1
00:00:09,200 --> 00:00:06,760
welcome to NASA's Jet Propulsion

2
00:00:11,600 --> 00:00:09,210
Laboratory I'm Jane Platt with the media

3
00:00:14,330 --> 00:00:11,610
relations office oh the Mars Curiosity

4
00:00:17,090 --> 00:00:14,340
rover is settling in well into its new

5
00:00:19,670 --> 00:00:17,100
home on Mars and I guess we could say

6
00:00:21,400 --> 00:00:19,680
it's really on a roll right now we're

7
00:00:23,420 --> 00:00:21,410
going to be hearing from a panel of

8
00:00:25,880 --> 00:00:23,430
scientists and engineers to tell us

9
00:00:27,349 --> 00:00:25,890
what's going on but first I did want to

10
00:00:29,810 --> 00:00:27,359
mention that today has been declared

11
00:00:32,420 --> 00:00:29,820
space day by California Governor Jerry

12
00:00:34,940 --> 00:00:32,430
Brown who will be visiting JPL and

13
00:00:36,229 --> 00:00:34,950

meeting with the rover team later on but

14
00:00:38,720 --> 00:00:36,239
in the meantime we're going to start

15
00:00:40,310 --> 00:00:38,730
with our panel and we're going to

16
00:00:42,889 --> 00:00:40,320
introduce them first of all we have

17
00:00:45,260 --> 00:00:42,899
Michael Meyer he's the lead scientist

18
00:00:47,959 --> 00:00:45,270
for the Mars exploration program NASA

19
00:00:51,439 --> 00:00:47,969
headquarters in Washington we have Pete

20
00:00:54,200 --> 00:00:51,449
tysinger the MSL project manager for a

21
00:00:56,330 --> 00:00:54,210
Jet Propulsion Laboratory and we have

22
00:00:59,119 --> 00:00:56,340
Roger Weems principal investigator of

23
00:01:05,750 --> 00:00:59,129
the chemcam instrument Los Alamos

24
00:01:07,850 --> 00:01:05,760
National Laboratory in New Mexico Matt

25
00:01:10,520 --> 00:01:07,860
hive early mat heavily is next and he's

26
00:01:13,370 --> 00:01:10,530
the lead Rover planner for he's are at

27
00:01:15,530 --> 00:01:13,380
JPL and Roger Weems then is the

28
00:01:18,230 --> 00:01:15,540
principal investigator at chemcam from

29
00:01:20,810 --> 00:01:18,240
Los Alamos in New Mexico and we have

30
00:01:24,020 --> 00:01:20,820
last but not least joy crisp the deputy

31
00:01:25,370 --> 00:01:24,030
project scientist at JPL we're going to

32
00:01:27,280 --> 00:01:25,380
start things off this morning with a

33
00:01:30,230 --> 00:01:27,290
special announcement from Michael Meyer

34
00:01:31,730 --> 00:01:30,240
well thank you actually before I make

35
00:01:33,620 --> 00:01:31,740
the announcement which I think all of

36
00:01:37,100 --> 00:01:33,630
you will enjoy I would like to show you

37
00:01:40,810 --> 00:01:37,110
a short video this video was made on the

38
00:01:45,469 --> 00:01:40,820

eve of the arrival at Mars of Mariner 9

39
00:01:47,090 --> 00:01:45,479
this was in November of 1971 and in the

40
00:01:50,380 --> 00:01:47,100
video you'll see a couple people you

41
00:01:54,530 --> 00:01:50,390
might recognize like Bruce Murray and

42
00:01:57,679 --> 00:01:54,540
Carl Sagan and Ray Bradbury so we can

43
00:02:00,200 --> 00:01:57,689
look at that video I was hoping that

44
00:02:03,469 --> 00:02:00,210
during the last few days as we got

45
00:02:05,240 --> 00:02:03,479
closer to Mars and the dust cleared that

46
00:02:12,750 --> 00:02:05,250
we see a lot of Martian standing there

47
00:02:22,980 --> 00:02:14,570
you

48
00:02:24,990 --> 00:02:22,990
brought along too though I'm going to

49
00:02:27,480 --> 00:02:25,000
keep this short because I much rather

50
00:02:29,700 --> 00:02:27,490
listen to our scientific friends here

51
00:02:31,980 --> 00:02:29,710
today tell us about what's coming up

52
00:02:33,690 --> 00:02:31,990
this week but I every time I get a group

53
00:02:37,020 --> 00:02:33,700
of people together and have them trapped

54
00:02:40,800 --> 00:02:37,030
in a pile like this i bring a poem say

55
00:02:43,200 --> 00:02:40,810
and you can't escape me but luckily it's

56
00:02:45,630 --> 00:02:43,210
a short poem but it sums up some of my

57
00:02:47,370 --> 00:02:45,640
feelings on why i love space travel why

58
00:02:49,290 --> 00:02:47,380
i write science fiction why i'm

59
00:02:53,360 --> 00:02:49,300
intrigued with what's going on this

60
00:02:55,500 --> 00:02:53,370
weekend of Mars and part of this has my

61
00:02:57,840 --> 00:02:55,510
philosophy about space travel and

62
00:03:00,390 --> 00:02:57,850
initial permit are read it to you it's

63
00:03:02,700 --> 00:03:00,400

very very short the fence we walked

64
00:03:05,340 --> 00:03:02,710
between the years that balance us serene

65
00:03:07,230 --> 00:03:05,350
was a place half in the sky we're in the

66
00:03:09,720 --> 00:03:07,240
green of leaf and promising of peach

67
00:03:12,210 --> 00:03:09,730
we've reached our hand attention almost

68
00:03:15,750 --> 00:03:12,220
touched the sky if we could reach and

69
00:03:20,130 --> 00:03:15,760
touch me said it strategist not to never

70
00:03:22,380 --> 00:03:20,140
to be dead we ate and almost touched

71
00:03:25,290 --> 00:03:22,390
that stuff our reach was never quite

72
00:03:28,410 --> 00:03:25,300
enough if only we had Tyler bin and

73
00:03:30,479 --> 00:03:28,420
touched God's cuff is his hem we would

74
00:03:33,540 --> 00:03:30,489
not have to go with them who have gone

75
00:03:36,540 --> 00:03:33,550
before who sure does us two towels they

76
00:03:38,760 --> 00:03:36,550
could stand and hopes by stretching tell

77
00:03:41,240 --> 00:03:38,770
that they might keep their land their

78
00:03:44,009 --> 00:03:41,250
home their heart their flesh and sold

79
00:03:47,910 --> 00:03:44,019
but they like us for standing in a hole

80
00:03:51,060 --> 00:03:47,920
Oh Thomas will erase one day stand

81
00:03:53,280 --> 00:03:51,070
really tower across the void across the

82
00:03:56,280 --> 00:03:53,290
universe and all and measured out with

83
00:03:59,430 --> 00:03:56,290
rocket fire at last put Adams finger

84
00:04:02,940 --> 00:03:59,440
fourth as on the Sistine ceiling and

85
00:04:06,120 --> 00:04:02,950
God's hand come down the other way to

86
00:04:09,240 --> 00:04:06,130
measure man and find him good and gift

87
00:04:13,620 --> 00:04:09,250
him with forevers day I worked for that

88
00:04:16,830 --> 00:04:13,630

short man large dream i send my rockets

89
00:04:19,240 --> 00:04:16,840
forth between my ears hoping an inch of

90
00:04:22,240 --> 00:04:19,250
good is worth a pound of years

91
00:04:25,180 --> 00:04:22,250
aching to hear a voice cried back around

92
00:04:39,540 --> 00:04:25,190
the universal man we've reached Alpha

93
00:04:51,880 --> 00:04:45,610
and today Saul 16 we had the first

94
00:04:53,620 --> 00:04:51,890
roving astrobiology rover on Mars and we

95
00:04:56,980 --> 00:04:53,630
have truly extended our reach and

96
00:05:01,420 --> 00:04:56,990
touched another planet today would have

97
00:05:03,460 --> 00:05:01,430
been Ray Bradbury's 92nd birthday but he

98
00:05:05,440 --> 00:05:03,470
has already reached in mortality with

99
00:05:10,750 --> 00:05:05,450
the hundreds of short stories he's

100
00:05:12,730 --> 00:05:10,760
written and nearly 50 books his books

101
00:05:15,490 --> 00:05:12,740
have truly inspired us the Martian

102
00:05:18,250 --> 00:05:15,500
Chronicles have inspired our curiosity

103
00:05:22,480 --> 00:05:18,260
and open our minds of the possibility of

104
00:05:25,420 --> 00:05:22,490
life on Mars in his honor we declared

105
00:05:28,990 --> 00:05:25,430
the place that that curiosity touched

106
00:05:34,330 --> 00:05:29,000
down to be it forever known as Bradbury

107
00:05:36,880 --> 00:05:34,340
landing I kind of like the name for one

108
00:05:39,730 --> 00:05:36,890
it was you know the majority vote of the

109
00:05:42,640 --> 00:05:39,740
science team having been inspired by Ray

110
00:05:46,630 --> 00:05:42,650
Bradbury landing is actually an event

111
00:05:49,000 --> 00:05:46,640
it's not an object also it harkens back

112
00:05:51,850 --> 00:05:49,010
to the time when ships landed on the

113
00:05:58,810 --> 00:05:51,860

shores of other new worlds to explore

114
00:06:03,520 --> 00:05:58,820
and this place might in fact with its

115
00:06:06,159 --> 00:06:03,530
water reference be even more apropos so

116
00:06:07,990 --> 00:06:06,169
I would like to choose I would like to

117
00:06:10,120 --> 00:06:08,000
relay to you one of my favorite scene

118
00:06:12,700 --> 00:06:10,130
from the Martian Chronicles and that was

119
00:06:16,330 --> 00:06:12,710
when the humans peer over the rim of one

120
00:06:18,719 --> 00:06:16,340
of the Martian canals and there they see

121
00:06:23,320 --> 00:06:18,729
reflected in the water Martians and

122
00:06:25,930 --> 00:06:23,330
themselves and so as we look forward to

123
00:06:27,909 --> 00:06:25,940
one of those days I would like to now

124
00:06:31,390 --> 00:06:27,919
turn it over to peek tysinger who will

125
00:06:33,600 --> 00:06:31,400
tell us about our intrepid Martian the

126
00:06:37,270 --> 00:06:33,610
rover Curiosity

127
00:06:39,640 --> 00:06:37,280
thank you Mike um i would like before i

128
00:06:48,219 --> 00:06:39,650
start to give a small hand of applause

129
00:06:50,439 --> 00:06:48,229
to Ray Bradbury he was a friend of JPL

130
00:06:52,600 --> 00:06:50,449
as well as of the total space program

131
00:06:54,670 --> 00:06:52,610
and and and several people including

132
00:06:58,809 --> 00:06:54,680
myself had the honor of meeting him and

133
00:07:00,969 --> 00:06:58,819
and so very apropos gesture um you are

134
00:07:04,240 --> 00:07:00,979
looking here today at a very smiley

135
00:07:06,520 --> 00:07:04,250
ecstatic project manager we have

136
00:07:09,040 --> 00:07:06,530
completed 16 souls on the surface and

137
00:07:13,270 --> 00:07:09,050
everything has been going extremely well

138
00:07:14,950 --> 00:07:13,280

I mean really extremely well we have no

139
00:07:17,020 --> 00:07:14,960
anomalies or other issues that we're

140
00:07:19,420 --> 00:07:17,030
working with the exception of the rims

141
00:07:22,390 --> 00:07:19,430
win sensor anomaly which is still in

142
00:07:25,270 --> 00:07:22,400
work and if I could have the first slide

143
00:07:28,059 --> 00:07:25,280
please I kind of like to take you back

144
00:07:29,529 --> 00:07:28,069
to to the day before landing I think

145
00:07:31,480 --> 00:07:29,539
Richard cooks that on the stage and

146
00:07:33,790 --> 00:07:31,490
talked about what the near-term plans

147
00:07:35,469 --> 00:07:33,800
were going to be after 10 31 on that

148
00:07:37,540 --> 00:07:35,479
Sunday evening I'd like to kind of let

149
00:07:39,820 --> 00:07:37,550
you know what's happened in the early

150
00:07:40,990 --> 00:07:39,830
first week of the planned activities we

151
00:07:42,850 --> 00:07:41,000
were going to do the high-gain antenna

152
00:07:45,459 --> 00:07:42,860
deploy mass deploy instrumen aliveness

153
00:07:46,839 --> 00:07:45,469
checks acquire panorama we had a quiet

154
00:07:48,640 --> 00:07:46,849
day planned and we were going to start

155
00:07:50,320 --> 00:07:48,650
and then a few days later finish the

156
00:07:52,029 --> 00:07:50,330
flight software changed the surface load

157
00:07:53,469 --> 00:07:52,039
and notice that check marks because

158
00:07:56,769 --> 00:07:53,479
we've successfully completed all those

159
00:08:00,550 --> 00:07:56,779
activities basically on plan next slide

160
00:08:03,219 --> 00:08:00,560
please and this was kind of the longer

161
00:08:04,540 --> 00:08:03,229
view going forward in early August we

162
00:08:06,010 --> 00:08:04,550
were going to get the first images and

163
00:08:08,860 --> 00:08:06,020

finished the engineering check out and

164
00:08:10,570 --> 00:08:08,870
we've completed that activity in mid to

165
00:08:14,170 --> 00:08:10,580
late august we were complete the payload

166
00:08:15,490 --> 00:08:14,180
checkouts and we've done that and and

167
00:08:17,499 --> 00:08:15,500
we're going to check out the sample

168
00:08:20,379 --> 00:08:17,509
system and we have not quite completed

169
00:08:21,730 --> 00:08:20,389
that work we have done a short drive

170
00:08:23,469 --> 00:08:21,740
today that Matt will talk about in a

171
00:08:26,189 --> 00:08:23,479
second and with that activity we have

172
00:08:30,159 --> 00:08:26,199
completed the characterization phase a

173
00:08:32,319 --> 00:08:30,169
1-1 both a and B if you recall in that

174
00:08:34,449 --> 00:08:32,329
plan of there's going to be an

175
00:08:37,060 --> 00:08:34,459
intermission between cap 1 and cap too

176
00:08:38,649 --> 00:08:37,070
and that is going to take place and and

177
00:08:41,920 --> 00:08:38,659
that intermission is likely to be a

178
00:08:44,350 --> 00:08:41,930
little bit more extended and so and so

179
00:08:46,060 --> 00:08:44,360
rather than do the surface sample

180
00:08:46,480 --> 00:08:46,070
checkouts and then the first drive I

181
00:08:47,710 --> 00:08:46,490
think this

182
00:08:49,620 --> 00:08:47,720
scientists have decided we're going to

183
00:08:51,850 --> 00:08:49,630
take a little bit of an extensive drive

184
00:08:54,340 --> 00:08:51,860
since we now know the system works well

185
00:08:57,550 --> 00:08:54,350
and and then we will complete the sample

186
00:08:59,110 --> 00:08:57,560
system checkouts later in August we

187
00:09:01,510 --> 00:08:59,120
still ought to be able to complete a

188
00:09:04,240 --> 00:09:01,520

scoop sample in midair late-september on

189
00:09:06,280 --> 00:09:04,250
plan and Anna first drill symbol in

190
00:09:08,079 --> 00:09:06,290
October November so right now a little

191
00:09:10,930 --> 00:09:08,089
bit more intermission a little bit more

192
00:09:13,210 --> 00:09:10,940
science from that and and and but we're

193
00:09:15,579 --> 00:09:13,220
basically on plan with what I like to

194
00:09:18,130 --> 00:09:15,589
repeat is that extremely well behaved a

195
00:09:21,190 --> 00:09:18,140
flight system on Mars and Matt will tell

196
00:09:22,720 --> 00:09:21,200
us about today's drive thanks Pete so

197
00:09:25,540 --> 00:09:22,730
let's get straight to the good stuff and

198
00:09:28,090 --> 00:09:25,550
put up the image from today the very

199
00:09:30,280 --> 00:09:28,100
beautiful image so I'm pleased to report

200
00:09:39,160 --> 00:09:30,290
that curiosity today had our first

201
00:09:41,530 --> 00:09:39,170
successful drive on Mars so this this

202
00:09:43,210 --> 00:09:41,540
Drive check out coupled with yester

203
00:09:45,190 --> 00:09:43,220
Sol's check out of the steering

204
00:09:47,949 --> 00:09:45,200
actuators on cell 15 means that we have

205
00:09:50,199 --> 00:09:47,959
a fully functioning mobility system on

206
00:09:52,210 --> 00:09:50,209
our Rover and in this image you can see

207
00:09:53,650 --> 00:09:52,220
our touchdown point you can see the

208
00:09:56,769 --> 00:09:53,660
tracks driving away from that location

209
00:09:58,960 --> 00:09:56,779
as well as the scour marks to the right

210
00:10:01,630 --> 00:09:58,970
and the left of the rover's initial

211
00:10:04,269 --> 00:10:01,640
position we drove forward did it turn in

212
00:10:06,069 --> 00:10:04,279
place and backed up and you can see that

213
00:10:08,500 --> 00:10:06,079

the the soil underneath the rover it

214
00:10:11,199 --> 00:10:08,510
kind of confirms our expectations that

215
00:10:13,780 --> 00:10:11,209
the soil is firm great for mobility

216
00:10:15,310 --> 00:10:13,790
we're not in seeing too much sinkage and

217
00:10:17,740 --> 00:10:15,320
that we should have smooth sailing ahead

218
00:10:19,810 --> 00:10:17,750
of us I've also got another graphic

219
00:10:23,819 --> 00:10:19,820
showing the animation of the drive today

220
00:10:26,170 --> 00:10:23,829
if we can move to that so this is our

221
00:10:28,090 --> 00:10:26,180
simulation and visualization tool which

222
00:10:30,280 --> 00:10:28,100
shows our first drive so we initially

223
00:10:32,800 --> 00:10:30,290
bumped forward 90 centimeters to image

224
00:10:34,650 --> 00:10:32,810
the wheels and then drove an additional

225
00:10:37,600 --> 00:10:34,660
distance to total four and a half meters

226
00:10:38,949 --> 00:10:37,610
where we did our first turn in place and

227
00:10:40,480 --> 00:10:38,959
you can see we're imaging every once in

228
00:10:41,829 --> 00:10:40,490
a while to look at the wheels as we're

229
00:10:44,880 --> 00:10:41,839
driving to inspect them and check them

230
00:10:47,500 --> 00:10:44,890
out turning half of our 120 degree turn

231
00:10:50,260 --> 00:10:47,510
turning the remaining distance and then

232
00:10:52,449 --> 00:10:50,270
backing up two and a half meters so this

233
00:10:55,000 --> 00:10:52,459
final location places us in a good spot

234
00:10:56,650 --> 00:10:55,010
to do some good science here we've got

235
00:10:58,780 --> 00:10:56,660
the gold burns scour off to the right

236
00:11:00,100 --> 00:10:58,790
side of the rover where we can view it

237
00:11:00,310 --> 00:11:00,110
with the chemcam instrument and the

238
00:11:02,290 --> 00:11:00,320

other

239
00:11:04,270 --> 00:11:02,300
instruments the key things about the

240
00:11:05,830 --> 00:11:04,280
drive today were that we were able to do

241
00:11:07,750 --> 00:11:05,840
one full revolution of the drive

242
00:11:09,700 --> 00:11:07,760
actuators in the forward direction we

243
00:11:11,380 --> 00:11:09,710
were able to turn and see that the

244
00:11:13,540 --> 00:11:11,390
inertial measurement unit telling the

245
00:11:15,100 --> 00:11:13,550
rover how it's heading is changing is

246
00:11:16,780 --> 00:11:15,110
working properly and we were able to

247
00:11:19,180 --> 00:11:16,790
back up another full revolution of the

248
00:11:20,590 --> 00:11:19,190
drive actuators so we were able to see

249
00:11:22,840 --> 00:11:20,600
motor currents we were able to get the

250
00:11:25,780 --> 00:11:22,850
data and everything looks perfectly

251
00:11:28,900 --> 00:11:25,790
nominal so we're very excited to to have

252
00:11:30,820 --> 00:11:28,910
this kind of milestone behind us we see

253
00:11:32,920 --> 00:11:30,830
that the system is performing very well

254
00:11:34,780 --> 00:11:32,930
and we're in a great place to do some

255
00:11:38,830 --> 00:11:34,790
science so with that I'll pass it over

256
00:11:41,590 --> 00:11:38,840
to Roger thanks Matt exciting so I'm

257
00:11:43,900 --> 00:11:41,600
going to talk about the check out of the

258
00:11:47,080 --> 00:11:43,910
chemcam instrument and some of the first

259
00:11:50,110 --> 00:11:47,090
science with it the chemcam is the laser

260
00:11:54,160 --> 00:11:50,120
instrument which fires high-energy

261
00:11:58,270 --> 00:11:54,170
pulses at targets up to almost 25 feet

262
00:12:00,940 --> 00:11:58,280
away so it that produces plasmas that

263
00:12:05,080 --> 00:12:00,950

provide chemical composition of the

264
00:12:07,600 --> 00:12:05,090
samples for us to to understand so we're

265
00:12:09,850 --> 00:12:07,610
going to cut to a video here which will

266
00:12:11,350 --> 00:12:09,860
show a demonstration before we

267
00:12:14,170 --> 00:12:11,360
integrated this instrument onto the

268
00:12:15,970 --> 00:12:14,180
rover so here is the mast part of the

269
00:12:18,220 --> 00:12:15,980
chemcam instrument you see a four and a

270
00:12:20,830 --> 00:12:18,230
half inch telescope there the laser is

271
00:12:22,240 --> 00:12:20,840
right behind and we're going to show a

272
00:12:24,190 --> 00:12:22,250
little demonstration where this

273
00:12:26,950 --> 00:12:24,200
instrument is going to be used to fire

274
00:12:29,410 --> 00:12:26,960
at an iron pyrite target about eight

275
00:12:31,660 --> 00:12:29,420
feet away so we're setting it up here

276
00:12:34,120 --> 00:12:31,670
the laser beam is invisible but you

277
00:12:36,820 --> 00:12:34,130
actually see the plasmas first at three

278
00:12:38,620 --> 00:12:36,830
hurtz here and then at ten Hertz so

279
00:12:40,840 --> 00:12:38,630
you'll see how it can shoot and then we

280
00:12:42,040 --> 00:12:40,850
just show a still image of the plasma so

281
00:12:45,280 --> 00:12:42,050
you can see what it really looks like

282
00:12:47,440 --> 00:12:45,290
missed this test was done at terrestrial

283
00:12:50,560 --> 00:12:47,450
pressure it was done in Los Alamos

284
00:12:52,600 --> 00:12:50,570
National Lab and the plasmas are more

285
00:12:54,910 --> 00:12:52,610
confined in a terrestrial atmosphere

286
00:12:56,890 --> 00:12:54,920
than the air on Mars and so if we show

287
00:12:58,620 --> 00:12:56,900
the next image you'll actually see the

288
00:13:02,050 --> 00:12:58,630

difference so on the Left you'll see

289
00:13:04,270 --> 00:13:02,060
what a plasma looks like at in a

290
00:13:05,710 --> 00:13:04,280
terrestrial environment that's but this

291
00:13:07,900 --> 00:13:05,720
was in a chamber and so then we

292
00:13:10,360 --> 00:13:07,910
evacuated it down to Mars pressure which

293
00:13:12,700 --> 00:13:10,370
is about 1% of Earth's pressure and on

294
00:13:13,870 --> 00:13:12,710
the right you can see the size and

295
00:13:16,480 --> 00:13:13,880
brilliance of the plasma

296
00:13:18,130 --> 00:13:16,490
mars pressure and so on the right is

297
00:13:22,660 --> 00:13:18,140
what's actually happening now on Mars

298
00:13:24,580 --> 00:13:22,670
and so as you and you know the the short

299
00:13:30,880 --> 00:13:24,590
of this is that that we were getting

300
00:13:33,640 --> 00:13:30,890
great signal so far so basically chemcam

301
00:13:37,710 --> 00:13:33,650
also includes a remote micro imager so

302
00:13:40,210 --> 00:13:37,720
this imager is designed to take close-up

303
00:13:42,400 --> 00:13:40,220
high-resolution images to provide the

304
00:13:44,830 --> 00:13:42,410
context for these small analysis spots

305
00:13:47,650 --> 00:13:44,840
that we hit with the laser but it can

306
00:13:50,260 --> 00:13:47,660
also image other areas as well so until

307
00:13:51,670 --> 00:13:50,270
we pull out the mastcam 100 and start

308
00:13:55,560 --> 00:13:51,680
using that this is a highest resolution

309
00:13:58,810 --> 00:13:55,570
imager on the rover for right now so

310
00:14:02,320 --> 00:13:58,820
basically in the next image will show

311
00:14:04,960 --> 00:14:02,330
the rock that we first analyzed on the

312
00:14:08,200 --> 00:14:04,970
surface of Mars this was a rock called

313
00:14:11,140 --> 00:14:08,210

coronation it was it was selected

314
00:14:14,020 --> 00:14:11,150
because it was at a nice distance from

315
00:14:16,060 --> 00:14:14,030
the rover it had a nice flat face the

316
00:14:19,210 --> 00:14:16,070
rock itself is about only three inches

317
00:14:22,390 --> 00:14:19,220
across and it's about let's see about

318
00:14:24,580 --> 00:14:22,400
eight feet from the instrument and so we

319
00:14:28,270 --> 00:14:24,590
sent up the commands on Saturday night

320
00:14:31,030 --> 00:14:28,280
and the spectra came back on early on

321
00:14:33,850 --> 00:14:31,040
Sunday morning and we had a very excited

322
00:14:36,040 --> 00:14:33,860
team to look at this and actually the

323
00:14:37,930 --> 00:14:36,050
way the way we did this we actually took

324
00:14:40,510 --> 00:14:37,940
an image the day before and then and

325
00:14:42,460 --> 00:14:40,520
then repointed just slightly so the

326
00:14:44,110 --> 00:14:42,470
image you see on this on this picture is

327
00:14:46,390 --> 00:14:44,120
just a little bit off but the next day

328
00:14:48,520 --> 00:14:46,400
we got it right in the middle and we

329
00:14:51,160 --> 00:14:48,530
show a little inset of where where it

330
00:14:54,180 --> 00:14:51,170
hit on the rock and I'll show another

331
00:14:57,490 --> 00:14:54,190
one like that a little bit later but the

332
00:15:01,030 --> 00:14:57,500
next slide will show is actually the the

333
00:15:04,030 --> 00:15:01,040
spectrum from this rock in short we got

334
00:15:06,810 --> 00:15:04,040
excellent signal we actually saturated

335
00:15:09,610 --> 00:15:06,820
one emission-line oxygen just slightly

336
00:15:12,580 --> 00:15:09,620
so that just shows what good signal

337
00:15:17,140 --> 00:15:12,590
we're getting from from Mars so the

338
00:15:19,600 --> 00:15:17,150

spectrum consists of 6144 channels that

339
00:15:23,320 --> 00:15:19,610
span the wavelength range from 240 to

340
00:15:25,620 --> 00:15:23,330
850 nanometers and so that covers the

341
00:15:27,220 --> 00:15:25,630
ultraviolet with one spectrometer a

342
00:15:28,720 --> 00:15:27,230
violet and blue ray

343
00:15:31,260 --> 00:15:28,730
change with another spectrometer and

344
00:15:34,840 --> 00:15:31,270
then the visible and near-infrared range

345
00:15:36,880 --> 00:15:34,850
that Ric with the third spectrometer and

346
00:15:40,600 --> 00:15:36,890
so a color covers all the rainbow colors

347
00:15:42,670 --> 00:15:40,610
plus a bunch on both sides and so you

348
00:15:44,530 --> 00:15:42,680
can see labeled on there a number of

349
00:15:46,270 --> 00:15:44,540
emission lines that represent different

350
00:15:48,400 --> 00:15:46,280
elements and so those are the things we

351
00:15:51,160 --> 00:15:48,410
look for and so we can see the major

352
00:15:55,260 --> 00:15:51,170
elements on here oxygen silicon

353
00:15:57,910 --> 00:15:55,270
magnesium iron sodium potassium calcium

354
00:15:59,620 --> 00:15:57,920
but there's also minor and trace

355
00:16:01,450 --> 00:15:59,630
elements that we can really pick up with

356
00:16:04,600 --> 00:16:01,460
this instrument and so the inset on the

357
00:16:07,920 --> 00:16:04,610
upper left actually shows titanium and

358
00:16:11,680 --> 00:16:07,930
manganese which are which are quite

359
00:16:13,600 --> 00:16:11,690
lower in composition and also if you'll

360
00:16:15,580 --> 00:16:13,610
if you look you can see a lithium

361
00:16:18,760 --> 00:16:15,590
pointed out as well and that's probably

362
00:16:20,200 --> 00:16:18,770
less than 50 parts per million so

363
00:16:22,300 --> 00:16:20,210

there's a lot of detail we can get from

364
00:16:24,520 --> 00:16:22,310
this instrument and so we're really

365
00:16:26,590 --> 00:16:24,530
excited about that just one more thing

366
00:16:30,280 --> 00:16:26,600
about that is the inset near the center

367
00:16:33,340 --> 00:16:30,290
which shows the peaks of hydrogen and

368
00:16:35,560 --> 00:16:33,350
carbon the carbon peak on the right of

369
00:16:37,780 --> 00:16:35,570
this inset is from the atmosphere so

370
00:16:40,300 --> 00:16:37,790
there's nothing real big there in terms

371
00:16:43,690 --> 00:16:40,310
of findings the peak on the left showing

372
00:16:46,960 --> 00:16:43,700
hydrogen this is actually a sequence

373
00:16:50,260 --> 00:16:46,970
plot which shows every single laser shot

374
00:16:52,690 --> 00:16:50,270
as a separate spectrum and we did 30

375
00:16:55,870 --> 00:16:52,700
shots here and so the the first shot is

376
00:16:57,430 --> 00:16:55,880
shown in the white and that curve shows

377
00:16:59,530 --> 00:16:57,440
that we actually had hydrogen on the

378
00:17:00,850 --> 00:16:59,540
first shot but then I went down we could

379
00:17:02,770 --> 00:17:00,860
barely see it on the second shot and

380
00:17:04,840 --> 00:17:02,780
then it went away so it shows us that on

381
00:17:07,480 --> 00:17:04,850
the very surface of this rock we had

382
00:17:09,280 --> 00:17:07,490
hydrogen another thing that we saw on

383
00:17:12,550 --> 00:17:09,290
the surface was an enhancement of

384
00:17:13,960 --> 00:17:12,560
magnesium so we saw this on Coronation

385
00:17:15,640 --> 00:17:13,970
we also saw this on all of the samples

386
00:17:17,800 --> 00:17:15,650
we've looked at so far including the

387
00:17:19,750 --> 00:17:17,810
calibration target on the rover so this

388
00:17:21,460 --> 00:17:19,760

may be indicative of something from the

389
00:17:24,610 --> 00:17:21,470
dust where we've got to look into this a

390
00:17:27,190 --> 00:17:24,620
little bit more okay so after this rock

391
00:17:28,960 --> 00:17:27,200
we kind of told the science team that

392
00:17:31,840 --> 00:17:28,970
they were free to start choosing some

393
00:17:34,180 --> 00:17:31,850
targets and they went and selected the

394
00:17:37,150 --> 00:17:34,190
Goulburn scour this is the area where

395
00:17:38,710 --> 00:17:37,160
the rover's or the sky cranes thrusters

396
00:17:40,570 --> 00:17:38,720
actually sort of dug in a little bit

397
00:17:43,090 --> 00:17:40,580
with the blast

398
00:17:45,190 --> 00:17:43,100
and they uncovered a small rock outcrop

399
00:17:47,470 --> 00:17:45,200
which is of interest because of the way

400
00:17:49,419 --> 00:17:47,480
it looks it looks as if may have some

401
00:17:51,130 --> 00:17:49,429
some of the layers in it and it's

402
00:17:55,810 --> 00:17:51,140
bedrock so if we can go to the next

403
00:17:59,409 --> 00:17:55,820
image umm so the this image shows a mast

404
00:18:01,990 --> 00:17:59,419
cam a 34 image in the center and it is

405
00:18:05,970 --> 00:18:02,000
labeled with the locations of the remote

406
00:18:08,680 --> 00:18:05,980
micro imager that's chem cams imager

407
00:18:10,240 --> 00:18:08,690
pictures that were taken pictures one

408
00:18:13,149 --> 00:18:10,250
through six these are the little round

409
00:18:15,279 --> 00:18:13,159
images that show high resolution and so

410
00:18:18,909 --> 00:18:15,289
we targeted this for both imaging and we

411
00:18:21,669 --> 00:18:18,919
targeted Goulburn locations two three

412
00:18:24,669 --> 00:18:21,679
and four for the laser as well and so we

413
00:18:28,690 --> 00:18:24,679

shot the laser at the center of these of

414
00:18:31,149 --> 00:18:28,700
these images and so the the results we

415
00:18:33,940 --> 00:18:31,159
got there are pretty consistent with

416
00:18:36,580 --> 00:18:33,950
what we saw on coronation the coronation

417
00:18:39,789 --> 00:18:36,590
results really look like a basaltic

418
00:18:41,950 --> 00:18:39,799
composition and so that's not too

419
00:18:43,659 --> 00:18:41,960
surprising for the surface of Mars we

420
00:18:47,860 --> 00:18:43,669
know that basalt is the major igneous

421
00:18:49,690 --> 00:18:47,870
rock on Mars the fact that goulburn

422
00:18:52,419 --> 00:18:49,700
which looks a little bit sedimentary

423
00:18:54,490 --> 00:18:52,429
shows a basaltic composition is also not

424
00:18:56,950 --> 00:18:54,500
too surprising because when we look at

425
00:18:58,860 --> 00:18:56,960
this close up with our mi the remote

426
00:19:01,690 --> 00:18:58,870
micro imager we see that there are

427
00:19:03,970 --> 00:19:01,700
clasts or rock fragments that look like

428
00:19:06,340 --> 00:19:03,980
they were probably basaltic as well and

429
00:19:08,620 --> 00:19:06,350
so if this is a sedimentary rock and

430
00:19:11,409 --> 00:19:08,630
incorporated and loosely cemented some

431
00:19:13,240 --> 00:19:11,419
of these basaltic rock fragments some of

432
00:19:15,759 --> 00:19:13,250
them are our angular so they looked like

433
00:19:18,279 --> 00:19:15,769
they didn't get much altered and some of

434
00:19:21,220 --> 00:19:18,289
them are a little bit more rounded so

435
00:19:23,529 --> 00:19:21,230
that's kind of the story we've also shot

436
00:19:25,779 --> 00:19:23,539
a couple of other rocks one of them did

437
00:19:27,850 --> 00:19:25,789
give a different composition but it's

438
00:19:29,799 --> 00:19:27,860

still consistent with an igneous rock it

439
00:19:33,879 --> 00:19:29,809
looks like we hit more of a mineral

440
00:19:35,680 --> 00:19:33,889
grain potentially plagioclase but it's

441
00:19:37,629 --> 00:19:35,690
still consistent with a basaltic

442
00:19:39,700 --> 00:19:37,639
composition but because of the small

443
00:19:41,710 --> 00:19:39,710
spots that chemcam can shoot we can get

444
00:19:43,960 --> 00:19:41,720
single mineral grains if that's a larger

445
00:19:46,990 --> 00:19:43,970
grained rock what we'll need to do is

446
00:19:49,659 --> 00:19:47,000
move towards doing rasters and in line

447
00:19:51,879 --> 00:19:49,669
scans so we get more analysis spots on

448
00:19:53,409 --> 00:19:51,889
single rocks so we can really tell so

449
00:19:54,220 --> 00:19:53,419
we're still working on checking some of

450
00:19:56,260 --> 00:19:54,230
those things out

451
00:19:59,710 --> 00:19:56,270
so I'm just going to show up a final

452
00:20:03,010 --> 00:19:59,720
image which is actually the Goulburn

453
00:20:04,960 --> 00:20:03,020
number three and this is a an animation

454
00:20:07,810 --> 00:20:04,970
to just cuts between a before-and-after

455
00:20:10,510 --> 00:20:07,820
image that we shot that we took with

456
00:20:12,039 --> 00:20:10,520
with the micro imager showing what the

457
00:20:14,320 --> 00:20:12,049
rock looks like just before and just

458
00:20:16,270 --> 00:20:14,330
after shooting with the laser and so you

459
00:20:19,240 --> 00:20:16,280
can see how we can see where the laser

460
00:20:20,320 --> 00:20:19,250
shot so there you have it and we're

461
00:20:23,260 --> 00:20:20,330
going to be looking forward to doing

462
00:20:25,060 --> 00:20:23,270
more lots more science with the chemcam

463
00:20:27,430 --> 00:20:25,070

instrument but we're excited that it's

464
00:20:28,840 --> 00:20:27,440
looking great so far so I'll turn it

465
00:20:30,640 --> 00:20:28,850
over to joy crisp who's going to talk

466
00:20:33,250 --> 00:20:30,650
more about the overall science status of

467
00:20:34,840 --> 00:20:33,260
the mission thank you so I'm going to go

468
00:20:37,750 --> 00:20:34,850
over some more specifics about what

469
00:20:41,049 --> 00:20:37,760
we've done for science and what's coming

470
00:20:43,870 --> 00:20:41,059
in our science plans the engineering

471
00:20:45,700 --> 00:20:43,880
cameras are now fully checked out and

472
00:20:49,090 --> 00:20:45,710
being used to measure atmospheric dust

473
00:20:51,880 --> 00:20:49,100
winds and clouds we've taken color

474
00:20:54,430 --> 00:20:51,890
images from Mali and mask am we've also

475
00:20:57,909 --> 00:20:54,440
performed thorough check outs on 8 of

476
00:21:00,400 --> 00:20:57,919
our 10 scientific instruments as we've

477
00:21:03,610 --> 00:21:00,410
described in previous press briefings

478
00:21:06,100 --> 00:21:03,620
the the rad radiation monitor the REMS

479
00:21:08,110 --> 00:21:06,110
weather station that Dan neutron

480
00:21:11,049 --> 00:21:08,120
subsurface sounder and chemcam laser

481
00:21:14,020 --> 00:21:11,059
spectrometer and imager are already

482
00:21:15,730 --> 00:21:14,030
taking scientific measurements the Dan

483
00:21:17,919 --> 00:21:15,740
team is busy assessing their first

484
00:21:20,650 --> 00:21:17,929
active measurement that they reported in

485
00:21:22,539 --> 00:21:20,660
the previous press conference chemcam

486
00:21:24,850 --> 00:21:22,549
team is poring over their data as you

487
00:21:27,789 --> 00:21:24,860
heard from Roger and we've got several

488
00:21:30,520 --> 00:21:27,799

days of all day all night weather

489
00:21:32,560 --> 00:21:30,530
readings we're studying and we've

490
00:21:34,900 --> 00:21:32,570
partially checked out the remaining two

491
00:21:39,130 --> 00:21:34,910
instruments our analytical laboratories

492
00:21:42,070 --> 00:21:39,140
Sam and chemin so we're about to go into

493
00:21:45,250 --> 00:21:42,080
this intermission period which we have

494
00:21:48,310 --> 00:21:45,260
three major activities going on in this

495
00:21:50,919 --> 00:21:48,320
period so we'll have two separate days

496
00:21:54,220 --> 00:21:50,929
where we do some Sam atmospheric

497
00:21:56,970 --> 00:21:54,230
checkouts and first time we do that that

498
00:21:59,919 --> 00:21:56,980
will be the first turn on of Sam's pumps

499
00:22:02,649 --> 00:21:59,929
quadrupole mass spectrometer and tunable

500
00:22:06,430 --> 00:22:02,659
laser spectrometer will be very exciting

501
00:22:06,630 --> 00:22:06,440
we will have a campaign to do some of

502
00:22:09,900 --> 00:22:06,640
the

503
00:22:12,990 --> 00:22:09,910
advanced capabilities of mastcam like

504
00:22:16,440 --> 00:22:13,000
the precise focusing over the range that

505
00:22:20,340 --> 00:22:16,450
that it can focus on taking long-range

506
00:22:22,860 --> 00:22:20,350
3d images by positioning the rover at

507
00:22:26,280 --> 00:22:22,870
different parking spots and using those

508
00:22:28,800 --> 00:22:26,290
spots like different I positions to get

509
00:22:31,920 --> 00:22:28,810
the 3d range information and check that

510
00:22:34,380 --> 00:22:31,930
out and and then also thirdly the

511
00:22:36,510 --> 00:22:34,390
chemcam laser spectrometer we're going

512
00:22:38,580 --> 00:22:36,520
to do some more characterization of that

513
00:22:40,440 --> 00:22:38,590

to understand how well the optics are

514
00:22:44,400 --> 00:22:40,450
aligned and how sensitive the

515
00:22:46,470 --> 00:22:44,410
spectrometer is so after the

516
00:22:49,620 --> 00:22:46,480
intermission then we're currently

517
00:22:52,170 --> 00:22:49,630
planning to drive towards glenelg which

518
00:22:53,850 --> 00:22:52,180
is 400 meters to the east that's the

519
00:22:55,980 --> 00:22:53,860
triple Junction that we've shown

520
00:23:00,930 --> 00:22:55,990
pictures of before and we're thinking of

521
00:23:03,990 --> 00:23:00,940
spending a few more days before we start

522
00:23:07,710 --> 00:23:04,000
driving towards that examining the

523
00:23:12,330 --> 00:23:07,720
scours these scours from the sky crane

524
00:23:16,980 --> 00:23:12,340
thrusters using mass cam cam cam and Dan

525
00:23:19,590 --> 00:23:16,990
okay now on the way to glenelg we'd like

526
00:23:23,010 --> 00:23:19,600
to stop as soon as we encounter

527
00:23:25,800 --> 00:23:23,020
scoopable fine material to get going

528
00:23:28,850 --> 00:23:25,810
testing out the sample handling system

529
00:23:32,460 --> 00:23:28,860
and getting sample into Sam and chemin

530
00:23:35,070 --> 00:23:32,470
the first material would be scoopable

531
00:23:37,500 --> 00:23:35,080
fines and we would be trying to clean

532
00:23:40,200 --> 00:23:37,510
out that sample acquisition the scoop

533
00:23:42,510 --> 00:23:40,210
and sample handling system by doing that

534
00:23:44,820 --> 00:23:42,520
several times just tossing it out on the

535
00:23:49,800 --> 00:23:44,830
ground and then taking a sample to put

536
00:23:51,840 --> 00:23:49,810
into Sam and Kim in we might uh likely

537
00:23:54,840 --> 00:23:51,850
hold off on doing our first contact

538
00:23:57,810 --> 00:23:54,850

science with apxs and Molly until we get

539
00:23:59,580 --> 00:23:57,820
to that that area but that is to be

540
00:24:02,160 --> 00:23:59,590
determined we may encounter something

541
00:24:06,240 --> 00:24:02,170
that we want to do that on before we get

542
00:24:11,190 --> 00:24:06,250
there this stop at the scoopable finds

543
00:24:13,350 --> 00:24:11,200
is likely to take a few weeks but so all

544
00:24:16,290 --> 00:24:13,360
of this is it's still fairly uncertain

545
00:24:18,900 --> 00:24:16,300
in terms of the timing when we finally

546
00:24:20,659 --> 00:24:18,910
get to glenelg after doing that we want

547
00:24:23,269 --> 00:24:20,669
to study the outcrop there

548
00:24:25,779 --> 00:24:23,279
and take a look at the contacts between

549
00:24:28,789 --> 00:24:25,789
the three different terrain types and

550
00:24:31,690 --> 00:24:28,799
maybe there is where we would decide to

551
00:24:35,389 --> 00:24:31,700
do our first drilling into rock and

552
00:24:37,549 --> 00:24:35,399
after glenelg we head for Mount sharp

553
00:24:41,119 --> 00:24:37,559
and that will be a much longer drive

554
00:24:45,229 --> 00:24:41,129
with probably some few brief stops along

555
00:24:47,720 --> 00:24:45,239
the way and that that's going to take

556
00:24:50,840 --> 00:24:47,730
several months before we get to that

557
00:24:53,570 --> 00:24:50,850
point that's pretty much sums up what

558
00:24:56,060 --> 00:24:53,580
we've done what we're doing we really

559
00:24:58,430 --> 00:24:56,070
are ramping up from having the initial

560
00:25:00,499 --> 00:24:58,440
checkouts under our belt and now we're

561
00:25:02,779 --> 00:25:00,509
doing very complicated activity plans

562
00:25:05,060 --> 00:25:02,789
each day and working hard on these

563
00:25:06,649 --> 00:25:05,070

strategic plans what the order of

564
00:25:09,049 --> 00:25:06,659
activity should be and how long

565
00:25:12,739 --> 00:25:09,059
everything's going to take so I'll hand

566
00:25:16,220 --> 00:25:12,749
it back to rosemary for QA okay thank

567
00:25:18,200 --> 00:25:16,230
you joy I like to start with a couple of

568
00:25:20,210 --> 00:25:18,210
questions here in the auditorium at JPL

569
00:25:22,159 --> 00:25:20,220
we do have some reporters on the line so

570
00:25:24,289 --> 00:25:22,169
we will get to those as well if you have

571
00:25:27,259 --> 00:25:24,299
a question please raise your hand high

572
00:25:29,840 --> 00:25:27,269
and wait for the mic to get to you and

573
00:25:32,749 --> 00:25:29,850
then identify yourself your name and

574
00:25:34,820 --> 00:25:32,759
your affiliation so do we have a

575
00:25:38,359 --> 00:25:34,830
question yeah let's go in the third row

576
00:25:41,269 --> 00:25:38,369
right here yes Steve Federman from CBS

577
00:25:44,450 --> 00:25:41,279
Pete and matt i guess or anyone wants a

578
00:25:46,999 --> 00:25:44,460
chip comment how significant is this

579
00:25:51,259 --> 00:25:47,009
landmark moment the first drive as short

580
00:25:53,119 --> 00:25:51,269
as it might have been um they couldn't

581
00:25:55,970 --> 00:25:53,129
be more important I mean we build a

582
00:25:58,039 --> 00:25:55,980
rover so unless the rover rose we really

583
00:26:00,080 --> 00:25:58,049
haven't accomplished anything and and so

584
00:26:02,769 --> 00:26:00,090
yes tremendous and and the fact that we

585
00:26:05,419 --> 00:26:02,779
were completely exercised it in

586
00:26:08,659 --> 00:26:05,429
everything was on track is a big moment

587
00:26:10,999 --> 00:26:08,669
very big moment yeah I mean we've got an

588
00:26:13,190 --> 00:26:11,009

amazing team that built this very

589
00:26:14,180 --> 00:26:13,200
capable Rover we had a lot of confidence

590
00:26:15,289 --> 00:26:14,190
that it was going to work but you're

591
00:26:17,659 --> 00:26:15,299
always a little nervous until you get

592
00:26:20,210 --> 00:26:17,669
the data so seeing that you know

593
00:26:21,289 --> 00:26:20,220
everything was nominal as Pete said all

594
00:26:23,989 --> 00:26:21,299
the steer actuators all the drive

595
00:26:25,489 --> 00:26:23,999
actuators work all the instruments you

596
00:26:27,190 --> 00:26:25,499
know the inertial measurement unit that

597
00:26:29,690 --> 00:26:27,200
tells us how we're returning all works

598
00:26:31,489 --> 00:26:29,700
we can now kind of focus on moving to

599
00:26:32,779 --> 00:26:31,499
checking out higher level behaviors for

600
00:26:33,500 --> 00:26:32,789
the rover which will allow us to drive

601
00:26:35,300 --> 00:26:33,510
further every day

602
00:26:37,790 --> 00:26:35,310
a allow us to do kind of autonomous

603
00:26:39,020 --> 00:26:37,800
terrain assessment visual odometry to

604
00:26:42,080 --> 00:26:39,030
more accurately track where the river

605
00:26:43,730 --> 00:26:42,090
goes so we're on pace to having this

606
00:26:45,860 --> 00:26:43,740
amazingly capable rover that can

607
00:26:48,170 --> 00:26:45,870
traverse over to the base of Mount sharp

608
00:26:50,750 --> 00:26:48,180
if I'd like to have just one of the

609
00:26:52,970 --> 00:26:50,760
thing as as you know in the past when

610
00:26:54,500 --> 00:26:52,980
the project got into difficulty one of

611
00:26:55,910 --> 00:26:54,510
the principal double melodies

612
00:26:58,250 --> 00:26:55,920
developmental issues we were working

613
00:27:01,280 --> 00:26:58,260

with with the actuators and I think we

614
00:27:03,680 --> 00:27:01,290
need to recognize the actuator aeroflex

615
00:27:06,020 --> 00:27:03,690
actuator supplier and the actuator team

616
00:27:08,300 --> 00:27:06,030
here at JPL for what has been perfect

617
00:27:10,250 --> 00:27:08,310
performance so far on Mars and it's not

618
00:27:13,670 --> 00:27:10,260
just the drive it's also the arm and the

619
00:27:15,770 --> 00:27:13,680
mast and and the high-gain antenna so so

620
00:27:17,720 --> 00:27:15,780
far they've been just perfect over what

621
00:27:19,040 --> 00:27:17,730
is a very demanding environment so those

622
00:27:21,950 --> 00:27:19,050
that take those people things we

623
00:27:24,890 --> 00:27:21,960
congratulated for that okay do we have

624
00:27:28,010 --> 00:27:24,900
another question here at JPL if so raise

625
00:27:30,140 --> 00:27:28,020
your hand let's go to the phones then we

626
00:27:31,670 --> 00:27:30,150
can always jump back here the first

627
00:27:34,790 --> 00:27:31,680
question on the phone will come from

628
00:27:37,070 --> 00:27:34,800
Eric hand at nature go ahead Eric hi

629
00:27:40,940 --> 00:27:37,080
thanks yeah my questions for joy crisp

630
00:27:44,660 --> 00:27:40,950
hi joy if you could give me a more

631
00:27:48,590 --> 00:27:44,670
specific timeline for the intermission

632
00:27:50,180 --> 00:27:48,600
when I guess in terms of the specifics

633
00:27:52,580 --> 00:27:50,190
all in which the activity would happen

634
00:27:56,870 --> 00:27:52,590
can you say when intermission would

635
00:28:00,320 --> 00:27:56,880
begin when the Sam first Sam atmospheric

636
00:28:05,780 --> 00:28:00,330
study would happen and then when you

637
00:28:07,670 --> 00:28:05,790
might begin the drive take Leonard well

638
00:28:12,020 --> 00:28:07,680

all I can say is we're beginning it

639
00:28:14,720 --> 00:28:12,030
tomorrow and it will span several days

640
00:28:17,980 --> 00:28:14,730
and we can't know exactly what days

641
00:28:20,360 --> 00:28:17,990
we're going to do each thing I believe

642
00:28:24,350 --> 00:28:20,370
that we're going to be trying to do the

643
00:28:26,750 --> 00:28:24,360
first Sam atmospheric tests on Saul 18

644
00:28:29,150 --> 00:28:26,760
but these things are subject to change

645
00:28:34,070 --> 00:28:29,160
as we do the planning things can change

646
00:28:36,020 --> 00:28:34,080
the order in which we do things so the

647
00:28:39,720 --> 00:28:36,030
best answer I can give you is in a

648
00:28:42,450 --> 00:28:39,730
period of a few days

649
00:28:44,990 --> 00:28:42,460
and and like on the order of a week is

650
00:28:49,890 --> 00:28:45,000
what that intermission will will last

651
00:28:51,720 --> 00:28:49,900
and that's the best I can do so on the

652
00:28:54,090 --> 00:28:51,730
order of a week later you might begin

653
00:28:57,570 --> 00:28:54,100
the drive to Leonard on that order and

654
00:29:00,330 --> 00:28:57,580
as a quick follow-up how quickly do you

655
00:29:02,070 --> 00:29:00,340
think you might be able to have a trace

656
00:29:04,860 --> 00:29:02,080
gas result from Sam is that's something

657
00:29:08,580 --> 00:29:04,870
you'll you'll be able to to know in a

658
00:29:10,890 --> 00:29:08,590
day or two the the first atmospheric

659
00:29:13,950 --> 00:29:10,900
measurements done by Sam are really

660
00:29:16,950 --> 00:29:13,960
check out not so much meant to be

661
00:29:20,130 --> 00:29:16,960
definitive measurements so they really

662
00:29:25,020 --> 00:29:20,140
need to to they're not optimized yet for

663
00:29:27,210 --> 00:29:25,030

making good measurements and so you'll

664
00:29:29,010 --> 00:29:27,220
just have to stay tuned for for what

665
00:29:31,020 --> 00:29:29,020
they can say about those measurements

666
00:29:33,450 --> 00:29:31,030
but really they're meant for just the

667
00:29:36,780 --> 00:29:33,460
first checkouts very first one is very

668
00:29:38,460 --> 00:29:36,790
short integration time they they will

669
00:29:41,610 --> 00:29:38,470
learn from those how to set up the

670
00:29:44,730 --> 00:29:41,620
measurements for a very good careful

671
00:29:47,310 --> 00:29:44,740
analysis so it's not possible that you

672
00:29:50,730 --> 00:29:47,320
could maybe see signs of methane in this

673
00:29:54,030 --> 00:29:50,740
first check out I I will leave that to

674
00:29:56,730 --> 00:29:54,040
the San pi/2 report after he sees his

675
00:29:59,310 --> 00:29:56,740
measurements but for now it's it's being

676
00:30:02,520 --> 00:29:59,320
it's it's really meant to be a check out

677
00:30:04,200 --> 00:30:02,530
okay thank you okay we're going to take

678
00:30:07,200 --> 00:30:04,210
another question by phone from the LA

679
00:30:08,550 --> 00:30:07,210
Times Amina kaun hai I think we're

680
00:30:09,630 --> 00:30:08,560
taking my question I just wanted to see

681
00:30:12,810 --> 00:30:09,640
if you could talk a little bit more

682
00:30:14,250 --> 00:30:12,820
about glenelg and the three types of

683
00:30:17,100 --> 00:30:14,260
terrain there you know what do they look

684
00:30:18,600 --> 00:30:17,110
like is it just that layered bedrock

685
00:30:20,040 --> 00:30:18,610
that you guys are looking to drill and

686
00:30:21,660 --> 00:30:20,050
you know before you get there is there

687
00:30:26,250 --> 00:30:21,670
any sort of sense of what the story is

688
00:30:28,620 --> 00:30:26,260

geologically there we have seen very

689
00:30:31,430 --> 00:30:28,630
many interesting cartoons by the science

690
00:30:35,480 --> 00:30:31,440
team trying to look at different

691
00:30:39,630 --> 00:30:35,490
possibilities for what the geologic

692
00:30:43,110 --> 00:30:39,640
situation is there and so they're really

693
00:30:45,590 --> 00:30:43,120
in the hypothesis stage and it's too

694
00:30:49,620 --> 00:30:45,600
early to say what we can see is

695
00:30:51,450 --> 00:30:49,630
different textures to these terrains in

696
00:30:55,049 --> 00:30:51,460
terms of cratering and

697
00:30:58,169 --> 00:30:55,059
looks to them they're albedo's it's it's

698
00:31:01,169 --> 00:30:58,179
it's nearby and it looks like we should

699
00:31:03,570 --> 00:31:01,179
be able to encounter bedrock there so

700
00:31:05,940 --> 00:31:03,580
the that's that's a really good reason

701
00:31:09,690 --> 00:31:05,950
for going there is is to be able to

702
00:31:12,120 --> 00:31:09,700
examine three different materials that

703
00:31:16,380 --> 00:31:12,130
are in place that look like we could

704
00:31:20,070 --> 00:31:16,390
sample rock not much more I can say

705
00:31:21,870 --> 00:31:20,080
about it at this point but that it does

706
00:31:26,899 --> 00:31:21,880
look intriguing I don't know if anybody

707
00:31:31,620 --> 00:31:29,070
okay well then let's take our next

708
00:31:34,830 --> 00:31:31,630
question again by phone that's Irene

709
00:31:37,710 --> 00:31:34,840
Klotz from Reuters hi thanks very much

710
00:31:39,960 --> 00:31:37,720
ever just one quick follow-up about the

711
00:31:43,110 --> 00:31:39,970
drive just wanted to know if indeed it

712
00:31:46,049 --> 00:31:43,120
took 30 minutes as we were told

713
00:31:48,330 --> 00:31:46,059

yesterday that that would be the likely

714
00:31:51,779 --> 00:31:48,340
duration of it and then I have a couple

715
00:31:54,659 --> 00:31:51,789
questions about cam cam thanks so the

716
00:31:58,139 --> 00:31:54,669
drive started local solar time at 1332

717
00:32:00,840 --> 00:31:58,149
which was 717 am here pacific daylight

718
00:32:03,330 --> 00:32:00,850
time and with all the imaging it took

719
00:32:06,419 --> 00:32:03,340
roughly 16 minutes and the majority of

720
00:32:08,490 --> 00:32:06,429
that time is spent taking the images the

721
00:32:14,159 --> 00:32:08,500
rover actually probably only drove for

722
00:32:17,370 --> 00:32:14,169
45 minutes of that motion and that for

723
00:32:18,960 --> 00:32:17,380
Roger the one of the things I think you

724
00:32:21,240 --> 00:32:18,970
all have talked about earlier with chem

725
00:32:24,990 --> 00:32:21,250
can as you are curious if you were going

726
00:32:27,419 --> 00:32:25,000
to see different spectra as you as you

727
00:32:29,720 --> 00:32:27,429
pulse deeper into the rock and was

728
00:32:33,019 --> 00:32:29,730
wondering if you did see any composition

729
00:32:34,769 --> 00:32:33,029
changes and then I think I might have

730
00:32:36,870 --> 00:32:34,779
wasn't sure about this but his

731
00:32:38,460 --> 00:32:36,880
coronation actually at the Goulburn

732
00:32:42,120 --> 00:32:38,470
scour or was that in a different

733
00:32:43,830 --> 00:32:42,130
location thanks um no I'll answer your

734
00:32:46,560 --> 00:32:43,840
first question or your last question

735
00:32:50,130 --> 00:32:46,570
first coronation was not a part of the

736
00:32:52,440 --> 00:32:50,140
Goulburn scour it was just sort of ahead

737
00:32:54,180 --> 00:32:52,450
of and a little bit to the right of the

738
00:32:56,669 --> 00:32:54,190

rover where it was sitting when it

739
00:32:59,879 --> 00:32:56,679
landed the Goulburn scour was off to the

740
00:33:02,010 --> 00:32:59,889
left and so if you look back at image at

741
00:33:04,440 --> 00:33:02,020
the image of coronation you'll actually

742
00:33:05,790 --> 00:33:04,450
see the rover's shadow in it

743
00:33:09,540 --> 00:33:05,800
and that's sort of looking to the

744
00:33:11,850 --> 00:33:09,550
forward side of the rover so let's see

745
00:33:13,680 --> 00:33:11,860
the other was about asking whether we

746
00:33:16,680 --> 00:33:13,690
were seeing differences in the spectra

747
00:33:19,740 --> 00:33:16,690
as we as we dug down into the rock so

748
00:33:23,130 --> 00:33:19,750
the the little inset of the spectrum did

749
00:33:25,530 --> 00:33:23,140
show the hydrogen at the very surface so

750
00:33:27,570 --> 00:33:25,540
of course the surface is one thing we

751
00:33:31,620 --> 00:33:27,580
were interested in and we'll be looking

752
00:33:33,300 --> 00:33:31,630
into that further there there was a hint

753
00:33:36,120 --> 00:33:33,310
of some other variations and one other

754
00:33:38,430 --> 00:33:36,130
measurement we made but this can be say

755
00:33:40,620 --> 00:33:38,440
a transition between looking at one

756
00:33:43,860 --> 00:33:40,630
mineral grain to another so we have to

757
00:33:46,500 --> 00:33:43,870
look at that a little bit more okay

758
00:33:48,180 --> 00:33:46,510
before we before we go back to another

759
00:33:50,730 --> 00:33:48,190
phone question just want to make sure

760
00:33:52,620 --> 00:33:50,740
anybody reporters here at JPL who have a

761
00:33:54,420 --> 00:33:52,630
question just go ahead and raise your

762
00:33:56,040 --> 00:33:54,430
hand and we will get to you but in the

763
00:33:59,580 --> 00:33:56,050

meantime let's take a phone question

764
00:34:01,380 --> 00:33:59,590
from Leo and right at irish TV thanks

765
00:34:03,720 --> 00:34:01,390
very much Jane there just a quick

766
00:34:06,450 --> 00:34:03,730
question about coronation and the

767
00:34:08,910 --> 00:34:06,460
spectra you said that is it a basaltic

768
00:34:12,150 --> 00:34:08,920
composition so I mean what do you say

769
00:34:15,240 --> 00:34:12,160
you think this is Bassel Jim but not as

770
00:34:17,040 --> 00:34:15,250
we know it or is this the standard bath

771
00:34:18,930 --> 00:34:17,050
salt and can you make any comparison

772
00:34:21,240 --> 00:34:18,940
with you know where on earth you might

773
00:34:23,250 --> 00:34:21,250
find similar bath salts given that you

774
00:34:26,550 --> 00:34:23,260
seem to know so much about this already

775
00:34:29,580 --> 00:34:26,560
thanks to this instrument yeah thanks

776
00:34:34,470 --> 00:34:29,590
we're still working on the calibrations

777
00:34:36,720 --> 00:34:34,480
in a big way yet on on cam cam we have a

778
00:34:38,160 --> 00:34:36,730
number of different types of calibration

779
00:34:41,900 --> 00:34:38,170
we have to do first of all wavelength

780
00:34:44,670 --> 00:34:41,910
calibration this is much this this

781
00:34:46,320 --> 00:34:44,680
spectrometer has much higher sensitivity

782
00:34:48,900 --> 00:34:46,330
to the wavelength than anything that

783
00:34:50,820 --> 00:34:48,910
we've we've used in this spectral region

784
00:34:53,370 --> 00:34:50,830
before and so we're working to make sure

785
00:34:55,290 --> 00:34:53,380
that that is characterized I mean the

786
00:34:57,240 --> 00:34:55,300
wavelength shifts just a little bit when

787
00:34:59,190 --> 00:34:57,250
when the rover changes temperature just

788
00:35:02,130 --> 00:34:59,200

slightly during a day and so we're

789
00:35:04,950 --> 00:35:02,140
working on that we also have a spectral

790
00:35:06,860 --> 00:35:04,960
library that we built up back here

791
00:35:09,900 --> 00:35:06,870
before we sent the instrument off and

792
00:35:11,180 --> 00:35:09,910
and so we have those to compare with but

793
00:35:14,190 --> 00:35:11,190
right now all we're doing is looking

794
00:35:16,790 --> 00:35:14,200
qualitatively at that spectrum and sort

795
00:35:18,089 --> 00:35:16,800
of you know matching it up against a

796
00:35:20,039 --> 00:35:18,099
spectrum

797
00:35:21,719 --> 00:35:20,049
that we have from the laboratory and it

798
00:35:23,789 --> 00:35:21,729
just looks like some of the basalts

799
00:35:26,489 --> 00:35:23,799
we're going to get into the quantitative

800
00:35:29,370 --> 00:35:26,499
aspects in a little bit but I also want

801
00:35:32,579 --> 00:35:29,380
to say that that chemcam is is a bit

802
00:35:34,979 --> 00:35:32,589
less quantitative actually then then the

803
00:35:37,440 --> 00:35:34,989
apxs instrument on board for many

804
00:35:40,380 --> 00:35:37,450
elements and so we're also looking

805
00:35:42,479 --> 00:35:40,390
forward to when apxs gets deployed on

806
00:35:44,460 --> 00:35:42,489
the arm and when we can make some cross

807
00:35:46,650 --> 00:35:44,470
calibrations which will make us more

808
00:35:48,450 --> 00:35:46,660
certain of our of our compositions as

809
00:35:51,779 --> 00:35:48,460
well these two instruments really

810
00:35:53,880 --> 00:35:51,789
complement each other very well chemcam

811
00:35:57,599 --> 00:35:53,890
gets some elements very sensitively that

812
00:35:59,519 --> 00:35:57,609
apxs didn't does not an apxs tends to

813
00:36:04,769 --> 00:35:59,529

have more accuracy overall than chemcam

814
00:36:06,120 --> 00:36:04,779
so it's a great duo to have our next

815
00:36:16,499 --> 00:36:06,130
question is going to come from ken

816
00:36:18,269 --> 00:36:16,509
kremer @ Space Flight magazine hello ken

817
00:36:21,989 --> 00:36:18,279
are you still there so you can go ahead

818
00:36:24,319 --> 00:36:21,999
and ask your question ok I guess yeah

819
00:36:26,940 --> 00:36:24,329
we'll come back to can if he reappears

820
00:36:29,299 --> 00:36:26,950
the next question is going to come from

821
00:36:34,049 --> 00:36:29,309
Robert Perlman at collectspace.com

822
00:36:38,579 --> 00:36:34,059
Robert you there I am looking at the

823
00:36:43,529 --> 00:36:38,589
track can you quantify how deep or how

824
00:36:45,509 --> 00:36:43,539
shallow the the track marks are and if

825
00:36:47,130 --> 00:36:45,519
for example if a good windstorm came by

826
00:36:48,479 --> 00:36:47,140
would they just be blown away or what

827
00:36:51,359 --> 00:36:48,489
does that tell you about the nature of

828
00:36:54,120 --> 00:36:51,369
the land that you landed on I have a

829
00:36:56,249 --> 00:36:54,130
follow I can answer maybe just how deep

830
00:36:58,380 --> 00:36:56,259
we sink so we've got the cleats which

831
00:37:01,049 --> 00:36:58,390
are about a centimeter or so tall and

832
00:37:02,549 --> 00:37:01,059
what happens is we dig into the terrain

833
00:37:03,989 --> 00:37:02,559
with the cleats and then the ground

834
00:37:05,880 --> 00:37:03,999
pressure is absorbed by the rest of the

835
00:37:07,709 --> 00:37:05,890
wheel and we don't see much sinkage

836
00:37:09,029 --> 00:37:07,719
beyond that where if you were driving on

837
00:37:11,670 --> 00:37:09,039
really soft sand you would see

838
00:37:13,829 --> 00:37:11,680

significantly more sinkage so we can

839
00:37:16,049 --> 00:37:13,839
tell just from the properties of looking

840
00:37:18,450 --> 00:37:16,059
at these tracks kind of how firm the

841
00:37:19,799 --> 00:37:18,460
soil is but I don't think I can

842
00:37:21,359 --> 00:37:19,809
necessarily answer a question about the

843
00:37:26,180 --> 00:37:21,369
dust and how they might get covered up

844
00:37:29,150 --> 00:37:26,190
maybe joy depend on what the winds do

845
00:37:30,530 --> 00:37:29,160
and whether there's fine material that

846
00:37:34,340 --> 00:37:30,540
will get deposited on these tracks or

847
00:37:36,980 --> 00:37:34,350
not i think if i'm not mistaken it's the

848
00:37:40,550 --> 00:37:36,990
tracks should be somewhat similar in

849
00:37:41,780 --> 00:37:40,560
depth to mur tracks so there still could

850
00:37:43,700 --> 00:37:41,790
be a difference in the material

851
00:37:46,880 --> 00:37:43,710
properties here but if you treat them as

852
00:37:50,450 --> 00:37:46,890
murder tracks then there were times it

853
00:37:52,820 --> 00:37:50,460
took a little when the tracks would get

854
00:37:55,910 --> 00:37:52,830
covered and doesn't start to disappear

855
00:37:58,970 --> 00:37:55,920
so I don't expect that this would happen

856
00:38:01,310 --> 00:37:58,980
rapidly but maybe after many months or

857
00:38:05,900 --> 00:38:01,320
years get harder and harder to see these

858
00:38:08,450 --> 00:38:05,910
tracks I think and just a quick

859
00:38:12,010 --> 00:38:08,460
follow-up with regards to Bradbury

860
00:38:14,210 --> 00:38:12,020
landing is it defined by the borders of

861
00:38:15,980 --> 00:38:14,220
curiosities wheels where it's set where

862
00:38:18,530 --> 00:38:15,990
it landed or it does it accomplish this

863
00:38:20,900 --> 00:38:18,540

whole area where you're now even sitting

864
00:38:23,240 --> 00:38:20,910
now well we're actually thinking of

865
00:38:29,050 --> 00:38:23,250
using the the wheel marks as the corner

866
00:38:31,790 --> 00:38:29,060
posts for Bradbury landing a great thing

867
00:38:33,950 --> 00:38:31,800
i'm told that ken Kramer of spaceflight

868
00:38:36,830 --> 00:38:33,960
magazine has reappeared so go ahead Ken

869
00:38:39,530 --> 00:38:36,840
okay I here can you hear me I hope we

870
00:38:41,900 --> 00:38:39,540
didn't get disconnected again my

871
00:38:44,480 --> 00:38:41,910
question is for Roger Weems I wonder if

872
00:38:47,060 --> 00:38:44,490
you could talk about how many targets in

873
00:38:49,520 --> 00:38:47,070
a day can you can you analyze with with

874
00:38:51,380 --> 00:38:49,530
chemcam I understand it's 14,000 overall

875
00:38:55,100 --> 00:38:51,390
but almost wondering in a day how many

876
00:38:58,010 --> 00:38:55,110
can can you analyze yes that 14,000

877
00:38:59,960 --> 00:38:58,020
number can came from looking at the

878
00:39:02,090 --> 00:38:59,970
number of days or Sol's that were going

879
00:39:05,750 --> 00:39:02,100
to be on Mars in the nominal mission

880
00:39:08,570 --> 00:39:05,760
which is 700 some and and assuming that

881
00:39:11,810 --> 00:39:08,580
a maximum that we would possibly do

882
00:39:13,970 --> 00:39:11,820
would be 20 analyses per day and so

883
00:39:16,340 --> 00:39:13,980
that's how we came up with that now it's

884
00:39:18,860 --> 00:39:16,350
going to be a long time or it could be a

885
00:39:22,160 --> 00:39:18,870
while anyway before we are we get to do

886
00:39:24,260 --> 00:39:22,170
20 analyses in one day but if we arrive

887
00:39:26,750 --> 00:39:24,270
at a new site after driving some

888
00:39:29,570 --> 00:39:26,760

distance and you can imagine an outcrop

889
00:39:31,460 --> 00:39:29,580
in front of us we could perhaps target

890
00:39:34,940 --> 00:39:31,470
something close to that it really

891
00:39:36,740 --> 00:39:34,950
depends how how crafty and how skillful

892
00:39:39,240 --> 00:39:36,750
some of our uplink people get and

893
00:39:40,950 --> 00:39:39,250
devising these sequences

894
00:39:44,850 --> 00:39:40,960
and they're coming up to speed very

895
00:39:47,400 --> 00:39:44,860
nicely okay I was willing to act after

896
00:39:49,830 --> 00:39:47,410
you get the data how quickly are you

897
00:39:52,740 --> 00:39:49,840
able to analyze it and decide you know

898
00:39:55,170 --> 00:39:52,750
what what you're seeing yeah so the

899
00:39:58,830 --> 00:39:55,180
process once the once the information

900
00:40:01,920 --> 00:39:58,840
comes down we have a role called a

901
00:40:05,520 --> 00:40:01,930
payload downlink lead and so that person

902
00:40:08,730 --> 00:40:05,530
is responsible on our chemcam team for

903
00:40:12,120 --> 00:40:08,740
pulling the data over onto a computer

904
00:40:14,640 --> 00:40:12,130
and starting to first of all check out

905
00:40:18,930 --> 00:40:14,650
what files did we receive and then

906
00:40:20,760 --> 00:40:18,940
secondly are they looking okay and so we

907
00:40:22,290 --> 00:40:20,770
look at the images that we received and

908
00:40:24,690 --> 00:40:22,300
we look at the spectra that we received

909
00:40:27,600 --> 00:40:24,700
and we look at other things such as we

910
00:40:29,280 --> 00:40:27,610
usually usually take a non laser dark

911
00:40:31,290 --> 00:40:29,290
spectrum as well to subtract the

912
00:40:34,470 --> 00:40:31,300
background all of those things get

913
00:40:37,320 --> 00:40:34,480

pulled together and then within within

914
00:40:41,220 --> 00:40:37,330
about a couple of hours they've usually

915
00:40:45,000 --> 00:40:41,230
gone through and catalogued what we've

916
00:40:46,650 --> 00:40:45,010
seen and we get ready to present that at

917
00:40:48,840 --> 00:40:46,660
a science kickoff meeting with in about

918
00:40:50,910 --> 00:40:48,850
two hours of the downlink and then we

919
00:40:54,420 --> 00:40:50,920
usually do more analysis after that but

920
00:40:56,670 --> 00:40:54,430
that's the initial thank you we're going

921
00:40:59,040 --> 00:40:56,680
to take a question now from space calm

922
00:41:02,190 --> 00:40:59,050
and mike wall and i see we do have a

923
00:41:03,900 --> 00:41:02,200
question after that from JPL go ahead

924
00:41:07,110 --> 00:41:03,910
Mike yeah oh yeah hi this one's probably

925
00:41:09,150 --> 00:41:07,120
for format do you guys have any idea I

926
00:41:10,650 --> 00:41:09,160
mean once you guys start start to

927
00:41:12,870 --> 00:41:10,660
actually drive made your first big

928
00:41:14,130 --> 00:41:12,880
drives I mean how how long are those

929
00:41:18,750 --> 00:41:14,140
first drive is going to be when you

930
00:41:20,190 --> 00:41:18,760
finally head out from from the yeah like

931
00:41:22,380 --> 00:41:20,200
the like sort of landing site where you

932
00:41:24,300 --> 00:41:22,390
are now and and like head toward your

933
00:41:26,010 --> 00:41:24,310
first big science target like there's

934
00:41:28,110 --> 00:41:26,020
going to be 10 to 20 meters like I've

935
00:41:29,700 --> 00:41:28,120
heard before you guys like have a little

936
00:41:33,360 --> 00:41:29,710
more confidence now that like maybe can

937
00:41:35,130 --> 00:41:33,370
mix them and a longer drive that's a

938
00:41:37,620 --> 00:41:35,140

good question Mike so we'll start out

939
00:41:39,360 --> 00:41:37,630
with fairly modest drives in a 10 meter

940
00:41:40,620 --> 00:41:39,370
range and then as I mentioned before

941
00:41:43,200 --> 00:41:40,630
we're going to do a couple checkouts

942
00:41:45,330 --> 00:41:43,210
we're going to check out the autonomous

943
00:41:47,610 --> 00:41:45,340
ability of the rover to image obstacles

944
00:41:49,860 --> 00:41:47,620
and identify hazards so that it doesn't

945
00:41:51,240 --> 00:41:49,870
you know it keeps itself safe we'll

946
00:41:52,710 --> 00:41:51,250
check out visual odometry where the

947
00:41:53,100 --> 00:41:52,720
rover takes a couple of images and is

948
00:41:55,110 --> 00:41:53,110
able to

949
00:41:56,910 --> 00:41:55,120
how far it moves so we can see if we're

950
00:41:58,590 --> 00:41:56,920
slipping and abetting in the in the

951
00:42:00,720 --> 00:41:58,600
terrain and we're doing that on Mars

952
00:42:02,550 --> 00:42:00,730
because we've never done that image

953
00:42:04,020 --> 00:42:02,560
processing on board the software using

954
00:42:05,280 --> 00:42:04,030
images coming from Mars it's different

955
00:42:06,270 --> 00:42:05,290
lighting it's different terrain so we

956
00:42:08,460 --> 00:42:06,280
just want to make sure it's all working

957
00:42:09,930 --> 00:42:08,470
as we expect once we get that

958
00:42:11,250 --> 00:42:09,940
functionality checked out and we have

959
00:42:13,320 --> 00:42:11,260
confidence in it will start expanding

960
00:42:16,980 --> 00:42:13,330
the drive distances will go to 20 meters

961
00:42:18,930 --> 00:42:16,990
30 meters 40 meters and 40 meters is

962
00:42:20,250 --> 00:42:18,940
kind of the edge of our nav cam horizon

963
00:42:22,710 --> 00:42:20,260

that we can see right now that's where

964
00:42:24,930 --> 00:42:22,720
we get good stereo data with these nav

965
00:42:26,880 --> 00:42:24,940
cams that we're taking and then as we

966
00:42:28,200 --> 00:42:26,890
continue to have more and more

967
00:42:29,430 --> 00:42:28,210
confidence in the system will extend

968
00:42:32,760 --> 00:42:29,440
those drives and will start driving

969
00:42:34,140 --> 00:42:32,770
beyond that nav cam horizon out 50 even

970
00:42:38,310 --> 00:42:34,150
up to a potentially hundred meters or so

971
00:42:40,980 --> 00:42:38,320
poor persol we're going to jump back to

972
00:42:42,300 --> 00:42:40,990
JPL we have a question from women in the

973
00:42:45,690 --> 00:42:42,310
row there please state your name and

974
00:42:47,970 --> 00:42:45,700
affiliation Amy Johnson kcbs-tv I think

975
00:42:50,070 --> 00:42:47,980
my question is for Matt and looking at

976
00:42:51,900 --> 00:42:50,080
the screen here this photo I I can

977
00:42:53,670 --> 00:42:51,910
clearly make out the tracks but can you

978
00:42:56,700 --> 00:42:53,680
explain a little bit more about what

979
00:42:59,670 --> 00:42:56,710
we're actually seeing in this photo yes

980
00:43:01,260 --> 00:42:59,680
so this is a very historic photo there's

981
00:43:03,420 --> 00:43:01,270
only one place on Mars where you start

982
00:43:04,980 --> 00:43:03,430
your tracks and you can see exactly

983
00:43:07,260 --> 00:43:04,990
where we landed because you can see the

984
00:43:08,970 --> 00:43:07,270
tracks where we're starting and then to

985
00:43:11,040 --> 00:43:08,980
the right of the tracks you can see kind

986
00:43:13,290 --> 00:43:11,050
of two dark spots those are the scour

987
00:43:15,270 --> 00:43:13,300
marks form from the landing engines and

988
00:43:17,700 --> 00:43:15,280

then similar you see them symmetrically

989
00:43:19,350 --> 00:43:17,710
on the other side the two left marks and

990
00:43:21,360 --> 00:43:19,360
then you can see the tracks how we drive

991
00:43:23,460 --> 00:43:21,370
forward and then you can see roughly a

992
00:43:25,170 --> 00:43:23,470
circle which is where the rover did what

993
00:43:27,180 --> 00:43:25,180
we call its turn in place maneuver so it

994
00:43:30,210 --> 00:43:27,190
steered all of its wheels and then it

995
00:43:31,470 --> 00:43:30,220
performed a turn of 120 degrees pivoting

996
00:43:34,260 --> 00:43:31,480
about that point in the middle of that

997
00:43:35,700 --> 00:43:34,270
circle and then it backed up one of the

998
00:43:37,890 --> 00:43:35,710
other things that we can point out in

999
00:43:40,260 --> 00:43:37,900
here is that we see different patterns

1000
00:43:42,360 --> 00:43:40,270
in the wheels we have intentionally put

1001
00:43:44,070 --> 00:43:42,370
holes in the wheels to leave a unique

1002
00:43:46,470 --> 00:43:44,080
track on Mars that we can use for that

1003
00:43:47,940 --> 00:43:46,480
visual odometry where we can for in sand

1004
00:43:49,560 --> 00:43:47,950
dunes where we don't have lots of rock

1005
00:43:52,520 --> 00:43:49,570
features around us we can use those

1006
00:43:54,780 --> 00:43:52,530
patterns to to do our visual odometry

1007
00:43:56,760 --> 00:43:54,790
the other thing to note in here is

1008
00:43:59,190 --> 00:43:56,770
there's a small rock under where we

1009
00:44:00,750 --> 00:43:59,200
landed on the right rear wheel and when

1010
00:44:03,180 --> 00:44:00,760
we did our steer actuator check out we

1011
00:44:04,530 --> 00:44:03,190
saw some somewhat high currents and you

1012
00:44:06,120 --> 00:44:04,540
can actually see in the animation that

1013
00:44:06,480 --> 00:44:06,130

the bogie the suspension system at the

1014
00:44:08,400 --> 00:44:06,490
back of

1015
00:44:10,470 --> 00:44:08,410
Rover kind of tweaks out to the to the

1016
00:44:12,960 --> 00:44:10,480
right a little bit and we were able to

1017
00:44:15,390 --> 00:44:12,970
confirm that we were kind of on that

1018
00:44:17,250 --> 00:44:15,400
nine centimeter tall rock when we landed

1019
00:44:18,630 --> 00:44:17,260
down so this is great we're able to see

1020
00:44:20,100 --> 00:44:18,640
under the rover see exactly what we

1021
00:44:22,410 --> 00:44:20,110
landed on and kind of correlate that to

1022
00:44:25,500 --> 00:44:22,420
the engineering we data we got from the

1023
00:44:27,800 --> 00:44:25,510
Saul 15 steer actuator check out that

1024
00:44:30,750 --> 00:44:27,810
answer your question it did thank you

1025
00:44:33,630 --> 00:44:30,760
okay that oh it looks like we have what

1026
00:44:35,220 --> 00:44:33,640
time for one more question go ahead nice

1027
00:44:39,090 --> 00:44:35,230
ending question the you present of the

1028
00:44:41,040 --> 00:44:39,100
United States of lauded JPL and ms dr.

1029
00:44:42,210 --> 00:44:41,050
elachi the Governor of California is

1030
00:44:44,220 --> 00:44:42,220
going to be here today Michael if you

1031
00:44:46,859 --> 00:44:44,230
wouldn't mind everything seems to have

1032
00:44:49,890 --> 00:44:46,869
been working perfectly up till now it is

1033
00:44:51,930 --> 00:44:49,900
it seems to be textbook give us an

1034
00:44:55,410 --> 00:44:51,940
assessment several weeks into this now

1035
00:44:57,060 --> 00:44:55,420
as to how your team is working your soul

1036
00:44:59,790 --> 00:44:57,070
is a different day than the one that

1037
00:45:01,050 --> 00:44:59,800
we're used to and and what what the

1038
00:45:03,000 --> 00:45:01,060

attitude is like now that you've

1039
00:45:05,580 --> 00:45:03,010
captured the nation's attention and the

1040
00:45:09,870 --> 00:45:05,590
imagination of so many with this with

1041
00:45:12,390 --> 00:45:09,880
this Rover the team is tremendously

1042
00:45:14,580 --> 00:45:12,400
excited everything's working there the

1043
00:45:16,070 --> 00:45:14,590
we've kind of gone through starting in

1044
00:45:18,570 --> 00:45:16,080
the middle of the night going through

1045
00:45:19,590 --> 00:45:18,580
daylight and and actually over the next

1046
00:45:21,900 --> 00:45:19,600
couple of weeks we're going to move back

1047
00:45:23,400 --> 00:45:21,910
to being on the night shift as you know

1048
00:45:27,330 --> 00:45:23,410
the difference between Earth Day and

1049
00:45:31,230 --> 00:45:27,340
marsall shifts out of you know from day

1050
00:45:35,340 --> 00:45:31,240
to day night but everything's working

1051
00:45:36,810 --> 00:45:35,350
the the hard part is kind of damn

1052
00:45:38,640 --> 00:45:36,820
purring the excitement a little bit so

1053
00:45:41,160 --> 00:45:38,650
that people get enough rest so that they

1054
00:45:44,550 --> 00:45:41,170
are in it for the long haul instead of

1055
00:45:46,349 --> 00:45:44,560
just just waiting anxiously for each

1056
00:45:49,470 --> 00:45:46,359
image to come down but it is fantastic

1057
00:45:52,680 --> 00:45:49,480
how well everything is working and so

1058
00:45:54,450 --> 00:45:52,690
everything that we've promised with with

1059
00:45:55,890 --> 00:45:54,460
this Rover going to Mars and going to

1060
00:45:58,200 --> 00:45:55,900
place where we think is interacted with

1061
00:45:59,849 --> 00:45:58,210
water I we have high hopes that this is

1062
00:46:01,880 --> 00:45:59,859
going to really prove out this region

1063
00:46:05,730 --> 00:46:01,890

and tell us whether or not it was ever

1064
00:46:07,800 --> 00:46:05,740
potentially habitable and I wouldn't be

1065
00:46:09,780 --> 00:46:07,810
doing my job if I didn't exercise a

1066
00:46:13,200 --> 00:46:09,790
little bit of caution here

1067
00:46:16,380 --> 00:46:13,210
ok we are 16 days into a two-year

1068
00:46:20,400 --> 00:46:16,390
mission ok we haven't put the grout the

1069
00:46:22,170 --> 00:46:20,410
arm on the ground yet ok there's a we

1070
00:46:24,140 --> 00:46:22,180
haven't exercised a sample gathering

1071
00:46:27,060 --> 00:46:24,150
capability which is a key key key

1072
00:46:29,340 --> 00:46:27,070
element of this Rover science mission so

1073
00:46:33,030 --> 00:46:29,350
as good as its gon and as wonderful as

1074
00:46:34,560 --> 00:46:33,040
it is you know we still only checked off

1075
00:46:39,180 --> 00:46:34,570
about two of the level one requirement

1076
00:46:41,700 --> 00:46:39,190
boxes launched on time land on Mars ok

1077
00:46:43,890 --> 00:46:41,710
and and we got a long way to go before

1078
00:46:46,620 --> 00:46:43,900
this mission reached its full its full

1079
00:46:48,930 --> 00:46:46,630
potential but but the fact we haven't

1080
00:46:54,270 --> 00:46:48,940
had any early problem is is in fact

1081
00:46:57,720 --> 00:46:54,280
fantastic but I just you know managing

1082
00:46:59,520 --> 00:46:57,730
expectations right you know and and we

1083
00:47:02,040 --> 00:46:59,530
got to keep doing this as the team has

1084
00:47:04,380 --> 00:47:02,050
been doing methodically properly

1085
00:47:06,300 --> 00:47:04,390
prudently so as not to get out of

1086
00:47:10,320 --> 00:47:06,310
ourselves and cause ourselves our own

1087
00:47:12,750 --> 00:47:10,330
headache so but as as Michael said so

1088
00:47:17,160 --> 00:47:12,760

far it's been wonderful science

1089
00:47:21,540 --> 00:47:17,170
engineering enthusiasm caution what more

1090
00:47:24,210 --> 00:47:21,550
we connect all right well that wraps up

1091
00:47:26,190 --> 00:47:24,220
the Q&A portion and thank you to our

1092
00:47:27,840 --> 00:47:26,200
panelists immediately after this we will

1093
00:47:29,580 --> 00:47:27,850
replay the visuals from the news

1094
00:47:32,780 --> 00:47:29,590
conference and remember a lot of

1095
00:47:38,550 --> 00:47:32,790
informations online and images 24-7 at

1096
00:47:42,090 --> 00:47:38,560
WWDC gov / MSL however in closing we do

1097
00:47:44,550 --> 00:47:42,100
have a short video clip from 2009 when

1098
00:47:46,590 --> 00:47:44,560
Ray Bradbury visited JPL and he was

1099
00:47:49,110 --> 00:47:46,600
right here in this von karman auditorium

1100
00:47:52,050 --> 00:47:49,120
he was here to congratulate the team on

1101
00:47:55,590 --> 00:47:52,060
the fifth anniversary of the twin Mars

1102
00:47:58,260 --> 00:47:55,600
rovers spirit and opportunity and some

1103
00:47:59,760 --> 00:47:58,270
of the rover drivers they were very

1104
00:48:02,490 --> 00:47:59,770
excited to meet him and wanted to

1105
00:48:05,400 --> 00:48:02,500
express their gratitude to him for

1106
00:48:07,740 --> 00:48:05,410
inspiring them so we have a very short

1107
00:48:12,100 --> 00:48:07,750
video remembrance of that day to share

1108
00:48:35,070 --> 00:48:18,240
you

1109
00:48:40,060 --> 00:48:37,630
having Ray Bradbury here was incredible

1110
00:48:42,370 --> 00:48:40,070
because in particular from Mars he

1111
00:48:45,550 --> 00:48:42,380
really has been one of the voices from

1112
00:48:48,370 --> 00:48:45,560
very very early on for going to Mars and

1113
00:48:51,190 --> 00:48:48,380

exploring Mars long before we knew how

1114
00:48:52,990 --> 00:48:51,200
to do it he was taking us there in our

1115
00:48:54,730 --> 00:48:53,000
minds he introduce you to some of the

1116
00:48:57,550 --> 00:48:54,740
other people to drive the rover with me

1117
00:49:00,400 --> 00:48:57,560
yes sir so our Rovers well just like

1118
00:49:04,360 --> 00:49:00,410
this when he came to the operations room

1119
00:49:07,330 --> 00:49:04,370
and we showed him that the model of the

1120
00:49:09,070 --> 00:49:07,340
rover and the the large-scale panoramic

1121
00:49:12,090 --> 00:49:09,080
pictures that we've taken the actual

1122
00:49:14,890 --> 00:49:12,100
photographs of the surface of the planet

1123
00:49:17,260 --> 00:49:14,900
it was like watching him experience it

1124
00:49:19,060 --> 00:49:17,270
as a child almost would experience it

1125
00:49:22,120 --> 00:49:19,070
just the wonderment he has never lost

1126
00:49:24,190 --> 00:49:22,130
that wonder for Mars that he's always

1127
00:49:25,750 --> 00:49:24,200
conveyed in his books there you go we're

1128
00:49:27,790 --> 00:49:25,760
getting a vit already we're gonna have

1129
00:49:29,980 --> 00:49:27,800
to hire you showing him how we control

1130
00:49:31,990 --> 00:49:29,990
the rover and using the simulator and

1131
00:49:33,880 --> 00:49:32,000
letting him we basically drive for

1132
00:49:36,310 --> 00:49:33,890
simulated over across the surface of the

1133
00:49:38,530 --> 00:49:36,320
planet and letting him see the reality

1134
00:49:40,990 --> 00:49:38,540
of that was very rewarding for us

1135
00:49:44,470 --> 00:49:41,000
because we could tell how how much it

1136
00:49:46,870 --> 00:49:44,480
meant to him to see this that once that

1137
00:49:50,320 --> 00:49:46,880
was only fiction that partly because of

1138
00:49:52,630 --> 00:49:50,330

his vision and his sharing that vision