



1
00:00:00,000 --> 00:00:16,800

l

2
00:00:22,170 --> 00:00:19,650

right now state separation and the curt

3
00:00:24,390 --> 00:00:22,180

all systems are go for entry descent

4
00:00:25,979 --> 00:00:24,400

landing we are currently six minutes

5
00:00:27,960 --> 00:00:25,989

from landing at the Gusev crater in the

6
00:00:29,609 --> 00:00:27,970

southern hemisphere mars literally and

7
00:00:31,740 --> 00:00:29,619

this is no overstatement the future the

8
00:00:33,660 --> 00:00:31,750

Mars program was a stake but perhaps a

9
00:00:36,840 --> 00:00:33,670

lot more was writing on the future with

10
00:00:40,470 --> 00:00:36,850

space science program at NASA and NASA's

11
00:00:43,610 --> 00:00:40,480

reputation itself the vehicle is now at

12
00:00:50,130 --> 00:00:46,770

everything that you've worked for for so

13
00:00:58,369 --> 00:00:50,140

many years is on the line expect a

14

00:01:03,450 --> 00:01:01,490

later temporary to the men detected

15

00:01:07,289 --> 00:01:03,460

spacecraft reporting that the radar is

16

00:01:11,160 --> 00:01:07,299

in Las expected retro rocket ignition on

17

00:01:20,330 --> 00:01:11,170

my mark mark waiting confirmations that

18

00:01:25,560 --> 00:01:23,039

think there were two almost simultaneous

19

00:01:29,099 --> 00:01:25,570

emotions one was relief the other was

20

00:01:31,380 --> 00:01:29,109

pride in the team I mean it what we do

21

00:01:34,050 --> 00:01:31,390

is truly a team effort to take so many

22

00:01:35,550 --> 00:01:34,060

people to make these missions work it

23

00:01:37,770 --> 00:01:35,560

looks easy when you see it on television

24

00:01:46,620 --> 00:01:37,780

the rover has landed face pedal down

25

00:01:49,999 --> 00:01:46,630

which means right side up it was a

26
00:01:52,919 --> 00:01:50,009
thrill beyond thrills not just actually

27
00:01:54,899 --> 00:01:52,929
witnessing what was taking place but to

28
00:01:59,249 --> 00:01:54,909
be able to experience that through the

29
00:02:02,249 --> 00:01:59,259
eyes of these amazing individuals when

30
00:02:05,039 --> 00:02:02,259
those first pictures came back everyone

31
00:02:07,469 --> 00:02:05,049
was so overwhelmed and they were so much

32
00:02:10,280 --> 00:02:07,479
earlier than had been anticipated even

33
00:02:13,590 --> 00:02:10,290
during difficult times here at JPL

34
00:02:16,380 --> 00:02:13,600
always a sense of optimism and I go back

35
00:02:18,690 --> 00:02:16,390
to that great line that if you don't

36
00:02:24,059 --> 00:02:18,700
take risks you're not going to learn

37
00:02:25,920 --> 00:02:24,069
anything and a good evening from a

38
00:02:27,509 --> 00:02:25,930

flight second opportunity this time we

39

00:02:30,210 --> 00:02:27,519

are approximately five minutes 53

40

00:02:32,580 --> 00:02:30,220

seconds from letting at the murti any

41

00:02:33,630 --> 00:02:32,590

planes near the equator Mars for

42

00:02:37,140 --> 00:02:33,640

velocity is remote

43

00:02:44,190 --> 00:02:37,150

193 miles per hour Nerra shoot deploy

44

00:02:47,340 --> 00:02:44,200

has been detected for an altitude 5,000

45

00:02:49,410 --> 00:02:47,350

feet 160 miles per hour winter solution

46

00:03:07,410 --> 00:02:49,420

matrix 21 trust rocket ignition on my

47

00:03:12,400 --> 00:03:09,730

on my return buddy

48

00:03:15,430 --> 00:03:12,410

Governor Schwarzenegger was there Vice

49

00:03:18,460 --> 00:03:15,440

President Gore was there wanly with

50

00:03:22,150 --> 00:03:18,470

representatives John Culbertson and Adam

51
00:03:24,840 --> 00:03:22,160
Schiff what was I think really most fun

52
00:03:28,990 --> 00:03:24,850
for for the non-scientists in the room

53
00:03:31,480 --> 00:03:29,000
was just watching the faces of the

54
00:03:35,020 --> 00:03:31,490
people that had devoted the last several

55
00:03:37,840 --> 00:03:35,030
years of their life to this and seeing

56
00:03:40,840 --> 00:03:37,850
their enjoyment and their excitement and

57
00:03:43,570 --> 00:03:40,850
here you have these normally fairly

58
00:03:50,650 --> 00:03:43,580
stoic scientific types not given to

59
00:03:55,610 --> 00:03:53,510
not only did we begin a new chapter in

60
00:03:58,040 --> 00:03:55,620
our understanding in Mars and a new way

61
00:04:01,340 --> 00:03:58,050
to explore planetary surfaces with with

62
00:04:03,500 --> 00:04:01,350
Rovers so we also help to stimulate the

63
00:04:07,220 --> 00:04:03,510

space program in other direction holy

64

00:04:09,680 --> 00:04:07,230

smokes when our children and

65

00:04:12,020 --> 00:04:09,690

grandchildren bring home that science

66

00:04:16,280 --> 00:04:12,030

book where it says you know there is

67

00:04:20,080 --> 00:04:16,290

evidence of liquid water on Mars to know

68

00:04:24,830 --> 00:04:20,090

that you helped build and operate and

69

00:04:30,510 --> 00:04:24,840

direct the rover to that spot yeah that

70

00:04:34,350 --> 00:04:32,760

but even beyond the science the success

71

00:04:37,140 --> 00:04:34,360

of the Mars rovers does something for

72

00:04:39,749 --> 00:04:37,150

the American spirit perhaps the most

73

00:04:41,610 --> 00:04:39,759

important thing is the Mars rovers have

74

00:04:43,860 --> 00:04:41,620

a life of their own not just

75

00:04:45,659 --> 00:04:43,870

scientifically in terms of school kids

76
00:04:48,749 --> 00:04:45,669
of the country with the American people

77
00:04:51,149 --> 00:04:48,759
if not the world we can do something

78
00:05:08,040 --> 00:04:51,159
that nobody else on earth is that we've

79
00:05:13,540 --> 00:05:11,620
hard to believe five years I don't know

80
00:05:15,250 --> 00:05:13,550
how many time I took my car to repair

81
00:05:17,140 --> 00:05:15,260
over the last five years and here we

82
00:05:19,870 --> 00:05:17,150
have these Rovers still working but

83
00:05:22,300 --> 00:05:19,880
first good afternoon and I want to say a

84
00:05:24,730 --> 00:05:22,310
few words about the rover's or the Mars

85
00:05:27,640 --> 00:05:24,740
rover by not talking very much about

86
00:05:30,190 --> 00:05:27,650
them and what I want to do is to put in

87
00:05:33,550 --> 00:05:30,200
perspective how do they fit in our whole

88
00:05:35,620 --> 00:05:33,560

picture of Mars exploration you may not

89

00:05:37,650 --> 00:05:35,630

remember because many of you are

90

00:05:40,600 --> 00:05:37,660

relatively young that we started

91

00:05:42,250 --> 00:05:40,610

attempts to explore Mars 44 years ago

92

00:05:45,190 --> 00:05:42,260

there might be a couple of you who were

93

00:05:48,520 --> 00:05:45,200

here at that time and that first attempt

94

00:05:50,500 --> 00:05:48,530

was with Mariner 3 and some of you

95

00:05:52,840 --> 00:05:50,510

remember that Meredith 3 did not work

96

00:05:55,300 --> 00:05:52,850

you know at launch we had an issue with

97

00:05:57,040 --> 00:05:55,310

was a shield you know on the top of the

98

00:05:59,380 --> 00:05:57,050

rocket and it went down into the ocean

99

00:06:01,000 --> 00:05:59,390

but fortunately we had Mariner 4 which

100

00:06:03,280 --> 00:06:01,010

was launched very shortly after that I

101
00:06:06,790 --> 00:06:03,290
mean few weeks after that and that gave

102
00:06:09,040 --> 00:06:06,800
us our first look at Mars you know six

103
00:06:10,960 --> 00:06:09,050
months later and it looked like the moon

104
00:06:13,150 --> 00:06:10,970
it looked like very there is nothing

105
00:06:15,550 --> 00:06:13,160
exciting about it it was just craters

106
00:06:18,490 --> 00:06:15,560
and so on and it's amazing you look at

107
00:06:21,370 --> 00:06:18,500
it now after we flew the vicus re first

108
00:06:24,100 --> 00:06:21,380
of a series of mariners Mariner 3 4 6 &

109
00:06:27,240 --> 00:06:24,110
7 the Viking Mars Observer Global

110
00:06:30,280 --> 00:06:27,250
Surveyor Pathfinder mars climate orbiter

111
00:06:32,530 --> 00:06:30,290
polar lander which did not you know work

112
00:06:34,630 --> 00:06:32,540
deep space to odyssey mars

113
00:06:36,310 --> 00:06:34,640

reconnaissance orbiter and spirit and

114

00:06:38,590 --> 00:06:36,320

opportunity now and we have a completely

115

00:06:40,690 --> 00:06:38,600

different picture of what Mars look like

116

00:06:44,190 --> 00:06:40,700

it's a very live planet in geologic

117

00:06:47,470 --> 00:06:44,200

terms we had our good days and bad days

118

00:06:49,510 --> 00:06:47,480

from the bad days we learned a lot they

119

00:06:51,640 --> 00:06:49,520

were heartbreaking experiences but we

120

00:06:53,380 --> 00:06:51,650

learned from them and here we have our

121

00:06:55,420 --> 00:06:53,390

nation has these two Rovers on Mars

122

00:06:57,490 --> 00:06:55,430

which have been operating for five years

123

00:07:00,390 --> 00:06:57,500

in addition to the two orbiters and

124

00:07:04,210 --> 00:07:00,400

Phoenix which did this job over the last

125

00:07:07,510 --> 00:07:04,220

six months well what's in my mind what's

126

00:07:09,880 --> 00:07:07,520

exciting that in this machine all of you

127

00:07:13,590 --> 00:07:09,890

you have poured basically your hard work

128

00:07:16,780 --> 00:07:13,600

your emotion your love into them and

129

00:07:18,430 --> 00:07:16,790

basically put your hopes and dreams and

130

00:07:20,140 --> 00:07:18,440

that's what we are seeing all that

131

00:07:21,640 --> 00:07:20,150

advances that have occurred as

132

00:07:22,990 --> 00:07:21,650

the result of that they effectively they

133

00:07:26,350 --> 00:07:23,000

are really extension of us their

134

00:07:29,110 --> 00:07:26,360

extension of each and every one of us if

135

00:07:31,480 --> 00:07:29,120

anything marks differently these Rovers

136

00:07:33,700 --> 00:07:31,490

on other thing it's a perspectives they

137

00:07:36,490 --> 00:07:33,710

provide I mean we have spacecraft which

138

00:07:38,470 --> 00:07:36,500

are in orbit around different planets

139

00:07:40,660 --> 00:07:38,480

and we get very exciting images but in

140

00:07:42,910 --> 00:07:40,670

these Rovers because they have two eyes

141

00:07:45,400 --> 00:07:42,920

like our eyes and they move around like

142

00:07:47,650 --> 00:07:45,410

we move basically every day they give us

143

00:07:50,200 --> 00:07:47,660

a new perspective of what's on another

144

00:07:54,190 --> 00:07:50,210

planet as if we were you know walking

145

00:07:56,590 --> 00:07:54,200

you know on that planet now I have no

146

00:07:59,860 --> 00:07:56,600

idea how much they they they will be

147

00:08:02,260 --> 00:07:59,870

with us but in a sense they will be with

148

00:08:04,870 --> 00:08:02,270

us forever because we really have lived

149

00:08:06,580 --> 00:08:04,880

through the development through the

150

00:08:08,530 --> 00:08:06,590

operations for the excitement of these

151

00:08:11,380 --> 00:08:08,540

Rovers and in a sense they became

152

00:08:14,850 --> 00:08:11,390

American icons they represent some of

153

00:08:18,340 --> 00:08:14,860

the best American values being curious

154

00:08:20,230 --> 00:08:18,350

borderie reaching to new frontiers doing

155

00:08:22,480 --> 00:08:20,240

hard things like Kennedy would say and

156

00:08:25,000 --> 00:08:22,490

doing mighty things like Teddy Roosevelt

157

00:08:26,860 --> 00:08:25,010

you know would say so that's what all of

158

00:08:29,310 --> 00:08:26,870

you as a team and these Rovers as an

159

00:08:32,020 --> 00:08:29,320

extension of us you know have been doing

160

00:08:33,820 --> 00:08:32,030

there is not a single day that I don't

161

00:08:36,100 --> 00:08:33,830

think about them there is not a single

162

00:08:37,990 --> 00:08:36,110

day that I don't think about all of you

163

00:08:39,430 --> 00:08:38,000

there is not a single days that I don't

164

00:08:43,180 --> 00:08:39,440

think about those six minutes of Terror

165

00:08:44,770 --> 00:08:43,190

which happened twice and every time I

166

00:08:46,690 --> 00:08:44,780

see this video and i can tell you or

167

00:08:48,490 --> 00:08:46,700

these videos and I show them almost on

168

00:08:50,860 --> 00:08:48,500

the average twice a week and talks that

169

00:08:52,540 --> 00:08:50,870

I have every time I look at them even

170

00:08:54,580 --> 00:08:52,550

after five years the last one being a

171

00:08:57,280 --> 00:08:54,590

couple of weeks ago you know my heart

172

00:08:59,440 --> 00:08:57,290

beats pizza in almost tears come to my

173

00:09:01,480 --> 00:08:59,450

eye I mean Adam uncontrollable you know

174

00:09:03,460 --> 00:09:01,490

to see the excitement and and what

175

00:09:05,470 --> 00:09:03,470

people did and the emotion which came

176

00:09:07,900 --> 00:09:05,480

you know with all the teams that have

177

00:09:10,300 --> 00:09:07,910

done that so I want to congratulate each

178

00:09:12,250 --> 00:09:10,310

and every one of you everybody who

179

00:09:14,470 --> 00:09:12,260

participated in this all the way from

180

00:09:16,780 --> 00:09:14,480

Miles O'Brien who was our reporter to

181

00:09:19,780 --> 00:09:16,790

the scientist who worked with us to the

182

00:09:22,210 --> 00:09:19,790

local official to the national officials

183

00:09:24,640 --> 00:09:22,220

everybody was part of our team and I

184

00:09:25,990 --> 00:09:24,650

think we all can take a great pride you

185

00:09:28,240 --> 00:09:26,000

know in what has happened over the last

186

00:09:29,650 --> 00:09:28,250

five years and hopefully we'll be taking

187

00:09:31,300 --> 00:09:29,660

pride about what would be happening over

188

00:09:33,160 --> 00:09:31,310

the next you know four or five years

189

00:09:33,790 --> 00:09:33,170

both on these Rovers as well as other

190

00:09:36,280 --> 00:09:33,800

activity

191

00:09:37,990 --> 00:09:36,290

that who are doing now before I step

192

00:09:40,269 --> 00:09:38,000

down and introduce John callous I want

193

00:09:42,759 --> 00:09:40,279

to recognize a number of officials that

194

00:09:44,889 --> 00:09:42,769

are here and either they are here or

195

00:09:46,750 --> 00:09:44,899

they will be coming shortly first I want

196

00:09:49,000 --> 00:09:46,760

to start with supervisor Mike on tone of

197

00:09:53,710 --> 00:09:49,010

it as iam sitting there who represent

198

00:09:55,990 --> 00:09:53,720

the JPL the Los Angeles you know a los

199

00:09:59,590 --> 00:09:56,000

angeles board of supervisors we have a

200

00:10:05,079 --> 00:09:59,600

mere stephen del curso here is the mayor

201
00:10:07,120 --> 00:10:05,089
of the city of luck and yada I don't see

202
00:10:09,280 --> 00:10:07,130
bill bogaard all that bill just came

203
00:10:15,100 --> 00:10:09,290
sure so this is Mayor Bill Bogart of the

204
00:10:16,750 --> 00:10:15,110
City of Pasadena and I always say we are

205
00:10:19,000 --> 00:10:16,760
so important that we are part of two

206
00:10:21,280 --> 00:10:19,010
cities here not many places can can

207
00:10:23,800 --> 00:10:21,290
claim that we have representing

208
00:10:29,199 --> 00:10:23,810
congressman david dreier marc marquez

209
00:10:31,000 --> 00:10:29,209
harmsen is here and representing

210
00:10:36,759 --> 00:10:31,010
congressman Adam Schiff is Yvonne sue

211
00:10:38,800 --> 00:10:36,769
Yvonne is here also we are so important

212
00:10:40,720 --> 00:10:38,810
to have two congressmen who represent us

213
00:10:44,079 --> 00:10:40,730

and also have representing Senator Carl

214

00:10:48,850 --> 00:10:44,089

you stallin mango glue the lien is here

215

00:10:51,280 --> 00:10:48,860

thank you for coming and representing

216

00:10:56,580 --> 00:10:51,290

assemblyman on and tawny port on Tino is

217

00:11:00,570 --> 00:10:58,650

so again I want to thank all of you for

218

00:11:03,240 --> 00:11:00,580

coming we need to take a great pride of

219

00:11:05,190 --> 00:11:03,250

being part of the community that that is

220

00:11:07,590 --> 00:11:05,200

here and with this now I want to

221

00:11:09,270 --> 00:11:07,600

introduce a present project manager who

222

00:11:11,550 --> 00:11:09,280

is really making sure that the reader

223

00:11:20,910 --> 00:11:11,560

offers are our roving all over the place

224

00:11:28,060 --> 00:11:25,740

thank you very much good afternoon Wow

225

00:11:30,670 --> 00:11:28,070

shortly after i became project manager

226

00:11:32,290 --> 00:11:30,680

about two and a half years ago i was

227

00:11:33,940 --> 00:11:32,300

standing in the lunch line with Pete I

228

00:11:36,520 --> 00:11:33,950

senior and Pete was asking me how it was

229

00:11:38,830 --> 00:11:36,530

going and I said that it was going

230

00:11:40,990 --> 00:11:38,840

phenomenal was outstanding and there was

231

00:11:42,280 --> 00:11:41,000

another Rover developer who was also in

232

00:11:44,440 --> 00:11:42,290

the lunch line her turned around and

233

00:11:47,920 --> 00:11:44,450

said yeah it's easy when someone hands

234

00:11:51,790 --> 00:11:47,930

you something that works and that that

235

00:11:54,940 --> 00:11:51,800

is so true these Rovers are phenomenal

236

00:11:57,220 --> 00:11:54,950

there are magnificent machines and the

237

00:11:59,050 --> 00:11:57,230

people the teams that operate these

238

00:12:02,020 --> 00:11:59,060

Rovers and keep them going every day are

239

00:12:04,180 --> 00:12:02,030

phenomenal so my job is indeed an easy

240

00:12:06,100 --> 00:12:04,190

one you know we've all been talking

241

00:12:08,770 --> 00:12:06,110

about Wow who would have thought they

242

00:12:12,010 --> 00:12:08,780

would lasted five years for me actually

243

00:12:13,840 --> 00:12:12,020

the question is really who would have

244

00:12:16,420 --> 00:12:13,850

thought the adventure would have been

245

00:12:18,910 --> 00:12:16,430

this great I mean it is really a

246

00:12:20,890 --> 00:12:18,920

phenomenal accomplishment and yet

247

00:12:23,170 --> 00:12:20,900

there's more to come you know we've

248

00:12:26,650 --> 00:12:23,180

climbed mountains we've descended into

249

00:12:29,200 --> 00:12:26,660

deep craters we've survived three

250

00:12:33,010 --> 00:12:29,210

Martian winters we've survived two Rover

251

00:12:35,230 --> 00:12:33,020

killing dust storms and you know it's

252

00:12:37,480 --> 00:12:35,240

amazing just the discoveries that have

253

00:12:40,180 --> 00:12:37,490

you know reshaped our understanding of

254

00:12:42,340 --> 00:12:40,190

this alien world you know all of you

255

00:12:44,920 --> 00:12:42,350

have been a great part of this whole

256

00:12:47,050 --> 00:12:44,930

undertaking and all of you must take

257

00:12:50,190 --> 00:12:47,060

credit for this fine accomplishment so

258

00:12:57,050 --> 00:12:50,200

please give yourself a hand at this time

259

00:13:01,680 --> 00:13:00,270

now of course thousands of thousands of

260

00:13:03,900 --> 00:13:01,690

people have contributed to this mission

261

00:13:05,910 --> 00:13:03,910

and it would be impossible to recognize

262

00:13:08,970 --> 00:13:05,920

everyone but I would like to acknowledge

263

00:13:11,310 --> 00:13:08,980

just a few people here today I'd like to

264

00:13:13,650 --> 00:13:11,320

ask the previous project managers Pete I

265

00:13:15,030 --> 00:13:13,660

senior Richard Cook and Jim Erickson to

266

00:13:26,490 --> 00:13:15,040

stand and be acknowledged please

267

00:13:32,680 --> 00:13:29,620

also we wouldn't be here celebrating if

268

00:13:34,660 --> 00:13:32,690

it wasn't for our sister missions Mars

269

00:13:36,790 --> 00:13:34,670

Odyssey for consistently and reliably

270

00:13:38,499 --> 00:13:36,800

returning over ninety seven percent of

271

00:13:41,800 --> 00:13:38,509

our data and the Mars Reconnaissance

272

00:13:43,300 --> 00:13:41,810

Orbiter like a guardian angel keeping a

273

00:13:45,160 --> 00:13:43,310

watchful eye on our two intrepid

274

00:13:51,930 --> 00:13:45,170

explorers Phil varghese Jim Erickson

275

00:13:58,600 --> 00:13:56,949

thank you very much and join me in

276

00:14:00,819 --> 00:13:58,610

acknowledging the to Mars program

277

00:14:02,199 --> 00:14:00,829

managers that husband this project

278

00:14:04,629 --> 00:14:02,209

during the development phase and through

279

00:14:06,579 --> 00:14:04,639

the numerous extended missions Bruce

280

00:14:13,550 --> 00:14:06,589

naderi fuke Lee please stand and be

281

00:14:36,740 --> 00:14:16,890

thank you all very much now join me in

282

00:14:41,250 --> 00:14:38,880

this experience of spirit is something

283

00:14:42,750 --> 00:14:41,260

that I've really kind of integrated into

284

00:14:44,460 --> 00:14:42,760

my whole identity you know this has

285

00:14:45,750 --> 00:14:44,470

become part of what I do and it looked

286

00:14:47,310 --> 00:14:45,760

at the very beginning of the mission

287

00:14:49,290 --> 00:14:47,320

like this was going to be something that

288

00:14:51,540 --> 00:14:49,300

I got to do for very brief time for

289

00:14:53,160 --> 00:14:51,550

three months and that was terrific and

290

00:14:55,470 --> 00:14:53,170

it was unique and special I was really

291

00:14:56,760 --> 00:14:55,480

looking forward to it and I never in my

292

00:14:59,640 --> 00:14:56,770

wildest imagination believed it was

293

00:15:01,650 --> 00:14:59,650

going to go on for five years spirit

294

00:15:04,230 --> 00:15:01,660

really has had to have a lot of spirit

295

00:15:06,000 --> 00:15:04,240

to to keep going it's been the little

296

00:15:07,590 --> 00:15:06,010

Rover that could in a way it's had to

297

00:15:11,460 --> 00:15:07,600

work very hard for all of its

298

00:15:14,550 --> 00:15:11,470

discoveries shortly after spirit landed

299

00:15:16,770 --> 00:15:14,560

we had a problem we lost contact with

300

00:15:19,680 --> 00:15:16,780

the rover for a couple of days this was

301

00:15:21,390 --> 00:15:19,690

a particularly scary time because not

302

00:15:23,130 --> 00:15:21,400

only had we lost contact with one of the

303

00:15:24,320 --> 00:15:23,140

Rovers and we didn't know why we had

304

00:15:26,580 --> 00:15:24,330

another Rover coming in for a landing

305

00:15:27,960 --> 00:15:26,590

hardener heels and we didn't know if

306

00:15:29,970 --> 00:15:27,970

whatever it happened in the first Rover

307

00:15:32,610 --> 00:15:29,980

was going to happen to the second one it

308

00:15:35,400 --> 00:15:32,620

turned out that we were able to regain

309

00:15:37,140 --> 00:15:35,410

control of spirit she had filled up her

310

00:15:38,970 --> 00:15:37,150

own memory system or the equivalent of

311

00:15:40,770 --> 00:15:38,980

her hard disk and she couldn't boot up

312

00:15:42,750 --> 00:15:40,780

and she started booting up and said oh

313

00:15:45,210 --> 00:15:42,760

look my hard disk is full I can't boot

314

00:15:46,470 --> 00:15:45,220

up let me try rebooting and so she was

315

00:15:49,200 --> 00:15:46,480

basically just sitting there on Mars

316

00:15:50,550 --> 00:15:49,210

punching her own reboot button until we

317

00:15:51,840 --> 00:15:50,560

finally came along and figured out what

318

00:15:55,770 --> 00:15:51,850

was going on were able to get her to

319

00:15:58,350 --> 00:15:55,780

stop one of spirits very dramatic

320

00:16:00,690 --> 00:15:58,360

challenges was when she was racing the

321

00:16:02,010 --> 00:16:00,700

clock for her first trying to get to her

322

00:16:03,270 --> 00:16:02,020

first winter haven to try to get to a

323

00:16:04,560 --> 00:16:03,280

hill where she could point her solar

324

00:16:06,840 --> 00:16:04,570

panels directly toward the Sun he

325

00:16:08,460 --> 00:16:06,850

survived for the winter and she was

326

00:16:10,650 --> 00:16:08,470

already behind a little bit behind

327

00:16:13,500 --> 00:16:10,660

schedule and she was racing across these

328

00:16:16,230 --> 00:16:13,510

Plains toward the hill and as she was on

329

00:16:17,610 --> 00:16:16,240

her way her right front wheel which have

330

00:16:21,340 --> 00:16:17,620

been giving us some trouble finally

331

00:16:23,620 --> 00:16:21,350

stopped working and so now instead of

332

00:16:25,660 --> 00:16:23,630

a six-wheeled rover we had it over with

333

00:16:27,070 --> 00:16:25,670

five wheels and an anchor it ended up

334

00:16:28,510 --> 00:16:27,080

having to drive backwards because it's a

335

00:16:31,360 --> 00:16:28,520

lot easier to pull an anchor than to

336

00:16:33,580 --> 00:16:31,370

push one but naturally since its it's

337

00:16:35,410 --> 00:16:33,590

built to have very good traction it

338

00:16:37,870 --> 00:16:35,420

basically is digging into the ground and

339

00:16:40,450 --> 00:16:37,880

digging this trench behind us and as we

340

00:16:42,220 --> 00:16:40,460

dig this trench we're able to see things

341

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

that are normally invisible things that

342

00:16:46,480 --> 00:16:44,240

are under the surface one thing that we

343

00:16:49,840 --> 00:16:46,490

seem to be finding almost anywhere we're

344

00:16:52,360 --> 00:16:49,850

digging this trench are these widespread

345

00:16:54,310 --> 00:16:52,370

deposits of various kinds of salts and

346

00:16:57,130 --> 00:16:54,320

minerals they look this brilliant white

347

00:16:59,050 --> 00:16:57,140

or yellow and the color images and

348

00:17:02,800 --> 00:16:59,060

that's because they're either sulphur or

349

00:17:04,090 --> 00:17:02,810

silica or salts of various kinds and the

350

00:17:07,150 --> 00:17:04,100

really important thing about these

351

00:17:10,300 --> 00:17:07,160

minerals and salts in particular is it's

352

00:17:11,800 --> 00:17:10,310

the only way they form is with water so

353

00:17:14,560 --> 00:17:11,810

that the fact that we're finding these

354

00:17:18,370 --> 00:17:14,570

salt is real evidence that there was hot

355

00:17:20,440 --> 00:17:18,380

water over a very widespread area where

356

00:17:22,660 --> 00:17:20,450

spirit is exploring right now not just a

357

00:17:24,070 --> 00:17:22,670

little isolated pockets Mars really

358

00:17:26,620 --> 00:17:24,080

could have been a place that supported

359

00:17:29,380 --> 00:17:26,630

life and without these Rovers driving

360

00:17:31,450 --> 00:17:29,390

over these vast distances far beyond

361

00:17:34,180 --> 00:17:31,460

their expectations we would never have

362

00:17:35,920 --> 00:17:34,190

known that even on Mars life can give

363

00:17:38,800 --> 00:17:35,930

you lemons but you make lemonade out of

364

00:17:40,690 --> 00:17:38,810

that in spirits case you know she turned

365

00:17:44,020 --> 00:17:40,700

dragon that right front wheel into a

366

00:17:46,210 --> 00:17:44,030

great scientific discovery winter is a

367

00:17:48,670 --> 00:17:46,220

harsher time for spirit she's up on the

368

00:17:50,320 --> 00:17:48,680

top of home plate and we were scooting

369

00:17:51,760 --> 00:17:50,330

across the top of home plate as fast as

370

00:17:53,200 --> 00:17:51,770

we could toward the north face so we

371

00:17:55,540 --> 00:17:53,210

could tilt our solar panels as directly

372

00:17:56,800 --> 00:17:55,550

as possible toward the Sun and as we

373

00:18:00,820 --> 00:17:56,810

were doing that she went over a little

374

00:18:03,310 --> 00:18:00,830

rise and down into a pit which we now

375

00:18:06,430 --> 00:18:03,320

call Tartarus in this case not only was

376

00:18:07,960 --> 00:18:06,440

she figuratively on the edge she was

377

00:18:10,060 --> 00:18:07,970

also literally on the edge because the

378

00:18:11,770 --> 00:18:10,070

only way to escape from that pit was to

379

00:18:13,210 --> 00:18:11,780

drive right up along the edge of home

380

00:18:15,490 --> 00:18:13,220

plate with absolutely no margin for

381

00:18:18,520 --> 00:18:15,500

error whatsoever and kind of drive up

382

00:18:20,230 --> 00:18:18,530

and around this feature and then off to

383

00:18:22,790 --> 00:18:20,240

where she was trying to get to and where

384

00:18:24,630 --> 00:18:22,800

she could be safe for the winter

385

00:18:27,050 --> 00:18:24,640

certainly the the biggest thing that

386

00:18:30,200 --> 00:18:27,060

stands out and spirits whole mission is

387

00:18:32,520 --> 00:18:30,210

her view from the top of husband Hill

388

00:18:34,470 --> 00:18:32,530

this little rover that wasn't ever

389

00:18:36,960 --> 00:18:34,480

really designed to climb over anything

390

00:18:39,000 --> 00:18:36,970

bigger than her own wheels had now

391

00:18:41,400 --> 00:18:39,010

climbed a hill the height of the Statue

392

00:18:43,680 --> 00:18:41,410

of Liberty and was standing there at the

393

00:18:46,140 --> 00:18:43,690

top of that hill and took this beautiful

394

00:18:48,660 --> 00:18:46,150

360 degree panorama and just saw the

395

00:18:52,470 --> 00:18:48,670

most beautiful striking hilly landscape

396

00:18:55,470 --> 00:18:52,480

with this spectacular orange sky and the

397

00:18:58,410 --> 00:18:55,480

beautiful rust colored ground and it

398

00:19:00,210 --> 00:18:58,420

just sort of put the whole project in

399

00:19:02,130 --> 00:19:00,220

perspective for me this was what we were

400

00:19:04,770 --> 00:19:02,140

there for to explore and go out and see

401
00:19:07,920 --> 00:19:04,780
new places that have never been seen by

402
00:19:10,110 --> 00:19:07,930
human eyes Mars is pretty harsh place

403
00:19:13,230 --> 00:19:10,120
we've had dust storms before we have

404
00:19:16,920 --> 00:19:13,240
really low power situations in winter

405
00:19:20,160 --> 00:19:16,930
we've had other small glitches that have

406
00:19:22,110 --> 00:19:20,170
caused us some tense moments but spirit

407
00:19:25,620 --> 00:19:22,120
seems to always find a way of turning

408
00:19:29,790 --> 00:19:25,630
some kind of adversity into something

409
00:19:31,830 --> 00:19:29,800
positive it was only by outlasting her

410
00:19:34,200 --> 00:19:31,840
design specifications and never giving

411
00:19:36,800 --> 00:19:34,210
up and absolutely never you know letting

412
00:19:56,640 --> 00:19:36,810
Mars get her down that she ended up

413
00:20:02,440 --> 00:19:59,560

it is now my distinct pleasure to

414

00:20:04,840 --> 00:20:02,450

introduce the principal investigator for

415

00:20:15,830 --> 00:20:04,850

the Mars exploration Rovers dr. Steve

416

00:20:22,139 --> 00:20:18,240

this thing hasn't turned out anything

417

00:20:24,570 --> 00:20:22,149

like the way I expected it to when we

418

00:20:27,659 --> 00:20:24,580

first proposed what eventually became a

419

00:20:31,230 --> 00:20:27,669

miar to NASA it really was nothing like

420

00:20:33,299 --> 00:20:31,240

what this mission has become we all

421

00:20:35,009 --> 00:20:33,309

remember the pictures of the Viking

422

00:20:38,159 --> 00:20:35,019

landing sites and the Pathfinder

423

00:20:40,470 --> 00:20:38,169

lighting sites these flat planes strewn

424

00:20:41,669 --> 00:20:40,480

with boulders the boulders all kind of

425

00:20:42,720 --> 00:20:41,679

looked alike but you hope that maybe

426

00:20:45,360 --> 00:20:42,730

they were different from one another

427

00:20:48,450 --> 00:20:45,370

somehow and the idea was really very

428

00:20:51,180 --> 00:20:48,460

simple to take a set of fairly

429

00:20:53,369 --> 00:20:51,190

straightforward geological tools put

430

00:20:55,860 --> 00:20:53,379

them on a vehicle get them to one of

431

00:20:59,399 --> 00:20:55,870

those places and give them a few months

432

00:21:01,560 --> 00:20:59,409

to drive around from one Boulder to

433

00:21:04,799 --> 00:21:01,570

another see if there's some diversity

434

00:21:07,470 --> 00:21:04,809

there and try to piece together what the

435

00:21:08,999 --> 00:21:07,480

place might once have been like and do

436

00:21:11,820 --> 00:21:09,009

this for about three months or so and

437

00:21:14,730 --> 00:21:11,830

you've done a darn good geologic

438

00:21:17,580 --> 00:21:14,740

experiment it wasn't the rover mission

439

00:21:19,919 --> 00:21:17,590

of my dreams but it would have been good

440

00:21:24,180 --> 00:21:19,929

and I was proud to have been associated

441

00:21:27,090 --> 00:21:24,190

with it what we've gotten has been so

442

00:21:29,899 --> 00:21:27,100

much beyond the rover mission of my

443

00:21:33,389 --> 00:21:29,909

dreams I still I still can't believe

444

00:21:34,950 --> 00:21:33,399

what's happening I mean you know the

445

00:21:38,190 --> 00:21:34,960

story we've been there for five years

446

00:21:40,590 --> 00:21:38,200

we've driven 20 20 kilometers climbed

447

00:21:43,230 --> 00:21:40,600

the mountains gone into the craters it

448

00:21:44,990 --> 00:21:43,240

has been in the literal sense of the

449

00:21:46,799 --> 00:21:45,000

phrase the adventure of a lifetime

450

00:21:50,639 --> 00:21:46,809

remember when we got to the summit a

451
00:21:52,019 --> 00:21:50,649
husband he'll that view from the top you

452
00:21:53,999 --> 00:21:52,029
remember when we put remember the first

453
00:21:57,419 --> 00:21:54,009
day that we pulled up to the rim of

454
00:21:59,820 --> 00:21:57,429
endurance crater it was like pulling up

455
00:22:02,610 --> 00:21:59,830
to the edge of the Grand Canyon it was

456
00:22:04,460 --> 00:22:02,620
just phenomenal and you know I've

457
00:22:06,960 --> 00:22:04,470
thought a lot about why did this happen

458
00:22:09,389 --> 00:22:06,970
you know why are they still going after

459
00:22:11,039 --> 00:22:09,399
five years and a lot of people would

460
00:22:12,990 --> 00:22:11,049
point to the fact that we have had some

461
00:22:14,970 --> 00:22:13,000
lucky breaks I mean when you have a wind

462
00:22:16,499 --> 00:22:14,980
gust that totally cleans off your solar

463
00:22:19,430 --> 00:22:16,509

arrays when the rover is about to die

464

00:22:23,450 --> 00:22:19,440

okay things are going your way

465

00:22:27,409 --> 00:22:23,460

but i'm a firm believer that you make

466

00:22:31,539 --> 00:22:27,419

your own luck the reason the rover was

467

00:22:34,789 --> 00:22:31,549

still alive when that wind gust happened

468

00:22:36,950 --> 00:22:34,799

hundreds of Sol's into the mission was

469

00:22:39,409 --> 00:22:36,960

that a remarkable team had built some

470

00:22:43,100 --> 00:22:39,419

absolutely remarkable hardware I tried

471

00:22:44,240 --> 00:22:43,110

once to make a list of the names of all

472

00:22:47,330 --> 00:22:44,250

the people who have worked on this

473

00:22:49,279 --> 00:22:47,340

project there were more than 4,000 names

474

00:22:52,389 --> 00:22:49,289

on that list and I missed an awful lot

475

00:22:53,930 --> 00:22:52,399

of people it is a team that has

476
00:22:57,799 --> 00:22:53,940
accomplished what I thought was

477
00:23:01,210 --> 00:22:57,809
impossible it is a team that is united

478
00:23:04,759 --> 00:23:01,220
by many things but above all a passion

479
00:23:06,799 --> 00:23:04,769
for what we do and it's just such a joy

480
00:23:09,259 --> 00:23:06,809
to be part of this group and I will

481
00:23:10,159 --> 00:23:09,269
treasure it for the rest of my days you

482
00:23:13,310 --> 00:23:10,169
know when something like this happens

483
00:23:16,340 --> 00:23:13,320
when you have a celebration of five

484
00:23:19,460 --> 00:23:16,350
years on Mars it gets you thinking you

485
00:23:21,110 --> 00:23:19,470
know what is our missions legacy what is

486
00:23:22,490 --> 00:23:21,120
going to be what's going to be its place

487
00:23:23,840 --> 00:23:22,500
in history and you know I'm probably the

488
00:23:25,629 --> 00:23:23,850

worst guy in the world to try to answer

489

00:23:27,619 --> 00:23:25,639

that question I'm too close to it but

490

00:23:29,899 --> 00:23:27,629

there are a couple things that I hope

491

00:23:32,320 --> 00:23:29,909

for one of course is our scientific

492

00:23:35,480 --> 00:23:32,330

discoveries and what we have learned and

493

00:23:38,299 --> 00:23:35,490

continue to learn about Mars but the

494

00:23:40,909 --> 00:23:38,309

other one I think actually in the end

495

00:23:43,369 --> 00:23:40,919

might be even more important and I kind

496

00:23:45,590 --> 00:23:43,379

of hope that it will be like a number of

497

00:23:49,850 --> 00:23:45,600

people on this project I grew up during

498

00:23:53,840 --> 00:23:49,860

the 60s watching television and watching

499

00:23:55,460 --> 00:23:53,850

mercury and Gemini and Apollo as a kid

500

00:23:57,080 --> 00:23:55,470

and you know just dream that have

501
00:23:59,180 --> 00:23:57,090
growing up and send in space ships

502
00:24:00,769 --> 00:23:59,190
tomorrow something and I've actually

503
00:24:03,159 --> 00:24:00,779
gotten to do that with the finest team

504
00:24:09,259 --> 00:24:03,169
in the world and what I really hope is

505
00:24:12,200 --> 00:24:09,269
that people now who are in high school

506
00:24:14,899 --> 00:24:12,210
and middle school and elementary school

507
00:24:16,970 --> 00:24:14,909
are watching spirit and watching

508
00:24:18,499 --> 00:24:16,980
opportunity and watching a bunch of

509
00:24:23,600 --> 00:24:18,509
geeks jumping up and down like they just

510
00:24:27,379 --> 00:24:23,610
won the Super Bowl okay and looking at

511
00:24:30,710 --> 00:24:27,389
that and saying damn that's cool but I

512
00:24:32,480 --> 00:24:30,720
bet I could do even better if we've

513
00:24:32,740 --> 00:24:32,490

accomplished that we've accomplished the

514

00:24:45,370 --> 00:24:32,750

most

515

00:24:58,549 --> 00:24:48,649

and now we'll have a short video tribute

516

00:25:01,760 --> 00:24:58,559

to opportunity please I was an optimist

517

00:25:06,139 --> 00:25:01,770

from the very beginning and that I knew

518

00:25:08,600 --> 00:25:06,149

the Rovers were well built and that as

519

00:25:10,430 --> 00:25:08,610

long as we survived landing that we had

520

00:25:21,799 --> 00:25:10,440

a very good chance of an extended

521

00:25:24,110 --> 00:25:21,809

mission for opportunity things went well

522

00:25:26,779 --> 00:25:24,120

from the very beginning when we landed

523

00:25:29,029 --> 00:25:26,789

right within a short distance of the

524

00:25:30,769 --> 00:25:29,039

rover was exposed bedrock or when the

525

00:25:33,230 --> 00:25:30,779

scientists examined that bedrock in

526

00:25:36,019 --> 00:25:33,240

detail they determined that it was laid

527

00:25:37,669 --> 00:25:36,029

down in water from three and a half to

528

00:25:40,850 --> 00:25:37,679

four billion years ago so this was the

529

00:25:44,180 --> 00:25:40,860

first evidence of ancient surface water

530

00:25:45,769 --> 00:25:44,190

on Mars it's something that the

531

00:25:48,139 --> 00:25:45,779

scientists were looking for and it was

532

00:25:50,139 --> 00:25:48,149

right there where they landed so they

533

00:25:53,180 --> 00:25:50,149

couldn't have asked for a better spot

534

00:25:56,419 --> 00:25:53,190

well I think the greatest accomplishment

535

00:25:59,600 --> 00:25:56,429

of Eagle crater was they saw things that

536

00:26:03,279 --> 00:25:59,610

look like blueberries and these are

537

00:26:06,169 --> 00:26:03,289

things that are little tiny balls of

538

00:26:08,779 --> 00:26:06,179

material that looked like something that

539

00:26:10,630 --> 00:26:08,789

was produced in the presence of water

540

00:26:13,850 --> 00:26:10,640

and so this is one of the first

541

00:26:15,440 --> 00:26:13,860

indications that there had been water on

542

00:26:17,799 --> 00:26:15,450

Mars in the past

543

00:26:24,049 --> 00:26:17,809

so I think that was one of the greatest

544

00:26:26,120 --> 00:26:24,059

accomplishments craters are great or the

545

00:26:27,440 --> 00:26:26,130

geologist because they're like time

546

00:26:29,600 --> 00:26:27,450

tunnels there are big holes in the

547

00:26:31,250 --> 00:26:29,610

ground by going down into the crater

548

00:26:32,930 --> 00:26:31,260

you're essentially going back in time

549

00:26:35,659 --> 00:26:32,940

because you know the older rocks or

550

00:26:38,509 --> 00:26:35,669

towards the bottom opportunity is the

551
00:26:41,210 --> 00:26:38,519
crater exploring rover on this side of

552
00:26:44,269 --> 00:26:41,220
the planet endurance was exciting

553
00:26:45,919 --> 00:26:44,279
because this is the first big crater we

554
00:26:47,930 --> 00:26:45,929
adventure that's something we never

555
00:26:49,419 --> 00:26:47,940
thought we would ever do with a rover

556
00:26:52,009 --> 00:26:49,429
because it was considered too dangerous

557
00:26:55,610 --> 00:26:52,019
so we actually had to do some additional

558
00:26:57,710 --> 00:26:55,620
work here on earth to verify that it was

559
00:26:59,750 --> 00:26:57,720
safe not only to go down into the crater

560
00:27:01,850 --> 00:26:59,760
but that we could get back out again at

561
00:27:03,830 --> 00:27:01,860
times we've reached slopes about 30

562
00:27:05,600 --> 00:27:03,840
degrees and slightly higher it's

563
00:27:08,600 --> 00:27:05,610

actually hard for people to walk on

564

00:27:11,419 --> 00:27:08,610

30-degree slopes we had a lot of close

565

00:27:12,980 --> 00:27:11,429

calls where you know we'd be driving a

566

00:27:14,840 --> 00:27:12,990

particular location we'd start sliding

567

00:27:17,000 --> 00:27:14,850

then we try to go back up and we'd slide

568

00:27:18,980 --> 00:27:17,010

and it's a certain point for if you keep

569

00:27:21,409 --> 00:27:18,990

on sliding you know you may never get

570

00:27:23,720 --> 00:27:21,419

out it was a little nerve-wracking but

571

00:27:25,580 --> 00:27:23,730

they determined it was worth going in

572

00:27:29,000 --> 00:27:25,590

there because scientifically was so

573

00:27:33,019 --> 00:27:29,010

interesting our big crater was Victoria

574

00:27:36,680 --> 00:27:33,029

a half mile diameter crater that took us

575

00:27:39,460 --> 00:27:36,690

about two years to to reach and it was

576

00:27:42,350 --> 00:27:39,470

exciting because we've never been to

577

00:27:44,690 --> 00:27:42,360

crater quite that large and we had to

578

00:27:47,000 --> 00:27:44,700

find at first a safe place to go into

579

00:27:48,740 --> 00:27:47,010

this crater well for us actually it was

580

00:27:51,230 --> 00:27:48,750

a little scary to be perfectly honest

581

00:27:53,240 --> 00:27:51,240

imagine going to the edge of the Grand

582

00:27:55,310 --> 00:27:53,250

Canyon and looking over and

583

00:27:58,070 --> 00:27:55,320

here you are you're commanding a rover

584

00:27:59,690 --> 00:27:58,080

to go to the very edge and as a mission

585

00:28:01,910 --> 00:27:59,700

manager you're responsible for this

586

00:28:03,830 --> 00:28:01,920

health and safety of this Rover and so

587

00:28:05,120 --> 00:28:03,840

the scientists say go closer go closer

588

00:28:06,800 --> 00:28:05,130

because we want to see what's at the

589

00:28:08,630 --> 00:28:06,810

very edge you have to be very careful

590

00:28:13,370 --> 00:28:08,640

about getting as close to the edge as

591

00:28:15,110 --> 00:28:13,380

you can we're not falling over the

592

00:28:18,290 --> 00:28:15,120

greatest threat to opportunities

593

00:28:20,090 --> 00:28:18,300

survival was a global Martian dust storm

594

00:28:22,760 --> 00:28:20,100

and these are massive storms maybe they

595

00:28:24,980 --> 00:28:22,770

block out the Sun it was quite a

596

00:28:27,860 --> 00:28:24,990

surprise because you know we hadn't seen

597

00:28:30,920 --> 00:28:27,870

anything of that magnitude before and so

598

00:28:32,540 --> 00:28:30,930

it was it was very stressful at that

599

00:28:34,850 --> 00:28:32,550

time and we add that was actually right

600

00:28:37,550 --> 00:28:34,860

before we started our ingress into

601
00:28:39,620 --> 00:28:37,560
victoria crater that was very scary

602
00:28:41,570 --> 00:28:39,630
because during that period you know the

603
00:28:44,660 --> 00:28:41,580
cloud got very dark and since we're a

604
00:28:46,730 --> 00:28:44,670
solar powered vehicle our power got very

605
00:28:48,770 --> 00:28:46,740
low so there was about a two-week period

606
00:28:50,960 --> 00:28:48,780
where it was touch-and-go every day and

607
00:28:52,790 --> 00:28:50,970
we didn't know whether we've come in the

608
00:28:55,460 --> 00:28:52,800
next day and the road would still be

609
00:28:57,530 --> 00:28:55,470
there but it rode out the storm it got

610
00:29:04,330 --> 00:28:57,540
through it the skies cleared and the

611
00:29:09,139 --> 00:29:06,620
opportunity will be leaving Victoria

612
00:29:12,409 --> 00:29:09,149
crater and heading to an even larger

613
00:29:14,630 --> 00:29:12,419

crater this is called endeavour and it's

614

00:29:18,110 --> 00:29:14,640

20 kilometers in diameter so it's about

615

00:29:20,060 --> 00:29:18,120

12 miles and size and it's about 20

616

00:29:21,799 --> 00:29:20,070

kilometers away so you have another 12

617

00:29:24,620 --> 00:29:21,809

miles in distance so it's actually

618

00:29:26,810 --> 00:29:24,630

further away that all the driving that

619

00:29:29,659 --> 00:29:26,820

opportunity has done in the past five

620

00:29:31,700 --> 00:29:29,669

years so it's a very distant objective

621

00:29:33,830 --> 00:29:31,710

it's a very ambitious objective but

622

00:29:37,340 --> 00:29:33,840

scientifically that's the direction to

623

00:29:40,639 --> 00:29:37,350

head even if we don't reach this new

624

00:29:43,070 --> 00:29:40,649

larger giant crater the science that we

625

00:29:44,960 --> 00:29:43,080

can do along the way will add to the

626

00:29:47,629 --> 00:29:44,970

Martian history books and will extend

627

00:29:53,000 --> 00:29:47,639

our historical understanding of the

628

00:29:55,490 --> 00:29:53,010

geology on Mars I think the the great

629

00:29:58,460 --> 00:29:55,500

contribution that these Rovers have made

630

00:30:01,399 --> 00:29:58,470

is that they have made Mars a familiar

631

00:30:02,509 --> 00:30:01,409

place the images that we take are taken

632

00:30:04,399 --> 00:30:02,519

very much with a human perspective

633

00:30:06,919 --> 00:30:04,409

because the cameras on the rover write

634

00:30:09,500 --> 00:30:06,929

up about eye level for a person standing

635

00:30:11,000 --> 00:30:09,510

on Mars and so you get the the

636

00:30:13,299 --> 00:30:11,010

perspective as if you were the air

637

00:30:16,190 --> 00:30:13,309

yourself looking over these great vistas

638

00:30:18,500 --> 00:30:16,200

with five years of operation for for

639

00:30:20,419 --> 00:30:18,510

both Rovers and all the images you know

640

00:30:22,810 --> 00:30:20,429

the over quarter million images that

641

00:30:25,519 --> 00:30:22,820

have been returned have really made Mars

642

00:30:29,240 --> 00:30:25,529

seem like our neighborhood it's no

643

00:30:32,149 --> 00:30:29,250

longer an 8 a-4 nor alien or distant

644

00:30:35,240 --> 00:30:32,159

world it's now a familiar place that has

645

00:30:37,269 --> 00:30:35,250

earth-like characteristics we love the

646

00:30:40,039 --> 00:30:37,279

rover's as if they're our own children

647

00:30:41,690 --> 00:30:40,049

because it's gone through so much it's

648

00:30:43,269 --> 00:30:41,700

accomplished so much it's gone through

649

00:30:46,730 --> 00:30:43,279

hardships it's gone through incredible

650

00:30:48,470 --> 00:30:46,740

victories and so you know we love the

651
00:30:50,930 --> 00:30:48,480
rover's we care about them we worry

652
00:30:52,789 --> 00:30:50,940
about them we're excited when it makes

653
00:31:10,800 --> 00:30:52,799
these discoveries they're amazing

654
00:31:15,400 --> 00:31:13,240
near the end of the prime mission back

655
00:31:17,890 --> 00:31:15,410
in april two thousand for the rover's

656
00:31:20,350 --> 00:31:17,900
gained a new admirer someone literally

657
00:31:22,930 --> 00:31:20,360
out of this world commander mike fink

658
00:31:25,000 --> 00:31:22,940
had just begun a six-month tour on the

659
00:31:27,010 --> 00:31:25,010
international space station to be

660
00:31:29,170 --> 00:31:27,020
properly equipped one of our own Jim

661
00:31:31,270 --> 00:31:29,180
Rice provided him with a pair of 3d

662
00:31:33,460 --> 00:31:31,280
glasses in his personal kit so he could

663
00:31:36,040 --> 00:31:33,470

view the rover anaglyphs while on orbit

664

00:31:38,080 --> 00:31:36,050

now fast-forward five years and today

665

00:31:39,930 --> 00:31:38,090

Mike Fink is again on board the

666

00:31:43,210 --> 00:31:39,940

International Space Station commanding

667

00:31:48,160 --> 00:31:43,220

expedition 18 and he sends us this

668

00:31:49,780 --> 00:31:48,170

tribute hi I'm Mike Fink come in to the

669

00:31:53,410 --> 00:31:49,790

International Space Station expedition

670

00:31:55,540 --> 00:31:53,420

team and on behalf of my crew and the

671

00:31:57,580 --> 00:31:55,550

entire international space station team

672

00:31:59,520 --> 00:31:57,590

I'd like to extend our hearty

673

00:32:03,520 --> 00:31:59,530

congratulations to the Mars exploration

674

00:32:08,140 --> 00:32:03,530

routine for your 50-year anniversary on

675

00:32:10,540 --> 00:32:08,150

Mars I'd like to recognize and say hello

676

00:32:12,880 --> 00:32:10,550

to see squires the principal

677

00:32:15,640 --> 00:32:12,890

investigator project manager Jon Callas

678

00:32:17,230 --> 00:32:15,650

and project scientist mannered and all

679

00:32:20,010 --> 00:32:17,240

of the other Sciences all the other

680

00:32:22,000 --> 00:32:20,020

engineers other technicians the

681

00:32:24,460 --> 00:32:22,010

administrative assistants everybody

682

00:32:26,950 --> 00:32:24,470

helped out on this grand adventure that

683

00:32:31,300 --> 00:32:26,960

is really paving the way for me to go to

684

00:32:33,040 --> 00:32:31,310

the stars see I done incredible work and

685

00:32:35,650 --> 00:32:33,050

here aboard the International Space

686

00:32:38,740 --> 00:32:35,660

Station we're also working towards a

687

00:32:41,740 --> 00:32:38,750

manatee going on to the start we're

688

00:32:44,140 --> 00:32:41,750

really really glad to be on the sinking

689

00:32:56,099 --> 00:32:44,150

so congratulations for the International

690

00:33:00,759 --> 00:32:58,629

among our many special guests here today

691

00:33:04,839 --> 00:33:00,769

is someone who helped bring about the

692

00:33:06,479 --> 00:33:04,849

Space Age he's a space pioneering not in

693

00:33:09,459 --> 00:33:06,489

the building of rockets or spacecraft

694

00:33:11,139 --> 00:33:09,469

but in the imagining of them in the

695

00:33:14,049 --> 00:33:11,149

other ways who might experience the vast

696

00:33:15,789 --> 00:33:14,059

cosmos around us about the same time

697

00:33:18,219 --> 00:33:15,799

that JPL was coming into being many

698

00:33:20,619 --> 00:33:18,229

years ago just a few miles away here in

699

00:33:22,359 --> 00:33:20,629

Los Angeles this pioneer was in the

700

00:33:25,209 --> 00:33:22,369

process of becoming one of our nation's

701
00:33:27,190 --> 00:33:25,219
most gifted writers is one of those

702
00:33:30,069 --> 00:33:27,200
writers whose writing has changed the

703
00:33:31,899 --> 00:33:30,079
way people think he has more than 500

704
00:33:33,489 --> 00:33:31,909
published works exemplifying the

705
00:33:36,579 --> 00:33:33,499
american imagination at its most

706
00:33:39,839 --> 00:33:36,589
creative his best-known works the

707
00:33:43,449 --> 00:33:39,849
Martian Chronicles the illustrated man

708
00:33:46,509 --> 00:33:43,459
Fahrenheit 451 and something wicked this

709
00:33:50,019 --> 00:33:46,519
way comes our masterpieces is one of the

710
00:34:23,930 --> 00:33:50,029
truly classic authors of our time please

711
00:34:33,210 --> 00:34:28,859
floors yours when I was very young I

712
00:34:36,869 --> 00:34:33,220
lived in walking in the Illinois next to

713
00:34:40,669 --> 00:34:36,879

one of my favorite uncles and he had all

714

00:34:43,859 --> 00:34:40,679

the Martian books a big rice burroughs I

715

00:34:47,129 --> 00:34:43,869

should go over to his house and borrow

716

00:34:50,970 --> 00:34:47,139

these books and take them home and read

717

00:34:54,950 --> 00:34:50,980

them when I was 12 years old I decided

718

00:34:58,560 --> 00:34:54,960

it was going to be a writer I moved to

719

00:35:01,140 --> 00:34:58,570

Tucson Arizona and lived on Lowell

720

00:35:07,050 --> 00:35:01,150

Avenue you can't do better than that can

721

00:35:10,470 --> 00:35:07,060

you as a personal law and the drawings

722

00:35:15,270 --> 00:35:10,480

of scaparelli and I fell in love with

723

00:35:18,839 --> 00:35:15,280

Mars I read a book the gods of mars by

724

00:35:21,780 --> 00:35:18,849

edgar rice burroughs and it needed a

725

00:35:26,069 --> 00:35:21,790

sequel I didn't have the money to buy

726

00:35:30,210 --> 00:35:26,079

the seagull so wheres covers old I wrote

727

00:35:31,970 --> 00:35:30,220

a sequel to the gods of mars that's the

728

00:35:37,680 --> 00:35:31,980

very first thing they wrote about

729

00:35:42,300 --> 00:35:37,690

landing on Mars and saving DJ Thoris the

730

00:35:45,599 --> 00:35:42,310

wife of John Carter so you see my life

731

00:35:49,790 --> 00:35:45,609

has been spent on Mars for the very

732

00:35:53,700 --> 00:35:49,800

first and when I was in my teens and

733

00:35:58,309 --> 00:35:53,710

when I was that 30 years old i published

734

00:36:01,890 --> 00:35:58,319

the Martian Chronicles and all is Huxley

735

00:36:05,430 --> 00:36:01,900

the great English writer called me to

736

00:36:10,319 --> 00:36:05,440

his house one day fatigue we're 30 years

737

00:36:12,930 --> 00:36:10,329

old and he said mr. Bradbury do you know

738

00:36:16,770 --> 00:36:12,940

what you've done do you know what you

739

00:36:20,579 --> 00:36:16,780

are I said what am I he said you're a

740

00:36:25,260 --> 00:36:20,589

poet you're opposed you've written about

741

00:36:27,839 --> 00:36:25,270

Mars but it's poetry for God's sake this

742

00:36:31,829 --> 00:36:27,849

book is going to be around forever and

743

00:36:32,440 --> 00:36:31,839

to have all exactly the writer brave new

744

00:36:35,050 --> 00:36:32,450

worlds

745

00:36:38,319 --> 00:36:35,060

say this to me I couldn't believe it

746

00:36:41,680 --> 00:36:38,329

because I didn't realize all during my

747

00:36:44,650 --> 00:36:41,690

30s I was writing about the future so

748

00:36:51,010 --> 00:36:44,660

completely I was so madly in love with

749

00:36:55,300 --> 00:36:51,020

Mars so many years later I came out to

750

00:37:03,250 --> 00:36:55,310

Jet Propulsion lab when we had the first

751
00:37:07,540 --> 00:37:03,260
landing and in March or 1971 and instead

752
00:37:11,650 --> 00:37:07,550
of all night watching the screen waiting

753
00:37:16,030 --> 00:37:11,660
for the film's to come on projecting our

754
00:37:19,390 --> 00:37:16,040
first images of Mars and I noticed a man

755
00:37:22,990 --> 00:37:19,400
standing behind me I was afraid to speak

756
00:37:27,190 --> 00:37:23,000
to my first but I finally did he was

757
00:37:31,900 --> 00:37:27,200
Werner von Braun Wernher von Braun is

758
00:37:34,510 --> 00:37:31,910
the two halves of the destiny of man he

759
00:37:37,960 --> 00:37:34,520
is the Living metaphor of the dark and

760
00:37:41,680 --> 00:37:37,970
the light he's the man that invented the

761
00:37:44,770 --> 00:37:41,690
v2 rocket to destroyed London and killed

762
00:37:48,339 --> 00:37:44,780
people but it's also the man who helped

763
00:37:52,510 --> 00:37:48,349

invent the rocket to take us to the moon

764

00:37:56,440 --> 00:37:52,520

and to take us to Mars so I called him

765

00:37:59,980 --> 00:37:56,450

over and he signed an envelope for me

766

00:38:03,790 --> 00:37:59,990

and I have it here and he spoke well of

767

00:38:08,079 --> 00:38:03,800

me and the influence of my book on his

768

00:38:10,839 --> 00:38:08,089

being and inventor of the rocket so he

769

00:38:15,460 --> 00:38:10,849

was there all night with me the night of

770

00:38:18,430 --> 00:38:15,470

our first landing on Mars in the early

771

00:38:22,450 --> 00:38:18,440

morning the first images began to come

772

00:38:27,970 --> 00:38:22,460

through trust of the planet Mars and at

773

00:38:31,599 --> 00:38:27,980

noon the ABC TV people put me on TV to

774

00:38:34,569 --> 00:38:31,609

interview me about this landing and Roy

775

00:38:37,599 --> 00:38:34,579

deal the announcer said to me mr.

776

00:38:40,240 --> 00:38:37,609

Bradbury how does it feel as we've

777

00:38:43,420 --> 00:38:40,250

landed on Mars and there are no cities

778

00:38:50,710 --> 00:38:43,430

there and there are no Martians

779

00:38:53,799 --> 00:38:50,720

I said you are ridiculous the cities

780

00:38:57,490 --> 00:38:53,809

don't count is the Martians that counts

781

00:39:09,400 --> 00:38:57,500

and from this day on we are the

782

00:39:16,910 --> 00:39:12,859

so I said shut up and get the hell out

783

00:39:21,380 --> 00:39:16,920

of here and I told boy Neil to go to

784

00:39:24,319 --> 00:39:21,390

hell because I was there weeping but I

785

00:39:30,079 --> 00:39:24,329

cried all night long was wonderful and

786

00:39:32,839 --> 00:39:30,089

then back in nineteen sixty-nine I was

787

00:39:37,400 --> 00:39:32,849

in London tonight we landed on the moon

788

00:39:41,150 --> 00:39:37,410

and David Frost asked me to come over to

789

00:39:44,390 --> 00:39:41,160

his show to be interviewed on TV to be

790

00:39:47,240 --> 00:39:44,400

seen by millions of people to celebrate

791

00:39:50,000 --> 00:39:47,250

the landing on the moon so i got there

792

00:39:54,019 --> 00:39:50,010

at eight thirty at night then in July

793

00:39:57,490 --> 00:39:54,029

and we landed on the moon and David

794

00:40:01,490 --> 00:39:57,500

Frost made fun of the whole thing

795

00:40:04,970 --> 00:40:01,500

McMillan the prime minister of London

796

00:40:10,089 --> 00:40:04,980

was on and david frost made fun of him

797

00:40:13,069 --> 00:40:10,099

and he made front of the astronauts

798

00:40:16,279 --> 00:40:13,079

stepping out on the Rockets are we

799

00:40:20,059 --> 00:40:16,289

getting ready to step out and land on

800

00:40:23,900 --> 00:40:20,069

the moon for the first time and round

801
00:40:26,329 --> 00:40:23,910
845 that night he said now I'm gradually

802
00:40:29,029 --> 00:40:26,339
introduced to you a great American

803
00:40:31,940 --> 00:40:29,039
talent he's going to speak about landing

804
00:40:35,200 --> 00:40:31,950
on the moon and he said I thought he was

805
00:40:43,099 --> 00:40:35,210
talking about me he's in hairiest

806
00:40:48,440 --> 00:40:43,109
Engelbert Humperdinck I said Jesus

807
00:40:53,599 --> 00:40:48,450
Christ Engelbert Humperdinck how stupid

808
00:40:57,319 --> 00:40:53,609
can you get so I ran out out of the

809
00:41:00,109 --> 00:40:57,329
television room ran out the parking lot

810
00:41:03,200 --> 00:41:00,119
and the producer followed me and said

811
00:41:05,839 --> 00:41:03,210
what are you doing out here I said I'm

812
00:41:09,470 --> 00:41:05,849
leaving this show that man is a stupid

813
00:41:11,349 --> 00:41:09,480

idiot he doesn't realize this is the

814

00:41:14,210 --> 00:41:11,359

greatest night in the history of mankind

815

00:41:17,059 --> 00:41:14,220

we've been waiting for millions of years

816

00:41:20,359 --> 00:41:17,069

should go to the moon and we're here now

817

00:41:21,309 --> 00:41:20,369

he should be celebrating give me a test

818

00:41:25,930 --> 00:41:21,319

again

819

00:41:29,589 --> 00:41:25,940

me out of here so I drove across London

820

00:41:33,459 --> 00:41:29,599

and I appeared on a show with Walter

821

00:41:37,359 --> 00:41:33,469

Cronkite @midnight until stop seen by

822

00:41:41,279 --> 00:41:37,369

millions of people and I spoke of how I

823

00:41:44,529 --> 00:41:41,289

felt about landing on the moon it was a

824

00:41:47,229 --> 00:41:44,539

fantastic broadcast I brought a copy

825

00:41:50,109 --> 00:41:47,239

with each at night and you see it in the

826

00:41:53,769 --> 00:41:50,119

most but when I was done with that

827

00:41:57,390 --> 00:41:53,779

broadcast instead of taking a cab back

828

00:42:00,549 --> 00:41:57,400

to my hotel in london i walked across

829

00:42:04,299 --> 00:42:00,559

london all night long the night we

830

00:42:07,569 --> 00:42:04,309

landed on the moon I worked with joy I

831

00:42:09,930 --> 00:42:07,579

couldn't believe I was only 48 years old

832

00:42:13,509 --> 00:42:09,940

I thought I would be an old man i

833

00:42:16,509 --> 00:42:13,519

thought i'd be 80 or 90 min add another

834

00:42:18,880 --> 00:42:16,519

moon Here I am only 48 I couldn't

835

00:42:22,059 --> 00:42:18,890

believe it he was wonderful so in the

836

00:42:24,910 --> 00:42:22,069

morning i connect him hotel there's a

837

00:42:28,630 --> 00:42:24,920

tabloid newspaper I didn't front I

838

00:42:31,569 --> 00:42:28,640

looked it said Neil Armstrong walks on

839

00:42:38,170 --> 00:42:31,579

the moon at dawn and the headline above

840

00:42:49,359 --> 00:42:38,180

his Bradbury walks at midnight the next

841

00:42:55,839 --> 00:42:52,939

now go do the right now you got on come

842

00:43:05,059 --> 00:42:55,849

in it right you got a minute more yeah

843

00:43:12,469 --> 00:43:05,069

okay thank you you finish yeah I want

844

00:43:16,239 --> 00:43:12,479

him to tell my god once you get it will

845

00:43:22,660 --> 00:43:16,249

be shown later it'll be show later okay

846

00:43:35,980 --> 00:43:33,370

ray bradbury our keynote speaker today

847

00:43:38,260 --> 00:43:35,990

is an Emmy award-winning 26-year

848

00:43:40,060 --> 00:43:38,270

broadcast news veteran who successfully

849

00:43:42,220 --> 00:43:40,070

melded a talent for telling complex

850

00:43:44,890 --> 00:43:42,230

stories in accessible terms with a

851
00:43:48,100 --> 00:43:44,900
lifelong passion for aviation space

852
00:43:50,050 --> 00:43:48,110
technology and the environment working

853
00:43:52,870 --> 00:43:50,060
for nearly 17 years as a correspondent

854
00:43:55,810 --> 00:43:52,880
anchor and producer at CNN in Atlanta

855
00:43:58,330 --> 00:43:55,820
and New York he has focused the leading

856
00:44:00,640 --> 00:43:58,340
edge of research and tank research and

857
00:44:03,400 --> 00:44:00,650
development known for his unparalleled

858
00:44:05,560 --> 00:44:03,410
coverage of space exploration he led

859
00:44:07,600 --> 00:44:05,570
CNN's coverage for the past 17 years

860
00:44:11,470 --> 00:44:07,610
including the loss of the space shuttle

861
00:44:15,160 --> 00:44:11,480
Columbia in February 2003 reporting live

862
00:44:16,960 --> 00:44:15,170
for 16 straight hours that accident

863
00:44:18,610 --> 00:44:16,970

scuttled the deal he had just brokered

864

00:44:20,790 --> 00:44:18,620
with NASA to make him the first

865

00:44:23,110 --> 00:44:20,800
journalist to fly in a space shuttle

866

00:44:26,500 --> 00:44:23,120
he's an experienced instrument-rated

867

00:44:27,760 --> 00:44:26,510
pilot and an airplane owner and has

868

00:44:30,430 --> 00:44:27,770
leveraged that insight and knowledge

869

00:44:33,820 --> 00:44:30,440
into unrivaled television coverage of

870

00:44:35,770 --> 00:44:33,830
aviation helping us now to appreciate

871

00:44:38,280 --> 00:44:35,780
the momentous impact of the mars

872

00:44:44,549 --> 00:44:38,290
exploration rover mission please welcome

873

00:44:51,839 --> 00:44:47,579
great to be here

874

00:44:54,059 --> 00:44:51,849
how are you all behind all this facial

875

00:44:56,849 --> 00:44:54,069
hair is a former CNN space correspondent

876

00:45:00,150 --> 00:44:56,859

just been accepted into the anchor

877

00:45:02,029 --> 00:45:00,160

protection program and I was told by my

878

00:45:05,339 --> 00:45:02,039

government handlers to grow a beard to

879

00:45:07,170 --> 00:45:05,349

adjust my looks please don't tell them

880

00:45:08,789 --> 00:45:07,180

I'm here okay actually I grew this

881

00:45:10,499 --> 00:45:08,799

despite the misgivings of my lovely

882

00:45:14,999 --> 00:45:10,509

bride sandy because for the first time

883

00:45:17,700 --> 00:45:15,009

in 26 years I own this turf baby I'm

884

00:45:19,200 --> 00:45:17,710

taking it back I was thinking about

885

00:45:22,559 --> 00:45:19,210

planting a flag but that seemed a little

886

00:45:24,329 --> 00:45:22,569

painful it's always great to be here my

887

00:45:27,180 --> 00:45:24,339

favorite space portal despite that

888

00:45:29,009 --> 00:45:27,190

picture the gateway to the universe is

889

00:45:33,140 --> 00:45:29,019

here one of the smartest places on the

890

00:45:35,640 --> 00:45:33,150

planet a fun place Disneyland for nerds

891

00:45:37,920 --> 00:45:35,650

you know Mars is my second favorite

892

00:45:39,839 --> 00:45:37,930

planet and many of you in this room make

893

00:45:42,589 --> 00:45:39,849

me feel as if I've been there how cool

894

00:45:45,690 --> 00:45:42,599

is that thanks for the outstanding

895

00:45:47,870 --> 00:45:45,700

vicarious thrill ride these past 40-plus

896

00:45:50,279 --> 00:45:47,880

years especially these past five

897

00:45:54,299 --> 00:45:50,289

sometimes I think we take for granted

898

00:45:57,620 --> 00:45:54,309

how amazing it is how a wash we are in

899

00:46:00,989 --> 00:45:57,630

these wonderful images these

900

00:46:02,819 --> 00:46:00,999

high-resolution panoramic microscopic

901
00:46:05,940 --> 00:46:02,829
three-dimensional images shot in the

902
00:46:08,309 --> 00:46:05,950
surface or in orbit what we found is a

903
00:46:10,739 --> 00:46:08,319
place it looks an awful lot like home if

904
00:46:12,779 --> 00:46:10,749
you're from New Mexico I guess and I

905
00:46:14,969 --> 00:46:12,789
think that's part of the appeal you look

906
00:46:18,630 --> 00:46:14,979
at Eagle crater and a human being can

907
00:46:20,969 --> 00:46:18,640
imagine being there in hiking boots it's

908
00:46:23,039 --> 00:46:20,979
truly a transformative experience and

909
00:46:25,499 --> 00:46:23,049
when you consider all the proof we have

910
00:46:28,079 --> 00:46:25,509
now amassed here or you have now amassed

911
00:46:30,329 --> 00:46:28,089
here that this place was once warm and

912
00:46:33,150 --> 00:46:30,339
wet you can't help but look at those

913
00:46:35,999 --> 00:46:33,160

pictures and think about our place in

914

00:46:38,700 --> 00:46:36,009

the universe and Wonder and how close we

915

00:46:41,640 --> 00:46:38,710

are to learning if we actually do have

916

00:46:44,249 --> 00:46:41,650

some company how great is it to be alive

917

00:46:47,009 --> 00:46:44,259

at this time when we just might learn

918

00:46:48,359 --> 00:46:47,019

the answer to that question we're lucky

919

00:46:50,880 --> 00:46:48,369

to have people like you who know how to

920

00:46:53,249 --> 00:46:50,890

get that answer of course we've been

921

00:46:55,709 --> 00:46:53,259

curious about the night sky since

922

00:46:58,380 --> 00:46:55,719

caveman looked up and said ugh or

923

00:46:59,700 --> 00:46:58,390

something or when they saw the spaceship

924

00:47:00,870 --> 00:46:59,710

land in the little green men build

925

00:47:02,579 --> 00:47:00,880

Stonehenge

926

00:47:04,499 --> 00:47:02,589

did you hear they found another stone

927

00:47:06,900 --> 00:47:04,509

hedge in Lake Michigan hear about this

928

00:47:09,960 --> 00:47:06,910

thing imagine that alien scuba divers

929

00:47:11,970 --> 00:47:09,970

hardly who knew who do while wasn't the

930

00:47:13,920 --> 00:47:11,980

subject of water in Mars we've touched

931

00:47:16,289 --> 00:47:13,930

on this a moment ago it's worth talking

932

00:47:19,589 --> 00:47:16,299

about the origins of our modern

933

00:47:21,390 --> 00:47:19,599

fascination with the Red Planet mr.

934

00:47:23,880 --> 00:47:21,400

Bradbury spoke about that it all begins

935

00:47:26,700 --> 00:47:23,890

with water Giovanni Schiaparelli and the

936

00:47:28,620 --> 00:47:26,710

canale he wrote about he meant natural

937

00:47:30,930 --> 00:47:28,630

channels but in this case something was

938

00:47:32,730 --> 00:47:30,940

gained in the translation and people

939

00:47:35,730 --> 00:47:32,740

assumed he was talking about canals

940

00:47:38,880 --> 00:47:35,740

which implies some sort of Martian cores

941

00:47:40,890 --> 00:47:38,890

of Engineers or something no one took

942

00:47:42,210 --> 00:47:40,900

the ball farther and ran harder than

943

00:47:44,640 --> 00:47:42,220

with that than the blue blooded

944

00:47:46,289 --> 00:47:44,650

astronomer percival lowell you know you

945

00:47:49,410 --> 00:47:46,299

don't hear about many boys being named

946

00:47:51,630 --> 00:47:49,420

personal these days do you and lo was

947

00:47:53,670 --> 00:47:51,640

convinced the canals were built by smart

948

00:47:55,559 --> 00:47:53,680

beings who are running out of water this

949

00:47:57,920 --> 00:47:55,569

of course began hg wells were the

950

00:48:00,900 --> 00:47:57,930

world's which begat edgar rice burroughs

951
00:48:04,259 --> 00:48:00,910
ray bradbury of course Robinson Crusoe

952
00:48:06,089 --> 00:48:04,269
on Mars and Marvin the Martian and for a

953
00:48:08,339 --> 00:48:06,099
long time there was nothing to stop the

954
00:48:11,190 --> 00:48:08,349
Martian train from kind of rolling down

955
00:48:13,289 --> 00:48:11,200
the tracks until mid sixties when you

956
00:48:16,140 --> 00:48:13,299
guys or your scientific ancestors

957
00:48:19,140 --> 00:48:16,150
launched a series of spacecraft called

958
00:48:21,480 --> 00:48:19,150
Mariner now scan line by scan line these

959
00:48:23,789 --> 00:48:21,490
faxes essentially from Mars gave us a

960
00:48:25,319 --> 00:48:23,799
whole new view of the red planet and it

961
00:48:28,289 --> 00:48:25,329
wasn't a very good place to find any

962
00:48:30,450 --> 00:48:28,299
condos or build them so much for that

963
00:48:32,609 --> 00:48:30,460

fun but before we get too depressed we

964

00:48:34,799 --> 00:48:32,619

had astronauts on the moon to entertain

965

00:48:36,900 --> 00:48:34,809

us maybe not David Frost but it

966

00:48:39,029 --> 00:48:36,910

entertained the rest of us and then

967

00:48:41,999 --> 00:48:39,039

before too long Mars came into focus

968

00:48:43,349 --> 00:48:42,009

again like it never had before 1976 the

969

00:48:46,109 --> 00:48:43,359

Viking landers arrived in the surface

970

00:48:47,670 --> 00:48:46,119

and the crowd went wild Mars and vivid

971

00:48:49,410 --> 00:48:47,680

color do not have just just said it

972

00:48:52,079 --> 00:48:49,420

really is kind of sepia there ladies and

973

00:48:54,569 --> 00:48:52,089

gentlemen Viking didn't find smoking gun

974

00:48:56,730 --> 00:48:54,579

proof of life on Mars but doesn't it

975

00:48:59,640 --> 00:48:56,740

seem kind of unlikely they'd find any

976

00:49:01,799 --> 00:48:59,650

guns at all there but but seriously that

977

00:49:03,900 --> 00:49:01,809

the data was kind of ambiguous and even

978

00:49:05,279 --> 00:49:03,910

today as I understand it there is some

979

00:49:07,410 --> 00:49:05,289

debate in the scientific community

980

00:49:09,269 --> 00:49:07,420

they're not speaking with one voice in

981

00:49:11,290 --> 00:49:09,279

this decided to stria Lee disagree a lot

982

00:49:15,220 --> 00:49:11,300

or something is that

983

00:49:17,930 --> 00:49:15,230

said how it works and I'm shocked

984

00:49:20,060 --> 00:49:17,940

fast-forward 20 years now that's what I

985

00:49:22,700 --> 00:49:20,070

call a gap don't do that again no more

986

00:49:30,230 --> 00:49:22,710

20-year gaps Pathfinder whoo yeah don't

987

00:49:32,360 --> 00:49:30,240

ever do that that was bad Pathfinder who

988

00:49:34,790 --> 00:49:32,370

would have predicted that one the

989

00:49:37,910 --> 00:49:34,800

Internet's all of them as a mass medium

990

00:49:40,010 --> 00:49:37,920

were new then and the google it was just

991

00:49:42,020 --> 00:49:40,020

a just a glint in Sergey and Larry his

992

00:49:43,880 --> 00:49:42,030

eyes and there was pathfinder on Mars

993

00:49:46,940 --> 00:49:43,890

and JPL was putting pictures on the web

994

00:49:49,490 --> 00:49:46,950

almost as fast as they got them imagine

995

00:49:54,200 --> 00:49:49,500

that you know millions of hits the first

996

00:49:56,210 --> 00:49:54,210

global web extravaganza Mars was ready

997

00:49:57,500 --> 00:49:56,220

for it's close ups the missions that

998

00:49:59,690 --> 00:49:57,510

have followed avow they're built in this

999

00:50:01,940 --> 00:49:59,700

connection or built on the suspense

1000

00:50:03,860 --> 00:50:01,950

because they didn't make it each time

1001
00:50:05,780 --> 00:50:03,870
you take us back there we learn

1002
00:50:07,760 --> 00:50:05,790
something new and we see something cool

1003
00:50:09,950 --> 00:50:07,770
like the blueberries the spheres that

1004
00:50:12,530 --> 00:50:09,960
had to be formed by water or we touch or

1005
00:50:15,080 --> 00:50:12,540
taste ice as Phoenix did and each time

1006
00:50:17,720 --> 00:50:15,090
you all take us to the edge of what is

1007
00:50:20,510 --> 00:50:17,730
possible it's nice to be there right

1008
00:50:23,480 --> 00:50:20,520
there with you the Mars rover team took

1009
00:50:25,970 --> 00:50:23,490
the Pathfinder philosophy one step

1010
00:50:28,520 --> 00:50:25,980
further you all have actually allowed

1011
00:50:30,410 --> 00:50:28,530
the public to see every image you see

1012
00:50:31,670 --> 00:50:30,420
that is truly remarkable nothing like

1013
00:50:33,260 --> 00:50:31,680

that has ever happened in the history of

1014

00:50:35,870 --> 00:50:33,270

science that I'm aware of of course I'm

1015

00:50:37,490 --> 00:50:35,880

a history major what do I know but the

1016

00:50:39,470 --> 00:50:37,500

Wonder opportunity and spirit are so

1017

00:50:41,690 --> 00:50:39,480

beloved and so much a part of our pop

1018

00:50:45,170 --> 00:50:41,700

culture they are literally and

1019

00:50:47,480 --> 00:50:45,180

figuratively rock stars the mission

1020

00:50:50,690 --> 00:50:47,490

ranks number one on the public awareness

1021

00:50:52,790 --> 00:50:50,700

scale in TV we call that a Q rating now

1022

00:50:57,440 --> 00:50:52,800

if I had opportunities Q rating I'd

1023

00:50:59,600 --> 00:50:57,450

still be at CNN I think I think the

1024

00:51:01,250 --> 00:50:59,610

thread that connects shipper le2 and

1025

00:51:04,340 --> 00:51:01,260

Lowell to opportunity and spirit in

1026
00:51:06,800 --> 00:51:04,350
Phoenix is the quest for understanding

1027
00:51:09,200 --> 00:51:06,810
if there's life outside our planet you

1028
00:51:11,210 --> 00:51:09,210
and those of us in the media well I

1029
00:51:14,360 --> 00:51:11,220
guess I'm now technically a recovering

1030
00:51:16,760 --> 00:51:14,370
journalists have done a good job setting

1031
00:51:19,220 --> 00:51:16,770
the bar on what might or might not be

1032
00:51:21,440 --> 00:51:19,230
found on Mars there aren't many people

1033
00:51:23,420 --> 00:51:21,450
left who are expecting to see Marvin the

1034
00:51:24,829 --> 00:51:23,430
Martian or the ruins of an ancient

1035
00:51:26,479 --> 00:51:24,839
civilization on Mars

1036
00:51:28,940 --> 00:51:26,489
even though some people are still

1037
00:51:30,650 --> 00:51:28,950
fixated on that silly old face image

1038
00:51:33,319 --> 00:51:30,660

captured by viking and ultimately

1039

00:51:35,209 --> 00:51:33,329

debunked by the global surveyor i guess

1040

00:51:37,640 --> 00:51:35,219

i can safely now share with you an

1041

00:51:39,170 --> 00:51:37,650

expression we have in the newsroom never

1042

00:51:43,130 --> 00:51:39,180

let the facts get in the way of a good

1043

00:51:45,380 --> 00:51:43,140

story my sense is people will be pretty

1044

00:51:49,160 --> 00:51:45,390

excited if you found a fossil matter of

1045

00:51:52,959 --> 00:51:49,170

fact we have empirical proof given the

1046

00:51:56,209 --> 00:51:52,969

DEFCON one media cluster event

1047

00:51:58,759 --> 00:51:56,219

surrounding the Allen Hills 84 double-o

1048

00:52:00,529 --> 00:51:58,769

one meteorite announcement it's not

1049

00:52:02,569 --> 00:52:00,539

exactly what said he had is in mind when

1050

00:52:06,049 --> 00:52:02,579

they sold Ron looking to make contact

1051
00:52:08,779 --> 00:52:06,059
but microbes on Mars are enough to lure

1052
00:52:12,380 --> 00:52:08,789
people away ever so briefly from

1053
00:52:15,680 --> 00:52:12,390
American Idol I guess the moral of this

1054
00:52:17,059 --> 00:52:15,690
is because we are among the living we

1055
00:52:20,059 --> 00:52:17,069
generally aren't interested in other

1056
00:52:21,799 --> 00:52:20,069
living things and this brings me to the

1057
00:52:24,739 --> 00:52:21,809
other great narrative that plays out

1058
00:52:27,229 --> 00:52:24,749
here it's the story of all of you often

1059
00:52:29,180 --> 00:52:27,239
wonder if you're all big gamblers you

1060
00:52:31,160 --> 00:52:29,190
know when you go to Vegas are you big on

1061
00:52:33,019 --> 00:52:31,170
the tables because what you do is such

1062
00:52:36,380 --> 00:52:33,029
an all-or-nothing thing in some cases

1063
00:52:38,269 --> 00:52:36,390

your risk whole career on a six-minute

1064

00:52:42,259 --> 00:52:38,279

plunge through an alien atmosphere I

1065

00:52:45,109 --> 00:52:42,269

mean that's that's all in baby this is

1066

00:52:46,640 --> 00:52:45,119

as exciting as science can be you know

1067

00:52:48,499 --> 00:52:46,650

we weren't there for the serendipitous

1068

00:52:51,589 --> 00:52:48,509

moments when they stumbled onto Teflon

1069

00:52:53,120 --> 00:52:51,599

or velcro or post-it notes and and said

1070

00:52:56,779 --> 00:52:53,130

Eureka and then called the patent lawyer

1071

00:52:59,120 --> 00:52:56,789

but but we are here with you over your

1072

00:53:02,029 --> 00:52:59,130

shoulders when you have those unbridled

1073

00:53:05,509 --> 00:53:02,039

moments of joy when that all-in bet pays

1074

00:53:09,890 --> 00:53:05,519

off or not in the business we call this

1075

00:53:11,950 --> 00:53:09,900

good TV suspense reality possibly

1076

00:53:13,999 --> 00:53:11,960

smoldering holes in the ground

1077

00:53:17,660 --> 00:53:14,009

everything but a vote to see who gets

1078

00:53:19,370 --> 00:53:17,670

booted off the island now Steve Squyres

1079

00:53:23,719 --> 00:53:19,380

and I did a special when the Phoenix

1080

00:53:25,640 --> 00:53:23,729

landed successfully and I gave all do

1081

00:53:28,700 --> 00:53:25,650

praise to the gods of orbital mechanics

1082

00:53:30,289 --> 00:53:28,710

as the earth received time of the

1083

00:53:32,539 --> 00:53:30,299

intended landing was near the end of an

1084

00:53:34,579 --> 00:53:32,549

hour and so I told CNN and with the

1085

00:53:36,559 --> 00:53:34,589

notion that be great idea to do an hour

1086

00:53:38,390 --> 00:53:36,569

on Mars and will test them recorded

1087

00:53:40,279 --> 00:53:38,400

pieces and we'll look at some of

1088

00:53:42,890 --> 00:53:40,289

Steve's favorite images from Mars over

1089

00:53:45,200 --> 00:53:42,900

the years and of course frequent cuts to

1090

00:53:48,529 --> 00:53:45,210

the control room live as the team endure

1091

00:53:50,390 --> 00:53:48,539

that hellish 6 minute period that final

1092

00:53:53,089 --> 00:53:50,400

stretch of the long trip to Mars it

1093

00:53:55,609 --> 00:53:53,099

really was a nail-biter and even better

1094

00:53:57,980 --> 00:53:55,619

as Phoenix fell to Mars we had data the

1095

00:53:59,359 --> 00:53:57,990

whole time how cool was that and then

1096

00:54:02,000 --> 00:53:59,369

the eruption we could not have

1097

00:54:05,690 --> 00:54:02,010

storyboarded an hour any better than

1098

00:54:08,799 --> 00:54:05,700

that and no scripts right no net the

1099

00:54:11,059 --> 00:54:08,809

ratings were huge the audience global

1100

00:54:13,400 --> 00:54:11,069

but the story really if you think about

1101
00:54:15,859 --> 00:54:13,410
it was not so much about Mars that day

1102
00:54:19,269 --> 00:54:15,869
it was about all of you the humans who

1103
00:54:22,309 --> 00:54:19,279
made it happen so the human adventure

1104
00:54:24,319 --> 00:54:22,319
doing of doing all this is the great

1105
00:54:26,390 --> 00:54:24,329
connection between those of you here and

1106
00:54:30,170 --> 00:54:26,400
those of us who only get a day pass to

1107
00:54:32,420 --> 00:54:30,180
disneyland for nerds so let's be honest

1108
00:54:34,849 --> 00:54:32,430
this is not a strong suit for most

1109
00:54:36,079 --> 00:54:34,859
scientists right for whatever reason

1110
00:54:38,269 --> 00:54:36,089
however you've been blessed with some

1111
00:54:41,750 --> 00:54:38,279
key people over the years who are great

1112
00:54:44,089 --> 00:54:41,760
communicators from seguin to squires so

1113
00:54:46,640 --> 00:54:44,099

I bet you're thinking well miles if this

1114

00:54:48,680 --> 00:54:46,650

is so why isn't there more coverage in

1115

00:54:50,870 --> 00:54:48,690

the mainstream media of our exploits in

1116

00:54:53,299 --> 00:54:50,880

the good old days it was different right

1117

00:54:55,279 --> 00:54:53,309

the coverage was longer better and

1118

00:54:58,460 --> 00:54:55,289

deeper as opposed to faster better

1119

00:54:59,539 --> 00:54:58,470

cheaper i guess the report the reporters

1120

00:55:02,089 --> 00:54:59,549

were enthused they were practically

1121

00:55:04,010 --> 00:55:02,099

cheerleaders except for David Frost and

1122

00:55:06,079 --> 00:55:04,020

the whole world the whole world was

1123

00:55:07,549 --> 00:55:06,089

watching oh and the women were more

1124

00:55:09,980 --> 00:55:07,559

beautiful in the beer tasted better too

1125

00:55:12,410 --> 00:55:09,990

and the kids were smarter anyway so what

1126
00:55:16,700 --> 00:55:12,420
happened to the media why do we see more

1127
00:55:20,730 --> 00:55:16,710
interested in Britney Spears than Tony

1128
00:55:31,150 --> 00:55:27,910
what's up with that okay it's a slightly

1129
00:55:33,480 --> 00:55:31,160
rhetorical question besides how the hell

1130
00:55:36,099 --> 00:55:33,490
should I know I just got canned

1131
00:55:38,230 --> 00:55:36,109
seriously though a lot of this has to do

1132
00:55:39,670 --> 00:55:38,240
with the space agency which you are

1133
00:55:42,819 --> 00:55:39,680
affiliated with affiliated with NASA

1134
00:55:44,559 --> 00:55:42,829
scribes to the no Buck Rogers no bucks

1135
00:55:46,210 --> 00:55:44,569
philosophy and there's probably some

1136
00:55:48,549 --> 00:55:46,220
truth to all that but sending humans

1137
00:55:51,279 --> 00:55:48,559
into the vacuum creates a bit of a

1138
00:55:52,870 --> 00:55:51,289

vacuum for the likes of you sadly it's

1139

00:55:54,730 --> 00:55:52,880

simply hard to compete with those

1140

00:55:56,920 --> 00:55:54,740

operations in houston and florida too

1141

00:55:59,230 --> 00:55:56,930

much money and too many flights fights

1142

00:56:01,509 --> 00:55:59,240

over how the money has or will be spent

1143

00:56:02,980 --> 00:56:01,519

shuttle launch coverage sadly has

1144

00:56:05,470 --> 00:56:02,990

degenerated into little more than a

1145

00:56:07,990 --> 00:56:05,480

Deathwatch type of coverage and the

1146

00:56:10,299 --> 00:56:08,000

space savvy press corps seems poised to

1147

00:56:12,700 --> 00:56:10,309

pounce on the next gaffe the fact that

1148

00:56:14,380 --> 00:56:12,710

CNN wiped out its entire highly

1149

00:56:16,839 --> 00:56:14,390

decorated i should say science and

1150

00:56:19,539 --> 00:56:16,849

technology unit including yours truly i

1151
00:56:21,400 --> 00:56:19,549
say ever so humbly should tell you a lot

1152
00:56:24,069 --> 00:56:21,410
about where things are right now in the

1153
00:56:26,799 --> 00:56:24,079
mainstream media we're talking about

1154
00:56:29,680 --> 00:56:26,809
plate tectonics here though the world is

1155
00:56:31,630 --> 00:56:29,690
shifting beneath the media's feet once

1156
00:56:33,190 --> 00:56:31,640
upon a time we had healthy newspapers in

1157
00:56:35,980 --> 00:56:33,200
this country soon we'll have nothing to

1158
00:56:38,859 --> 00:56:35,990
line the birdcage or wrap the fish so

1159
00:56:41,710 --> 00:56:38,869
what's the advice plastics no no I'm

1160
00:56:44,950 --> 00:56:41,720
sorry that's that's that was for an

1161
00:56:47,529 --> 00:56:44,960
older speech i guess i need to cup date

1162
00:56:51,160 --> 00:56:47,539
that one it's the internets all of them

1163
00:56:54,519 --> 00:56:51,170

seriously what you are you in a sense

1164

00:56:56,710 --> 00:56:54,529

started in 97 with had the Pathfinder

1165

00:57:00,029 --> 00:56:56,720

weba gonza he believed he's a senator

1166

00:57:03,099 --> 00:57:00,039

now what a great this is a great country

1167

00:57:05,470 --> 00:57:03,109

it's all grown at a Moore's Law clip

1168

00:57:07,809 --> 00:57:05,480

today bloggers tweeters Facebookers

1169

00:57:11,349 --> 00:57:07,819

random folks ranting with a DV camera to

1170

00:57:13,809 --> 00:57:11,359

Mac can do and can compete with a huge

1171

00:57:15,819 --> 00:57:13,819

globally deployed standing army of

1172

00:57:17,440 --> 00:57:15,829

journalists all their satellite trucks

1173

00:57:19,900 --> 00:57:17,450

and their producers and their makeup

1174

00:57:21,670 --> 00:57:19,910

artists and their reporters there are

1175

00:57:23,589 --> 00:57:21,680

interested people out there the

1176
00:57:26,890 --> 00:57:23,599
mainstream media may no longer be the

1177
00:57:28,180 --> 00:57:26,900
best way to reach them however it just

1178
00:57:30,130 --> 00:57:28,190
looks a lot different than those news

1179
00:57:32,200 --> 00:57:30,140
conferences in the 60s and 70s so

1180
00:57:33,609 --> 00:57:32,210
whatever you do I encourage you not to

1181
00:57:36,279 --> 00:57:33,619
stop of course

1182
00:57:38,859 --> 00:57:36,289
don't stop exploring but also don't stop

1183
00:57:41,829 --> 00:57:38,869
thinking of new ways to speak directly

1184
00:57:43,299 --> 00:57:41,839
to your audience this is the future you

1185
00:57:45,789 --> 00:57:43,309
get it here I know that but I'm just

1186
00:57:47,859 --> 00:57:45,799
underscoring the point my teenage kids

1187
00:57:50,380 --> 00:57:47,869
insist on a two-way transaction on

1188
00:57:52,029 --> 00:57:50,390

everything they do if they can't be a

1189

00:57:55,539 --> 00:57:52,039

part of your adventure they're out of

1190

00:57:57,789 --> 00:57:55,549

here so fortunately this is what you do

1191

00:57:59,470 --> 00:57:57,799

here in a long history of letting the

1192

00:58:01,150 --> 00:57:59,480

public in is what you're all about and

1193

00:58:02,380 --> 00:58:01,160

letting them look over your shoulders as

1194

00:58:05,200 --> 00:58:02,390

you do your work that's courageous

1195

00:58:07,599 --> 00:58:05,210

that's part of the risk right just keep

1196

00:58:09,549 --> 00:58:07,609

exploring new ways to engage them never

1197

00:58:12,309 --> 00:58:09,559

stop thinking of what is just over the

1198

00:58:29,200 --> 00:58:12,319

horizon on whatever planet you happen to

1199

00:58:33,020 --> 00:58:31,099

one of the more significant

1200

00:58:35,480 --> 00:58:33,030

accomplishments of this mission I think

1201

00:58:38,359 --> 00:58:35,490

the for me the one metric or the one

1202

00:58:40,789 --> 00:58:38,369

measure that really captures it is that

1203

00:58:43,370 --> 00:58:40,799

is the realization that Spirit and

1204

00:58:47,450 --> 00:58:43,380

Opportunity have made this strange alien

1205

00:58:51,049 --> 00:58:47,460

world a familiar place we now live in a

1206

00:58:52,460 --> 00:58:51,059

larger neighborhood and this adventure

1207

00:58:55,069 --> 00:58:52,470

continues for these two Rovers to

1208

00:58:59,240 --> 00:58:55,079

explore and discover for the benefit of

1209

00:59:02,270 --> 00:58:59,250

all these Rovers this mission and your

1210

00:59:05,960 --> 00:59:02,280

Labor's are the finest examples of what

1211

00:59:08,630 --> 00:59:05,970

humankind can do well done opportunity