 --> 00:06:32,160

a lot what do you think are some of the

158

00:06:34,629 --> 00:06:33,520

primary things that we've learned so i

159

00:06:36,550 --> 00:06:34,639

mean obviously one of the really cool

160

00:06:38,469 --> 00:06:36,560

things like jim mentioned mars has this

161

00:06:39,990 --> 00:06:38,479

incredible past where we think

162

00:06:41,350 --> 00:06:40,000

it was habitable at one point meaning

163

00:06:42,629 --> 00:06:41,360

that life could have survived we don't

164

00:06:44,070 --> 00:06:42,639

know if it existed then and that's some

165

00:06:46,629 --> 00:06:44,080

of the questions we still want to

166

00:06:48,309 --> 00:06:46,639

answer um but also we're really learning

167

00:06:49,749 --> 00:06:48,319

to be like great detectives about mars

168

00:06:51,029 --> 00:06:49,759

like we when we landed with curiosity we

169

00:06:52,550 --> 00:06:51,039

thought we knew what we were doing like

170

00:06:54,950 --> 00:06:52,560

we got this guys

171

00:06:56,629 --> 00:06:54,960

um and then it turns out mars has all

172

00:06:58,390 --> 00:06:56,639

these tricks up at sleeve and the rover

173

00:06:59,749 --> 00:06:58,400

has its own personality

174

00:07:01,270 --> 00:06:59,759

uh

175

00:07:04,629 --> 00:07:01,280

yeah yeah it's not as easy as you think

176

00:07:06,150 --> 00:07:04,639

dealing with a child on mars

177

00:07:07,749 --> 00:07:06,160

and then but we went there and we

178

00:07:09,589 --> 00:07:07,759

learned all these cool things we

179

00:07:11,189 --> 00:07:09,599

basically found out that we had

180

00:07:13,029 --> 00:07:11,199

capabilities on the rover that we hadn't

181

00:07:14,629 --> 00:07:13,039

even anticipated we can do essentially

182

00:07:16,469 --> 00:07:14,639

like isotope getting like carbon dating

183

00:07:18,070 --> 00:07:16,479

on mars now and that's something we

184

00:07:19,510 --> 00:07:18,080

didn't know we even could do when we

185

00:07:21,830 --> 00:07:19,520

launched this mission that's that's the

186

00:07:23,430 --> 00:07:21,840

crazy part so now we're going there with

187

00:07:25,749 --> 00:07:23,440

these new tools these new like you know

188

00:07:27,749 --> 00:07:25,759

thoughts about how to approach mars and

189

00:07:29,749 --> 00:07:27,759

not only gonna you know find where the

190

00:07:31,990 --> 00:07:29,759

cool stuff is on mars with our rover but

191

00:07:33,110 --> 00:07:32,000

hopefully lead to the next rovers having

192

00:07:34,870 --> 00:07:33,120

you know the right set of instruments to

193

00:07:36,390 --> 00:07:34,880

even start looking for life

194

00:07:38,950 --> 00:07:36,400

it is it is so interesting because there

195

00:07:41,510 --> 00:07:38,960

was such uh a concerted effort to get

196

00:07:42,870 --> 00:07:41,520

off the planet to land on the moon and

197

00:07:44,629 --> 00:07:42,880

since then because the political

198

00:07:46,150 --> 00:07:44,639

interests don't seem to be as aligned

199

00:07:48,150 --> 00:07:46,160

with it there seems to be less interest

200

00:07:50,469 --> 00:07:48,160

not only from government organizations

201
00:07:52,710 --> 00:07:50,479
but from the people themselves to to

202
00:07:55,029 --> 00:07:52,720
explore to travel to hit those uh

203
00:07:57,430 --> 00:07:55,039
milestones to if you think that this is

204
00:07:59,510 --> 00:07:57,440
the 45th anniversary of the splashdown

205
00:08:01,110 --> 00:07:59,520
of apollo where are we going to be in 50

206
00:08:02,469 --> 00:08:01,120
years i like to think that we'll be

207
00:08:04,550 --> 00:08:02,479
light years ahead just because of the

208
00:08:06,469 --> 00:08:04,560
exponential growth of technology but

209
00:08:08,469 --> 00:08:06,479
it's it's going to be up to us guys it's

210
00:08:11,029 --> 00:08:08,479
going to be up to us as a species being

211
00:08:12,309 --> 00:08:11,039
interested in doing that if

212
00:08:14,629 --> 00:08:12,319
they're not going to build it unless

213
00:08:15,670 --> 00:08:14,639

we're going to go so um

214

00:08:17,270 --> 00:08:15,680

jim that's actually something i want to

215

00:08:18,629 --> 00:08:17,280

ask you about what

216

00:08:20,550 --> 00:08:18,639

future missions are planned what do you

217

00:08:22,150 --> 00:08:20,560

think that they will do that something

218

00:08:23,110 --> 00:08:22,160

like curiosity on the ground right now

219

00:08:24,790 --> 00:08:23,120

can't do

220

00:08:26,869 --> 00:08:24,800

well we're currently building another

221

00:08:29,430 --> 00:08:26,879

rover very much like curiosity you know

222

00:08:31,830 --> 00:08:29,440

we use that straight crazy sky crane to

223

00:08:34,070 --> 00:08:31,840

land it and we can put one ton down on

224

00:08:36,230 --> 00:08:34,080

the ground and we're scouting out right

225

00:08:37,589 --> 00:08:36,240

now some of the best sites

226

00:08:40,310 --> 00:08:37,599

those sites

227

00:08:43,029 --> 00:08:40,320

for which mars during three and a half

228

00:08:45,590 --> 00:08:43,039

billion years ago was more earth-like

229

00:08:47,110 --> 00:08:45,600

than any other time in its history

230

00:08:48,470 --> 00:08:47,120

and so we're going to do some rock

231

00:08:51,030 --> 00:08:48,480

coring we're going to look and

232

00:08:53,350 --> 00:08:51,040

interrogate those cores and potentially

233

00:08:55,829 --> 00:08:53,360

bring them back and and that's like we

234

00:08:58,070 --> 00:08:55,839

did on the moon brought back samples and

235

00:08:59,910 --> 00:08:58,080

those samples from the moon have really

236

00:09:02,230 --> 00:08:59,920

told us a lot about the origin and

237

00:09:04,389 --> 00:09:02,240

evolution of the earth moon system so

238

00:09:05,829 --> 00:09:04,399

that's our next big step that's really

239

00:09:07,190 --> 00:09:05,839

exciting wait buzz i got to ask you

240

00:09:16,710 --> 00:09:07,200

because you're the only person in this

241

00:09:19,430 --> 00:09:17,829

i've seen

242

00:09:21,990 --> 00:09:19,440

you know i grew up just idolizing you

243

00:09:24,630 --> 00:09:22,000

man you're the coolest and so when i saw

244

00:09:26,870 --> 00:09:24,640

that first video of you uh walking on

245

00:09:28,550 --> 00:09:26,880

the moon um all i could think even as a

246

00:09:31,269 --> 00:09:28,560

child was wow he just looks like he's

247

00:09:33,030 --> 00:09:31,279

skipping and so i want to know

248

00:09:35,030 --> 00:09:33,040

do we blame the lead shoes was that

249

00:09:39,670 --> 00:09:35,040

about the weight of the the gravity or

250

00:09:39,680 --> 00:09:43,430

who had red shoes

251

00:09:46,710 --> 00:09:44,949

well you're the only one that you've

252

00:09:48,070 --> 00:09:46,720

stepped up onto the surface so that that

253

00:09:50,230 --> 00:09:48,080

experience that must have been well

254

00:09:52,230 --> 00:09:50,240

bruce mccandless said uh you've got to

255

00:09:54,790 --> 00:09:52,240

get back inside pretty soon

256

00:09:57,110 --> 00:09:54,800

so i i was thinking ahead yeah and i got

257

00:09:59,990 --> 00:09:57,120

in front of the camera and so i started

258

00:10:01,990 --> 00:10:00,000

doing a kangaroo hop and then move and

259

00:10:05,590 --> 00:10:02,000

change direction with a big heavy

260

00:10:08,949 --> 00:10:05,600

backpack on earth we'd weighed 360

261

00:10:12,070 --> 00:10:08,959

pounds but up there it's only 60 pounds

262

00:10:17,509 --> 00:10:12,080

so when you go to turn why

263

00:10:21,269 --> 00:10:19,430

some guy by the name of newton came up

264

00:10:23,350 --> 00:10:21,279

with that silly idea

265

00:10:26,230 --> 00:10:23,360

that that whack job

266

00:10:28,790 --> 00:10:26,240

so anyway i thought for sure as soon as

267

00:10:31,590 --> 00:10:28,800

i got back people were going to say oh

268

00:10:33,190 --> 00:10:31,600

we measured all your movements up there

269

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

and

270

00:10:37,829 --> 00:10:35,440

they came out

271

00:10:39,670 --> 00:10:37,839

not a word

272

00:10:41,190 --> 00:10:39,680

ten years later

273

00:10:43,110 --> 00:10:41,200

some japanese

274

00:10:45,269 --> 00:10:43,120

guy came up to me says i had my

275

00:10:47,509 --> 00:10:45,279

stopwatch on while you were doing that

276

00:10:49,269 --> 00:10:47,519

and it came out just like i had

277

00:10:53,829 --> 00:10:49,279

calculated

278

00:10:58,630 --> 00:10:56,150

wait buzz a lot of uh conversation has

279

00:11:00,470 --> 00:10:58,640

been had about um ellen degeneres's

280

00:11:04,630 --> 00:11:00,480

oscar selfie but you've taken the

281

00:11:08,550 --> 00:11:07,030

yeah but there is a shadow across my

282

00:11:10,470 --> 00:11:08,560

face

283

00:11:12,829 --> 00:11:10,480

listen listen it's hard to get the

284

00:11:15,670 --> 00:11:12,839

lighting right your first time out

285

00:11:17,269 --> 00:11:15,680

this well lovell had to move the

286

00:11:18,389 --> 00:11:17,279

spacecraft around

287

00:11:21,190 --> 00:11:18,399

uh

288

00:11:23,110 --> 00:11:21,200

but this is ultraviolet no less i mean

289

00:11:26,069 --> 00:11:23,120

how many selfie

290

00:11:27,829 --> 00:11:26,079

claimers today i think i think android

291

00:11:29,190 --> 00:11:27,839

android's trying to run that ultraviolet

292

00:11:31,030 --> 00:11:29,200

program but they've been the beta

293

00:11:32,710 --> 00:11:31,040

testing it i don't think iphone has it

294

00:11:34,550 --> 00:11:32,720

yet there's probably an app if we really

295

00:11:37,590 --> 00:11:34,560

think about it wait so bob eck i'm going

296

00:11:40,790 --> 00:11:39,350

humans and robots like that's the future

297

00:11:42,550 --> 00:11:40,800

and i'm not talking about body i'm not

298

00:11:44,389 --> 00:11:42,560

talking about like wearables or body

299

00:11:45,910 --> 00:11:44,399

mods or anything but humans and robots

300

00:11:47,829 --> 00:11:45,920

that's that's really the future in these

301
00:11:49,670 --> 00:11:47,839
situations where it's too dangerous for

302
00:11:50,949 --> 00:11:49,680
us to send a person we're gonna send

303
00:11:52,790 --> 00:11:50,959
robots

304
00:11:53,990 --> 00:11:52,800
so what do you think that looks like as

305
00:11:56,230 --> 00:11:54,000
we get further and further out into the

306
00:11:57,990 --> 00:11:56,240
solar system how soon till i can party

307
00:11:59,590 --> 00:11:58,000
with my own c-3po

308
00:12:01,750 --> 00:11:59,600
i hope so

309
00:12:03,430 --> 00:12:01,760
um i mean the iss already has a handful

310
00:12:05,509 --> 00:12:03,440
of robots there's dexter there's a

311
00:12:06,710 --> 00:12:05,519
robonaut there's kirobo i mean there's a

312
00:12:08,790 --> 00:12:06,720
europe is like the cutest by the way

313
00:12:10,470 --> 00:12:08,800

dexter is kind of the dubious name for

314

00:12:11,990 --> 00:12:10,480

the guy in waiting on the the space

315

00:12:13,350 --> 00:12:12,000

station by the way well it's also creepy

316

00:12:14,949 --> 00:12:13,360

because he's at the end of the canned

317

00:12:16,389 --> 00:12:14,959

arms so he looks like there's just a guy

318

00:12:17,509 --> 00:12:16,399

floating kind of out there with his

319

00:12:18,790 --> 00:12:17,519

little hands

320

00:12:20,870 --> 00:12:18,800

um

321

00:12:22,389 --> 00:12:20,880

but uh you know the the idea that these

322

00:12:23,269 --> 00:12:22,399

guys have already kind of started living

323

00:12:27,030 --> 00:12:23,279

with

324

00:12:29,190 --> 00:12:27,040

some of that experience um but i think

325

00:12:30,710 --> 00:12:29,200

the future you know we have certainly

326

00:12:31,910 --> 00:12:30,720

even from mars we have the idea that we

327

00:12:33,910 --> 00:12:31,920

would send humans and robots together

328

00:12:35,910 --> 00:12:33,920

robots could you know start exploring

329

00:12:37,829 --> 00:12:35,920

could start you know looking for the

330

00:12:39,750 --> 00:12:37,839

preliminary setup of a camp you know for

331

00:12:41,030 --> 00:12:39,760

humans before they get there

332

00:12:42,870 --> 00:12:41,040

and then you would keep operating them

333

00:12:44,870 --> 00:12:42,880

to produce you know food and water and

334

00:12:46,870 --> 00:12:44,880

on supplies like that um and then of

335

00:12:48,470 --> 00:12:46,880

course places beyond mars really that's

336

00:12:50,550 --> 00:12:48,480

the kind of places where it's still

337

00:12:51,670 --> 00:12:50,560

really not safe for humans its timelines

338

00:12:53,750 --> 00:12:51,680

are long

339

00:12:55,990 --> 00:12:53,760

you know radiation gets really harsh as

340

00:12:57,430 --> 00:12:56,000

you go further away especially near

341

00:12:58,629 --> 00:12:57,440

plans like jupiter

342

00:13:00,629 --> 00:12:58,639

and so you know we'll continue with the

343

00:13:02,389 --> 00:13:00,639

robotic exploration past mars and and

344

00:13:04,710 --> 00:13:02,399

hopefully you know in the near front we

345

00:13:06,470 --> 00:13:04,720

get all these cool robots and and

346

00:13:07,670 --> 00:13:06,480

kind of live in work buddies

347

00:13:08,949 --> 00:13:07,680

mike i don't know you have a couple of

348

00:13:10,949 --> 00:13:08,959

things probably to say about living uh

349

00:13:12,470 --> 00:13:10,959

living with robots

350

00:13:14,629 --> 00:13:12,480

you don't mean my former crew mates

351

00:13:17,110 --> 00:13:14,639

right

352

00:13:19,190 --> 00:13:17,120

no uh yeah that's uh it just goes to

353

00:13:21,030 --> 00:13:19,200

show that uh you know humans we're

354

00:13:23,509 --> 00:13:21,040

pretty clever and when we put our minds

355

00:13:24,710 --> 00:13:23,519

to it we can we we can actually figure

356

00:13:27,430 --> 00:13:24,720

out how to make

357

00:13:29,670 --> 00:13:27,440

things work better more efficiently and

358

00:13:31,430 --> 00:13:29,680

and have robots and and and of course

359

00:13:33,910 --> 00:13:31,440

you know just like you were saying it's

360

00:13:35,829 --> 00:13:33,920

that connection again with with science

361

00:13:37,670 --> 00:13:35,839

fiction and with fantasy we you know we

362

00:13:39,269 --> 00:13:37,680

can't imagine a future without robots

363

00:13:41,750 --> 00:13:39,279

and partially is because we've already

364

00:13:42,949 --> 00:13:41,760

imagined uh really cool futures with

365

00:13:44,710 --> 00:13:42,959

robots so

366

00:13:46,310 --> 00:13:44,720

they're definitely going to be to say

367

00:13:48,949 --> 00:13:46,320

you know around to stay and like you

368

00:13:50,710 --> 00:13:48,959

said the technology keeps expanding

369

00:13:52,389 --> 00:13:50,720

exponentially well partially because of

370

00:13:54,550 --> 00:13:52,399

the space program yeah absolutely well

371

00:13:56,550 --> 00:13:54,560

and then generationally we are

372

00:13:57,269 --> 00:13:56,560

innovating consistently like every time

373

00:14:57,430 --> 00:13:57,279

a

374

00:14:58,389 --> 00:14:57,440

this one um we've only got like seven

375

00:15:00,710 --> 00:14:58,399

extras

376

00:15:02,470 --> 00:15:00,720

so no this is uh this is what nasa is

377

00:15:05,430 --> 00:15:02,480

doing right now we have a big picture

378

00:15:07,990 --> 00:15:05,440

plan of of uh with the low earth orbit

379

00:15:09,430 --> 00:15:08,000

by making it accessible and uh we're

380

00:15:11,110 --> 00:15:09,440

doing that with our

381

00:15:12,069 --> 00:15:11,120

private industry partners and it's

382

00:15:13,910 --> 00:15:12,079

really exciting it's called the

383

00:15:16,949 --> 00:15:13,920

commercial crew program and that's going

384

00:15:19,509 --> 00:15:16,959

to allow nasa uh to spend our time

385

00:15:21,110 --> 00:15:19,519

effort money uh to to look beyond low

386

00:15:23,269 --> 00:15:21,120

earth orbit because we know we you know

387

00:15:25,189 --> 00:15:23,279

we we have it under control down here

388

00:15:27,509 --> 00:15:25,199

with uh with our private industry and

389

00:15:30,069 --> 00:15:27,519

then to uh we that'll help us with our

390

00:15:33,910 --> 00:15:32,389

ryan capsule aboard the sls rocket and

391

00:15:35,350 --> 00:15:33,920

that'll get us to uh but that's the

392

00:15:38,790 --> 00:15:35,360

model

393

00:15:41,189 --> 00:15:38,800

right there i mean besides him uh the uh

394

00:15:44,710 --> 00:15:41,199

so

395

00:15:46,150 --> 00:15:44,720

a little bit about the commercial crew

396

00:15:47,750 --> 00:15:46,160

program right now we have three

397

00:15:50,870 --> 00:15:47,760

different companies that are that are

398

00:15:52,870 --> 00:15:50,880

that are uh working uh towards

399

00:15:54,310 --> 00:15:52,880

getting access to low earth orbit they

400

00:15:56,470 --> 00:15:54,320

have different concepts out there one's

401
00:15:59,749 --> 00:15:56,480
a winged vehicle there's two other

402
00:16:00,949 --> 00:15:59,759
companies with capsule ideas they've

403
00:16:02,629 --> 00:16:00,959
they're being brilliant about it it's

404
00:16:03,749 --> 00:16:02,639
going to reduce the cost it's going to

405
00:16:05,670 --> 00:16:03,759
keep things

406
00:16:07,670 --> 00:16:05,680
safe so we can send people and with a

407
00:16:08,949 --> 00:16:07,680
cost reduction we're hoping that a whole

408
00:16:11,430 --> 00:16:08,959
new industry like we did with the

409
00:16:12,949 --> 00:16:11,440
airplane just a hundred years ago uh

410
00:16:14,470 --> 00:16:12,959
airplanes used to be only flown by

411
00:16:16,230 --> 00:16:14,480
government pilots and only the

412
00:16:18,310 --> 00:16:16,240
governments had airplanes and now you

413
00:16:20,230 --> 00:16:18,320

know now there's a whole industry out

414

00:16:21,430 --> 00:16:20,240

there where we can with the airplane

415

00:16:22,790 --> 00:16:21,440

ticket for like i don't know like twelve

416

00:16:24,790 --> 00:16:22,800

hundred dollars you'd go anywhere on

417

00:16:26,550 --> 00:16:24,800

this planet within 24 hours maybe

418

00:16:27,910 --> 00:16:26,560

because of antarctica but i mean that's

419

00:16:30,150 --> 00:16:27,920

the industry and by the way it's one of

420

00:16:31,910 --> 00:16:30,160

america's biggest exports our airplanes

421

00:16:34,829 --> 00:16:31,920

and aerospace kind of things so this is

422

00:16:38,470 --> 00:16:34,839

good for our country it's good for the

423

00:16:40,629 --> 00:16:38,480

planet and we at nasa are are giving our

424

00:16:42,710 --> 00:16:40,639

technical know-how to these companies as

425

00:16:44,230 --> 00:16:42,720

well as some seed money and they're

426

00:16:45,829 --> 00:16:44,240

running with it and yeah that's how they

427

00:16:48,310 --> 00:16:45,839

make the connect system so good you open

428

00:16:52,550 --> 00:16:49,590

there's no there's a lot there's a lot

429

00:16:55,749 --> 00:16:52,560

to be said for that uh so uh 2017 we're

430

00:16:57,990 --> 00:16:55,759

hoping to send uh humans uh off uh off

431

00:16:59,990 --> 00:16:58,000

of this planet on off of american soil

432

00:17:01,430 --> 00:17:00,000

with uh one of our industry partners or

433

00:17:02,710 --> 00:17:01,440

several of our industry partners we'll

434

00:17:04,630 --> 00:17:02,720

see how the contracts all come every

435

00:17:06,949 --> 00:17:04,640

single time i see elon musk i ask him if

436

00:17:08,230 --> 00:17:06,959

they're taking names yet for that list

437

00:17:09,750 --> 00:17:08,240

because there's seven seats on that

438

00:17:11,510 --> 00:17:09,760

capsule four of which are astronauts and

439

00:17:12,789 --> 00:17:11,520

three are civilians and he keeps saying

440

00:17:14,710 --> 00:17:12,799

we're not keeping a list yet and i just

441

00:17:16,470 --> 00:17:14,720

said i'm on that list

442

00:17:17,990 --> 00:17:16,480

on that list

443

00:17:19,669 --> 00:17:18,000

and uh well you're going to be on that

444

00:17:21,270 --> 00:17:19,679

list and and a lot of you guys are going

445

00:17:23,510 --> 00:17:21,280

to be on that list too that if we've if

446

00:17:25,029 --> 00:17:23,520

we've done if we've done our job right

447

00:17:27,510 --> 00:17:25,039

and we're working on it every day at

448

00:17:28,870 --> 00:17:27,520

nasa uh if we've done our job right

449

00:17:30,870 --> 00:17:28,880

that'll be the future that we're going

450

00:17:32,390 --> 00:17:30,880

to see in the next 15 or 20 years and

451

00:17:34,310 --> 00:17:32,400

it's an exciting one and that allows

452

00:17:37,270 --> 00:17:34,320

nasa and then we can talk more about the

453

00:17:39,270 --> 00:17:37,280

orion and go into going to sis means

454

00:17:40,549 --> 00:17:39,280

near lunar space and then uh heading off

455

00:17:41,909 --> 00:17:40,559

to heading off to mars because we're

456

00:17:43,830 --> 00:17:41,919

gonna have a rocket big enough to take

457

00:17:45,190 --> 00:17:43,840

us there it's just time really it's just

458

00:17:46,630 --> 00:17:45,200

time in figuring it out and everybody

459

00:17:48,549 --> 00:17:46,640

being interested in doing it if

460

00:17:52,150 --> 00:17:48,559

everybody if everybody collectively said

461

00:17:53,990 --> 00:17:52,160

hey i want a marriott on the moon

462

00:17:55,190 --> 00:17:54,000

there'd be a marriott on the moon guys

463

00:17:56,549 --> 00:17:55,200

and we'd all figure out a way to get

464

00:17:58,950 --> 00:17:56,559

there and it's not a space elevator i

465

00:18:00,470 --> 00:17:58,960

can tell you that um

466

00:18:01,669 --> 00:18:00,480

so but how do you guys respond and this

467

00:18:03,830 --> 00:18:01,679

is really for everybody how do you

468

00:18:05,510 --> 00:18:03,840

respond when people say sending humans

469

00:18:07,430 --> 00:18:05,520

to mars it's too risky it's too

470

00:18:09,350 --> 00:18:07,440

expensive

471

00:18:11,190 --> 00:18:09,360

lose a lot of life spend a ton of money

472

00:18:13,669 --> 00:18:11,200

why why everything's great here our

473

00:18:17,590 --> 00:18:13,679

planet's awesome

474

00:18:20,870 --> 00:18:19,590

you know in the last 50 years

475

00:18:23,029 --> 00:18:20,880

i mean

476

00:18:26,470 --> 00:18:23,039

earth rules guys why all right earth

477

00:18:28,070 --> 00:18:26,480

rules okay and and uh in the last 500

478

00:18:29,430 --> 00:18:28,080

million years there's been five mass

479

00:18:31,350 --> 00:18:29,440

extinctions

480

00:18:33,110 --> 00:18:31,360

and in many of our scientists and a lot

481

00:18:35,590 --> 00:18:33,120

of our engineers and others even

482

00:18:38,230 --> 00:18:35,600

astronauts uh have said

483

00:18:40,870 --> 00:18:38,240

a single planet species

484

00:18:42,710 --> 00:18:40,880

is not destined to survive that was

485

00:18:44,789 --> 00:18:42,720

stephen hawking

486

00:18:46,390 --> 00:18:44,799

yeah stephen and also a number of

487

00:18:47,990 --> 00:18:46,400

astronauts too and you probably have

488

00:18:51,669 --> 00:18:48,000

said that at least once in your life i'm

489

00:18:57,510 --> 00:18:54,830

no i told him not 200 years about 30

490

00:19:00,230 --> 00:18:57,520

years but indeed

491

00:19:01,909 --> 00:19:00,240

it's all about exploring it's all about

492

00:19:04,470 --> 00:19:01,919

taking the solar system you know the

493

00:19:06,789 --> 00:19:04,480

solar system is ours let's take it if

494

00:19:07,909 --> 00:19:06,799

we're going to move out let's take those

495

00:19:10,070 --> 00:19:07,919

steps

496

00:19:13,029 --> 00:19:10,080

and mars is that next logical stuff for

497

00:19:15,190 --> 00:19:13,039

human exploration we can do this

498

00:19:16,870 --> 00:19:15,200

it's sure it's going to be hard but

499

00:19:18,950 --> 00:19:16,880

we're going to be methodical

500

00:19:20,549 --> 00:19:18,960

we're going to be able to uh put down

501
00:19:21,990 --> 00:19:20,559
the infrastructure that we need we're

502
00:19:23,510 --> 00:19:22,000
going to be able to live off the land

503
00:19:26,150 --> 00:19:23,520
where we can

504
00:19:29,750 --> 00:19:26,160
and we're going to colonize that planet

505
00:19:34,310 --> 00:19:31,190
oh no you can applaud that that's pretty

506
00:19:37,830 --> 00:19:35,990
i think one really cool thing about mars

507
00:19:39,029 --> 00:19:37,840
and even the space station today is

508
00:19:40,630 --> 00:19:39,039
people kind of

509
00:19:41,909 --> 00:19:40,640
feel to realize that these are really

510
00:19:43,669 --> 00:19:41,919
tough things to do that they have to

511
00:19:45,909 --> 00:19:43,679
reuse resources they have to be better

512
00:19:49,190 --> 00:19:45,919
custodians and so the lessons we learn

513
00:19:50,710 --> 00:19:49,200

from iss and from going to mars and

514

00:19:52,789 --> 00:19:50,720

making people survive in places where we

515

00:19:55,510 --> 00:19:52,799

can't just get supplies to them

516

00:19:56,950 --> 00:19:55,520

with fedex

517

00:19:58,310 --> 00:19:56,960

you know that's the kind of lessons that

518

00:19:59,830 --> 00:19:58,320

we also need to learn here on earth and

519

00:20:01,430 --> 00:19:59,840

i think you know mike can probably talk

520

00:20:03,110 --> 00:20:01,440

to this too like you know we have a tiny

521

00:20:04,310 --> 00:20:03,120

i mean of course i haven't been off the

522

00:20:05,270 --> 00:20:04,320

planet guys so i don't know what it's

523

00:20:07,190 --> 00:20:05,280

like but

524

00:20:09,029 --> 00:20:07,200

um you know when you look when you look

525

00:20:10,789 --> 00:20:09,039

back uh i think at our planet you

526

00:20:12,070 --> 00:20:10,799

realize kind of the perspective of it

527

00:20:13,430 --> 00:20:12,080

all and even with the robotic vehicles

528

00:20:14,950 --> 00:20:13,440

when i see like a little speck in the

529

00:20:17,029 --> 00:20:14,960

sky that's earth it's it's a very

530

00:20:19,029 --> 00:20:17,039

powerful movement like feeling for me

531

00:20:21,029 --> 00:20:19,039

but i think realizing that this

532

00:20:22,470 --> 00:20:21,039

exploring space helps make us be better

533

00:20:23,750 --> 00:20:22,480

citizens of our own planet is also a

534

00:20:26,549 --> 00:20:23,760

really

535

00:20:29,669 --> 00:20:26,559

cool part of the whole process

536

00:20:31,190 --> 00:20:29,679

so we can all be like good neighbors

537

00:20:32,870 --> 00:20:31,200

i like that

538

00:20:34,710 --> 00:20:32,880

buzz

539

00:20:36,149 --> 00:20:34,720

you got advice i'm sure some of these

540

00:20:37,510 --> 00:20:36,159

people want to be astronauts and i'm

541

00:20:38,870 --> 00:20:37,520

sure the whole industry is going to

542

00:20:40,950 --> 00:20:38,880

evolve but

543

00:20:42,630 --> 00:20:40,960

like what did it take and mike you can

544

00:20:44,630 --> 00:20:42,640

respond to this too but what did it take

545

00:20:47,990 --> 00:20:44,640

for you like when did you decide that

546

00:20:49,669 --> 00:20:48,000

you wanted to be an astronaut

547

00:20:55,990 --> 00:20:49,679

were you little or were you like a

548

00:20:59,430 --> 00:20:57,750

i'm just kidding are you kidding this is

549

00:21:01,029 --> 00:20:59,440

a super american superhero i'm just

550

00:21:03,510 --> 00:21:01,039

kidding

551

00:21:05,990 --> 00:21:03,520

i i had a good friend at west point

552

00:21:10,310 --> 00:21:06,000

you're behind me ed white

553

00:21:16,310 --> 00:21:13,909

he called me up uh and said uh hey

554

00:21:18,230 --> 00:21:16,320

they're gonna have a new selection in

555

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

1962

556

00:21:23,110 --> 00:21:21,360

and i went and got my two-year masters

557

00:21:25,029 --> 00:21:23,120

at michigan and then i went through the

558

00:21:28,549 --> 00:21:25,039

test pilot school and i'm testing

559

00:21:31,750 --> 00:21:28,559

airplanes now at wright-patterson

560

00:21:34,310 --> 00:21:31,760

and i said well ed you know i can shoot

561

00:21:36,630 --> 00:21:34,320

gunnery much better than you can and i'm

562

00:21:38,950 --> 00:21:36,640

at mit now

563

00:21:40,630 --> 00:21:38,960

and uh what's this being a test pilot uh

564

00:21:42,950 --> 00:21:40,640

they don't really care about that i'm

565

00:21:47,270 --> 00:21:42,960

gonna reply too see

566

00:21:50,470 --> 00:21:49,430

but they changed their mind the next

567

00:21:52,630 --> 00:21:50,480

year

568

00:21:56,549 --> 00:21:52,640

and wanted some people with a little bit

569

00:22:00,390 --> 00:21:59,029

no ed was a great pilot

570

00:22:02,710 --> 00:22:00,400

probably would have been one of the

571

00:22:05,110 --> 00:22:02,720

first guys on on the moon

572

00:22:06,070 --> 00:22:05,120

uh if it was up to me and a lot of other

573

00:22:07,190 --> 00:22:06,080

people

574

00:22:10,390 --> 00:22:07,200

um

575

00:22:14,390 --> 00:22:10,400

now in 45 years

576

00:22:16,390 --> 00:22:14,400

the robots have improved quite a bit

577

00:22:19,990 --> 00:22:16,400

now i want you to tell me how much

578

00:22:21,669 --> 00:22:20,000

smarter is the human being now in 45

579

00:22:23,430 --> 00:22:21,679

years

580

00:22:26,870 --> 00:22:23,440

about the same right

581

00:22:29,590 --> 00:22:26,880

okay so we need to rely on robots a

582

00:22:31,590 --> 00:22:29,600

little more now here's an interesting

583

00:22:34,390 --> 00:22:31,600

piece of information

584

00:22:37,029 --> 00:22:34,400

uh i asked steve squires

585

00:22:39,909 --> 00:22:37,039

no i didn't ask him he he told me

586

00:22:40,870 --> 00:22:39,919

uh i said i want to land something right

587

00:22:44,789 --> 00:22:40,880

on

588

00:22:47,830 --> 00:22:44,799

call that a phobos

589

00:22:50,549 --> 00:22:47,840

so so we can look down and uh

590

00:22:52,390 --> 00:22:50,559

and watch the landing site and build

591

00:22:55,350 --> 00:22:52,400

things there

592

00:22:56,870 --> 00:22:55,360

and he said well you just tell me where

593

00:22:58,710 --> 00:22:56,880

where you want it and i'll put it there

594

00:23:01,750 --> 00:22:58,720

for you

595

00:23:03,350 --> 00:23:01,760

well he is a smart guy from cornell but

596

00:23:05,029 --> 00:23:03,360

i think one of the smartest things he

597

00:23:06,950 --> 00:23:05,039

told me was

598

00:23:08,630 --> 00:23:06,960

now when we put

599

00:23:12,549 --> 00:23:08,640

spirit and

600

00:23:13,990 --> 00:23:12,559

opportunity on opposite sides of

601
00:23:16,870 --> 00:23:14,000
mars

602
00:23:20,470 --> 00:23:16,880
maybe 11 12 years ago whenever it was

603
00:23:22,710 --> 00:23:20,480
they were built the last 90 days okay

604
00:23:24,230 --> 00:23:22,720
after five years spirit

605
00:23:26,549 --> 00:23:24,240
got stuck

606
00:23:27,590 --> 00:23:26,559
opportunity's still working

607
00:23:28,870 --> 00:23:27,600
so let's

608
00:23:30,950 --> 00:23:28,880
what he did

609
00:23:32,950 --> 00:23:30,960
take the first five years where both of

610
00:23:36,310 --> 00:23:32,960
they are doing their thing

611
00:23:38,070 --> 00:23:36,320
and we're telling them what to do

612
00:23:40,070 --> 00:23:38,080
one day at a time

613
00:23:41,350 --> 00:23:40,080

and so they plot through whatever

614

00:23:43,029 --> 00:23:41,360

they're doing

615

00:23:45,190 --> 00:23:43,039

we have a pretty good record of what

616

00:23:47,029 --> 00:23:45,200

they did in five years

617

00:23:49,110 --> 00:23:47,039

and he said

618

00:23:52,870 --> 00:23:49,120

now what they did in five years could

619

00:23:56,549 --> 00:23:52,880

have been done in one week

620

00:23:59,110 --> 00:23:56,559

if we had human intelligence in orbit

621

00:24:01,590 --> 00:23:59,120

around mars

622

00:24:02,549 --> 00:24:01,600

now stick that in your pipe and smoke it

623

00:24:06,230 --> 00:24:02,559

i think

624

00:24:09,029 --> 00:24:06,240

that people forget that tells you

625

00:24:12,149 --> 00:24:09,039

something about how we're going to go

626

00:24:15,110 --> 00:24:12,159

and uh and visit and do things

627

00:24:16,710 --> 00:24:15,120

and we've got to get people

628

00:24:20,710 --> 00:24:16,720

to the orbit

629

00:24:23,350 --> 00:24:20,720

of mars uh and sustain them there so

630

00:24:25,590 --> 00:24:23,360

that they can build

631

00:24:27,350 --> 00:24:25,600

a place to live

632

00:24:28,310 --> 00:24:27,360

and it makes a pretty cool machine to

633

00:24:29,990 --> 00:24:28,320

build it

634

00:24:32,950 --> 00:24:30,000

we may need to get them there and bring

635

00:24:35,510 --> 00:24:32,960

them back another group bringing it back

636

00:24:38,149 --> 00:24:35,520

by the third group they're probably

637

00:24:40,549 --> 00:24:38,159

uh pretty well finished

638

00:24:44,310 --> 00:24:40,559

now they know more about what they've

639

00:24:49,190 --> 00:24:46,950

because see we uh

640

00:24:51,350 --> 00:24:49,200

decided what we wanted at the moon not

641

00:24:53,830 --> 00:24:51,360

at mars and we learned how to do that on

642

00:24:57,110 --> 00:24:53,840

the big island of hawaii through uh

643

00:24:58,549 --> 00:24:57,120

geosynchronous satellite to houston we

644

00:25:01,350 --> 00:24:58,559

brought these things together and

645

00:25:03,990 --> 00:25:01,360

assembled them in a complex way

646

00:25:06,870 --> 00:25:04,000

and then redesigned them and all that

647

00:25:09,110 --> 00:25:06,880

so uh that's what we're gonna do for

648

00:25:10,070 --> 00:25:09,120

these guys now the third group that goes

649

00:25:12,149 --> 00:25:10,080

there

650

00:25:14,789 --> 00:25:12,159

they know i'm on that group they know

651
00:25:16,950 --> 00:25:14,799
more about what is down there than

652
00:25:19,430 --> 00:25:16,960
anybody on the world so they're going to

653
00:25:21,430 --> 00:25:19,440
be the first guys to land however many

654
00:25:26,149 --> 00:25:21,440
two four six

655
00:25:31,990 --> 00:25:27,750
get this

656
00:25:33,269 --> 00:25:32,000
18 people per mission

657
00:25:35,190 --> 00:25:33,279
all right i'm one of those 18. i'll

658
00:25:37,190 --> 00:25:35,200
explain it wait bob you can speak to

659
00:25:38,390 --> 00:25:37,200
this because i was out of jpl and we

660
00:25:39,909 --> 00:25:38,400
looked at a bunch of developing

661
00:25:41,430 --> 00:25:39,919
technologies and one of the things that

662
00:25:43,510 --> 00:25:41,440
i saw that was most impressive is that

663
00:25:45,830 --> 00:25:43,520

big crab thing on multiple wheels so

664

00:25:46,870 --> 00:25:45,840

this is an amazing device it's you

665

00:25:48,950 --> 00:25:46,880

probably describe it more detail but

666

00:25:51,110 --> 00:25:48,960

i'll give you the layman's of it it is a

667

00:25:52,950 --> 00:25:51,120

big metal circle with a bunch of arms

668

00:25:55,269 --> 00:25:52,960

each one of the arms has two wheels each

669

00:25:56,789 --> 00:25:55,279

one of those arms comes up independently

670

00:25:58,630 --> 00:25:56,799

and they're the wheels that it supports

671

00:26:00,470 --> 00:25:58,640

on that or that it's supported by but

672

00:26:02,549 --> 00:26:00,480

each one of them is also a tool a

673

00:26:04,630 --> 00:26:02,559

screwdriver means of assembly and so

674

00:26:06,310 --> 00:26:04,640

this thing is eventually meant to land

675

00:26:08,789 --> 00:26:06,320

on the surface

676
00:26:11,590 --> 00:26:08,799
you know to remove its payload and then

677
00:26:13,269 --> 00:26:11,600
construct habitats on the surface and so

678
00:26:15,110 --> 00:26:13,279
between that

679
00:26:16,470 --> 00:26:15,120
3d printing and all these other

680
00:26:18,070 --> 00:26:16,480
technologies that are getting invented

681
00:26:19,029 --> 00:26:18,080
just in these last five years that are

682
00:26:20,390 --> 00:26:19,039
really

683
00:26:21,430 --> 00:26:20,400
like the future looks pretty good what

684
00:26:23,110 --> 00:26:21,440
do you think it's actually going to look

685
00:26:24,789 --> 00:26:23,120
like when we get a mission there yeah i

686
00:26:27,029 --> 00:26:24,799
think this so he's talking about athlete

687
00:26:29,190 --> 00:26:27,039
which is this uh all-terrain hexagonal

688
00:26:30,870 --> 00:26:29,200

uh was it extraterrestrial they worked

689

00:26:33,750 --> 00:26:30,880

real hard to make it happen yeah we look

690

00:26:34,950 --> 00:26:33,760

we look for those acronyms at nasa a lot

691

00:26:36,070 --> 00:26:34,960

that's sort of like that's sort of like

692

00:26:40,870 --> 00:26:36,080

cobra coming up with some of their

693

00:26:44,390 --> 00:26:42,789

uh but yeah the idea is you know with

694

00:26:45,990 --> 00:26:44,400

with the apollo missions right we were

695

00:26:47,830 --> 00:26:46,000

limited even with the rover how far you

696

00:26:49,909 --> 00:26:47,840

could go away from the lander because

697

00:26:51,590 --> 00:26:49,919

you had to be able to walk back to

698

00:26:53,110 --> 00:26:51,600

the lander should something break but

699

00:26:54,390 --> 00:26:53,120

the idea for the future if we want to

700

00:26:55,990 --> 00:26:54,400

explore our planet is to be able to take

701
00:26:58,470 --> 00:26:56,000
our home essentially with us wherever we

702
00:27:00,870 --> 00:26:58,480
go basically you think rv on mars

703
00:27:02,230 --> 00:27:00,880
um and so the athlete is designed to do

704
00:27:03,909 --> 00:27:02,240
that it's supposed to be this like this

705
00:27:06,630 --> 00:27:03,919
vehicle that can come pick up your

706
00:27:07,909 --> 00:27:06,640
little habitat and drive along with you

707
00:27:09,350 --> 00:27:07,919
and explore so i think the future will

708
00:27:11,750 --> 00:27:09,360
look like that it'll be a bunch of rvs

709
00:27:13,190 --> 00:27:11,760
that kind of get to move around and uh

710
00:27:14,789 --> 00:27:13,200
you look like a caravan and then after

711
00:27:19,269 --> 00:27:14,799
we've settled we all get to pilot them

712
00:27:21,669 --> 00:27:20,549
i'm trying to lock in that i'm trying to

713
00:27:22,789 --> 00:27:21,679

lock that hashtag you know what's

714

00:27:24,950 --> 00:27:22,799

followed

715

00:27:26,470 --> 00:27:24,960

yeah mike i would take you on any vessel

716

00:27:31,750 --> 00:27:26,480

absolutely i'm an excellent driver i

717

00:27:34,630 --> 00:27:33,110

i'll be the next driver i'll take driver

718

00:27:36,630 --> 00:27:34,640

guys yeah well that but that's actually

719

00:27:37,990 --> 00:27:36,640

a good question so who

720

00:27:40,390 --> 00:27:38,000

i would go in a second i would go in a

721

00:27:42,230 --> 00:27:40,400

second i i you know the the no return of

722

00:27:43,430 --> 00:27:42,240

it option right now is kind of a

723

00:27:47,590 --> 00:27:43,440

negative just because i've got a lot of

724

00:27:48,950 --> 00:27:47,600

things here that keep me here but

725

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

but you know considering it like a

726

00:27:53,029 --> 00:27:50,720

multi-year trip sort of like we were

727

00:27:54,870 --> 00:27:53,039

when we were colonizing when we when we

728

00:27:57,029 --> 00:27:54,880

as a species were branching out off of

729

00:27:58,630 --> 00:27:57,039

our little you know uh uh islands and

730

00:28:00,470 --> 00:27:58,640

peninsulas and

731

00:28:02,389 --> 00:28:00,480

in continents to find our way to other

732

00:28:03,830 --> 00:28:02,399

ones that took months it took years a

733

00:28:05,110 --> 00:28:03,840

lot of people died was developing

734

00:28:06,310 --> 00:28:05,120

technologies

735

00:28:07,830 --> 00:28:06,320

there was a time when we were all on

736

00:28:09,029 --> 00:28:07,840

horseback so

737

00:28:11,110 --> 00:28:09,039

you know what i mean we've come a long

738

00:28:13,110 --> 00:28:11,120

way would you go

739

00:28:15,750 --> 00:28:13,120

i you know i i don't want to leave earth

740

00:28:17,350 --> 00:28:15,760

i like it here i'm happy to send robots

741

00:28:19,029 --> 00:28:17,360

uh they do a great job they take nice

742

00:28:20,549 --> 00:28:19,039

pictures even if you could go to the

743

00:28:22,630 --> 00:28:20,559

moon like you can go to cancun wouldn't

744

00:28:25,190 --> 00:28:22,640

you go i mean if i as long as i can come

745

00:28:27,510 --> 00:28:25,200

back or if there's like a starbucks

746

00:28:29,190 --> 00:28:27,520

somewhere there

747

00:28:31,430 --> 00:28:29,200

no no you can bring those powdered to go

748

00:28:33,590 --> 00:28:31,440

packs okay water then we're good yeah

749

00:28:34,789 --> 00:28:33,600

i'm ready

750

00:28:35,990 --> 00:28:34,799

mike would you go is it do you want to

751

00:28:38,549 --> 00:28:36,000

get back out you want to get back out

752

00:28:39,909 --> 00:28:38,559

there oh i i'd go on a heartbeat and

753

00:28:43,269 --> 00:28:39,919

there are some days at home where my

754

00:28:45,990 --> 00:28:43,279

wife would send me in a heartbeat so

755

00:28:47,510 --> 00:28:46,000

but uh yeah and and and it would be

756

00:28:49,430 --> 00:28:47,520

great if i could bring my family along

757

00:28:51,510 --> 00:28:49,440

because i i kind of liked them and uh

758

00:28:53,350 --> 00:28:51,520

but uh but that isn't that isn't that it

759

00:28:54,870 --> 00:28:53,360

right that we're we're gonna be pioneers

760

00:28:56,870 --> 00:28:54,880

as we go we're not gonna be just uh

761

00:28:58,470 --> 00:28:56,880

we're that generation though and and

762

00:29:00,470 --> 00:28:58,480

we'll uh and we'll

763

00:29:02,310 --> 00:29:00,480

we'll build new uh cities and new places

764

00:29:03,510 --> 00:29:02,320

uh all over our solar system and uh

765

00:29:05,110 --> 00:29:03,520

that's what i think that's what we're

766

00:29:06,710 --> 00:29:05,120

supposed to do and that's that would be

767

00:29:08,389 --> 00:29:06,720

humanity at its best i like to think

768

00:29:10,070 --> 00:29:08,399

there will be a time in a hundred years

769

00:29:11,430 --> 00:29:10,080

when people be like how did they not

770

00:29:13,110 --> 00:29:11,440

want to get out there gosh they just had

771

00:29:14,230 --> 00:29:13,120

to work through to get there jim would

772

00:29:17,350 --> 00:29:14,240

you go oh

773

00:29:20,549 --> 00:29:17,360

absolutely in about 10 years maybe 15

774

00:29:22,710 --> 00:29:20,559

everyone who's selected as an astronaut

775

00:29:25,750 --> 00:29:22,720

is going to have to sign a piece of

776

00:29:27,190 --> 00:29:25,760

paper that if they are successful

777

00:29:30,710 --> 00:29:27,200

they're going to spend the rest of their

778

00:29:33,350 --> 00:29:30,720

life on the surface of mars

779

00:29:34,789 --> 00:29:33,360

do we get extra pay for that

780

00:29:36,870 --> 00:29:34,799

i think it's uh it's the equivalent of

781

00:29:39,430 --> 00:29:36,880

like weekend golden times as far as the

782

00:29:41,350 --> 00:29:39,440

government is concerned

783

00:29:43,669 --> 00:29:41,360

i think yeah i think the non-return is

784

00:29:46,470 --> 00:29:43,679

like equivalent of union golden times on

785

00:29:52,830 --> 00:29:49,190

yeah oh absolutely when you take a look

786

00:29:55,590 --> 00:29:52,840

at what we see on mars it's absolutely

787

00:29:58,070 --> 00:29:55,600

phenomenal there there are

788

00:30:01,029 --> 00:29:58,080

shield volcanoes the size of the state

789

00:30:02,950 --> 00:30:01,039

of missouri there's huge canyons that if

790

00:30:04,789 --> 00:30:02,960

it sat in the united states would go

791

00:30:06,950 --> 00:30:04,799

from la to new york

792

00:30:08,710 --> 00:30:06,960

for which any one of the tributaries

793

00:30:08,710 --> 00:30:09,750

would make the grand canyon look like a

794

00:30:13,830 --> 00:30:11,750

the vistas that we observe and the

795

00:30:16,269 --> 00:30:13,840

things that we see on that planet and

796

00:30:17,990 --> 00:30:16,279

how it's evolved are absolutely

797

00:30:20,630 --> 00:30:18,000

spectacular

798

00:30:22,389 --> 00:30:20,640

those are vistas we always want to see

799

00:30:23,830 --> 00:30:22,399

those are those things on the other side

800

00:30:26,950 --> 00:30:23,840

of the mountain that our

801
00:30:29,590 --> 00:30:26,960
early pioneers did as they moved on and

802
00:30:32,870 --> 00:30:29,600
colonized the united states

803
00:30:34,230 --> 00:30:32,880
you know when we explore we do science

804
00:30:37,830 --> 00:30:34,240
and

805
00:30:40,389 --> 00:30:37,840
when we do that we explore to survive

806
00:30:48,149 --> 00:30:40,399
and that's the next step going to mars

807
00:30:51,510 --> 00:30:49,669
that isn't interesting it's an

808
00:30:52,950 --> 00:30:51,520
interesting question because you know we

809
00:30:55,110 --> 00:30:52,960
only live in our own

810
00:30:56,950 --> 00:30:55,120
lifetime and so it's hard to imagine

811
00:30:58,789 --> 00:30:56,960
things that came tens of millions of

812
00:31:00,630 --> 00:30:58,799
years before us but when you talk about

813
00:31:02,870 --> 00:31:00,640

what mars might have looked like isn't

814

00:31:05,190 --> 00:31:02,880

it possible that it was very similar to

815

00:31:07,350 --> 00:31:05,200

earth that it was incredibly similar so

816

00:31:09,029 --> 00:31:07,360

as we get there not that we haven't

817

00:31:10,789 --> 00:31:09,039

completely done all the archaeology we

818

00:31:11,909 --> 00:31:10,799

need to do on our own planet

819

00:31:13,830 --> 00:31:11,919

but when we get there we're going to

820

00:31:16,070 --> 00:31:13,840

find some really cool stuff

821

00:31:18,310 --> 00:31:16,080

yeah there's no question about that yeah

822

00:31:19,990 --> 00:31:18,320

you know curiosity is sitting in a place

823

00:31:22,470 --> 00:31:20,000

that hasn't changed in three and a half

824

00:31:25,029 --> 00:31:22,480

billion years it's literally in a

825

00:31:27,110 --> 00:31:25,039

location where it's gone back in time

826

00:31:29,269 --> 00:31:27,120

and what we found with curiosity is that

827

00:31:32,149 --> 00:31:29,279

that location had an enormous amount of

828

00:31:34,070 --> 00:31:32,159

water fast moving water in fact that

829

00:31:36,630 --> 00:31:34,080

water could have been drinkable if we

830

00:31:38,630 --> 00:31:36,640

were there at the time if microbes lived

831

00:31:39,909 --> 00:31:38,640

at that time they would flourish and

832

00:31:42,630 --> 00:31:39,919

survive

833

00:31:45,029 --> 00:31:42,640

so we don't really know if there's life

834

00:31:47,669 --> 00:31:45,039

on mars in the past there may even be

835

00:31:50,389 --> 00:31:47,679

life on mars today there's vast amounts

836

00:31:52,710 --> 00:31:50,399

of water and underground aquifers

837

00:31:54,950 --> 00:31:52,720

we see during the summer time certain

838

00:31:57,350 --> 00:31:54,960

craters literally weep

839

00:31:59,669 --> 00:31:57,360

with water briny water flowing down the

840

00:32:02,310 --> 00:31:59,679

edges of these craters

841

00:32:04,389 --> 00:32:02,320

so that's gonna be a water slide guys

842

00:32:06,230 --> 00:32:04,399

that's gonna be like an atlantis resort

843

00:32:08,789 --> 00:32:06,240

and that would be huge because they're

844

00:32:13,350 --> 00:32:08,799

more than a football field in length

845

00:32:17,110 --> 00:32:14,630

you'd have to cross your legs on the way

846

00:32:19,909 --> 00:32:17,120

down on mars

847

00:32:23,590 --> 00:32:19,919

there will be life on mars

848

00:32:25,269 --> 00:32:23,600

by 2040. two decades from the 50th

849

00:32:28,470 --> 00:32:25,279

anniversary

850

00:32:32,310 --> 00:32:28,480

of some guys kicking up dust on the moon

851

00:32:39,990 --> 00:32:33,029

um

852

00:32:43,750 --> 00:32:41,669

what do you think i feel like this is

853

00:32:45,190 --> 00:32:43,760

probably the time when we let the crowd

854

00:32:47,029 --> 00:32:45,200

ask you guys what they want to ask you

855

00:32:49,269 --> 00:32:47,039

there's a microphone here i would say be

856

00:32:50,470 --> 00:32:49,279

civil be civil

857

00:32:52,230 --> 00:32:50,480

don't rush

858

00:33:03,509 --> 00:32:52,240

we probably won't get to everybody but

859

00:33:05,750 --> 00:33:04,549

there you go

860

00:33:09,190 --> 00:33:05,760

can you see the pan can you see the

861

00:33:09,200 --> 00:33:13,590

yes yes you in the cape

862

00:33:13,600 --> 00:33:17,430

oh wait wait hold on let's is the mic on

863

00:33:17,440 --> 00:33:20,789

check check it

864

00:33:27,909 --> 00:33:22,789

almost there

865

00:33:27,919 --> 00:33:32,310

seems to be on

866

00:33:36,070 --> 00:33:33,110

check

867

00:33:47,430 --> 00:33:36,080

here wait wait

868

00:33:47,440 --> 00:33:52,070

all right let's hear it

869

00:33:58,950 --> 00:33:55,350

hi my name is rowan um hi

870

00:34:00,149 --> 00:33:58,960

what made you um good space

871

00:34:03,509 --> 00:34:00,159

to

872

00:34:04,870 --> 00:34:03,519

yeah um

873

00:34:07,750 --> 00:34:04,880

to

874

00:34:09,349 --> 00:34:07,760

buzz aldrin yes sir

875

00:34:11,270 --> 00:34:09,359

she said what made you want to go to

876

00:34:13,750 --> 00:34:11,280

space like when they when they asked you

877

00:34:19,270 --> 00:34:13,760

what made you want to go what inspired

878

00:34:19,280 --> 00:34:32,710

higher faster further

879

00:34:38,149 --> 00:34:36,950

and then it was okay to come back

880

00:34:40,550 --> 00:34:38,159

they were for sure gonna get you back

881

00:34:42,389 --> 00:34:40,560

there i'd like to i'd like to jump in on

882

00:34:44,710 --> 00:34:42,399

that just a second because uh today

883

00:34:46,389 --> 00:34:44,720

we're remembering 45 years ago well i

884

00:34:48,869 --> 00:34:46,399

was two and a half years old so you can

885

00:34:51,589 --> 00:34:48,879

do the math right i was watching buzz

886

00:34:53,349 --> 00:34:51,599

walk on the moon and sir you neil and

887

00:34:55,589 --> 00:34:53,359

then the other apollo guys after you

888

00:34:58,550 --> 00:34:55,599

guys inspired me i remember all the

889

00:35:00,390 --> 00:34:58,560

apollo missions uh after 11 and then i

890

00:35:01,910 --> 00:35:00,400

also remember skylab and that that

891

00:35:04,150 --> 00:35:01,920

inspired me and i'm hoping that what we

892

00:35:11,030 --> 00:35:04,160

do today is inspirational to the next

893

00:35:11,040 --> 00:35:13,990

thank you

894

00:35:19,109 --> 00:35:16,069

does that mean that's a yes you'll sign

895

00:35:23,990 --> 00:35:21,430

hi my name is eric uh i just want to say

896

00:35:25,829 --> 00:35:24,000

first off buzz uh you connect really

897

00:35:27,990 --> 00:35:25,839

well with uh the millennials like you

898

00:35:29,349 --> 00:35:28,000

were on reddit doing an ama like you

899

00:35:31,829 --> 00:35:29,359

connect really well with us and i think

900

00:35:34,230 --> 00:35:31,839

that's incredibly important uh what kind

901
00:35:37,349 --> 00:35:34,240
of opportunities uh do you see you

902
00:35:39,030 --> 00:35:37,359
talked about you know an 18-person crew

903
00:35:41,030 --> 00:35:39,040
going to mars

904
00:35:43,030 --> 00:35:41,040
what opportunities are there for people

905
00:35:45,430 --> 00:35:43,040
who are not scientists or people who are

906
00:35:47,750 --> 00:35:45,440
not astronauts and trained that way

907
00:35:49,349 --> 00:35:47,760
to actually be able to embark on these

908
00:35:52,310 --> 00:35:49,359
missions or get to be a part of these

909
00:35:56,790 --> 00:35:54,630
and that question's for all of you too

910
00:35:59,190 --> 00:35:56,800
let me ask answer part of that

911
00:36:01,750 --> 00:35:59,200
i didn't imply 18 people on one

912
00:36:18,069 --> 00:36:01,760
spacecraft

913
00:36:24,950 --> 00:36:20,870

if i were you i would uh

914

00:36:27,030 --> 00:36:24,960

maybe buy some stock in

915

00:36:28,310 --> 00:36:27,040

in x-core

916

00:36:30,069 --> 00:36:28,320

oh yeah i've seen that i've seen that

917

00:36:31,910 --> 00:36:30,079

plane it's pretty cool

918

00:36:33,910 --> 00:36:31,920

thank you their vehicle is cool

919

00:36:36,390 --> 00:36:33,920

well it's not a good business plan one

920

00:36:38,069 --> 00:36:36,400

one plane one passenger no but that's

921

00:36:40,069 --> 00:36:38,079

more like a that's more like

922

00:36:41,270 --> 00:36:40,079

you just wait and see what their future

923

00:36:42,710 --> 00:36:41,280

plans are

924

00:36:44,550 --> 00:36:42,720

i'm excited about that it's gonna be

925

00:36:46,150 --> 00:36:44,560

it's gonna be outposts and gas stations

926
00:36:47,510 --> 00:36:46,160
and landers all over we're gonna be

927
00:36:49,190 --> 00:36:47,520
landing on asteroids like ben affleck

928
00:36:50,310 --> 00:36:49,200
it's gonna be awesome

929
00:36:53,109 --> 00:36:50,320
hi

930
00:36:55,670 --> 00:36:53,119
my name's dina um and your buzz in your

931
00:36:58,390 --> 00:36:55,680
book mission to mars which i was hoping

932
00:37:00,630 --> 00:36:58,400
to get you to sign um there are many

933
00:37:02,870 --> 00:37:00,640
visionary ideas that seem to be a game

934
00:37:05,349 --> 00:37:02,880
plan for a step-by-step exploratory

935
00:37:06,630 --> 00:37:05,359
development of the moon

936
00:37:09,270 --> 00:37:06,640
near-earth or

937
00:37:11,030 --> 00:37:09,280
objects like asteroids and then

938
00:37:13,190 --> 00:37:11,040

mars and i'm wondering if you have seen

939

00:37:15,589 --> 00:37:13,200

any progress in the stepping stone

940

00:37:18,069 --> 00:37:15,599

projects to that evolution like the

941

00:37:20,230 --> 00:37:18,079

sentinel project or the asteroid bound

942

00:37:23,190 --> 00:37:20,240

missions like president obama spoke

943

00:37:26,710 --> 00:37:23,200

about in the 2010 speech space speech

944

00:37:28,470 --> 00:37:26,720

about asteroid bound missions by 2025.

945

00:37:29,750 --> 00:37:28,480

have you seen progress in any of these

946

00:37:32,310 --> 00:37:29,760

things

947

00:37:35,190 --> 00:37:32,320

well i was just talking to the expert

948

00:37:38,390 --> 00:37:35,200

scientists over here about what the

949

00:37:43,349 --> 00:37:38,400

president did say uh in april of 2010 he

950

00:37:47,430 --> 00:37:45,430

i thought that was a damn good idea

951
00:37:50,230 --> 00:37:47,440
because

952
00:37:51,349 --> 00:37:50,240
the reason that i put it and three other

953
00:37:54,630 --> 00:37:51,359
missions

954
00:37:55,910 --> 00:37:54,640
in my submission a year before to norm

955
00:37:57,109 --> 00:37:55,920
augustine's

956
00:37:58,470 --> 00:37:57,119
commission

957
00:38:01,510 --> 00:37:58,480
was to

958
00:38:04,470 --> 00:38:01,520
check out the spacecraft between it

959
00:38:05,430 --> 00:38:04,480
being at the libration points of the

960
00:38:08,310 --> 00:38:05,440
moon

961
00:38:11,030 --> 00:38:08,320
and before we had confidence to put

962
00:38:12,390 --> 00:38:11,040
people on the moon of mars for a year

963
00:38:14,870 --> 00:38:12,400

and a half

964

00:38:16,150 --> 00:38:14,880

so there were a number of things it was

965

00:38:18,630 --> 00:38:16,160

that mission

966

00:38:19,829 --> 00:38:18,640

to an asteroid was better than a mission

967

00:38:24,390 --> 00:38:19,839

to

968

00:38:26,630 --> 00:38:24,400

something it does something

969

00:38:29,510 --> 00:38:26,640

but it doesn't learn a whole lot about

970

00:38:30,950 --> 00:38:29,520

an asteroid unless you do something else

971

00:38:32,390 --> 00:38:30,960

and that's what i'm trying to tell

972

00:38:34,790 --> 00:38:32,400

people now

973

00:38:37,990 --> 00:38:34,800

before the human mission gets there you

974

00:38:40,790 --> 00:38:38,000

dispatch a robot on a year and a half

975

00:38:43,510 --> 00:38:40,800

mission checking out its solar electric

976
00:38:46,870 --> 00:38:43,520
propulsion and that son of a gun gets

977
00:38:49,349 --> 00:38:46,880
there two days after the humans get

978
00:38:52,230 --> 00:38:49,359
there in about three months and they

979
00:38:55,430 --> 00:38:52,240
stay for 60 days and then they come back

980
00:38:58,310 --> 00:38:55,440
in a year so you've taken two missions

981
00:39:00,790 --> 00:38:58,320
one a robotic mission to an asteroid

982
00:39:03,510 --> 00:39:00,800
which is greatly limited by the

983
00:39:05,829 --> 00:39:03,520
communication time from earth to the

984
00:39:08,230 --> 00:39:05,839
asteroid to tell what the robot should

985
00:39:09,990 --> 00:39:08,240
do and then come back again you take a

986
00:39:12,230 --> 00:39:10,000
human mission there and they can't do a

987
00:39:14,470 --> 00:39:12,240
whole lot they got to come back in 68

988
00:39:17,349 --> 00:39:14,480

but you take two missions and put them

989

00:39:20,150 --> 00:39:17,359

together on the same asteroid and man

990

00:39:21,270 --> 00:39:20,160

you make both of them tremendously

991

00:39:23,030 --> 00:39:21,280

improved

992

00:39:24,069 --> 00:39:23,040

anybody who's seen star trek knows you

993

00:39:26,630 --> 00:39:24,079

don't take a ship out without an

994

00:39:27,990 --> 00:39:26,640

astromech like that's

995

00:39:29,270 --> 00:39:28,000

that's just the way it goes there's a

996

00:39:30,630 --> 00:39:29,280

there's a couple of private companies

997

00:39:32,710 --> 00:39:30,640

that are also developing things like

998

00:39:34,550 --> 00:39:32,720

asteroid mining to try because they're

999

00:39:36,230 --> 00:39:34,560

just huge chunks of resources basically

1000

00:39:37,829 --> 00:39:36,240

orbiting our planet so instead of us

1001

00:39:39,109 --> 00:39:37,839

tearing apart our own planet for you

1002

00:39:40,710 --> 00:39:39,119

know small scraps of things we can go up

1003

00:39:42,870 --> 00:39:40,720

to space and find things that are the

1004

00:39:44,150 --> 00:39:42,880

size of texas and then mine them

1005

00:39:47,910 --> 00:39:44,160

well thank you and thank you for your

1006

00:39:49,270 --> 00:39:47,920

service to our country thank you cheers

1007

00:39:51,430 --> 00:39:49,280

guys we have

1008

00:39:52,470 --> 00:39:51,440

less than 15 minutes left in this panel

1009

00:39:53,750 --> 00:39:52,480

but i'll bet we can get through all

1010

00:39:56,470 --> 00:39:53,760

these questions

1011

00:39:57,990 --> 00:39:56,480

okay i'll be quick then so gentlemen um

1012

00:40:00,310 --> 00:39:58,000

quick question how would you describe

1013

00:40:04,950 --> 00:40:00,320

the feeling the first time you became

1014

00:40:10,950 --> 00:40:06,150

so uh

1015

00:40:16,150 --> 00:40:12,870

right

1016

00:40:18,470 --> 00:40:16,160

my name is zimmerman

1017

00:40:20,470 --> 00:40:18,480

uh buzz is uh

1018

00:40:22,870 --> 00:40:20,480

i think we both shared that the first

1019

00:40:25,270 --> 00:40:22,880

time you get into orbit is uh just as

1020

00:40:27,829 --> 00:40:25,280

cool as the second time and uh and and

1021

00:40:30,230 --> 00:40:27,839

beyond because when you see the planet

1022

00:40:31,670 --> 00:40:30,240

earth when you feel weightless uh it's

1023

00:40:33,510 --> 00:40:31,680

english has a really cool word

1024

00:40:36,150 --> 00:40:33,520

breathtaking i couldn't breathe for 30

1025

00:40:39,510 --> 00:40:36,160

seconds i was so happy buzz how was it

1026

00:40:41,030 --> 00:40:39,520

on your first first time in space

1027

00:40:43,349 --> 00:40:41,040

what was your feeling once you once you

1028

00:40:46,069 --> 00:40:43,359

reached or did the weightlessness in

1029

00:40:47,829 --> 00:40:46,079

actual space compare to the the

1030

00:40:49,589 --> 00:40:47,839

simulated weightlessness that you guys

1031

00:40:52,870 --> 00:40:49,599

trained under

1032

00:40:55,829 --> 00:40:52,880

well i was the first guy to take a

1033

00:40:58,069 --> 00:40:55,839

suggestion by some guys in baltimore

1034

00:40:59,430 --> 00:40:58,079

that maybe we could simulate

1035

00:41:03,030 --> 00:40:59,440

weightlessness

1036

00:41:05,109 --> 00:41:03,040

in neutral buoyancy in a water tank

1037

00:41:07,589 --> 00:41:05,119

having been a scuba diver for almost 10

1038

00:41:10,630 --> 00:41:07,599

years before that i knew that that would

1039

00:41:11,510 --> 00:41:10,640

work very very well

1040

00:41:13,829 --> 00:41:11,520

and

1041

00:41:16,309 --> 00:41:13,839

on the mission that i was on jimmy 12 we

1042

00:41:19,990 --> 00:41:16,319

did have the number one air force

1043

00:41:22,309 --> 00:41:20,000

experiment in the whole gemini program

1044

00:41:24,470 --> 00:41:22,319

the astronaut maneuvering unit and i

1045

00:41:26,950 --> 00:41:24,480

really look forward to

1046

00:41:28,790 --> 00:41:26,960

being able to activate that with all the

1047

00:41:31,910 --> 00:41:28,800

things that i'd practiced in the

1048

00:41:33,990 --> 00:41:31,920

swimming pool in baltimore and

1049

00:41:35,349 --> 00:41:34,000

i was very confident that i could do

1050

00:41:36,870 --> 00:41:35,359

that

1051
00:41:39,349 --> 00:41:36,880
now it's my second

1052
00:41:42,550 --> 00:41:39,359
worst mistake is that i

1053
00:41:43,750 --> 00:41:42,560
allowed nasa to cancel that

1054
00:41:46,230 --> 00:41:43,760
major

1055
00:41:48,230 --> 00:41:46,240
maneuvering unit instead i was doing a

1056
00:41:50,870 --> 00:41:48,240
bunch of mickey mouse things the foot

1057
00:41:53,109 --> 00:41:50,880
restraints were much better

1058
00:41:54,870 --> 00:41:53,119
it's it's a fantasy land when you first

1059
00:41:57,109 --> 00:41:54,880
get into space

1060
00:41:59,589 --> 00:41:57,119
things float around and you

1061
00:42:01,589 --> 00:41:59,599
do all sorts of things with uh

1062
00:42:04,150 --> 00:42:01,599
gumdrops or something nobody tells

1063
00:42:05,829 --> 00:42:04,160

nobody tells you about like the strength

1064

00:42:07,510 --> 00:42:05,839

against inertia though like everyone

1065

00:42:08,390 --> 00:42:07,520

talks about weightlessness as if it's

1066

00:42:10,710 --> 00:42:08,400

like

1067

00:42:12,230 --> 00:42:10,720

so beautiful but i did one of the zero g

1068

00:42:15,829 --> 00:42:12,240

flights that achieves weightlessness

1069

00:42:17,829 --> 00:42:15,839

through uh parables or parabolas and um

1070

00:42:19,670 --> 00:42:17,839

you have full faculty of your strength

1071

00:42:22,870 --> 00:42:19,680

and you can move like a ninja you just

1072

00:42:25,190 --> 00:42:22,880

have no weight on you so it's chaos it's

1073

00:42:27,430 --> 00:42:25,200

just like chaos and then the slightest

1074

00:42:30,230 --> 00:42:27,440

touch of something sends it

1075

00:42:31,990 --> 00:42:30,240

far across your vessel so you really

1076

00:42:36,150 --> 00:42:32,000

have to be just about as still as

1077

00:42:38,870 --> 00:42:36,160

possible for things not to be haywire

1078

00:42:41,510 --> 00:42:38,880

when you're under water you don't fight

1079

00:42:44,790 --> 00:42:41,520

the current you align yourself you do

1080

00:42:49,190 --> 00:42:44,800

things in a very delicate way

1081

00:42:51,190 --> 00:42:49,200

it is not a place for brute force

1082

00:42:53,109 --> 00:42:51,200

that gets you tired and sweaty and all

1083

00:42:54,950 --> 00:42:53,119

that

1084

00:42:57,670 --> 00:42:54,960

right on

1085

00:42:59,670 --> 00:42:57,680

hi there hi um so according to the fermi

1086

00:43:01,270 --> 00:42:59,680

paradox colonization of the galaxy

1087

00:43:03,109 --> 00:43:01,280

should have happened by somebody else

1088

00:43:04,790 --> 00:43:03,119

already oh it already did an alternate

1089

00:43:07,190 --> 00:43:04,800

timeline we split off like uh like

1090

00:43:08,390 --> 00:43:07,200

sliding doors

1091

00:43:09,430 --> 00:43:08,400

we're in like

1092

00:43:11,750 --> 00:43:09,440

i don't know how to calculate the

1093

00:43:13,349 --> 00:43:11,760

dimension but we are somewhere over here

1094

00:43:14,470 --> 00:43:13,359

and then the us colonizing is over here

1095

00:43:15,990 --> 00:43:14,480

so somewhere in between there's like

1096

00:43:17,670 --> 00:43:16,000

seven hundred thousand instances or like

1097

00:43:19,750 --> 00:43:17,680

in possibilities

1098

00:43:22,069 --> 00:43:19,760

um either why do you think the

1099

00:43:24,150 --> 00:43:22,079

colonization of our system by us will be

1100

00:43:33,430 --> 00:43:24,160

successful or why haven't we met anybody

1101
00:43:37,910 --> 00:43:35,829
you know the fermi paradox is all about

1102
00:43:39,349 --> 00:43:37,920
where are they if there is intelligent

1103
00:43:41,030 --> 00:43:39,359
life out there

1104
00:43:43,349 --> 00:43:41,040
and and you know we're taking a good

1105
00:43:44,230 --> 00:43:43,359
look at that we hope to be able to find

1106
00:43:46,630 --> 00:43:44,240
life

1107
00:43:49,349 --> 00:43:46,640
beyond earth which will tell probably

1108
00:43:51,510 --> 00:43:49,359
microbes perhaps at mars

1109
00:43:53,030 --> 00:43:51,520
europa is another fabulous opportunity

1110
00:43:54,630 --> 00:43:53,040
to look at life

1111
00:43:56,150 --> 00:43:54,640
because of the environment seems to be

1112
00:43:58,790 --> 00:43:56,160
just right

1113
00:44:00,710 --> 00:43:58,800

once that occurs we then have the

1114

00:44:02,870 --> 00:44:00,720

feeling that life can be

1115

00:44:05,109 --> 00:44:02,880

everywhere in our solar system and then

1116

00:44:06,630 --> 00:44:05,119

that next question is very pertinent

1117

00:44:08,710 --> 00:44:06,640

where are they

1118

00:44:10,470 --> 00:44:08,720

somebody has to be first

1119

00:44:11,430 --> 00:44:10,480

yeah it might be us

1120

00:44:13,430 --> 00:44:11,440

but

1121

00:44:15,510 --> 00:44:13,440

in reality it might tell us something

1122

00:44:19,190 --> 00:44:15,520

incredibly important and that is

1123

00:44:22,950 --> 00:44:19,200

intelligent life may not live long

1124

00:44:24,470 --> 00:44:22,960

and if we understand that we might be

1125

00:44:26,390 --> 00:44:24,480

able to think about our future

1126

00:44:29,829 --> 00:44:26,400

differently we might be able to as a

1127

00:44:32,710 --> 00:44:29,839

world come together as a world trek out

1128

00:44:36,230 --> 00:44:32,720

go to that go to mars and go beyond

1129

00:44:38,069 --> 00:44:36,240

and and then we'll be the ones uh to to

1130

00:44:39,510 --> 00:44:38,079

visit other places there's a there's an

1131

00:44:41,829 --> 00:44:39,520

interesting paradox on the other side of

1132

00:44:43,910 --> 00:44:41,839

that which is if there is another uh

1133

00:44:46,630 --> 00:44:43,920

life form that is intelligent enough to

1134

00:44:48,390 --> 00:44:46,640

travel beyond its own um uh interstellar

1135

00:44:49,589 --> 00:44:48,400

boundaries why would they want to hang

1136

00:44:51,030 --> 00:44:49,599

out with us when we haven't even figured

1137

00:44:52,950 --> 00:44:51,040

out how to get off our planet you know

1138

00:44:54,550 --> 00:44:52,960

we're still aiming weapons back in our

1139

00:44:56,630 --> 00:44:54,560

own territory so

1140

00:44:58,790 --> 00:44:56,640

you know there's like a million

1141

00:45:01,510 --> 00:44:58,800

answers to that i just wanted to hear

1142

00:45:01,520 --> 00:45:04,870

yes

1143

00:45:09,109 --> 00:45:07,030

hey guys i think that's a very dismal

1144

00:45:20,230 --> 00:45:09,119

thought i don't like it either

1145

00:45:23,589 --> 00:45:21,430

uh the representative of the lantern

1146

00:45:25,510 --> 00:45:23,599

court

1147

00:45:27,750 --> 00:45:25,520

hey guys i'm peter uh it's so cool to be

1148

00:45:29,349 --> 00:45:27,760

here and talk to you guys uh really

1149

00:45:31,829 --> 00:45:29,359

quick one to ask

1150

00:45:33,430 --> 00:45:31,839

buzz and mike what was a personal dream

1151

00:45:35,589 --> 00:45:33,440

that you guys had before going into

1152

00:45:38,150 --> 00:45:35,599

space how did that dream change when she

1153

00:45:39,670 --> 00:45:38,160

got into space and

1154

00:45:45,589 --> 00:45:39,680

what would you say to the kids of today

1155

00:46:23,589 --> 00:45:46,390

i

1156

00:46:25,589 --> 00:46:23,599

and then my dream after that was to do

1157

00:46:28,150 --> 00:46:25,599

it again because it's really it's really

1158

00:46:30,710 --> 00:46:28,160

amazing and and the inspiration or the

1159

00:46:32,230 --> 00:46:30,720

the message for the future explorers out

1160

00:46:33,589 --> 00:46:32,240

there and it doesn't matter what your

1161

00:46:35,990 --> 00:46:33,599

dream is maybe your dreams flying in

1162

00:46:38,069 --> 00:46:36,000

space it's not for everyone but it's

1163

00:46:39,670 --> 00:46:38,079

really cool but if you

1164

00:46:41,349 --> 00:46:39,680

but you know whatever your dream is

1165

00:46:44,069 --> 00:46:41,359

you've got to go for it we are in a

1166

00:46:46,309 --> 00:46:44,079

really awesome land and a time of

1167

00:46:48,390 --> 00:46:46,319

opportunity the there is the whole

1168

00:46:50,790 --> 00:46:48,400

brilliant future out for all of us and

1169

00:46:53,510 --> 00:46:50,800

we just need to work towards our dreams

1170

00:46:57,030 --> 00:46:53,520

and uh and and not be uh you know not

1171

00:46:59,349 --> 00:46:57,040

fall for the setbacks and and really uh

1172

00:47:00,710 --> 00:46:59,359

really go for them and they will it

1173

00:47:02,630 --> 00:47:00,720

takes a lot more hard work than walt

1174

00:47:03,829 --> 00:47:02,640

disney's wants to sell but it does

1175

00:47:05,510 --> 00:47:03,839

require a lot of hard work but your

1176

00:47:07,430 --> 00:47:05,520

dreams can come true i got to go fly in

1177

00:47:09,829 --> 00:47:07,440

space a couple times i got to be a lot

1178

00:47:11,430 --> 00:47:09,839

like buzz he's taller but

1179

00:47:13,270 --> 00:47:11,440

those those i mean those things can

1180

00:47:14,390 --> 00:47:13,280

happen and so don't sell yourself short

1181

00:47:21,030 --> 00:47:14,400

dream big

1182

00:47:24,710 --> 00:47:22,150

did you

1183

00:47:29,349 --> 00:47:24,720

realize if you if you go to mars you

1184

00:47:33,510 --> 00:47:30,950

uh yes from the from the rainbow dash in

1185

00:47:36,950 --> 00:47:34,309

hi

1186

00:47:38,870 --> 00:47:36,960

uh the microphone okay there we go you

1187

00:47:39,670 --> 00:47:38,880

can make it your own move whatever you

1188

00:47:42,230 --> 00:47:39,680

want

1189

00:47:44,870 --> 00:47:42,240

hi i'm natalie and first off

1190

00:47:45,990 --> 00:47:44,880

wow i cannot believe i'm in the presence

1191

00:47:48,950 --> 00:47:46,000

of

1192

00:47:53,670 --> 00:47:48,960

you guys that just makes me want to

1193

00:47:57,190 --> 00:47:55,430

that's what comic con is about right yes

1194

00:47:59,829 --> 00:47:57,200

that is i

1195

00:48:01,829 --> 00:47:59,839

i'm going to try not to freak out um my

1196

00:48:04,309 --> 00:48:01,839

question is to buzz aldrin

1197

00:48:07,190 --> 00:48:04,319

what was your first thought when you

1198

00:48:13,270 --> 00:48:07,200

first stepped on the moon

1199

00:48:16,870 --> 00:48:14,790

some of you may have heard this before

1200

00:48:19,349 --> 00:48:16,880

this way you're laughing

1201

00:48:20,870 --> 00:48:19,359

i could look down my window see and i

1202

00:48:23,910 --> 00:48:20,880

could see nails

1203

00:48:26,470 --> 00:48:23,920

kind of prancing around so

1204

00:48:28,150 --> 00:48:26,480

i knew the checklist really

1205

00:48:30,309 --> 00:48:28,160

didn't have to be

1206

00:48:32,790 --> 00:48:30,319

followed completely because it said when

1207

00:48:35,030 --> 00:48:32,800

you get down to the bottom of the ladder

1208

00:48:38,390 --> 00:48:35,040

that's after you jump back up to make

1209

00:48:40,549 --> 00:48:38,400

sure you can get to that bottom rung

1210

00:48:41,910 --> 00:48:40,559

then you said to hold on and check your

1211

00:48:45,030 --> 00:48:41,920

balance

1212

00:48:46,870 --> 00:48:45,040

i knew i didn't need to do that

1213

00:48:48,630 --> 00:48:46,880

but i had a sense

1214

00:48:51,510 --> 00:48:48,640

down in

1215

00:48:54,710 --> 00:48:51,520

the lower part of my torso

1216

00:48:57,030 --> 00:48:54,720

that maybe it was a time to

1217

00:49:00,870 --> 00:48:57,040

check the leakage of the

1218

00:49:00,880 --> 00:49:05,109

the urine collection device

1219

00:49:05,119 --> 00:49:10,630

some somebody has to have a first

1220

00:49:10,640 --> 00:49:19,910

thank you

1221

00:49:23,109 --> 00:49:21,030

we only have we only have a couple

1222

00:49:27,109 --> 00:49:23,119

minutes left okay hi my name is yvonne

1223

00:49:29,109 --> 00:49:27,119

and i'm here because my husband is

1224

00:49:31,190 --> 00:49:29,119

freaked out with buzz aldrin and he

1225

00:49:34,230 --> 00:49:31,200

couldn't come here because he will start

1226

00:49:36,710 --> 00:49:34,240

probably crying okay so he wants to know

1227

00:49:38,870 --> 00:49:36,720

if there was a shuttle right now that is

1228

00:49:40,790 --> 00:49:38,880

getting gassed up to go to mars will you

1229

00:49:46,790 --> 00:49:40,800

jump on it buzz as long as you could

1230

00:49:51,030 --> 00:49:47,990

would you go to mars if there was a for

1231

00:49:55,430 --> 00:49:51,040

sure a round trip i i i'm not an

1232

00:49:59,109 --> 00:49:56,270

no i

1233

00:50:01,750 --> 00:49:59,119

i really uh

1234

00:50:04,069 --> 00:50:01,760

i do think i do a better job here for

1235

00:50:06,710 --> 00:50:04,079

the future of our country staying right

1236

00:50:09,030 --> 00:50:06,720

where i am just using this and thinking

1237

00:50:14,549 --> 00:50:09,040

about guys going there and you do thank

1238

00:50:18,630 --> 00:50:16,870

are we waiting one more two more okay

1239

00:50:19,990 --> 00:50:18,640

two more two more you should decide

1240

00:50:21,910 --> 00:50:20,000

amongst yourselves who the last question

1241

00:50:28,069 --> 00:50:21,920

is

1242

00:50:29,270 --> 00:50:28,079

into imaginary superheroes i'm honored

1243

00:50:44,790 --> 00:50:29,280

to be here the first time we have real

1244

00:50:48,710 --> 00:50:47,270

my question is that oh go ahead

1245

00:50:50,230 --> 00:50:48,720

i'll go get the question if we got one

1246

00:50:52,230 --> 00:50:50,240

okay the question is we know that uh

1247

00:50:53,670 --> 00:50:52,240

nasa's working on a human-rated career

1248

00:50:55,349 --> 00:50:53,680

exploration vehicle

1249

00:50:58,069 --> 00:50:55,359

but we also know that due to political

1250

00:51:00,069 --> 00:50:58,079

situations russia has stopped u.s

1251
00:51:02,549 --> 00:51:00,079
access to the soyuz craft to get to the

1252
00:51:04,390 --> 00:51:02,559
space station in the future will nasa

1253
00:51:06,230 --> 00:51:04,400
have their human rated program

1254
00:51:08,950 --> 00:51:06,240
functioning and ready

1255
00:51:10,470 --> 00:51:08,960
by the time that occurs and what can the

1256
00:51:13,510 --> 00:51:10,480
people in this audience do to tell their

1257
00:51:14,870 --> 00:51:13,520
politicians that we want it to happen

1258
00:51:16,069 --> 00:51:14,880
from the from the politics side it's

1259
00:51:17,589 --> 00:51:16,079
less about

1260
00:51:19,270 --> 00:51:17,599
us i think because all of our

1261
00:51:21,430 --> 00:51:19,280
disagreements are

1262
00:51:23,109 --> 00:51:21,440
that's so complicated um and by all

1263
00:51:24,470 --> 00:51:23,119

accounts the soyuz is like getting into

1264

00:51:26,069 --> 00:51:24,480

a car accident with a truck by the way

1265

00:51:27,510 --> 00:51:26,079

from what i hear so the way it hits the

1266

00:51:29,430 --> 00:51:27,520

ground every every astronaut stepped out

1267

00:51:30,549 --> 00:51:29,440

of it just like ah

1268

00:51:32,309 --> 00:51:30,559

so but do you want to talk about that

1269

00:51:33,430 --> 00:51:32,319

what nasa is doing in the meantime real

1270

00:51:34,950 --> 00:51:33,440

quick

1271

00:51:37,430 --> 00:51:34,960

because we're running out of time but

1272

00:51:39,430 --> 00:51:37,440

but uh we have a great relationship with

1273

00:51:40,870 --> 00:51:39,440

russians in space in fact it's one of

1274

00:51:42,549 --> 00:51:40,880

the um

1275

00:51:43,750 --> 00:51:42,559

symbols of our two countries able to

1276

00:51:45,349 --> 00:51:43,760

work together and if we can work

1277

00:51:47,270 --> 00:51:45,359

together then you know then the rest of

1278

00:51:49,109 --> 00:51:47,280

the planet can work together so let's

1279

00:51:50,870 --> 00:51:49,119

you know we definitely keep that in mind

1280

00:51:53,030 --> 00:51:50,880

the russians are still letting us fly on

1281

00:51:55,670 --> 00:51:53,040

soyuz we're having another launch coming

1282

00:51:57,349 --> 00:51:55,680

up pretty soon and we're going to con

1283

00:51:58,710 --> 00:51:57,359

we're still planning on flying with them

1284

00:52:01,589 --> 00:51:58,720

we have the commercial crew program

1285

00:52:03,510 --> 00:52:01,599

that's going to get us in 2017 to

1286

00:52:05,589 --> 00:52:03,520

low earth orbit to the space station so

1287

00:52:07,670 --> 00:52:05,599

that's uh that's going to happen with uh

1288

00:52:09,589 --> 00:52:07,680

one or two or three of uh companies that

1289

00:52:12,630 --> 00:52:09,599

have been working on it and then we got

1290

00:52:14,710 --> 00:52:12,640

the crew exploration vehicle uh uh

1291

00:52:16,470 --> 00:52:14,720

orion right right orion's are really

1292

00:52:19,190 --> 00:52:16,480

awesome it's gonna take us beyond low

1293

00:52:22,150 --> 00:52:19,200

earth orbit to the moon

1294

00:52:23,829 --> 00:52:22,160

moon orbits lunar space as well as to

1295

00:52:25,670 --> 00:52:23,839

this asteroid that we talked about with

1296

00:52:27,589 --> 00:52:25,680

the asteroid redirect mission and

1297

00:52:29,750 --> 00:52:27,599

eventually the the orion is going to be

1298

00:52:31,030 --> 00:52:29,760

able to take us to mars so these things

1299

00:52:32,630 --> 00:52:31,040

are you know these are things are

1300

00:52:35,030 --> 00:52:32,640

happening they're happening now and it's

1301

00:52:36,390 --> 00:52:35,040

not theoretical it's real and it's a

1302

00:52:37,829 --> 00:52:36,400

real exciting that's actually a really

1303

00:52:40,069 --> 00:52:37,839

great point just speaking about the

1304

00:52:41,829 --> 00:52:40,079

international um cooperation of the

1305

00:52:44,069 --> 00:52:41,839

space station it really is the greatest

1306

00:52:45,990 --> 00:52:44,079

symbol of how well people from all

1307

00:52:47,270 --> 00:52:46,000

different places on this planet with all

1308

00:52:49,270 --> 00:52:47,280

different beliefs and philosophies can

1309

00:52:51,430 --> 00:52:49,280

work together to achieve a single goal

1310

00:52:53,030 --> 00:52:51,440

which is human you know

1311

00:52:55,670 --> 00:52:53,040

further exploration of space and human

1312

00:52:57,750 --> 00:52:55,680

preservation all right one more hi my

1313

00:52:58,950 --> 00:52:57,760

name is elizabeth and my question is i

1314

00:53:01,349 --> 00:52:58,960

know you guys have talked a lot about

1315

00:53:03,030 --> 00:53:01,359

mars and going back to lo going to low

1316

00:53:05,109 --> 00:53:03,040

earth orbit but are there any plans to

1317

00:53:07,829 --> 00:53:05,119

go back to the outer solar system and to

1318

00:53:09,510 --> 00:53:07,839

send more orbiting probes to uranus and

1319

00:53:11,589 --> 00:53:09,520

neptune

1320

00:53:12,829 --> 00:53:11,599

so like a voyager kind of thing

1321

00:53:14,710 --> 00:53:12,839

yeah

1322

00:53:17,829 --> 00:53:14,720

indeed now we have a spacecraft called

1323

00:53:20,069 --> 00:53:17,839

juno that's well on its way to jupiter

1324

00:53:22,230 --> 00:53:20,079

and in 2016 we're going to insert it in

1325

00:53:23,829 --> 00:53:22,240

orbit and we're going to see some

1326

00:53:26,150 --> 00:53:23,839

fabulous vistas from from that

1327

00:53:28,710 --> 00:53:26,160

spacecraft we have another spacecraft

1328

00:53:31,349 --> 00:53:28,720

called dawn that's using the first set

1329

00:53:33,589 --> 00:53:31,359

of ion engines for scientific purposes

1330

00:53:36,470 --> 00:53:33,599

making its way to a huge asteroid the

1331

00:53:38,150 --> 00:53:36,480

largest asteroid called ceres

1332

00:53:41,030 --> 00:53:38,160

and that will happen in

1333

00:53:43,430 --> 00:53:41,040

march of next year in july of next year

1334

00:53:45,349 --> 00:53:43,440

we're going to fly by the pluto system

1335

00:53:47,589 --> 00:53:45,359

and we're going to be able to see

1336

00:53:49,990 --> 00:53:47,599

what these outer regions of our solar

1337

00:53:51,430 --> 00:53:50,000

system look like now we have another set

1338

00:53:53,109 --> 00:53:51,440

of missions that are on the books that

1339

00:53:55,030 --> 00:53:53,119

we're working on we're talking about

1340

00:53:56,549 --> 00:53:55,040

going to europa and we would like to see

1341

00:53:58,790 --> 00:53:56,559

that happen

1342

00:54:03,750 --> 00:53:58,800

and so

1343

00:54:06,549 --> 00:54:04,710

that's me

1344

00:54:07,670 --> 00:54:06,559

is that for me okay

1345

00:54:08,950 --> 00:54:07,680

great great great good i've done this

1346

00:54:11,349 --> 00:54:08,960

right then okay guys this is the end of

1347

00:54:13,589 --> 00:54:11,359

it we have a special surprise for you uh

1348

00:54:16,069 --> 00:54:13,599

wife of apollo 12 pete conrad nancy

1349

00:54:24,390 --> 00:54:16,079

conrad is here

1350

00:54:27,990 --> 00:54:25,750

hi everybody

1351

00:54:30,870 --> 00:54:28,000

um as some of you may know i'm the chair

1352

00:54:33,589 --> 00:54:30,880

and founder of the conrad foundation and

1353

00:54:37,430 --> 00:54:33,599

we host a global competition for

1354

00:54:39,589 --> 00:54:37,440

students from the age of 13 to 25

1355

00:54:41,430 --> 00:54:39,599

and we invite you to create commercially

1356

00:54:43,510 --> 00:54:41,440

viable products

1357

00:54:45,829 --> 00:54:43,520

using stem science technology

1358

00:54:49,030 --> 00:54:45,839

engineering and math and we work in four

1359

00:54:51,430 --> 00:54:49,040

categories energy cyber

1360

00:54:53,990 --> 00:54:51,440

aerospace and health

1361

00:54:56,230 --> 00:54:54,000

and this year in partnership with nasa

1362

00:54:58,870 --> 00:54:56,240

this is so exciting

1363

00:55:01,910 --> 00:54:58,880

we are offering a special competition

1364

00:55:03,990 --> 00:55:01,920

called giant leap to mars

1365

00:55:06,150 --> 00:55:04,000

and the giant leap of course is the bow

1366

00:55:08,950 --> 00:55:06,160

to the 45th anniversary of our lunar

1367

00:55:10,549 --> 00:55:08,960

landings and as most of you know my late

1368

00:55:20,230 --> 00:55:10,559

husband was the third guy to walk on the

1369

00:55:25,349 --> 00:55:22,790

and his first words were whoopi that's a

1370

00:55:28,870 --> 00:55:25,359

whole other story go look it up

1371

00:55:30,710 --> 00:55:28,880

so part of giant leap to mars which is

1372

00:55:31,910 --> 00:55:30,720

just i'm so excited to share this with

1373

00:55:34,549 --> 00:55:31,920

you guys

1374

00:55:37,030 --> 00:55:34,559

is the word inspiration came up today

1375

00:55:39,430 --> 00:55:37,040

and we've been talking about mars so

1376

00:55:41,510 --> 00:55:39,440

we're going to invite you

1377

00:55:44,309 --> 00:55:41,520

to come into our competition just sign

1378

00:55:45,829 --> 00:55:44,319

up it's on conrad awards dot org it's

1379

00:55:49,510 --> 00:55:45,839

all on the internet

1380

00:55:53,670 --> 00:55:49,520

to create a comic book okay

1381

00:55:56,069 --> 00:55:53,680

i published one 20 years ago called

1382

00:55:58,390 --> 00:55:56,079

moonshot the flight of apollo 12 and i

1383

00:56:00,069 --> 00:55:58,400

dragged pete conrad here and he said

1384

00:56:02,470 --> 00:56:00,079

he'd come for a day and we were here for

1385

00:56:05,670 --> 00:56:02,480

five we had a blast

1386

00:56:07,589 --> 00:56:05,680

and so you guys are gonna have your own

1387

00:56:08,789 --> 00:56:07,599

moonshot you're gonna be able to write a

1388

00:56:11,430 --> 00:56:08,799

comic book

1389

00:56:13,589 --> 00:56:11,440

and create the art and the story and

1390

00:56:16,230 --> 00:56:13,599

talk about the technology and the human

1391

00:56:19,349 --> 00:56:16,240

factors that it would take to go to mars

1392

00:56:20,789 --> 00:56:19,359

you can also do that without writing a

1393

00:56:23,030 --> 00:56:20,799

comic book and just come into the

1394

00:56:23,990 --> 00:56:23,040

competition and address those issues as

1395

00:56:26,630 --> 00:56:24,000

well

1396

00:56:29,510 --> 00:56:26,640

in our standard spirit of innovation

1397

00:56:32,069 --> 00:56:29,520

challenges we are launching today so

1398

00:56:34,470 --> 00:56:32,079

don't miss this opportunity to be at

1399

00:56:44,150 --> 00:56:34,480

comic-con with your own comic book how

1400

00:56:47,589 --> 00:56:46,470

well guys we are on the wrap-up i just

1401

00:56:49,910 --> 00:56:47,599

want to say thank you so much for

1402

00:56:51,750 --> 00:56:49,920

everybody to for coming here and sharing

1403

00:57:05,589 --> 00:56:51,760

this with us if we could give a special

1404

00:57:05,599 --> 00:57:22,230

you down