
Google+


SOCIAL

1
00:00:10,890 --> 00:00:07,920
morley and I'll be your host for today's

2
00:00:13,680 --> 00:00:10,900
chat on August fifth or august six

3
00:00:15,450 --> 00:00:13,690
depending on where you were like us you

4
00:00:17,339 --> 00:00:15,460
probably held your breath for those

5
00:00:19,200 --> 00:00:17,349
seven minutes of terror as the Mars

6
00:00:21,570 --> 00:00:19,210
Science Laboratory Rover nickname

7
00:00:23,609 --> 00:00:21,580
curiosity nailed a never-before

8
00:00:26,700 --> 00:00:23,619
attempted entry descent and landing on

9
00:00:29,070 --> 00:00:26,710
to the red planet's surface for those of

10
00:00:30,630 --> 00:00:29,080
you watching this chat on NASA's Google+

11
00:00:33,180 --> 00:00:30,640
page we invite you to join in our

12
00:00:34,590 --> 00:00:33,190
conversation you can submit questions in

13
00:00:37,170 --> 00:00:34,600

the comments section on the NASA's

14
00:00:39,780 --> 00:00:37,180
Google+ page on the NASA facebook page

15
00:00:42,240 --> 00:00:39,790
or through twitter using the hashtag ask

16
00:00:44,479 --> 00:00:42,250
nasa will try to get as many of your

17
00:00:46,920 --> 00:00:44,489
questions as we can this morning so

18
00:00:48,690 --> 00:00:46,930
we're joined this morning by Karen mills

19
00:00:50,549 --> 00:00:48,700
who has served as the administrator of

20
00:00:53,670 --> 00:00:50,559
the Small Business Administration since

21
00:00:56,850 --> 00:00:53,680
2009 she has served in the president's

22
00:00:58,470 --> 00:00:56,860
cabinet since January of 2012 where she

23
00:01:00,810 --> 00:00:58,480
is a key member of the president's

24
00:01:02,880 --> 00:01:00,820
economic leadership team reflecting the

25
00:01:04,799 --> 00:01:02,890
important role that small businesses and

26
00:01:07,070 --> 00:01:04,809
entrepreneurs play in our nation's

27
00:01:09,510 --> 00:01:07,080
long-term economic growth and prosperity

28
00:01:11,850 --> 00:01:09,520
but that's probably likely what you

29
00:01:13,889 --> 00:01:11,860
already know about Karen mills but what

30
00:01:15,480 --> 00:01:13,899
you probably don't know is that she's

31
00:01:17,760 --> 00:01:15,490
actually tried to convince her three

32
00:01:20,880 --> 00:01:17,770
sons to go to Space Camp just so she

33
00:01:22,320 --> 00:01:20,890
could go join them and all they know

34
00:01:24,480 --> 00:01:22,330
they didn't end up going hopefully

35
00:01:26,760 --> 00:01:24,490
curiosity's exciting landing on Mars has

36
00:01:28,290 --> 00:01:26,770
reignited their interest ladies and

37
00:01:31,620 --> 00:01:28,300
gentlemen allow me to introduce the SBA

38
00:01:33,690 --> 00:01:31,630

administrator Karen mills well thank you

39
00:01:37,290 --> 00:01:33,700
very much and thank you to all of you

40
00:01:40,949 --> 00:01:37,300
and a TA for welcoming us virtually

41
00:01:43,050 --> 00:01:40,959
we're delighted to be with you as you

42
00:01:46,080 --> 00:01:43,060
just heard on august six the entire

43
00:01:52,080 --> 00:01:46,090
world was watching as nasa return as

44
00:01:55,680 --> 00:01:52,090
nasa returned to mars it was a 352

45
00:01:59,339 --> 00:01:55,690
million mile journey really astounding

46
00:02:01,109 --> 00:01:59,349
and a an extraordinary landing that

47
00:02:02,820 --> 00:02:01,119
demonstrated some cutting-edge

48
00:02:05,850 --> 00:02:02,830
technology we're going to be hearing

49
00:02:08,760 --> 00:02:05,860
more about curiosity is the largest

50
00:02:11,550 --> 00:02:08,770
Rover ever sent to another planet and I

51
00:02:14,610 --> 00:02:11,560
did ask how big is curiosity and I heard

52
00:02:18,750 --> 00:02:14,620
it's the size of a small car it's now in

53
00:02:20,880 --> 00:02:18,760
place and doing an unbelievable job

54
00:02:23,270 --> 00:02:20,890
I'm the administrator of the Small

55
00:02:26,309 --> 00:02:23,280
Business Administration as you know and

56
00:02:28,289 --> 00:02:26,319
from my perspective small businesses

57
00:02:32,580 --> 00:02:28,299
like a TA engineering are really

58
00:02:35,580 --> 00:02:32,590
essential to creating jobs to leading in

59
00:02:38,220 --> 00:02:35,590
the cutting-edge innovations that we

60
00:02:40,949 --> 00:02:38,230
have and creating the foundation for an

61
00:02:44,369 --> 00:02:40,959
economy that's built to last in fact

62
00:02:47,099 --> 00:02:44,379
over the last two decades small and new

63
00:02:51,270 --> 00:02:47,109

businesses have created two out of every

64
00:02:54,390 --> 00:02:51,280
three new jobs and half of the people

65
00:02:57,809 --> 00:02:54,400
who work in this country own or work for

66
00:03:00,780 --> 00:02:57,819
a small business so that's 28 million

67
00:03:05,039 --> 00:03:00,790
small firms today employing 60 million

68
00:03:07,710 --> 00:03:05,049
Americans and the reality is that small

69
00:03:09,869 --> 00:03:07,720
business contracting as we will talk

70
00:03:13,559 --> 00:03:09,879
about today is probably the single most

71
00:03:15,710 --> 00:03:13,569
important tool that we have at federal

72
00:03:19,860 --> 00:03:15,720
level to help America's small businesses

73
00:03:24,509 --> 00:03:19,870
grow and create jobs and turn innovation

74
00:03:28,699 --> 00:03:24,519
into lasting economic prosperity small

75
00:03:30,659 --> 00:03:28,709
business contracting is a win-win and

76
00:03:32,670 --> 00:03:30,669
one of the things you'll hear about

77
00:03:35,670 --> 00:03:32,680
today is how government gets to work

78
00:03:39,420 --> 00:03:35,680
with the most innovative and forward

79
00:03:42,750 --> 00:03:39,430
leaning companies in America and often

80
00:03:45,869 --> 00:03:42,760
with direct access to the CEO and small

81
00:03:47,809 --> 00:03:45,879
business also gets critical revenue to

82
00:03:50,670 --> 00:03:47,819
build and scale their operations

83
00:03:52,740 --> 00:03:50,680
President Obama understands this he has

84
00:03:57,470 --> 00:03:52,750
made small business contracting a

85
00:04:00,300 --> 00:03:57,480
priority across the administration and

86
00:04:03,089 --> 00:04:00,310
administrator Bolden has followed that

87
00:04:06,839 --> 00:04:03,099
lead and made it a priority across NASA

88
00:04:08,640 --> 00:04:06,849

at the SBA our goal is to make sure that

89
00:04:11,939 --> 00:04:08,650
the federal government and America's

90
00:04:14,129 --> 00:04:11,949
leading companies have access to the

91
00:04:16,860 --> 00:04:14,139
best small businesses in America today

92
00:04:20,099 --> 00:04:16,870
and that's why we provide a range of

93
00:04:23,010 --> 00:04:20,109
consulting and mentoring and local

94
00:04:27,540 --> 00:04:23,020
programs today we're talking with the

95
00:04:29,399 --> 00:04:27,550
small businesses and the team at ATA

96
00:04:32,129 --> 00:04:29,409
engineering who I hope we didn't just

97
00:04:35,010 --> 00:04:32,139
lose their

98
00:04:36,899 --> 00:04:35,020
you are about their big role that they

99
00:04:40,619 --> 00:04:36,909
played in the development of the

100
00:04:42,959 --> 00:04:40,629
Curiosity rover ata engineering and many

101
00:04:45,809 --> 00:04:42,969
other small businesses involved in the

102
00:04:48,330 --> 00:04:45,819
Mars Science Laboratory project really

103
00:04:51,209 --> 00:04:48,340
embodied the entrepreneurial spirit and

104
00:04:53,909 --> 00:04:51,219
the drive and the ability of America's

105
00:04:56,070 --> 00:04:53,919
small businesses to build groundbreaking

106
00:04:58,080 --> 00:04:56,080
tools that you're going to hear about in

107
00:05:01,439 --> 00:04:58,090
parts that help make even the most

108
00:05:03,749 --> 00:05:01,449
sophisticated projects possible and

109
00:05:06,390 --> 00:05:03,759
successful so this mission is really a

110
00:05:08,909 --> 00:05:06,400
shining example of what's possible when

111
00:05:12,450 --> 00:05:08,919
American small businesses are given the

112
00:05:14,850 --> 00:05:12,460
chance to do what they do best so thank

113
00:05:17,010 --> 00:05:14,860

you very much to Mary and her team at

114
00:05:19,740 --> 00:05:17,020
ATA for inviting us today to learn more

115
00:05:23,129 --> 00:05:19,750
about their company this is a terrific

116
00:05:27,209 --> 00:05:23,139
example about how of how America's small

117
00:05:29,700 --> 00:05:27,219
businesses get the job done Thank You

118
00:05:31,679 --> 00:05:29,710
administrator Mills we appreciate it now

119
00:05:34,140 --> 00:05:31,689
I'd like to invite nasa administrator

120
00:05:36,089 --> 00:05:34,150
charlie bolden to say a few words now

121
00:05:37,740 --> 00:05:36,099
during charlie's 34-year career in the

122
00:05:40,499 --> 00:05:37,750
Marines he became a decorated naval

123
00:05:42,600 --> 00:05:40,509
aviator and he was also a leader in the

124
00:05:44,820 --> 00:05:42,610
nasa astronaut office for 14 of those

125
00:05:46,890 --> 00:05:44,830
years including four missions on the

126
00:05:48,779 --> 00:05:46,900
space shuttle i like to say for a guy

127
00:05:51,839 --> 00:05:48,789
who spent so much time in space he's

128
00:05:53,579 --> 00:05:51,849
actually incredibly down to earth so

129
00:05:55,529 --> 00:05:53,589
without further ado Administrator

130
00:05:57,480 --> 00:05:55,539
Charlie Bolden Lauren thank you very

131
00:05:59,339 --> 00:05:57,490
much and administrator Mills thanks so

132
00:06:02,219 --> 00:05:59,349
much to you for for joining us today

133
00:06:04,079 --> 00:06:02,229
Mary Baker and Chris cubic can't thank

134
00:06:06,929 --> 00:06:04,089
you in the ATA engineering team enough

135
00:06:10,469 --> 00:06:06,939
for your hospitality here and out there

136
00:06:12,899 --> 00:06:10,479
in San Diego as administrator Mills has

137
00:06:15,179 --> 00:06:12,909
said small businesses are critical to us

138
00:06:17,670 --> 00:06:15,189

and NASA because they represent the best

139
00:06:20,159 --> 00:06:17,680
of American spirit of innovation these

140
00:06:22,889 --> 00:06:20,169
entrepreneurs have displayed the drive

141
00:06:25,350 --> 00:06:22,899
needed to solve problems and create

142
00:06:27,809 --> 00:06:25,360
capabilities that that that help the

143
00:06:29,939 --> 00:06:27,819
nation reach the moon launch great

144
00:06:33,029 --> 00:06:29,949
observatories enable humans to live and

145
00:06:35,429 --> 00:06:33,039
work in space possibly infinitely small

146
00:06:37,350 --> 00:06:35,439
businesses and entrepreneurs employ half

147
00:06:39,719 --> 00:06:37,360
of America's workers and create

148
00:06:42,059 --> 00:06:39,729
sixty-four percent of new jobs they're

149
00:06:43,949 --> 00:06:42,069
an essential part of our economic engine

150
00:06:44,999 --> 00:06:43,959
critical part of President Obama's

151
00:06:47,670 --> 00:06:45,009
vision

152
00:06:49,739 --> 00:06:47,680
for NASA the dedicated and mission focus

153
00:06:52,019 --> 00:06:49,749
work at a TA and our other small

154
00:06:54,980 --> 00:06:52,029
business partners has been essential to

155
00:06:58,079 --> 00:06:54,990
curiosity's early and ongoing success

156
00:07:00,540 --> 00:06:58,089
atas work on the landing gear and rover

157
00:07:02,670 --> 00:07:00,550
wheels in particular helped turn seven

158
00:07:05,850 --> 00:07:02,680
minutes of terror in 27 minutes of

159
00:07:07,980 --> 00:07:05,860
triumph curiosity is the largest Rover

160
00:07:10,040 --> 00:07:07,990
that's ever been sent to another planet

161
00:07:13,109 --> 00:07:10,050
and it will provide invaluable data

162
00:07:15,149 --> 00:07:13,119
regarding Mars's Mars that will benefit

163
00:07:17,969 --> 00:07:15,159

the scientific community for years to

164
00:07:20,369 --> 00:07:17,979
come small businesses help support the

165
00:07:23,070 --> 00:07:20,379
design and fabrication of curiosity and

166
00:07:26,010 --> 00:07:23,080
also took many other activities that may

167
00:07:28,260 --> 00:07:26,020
wish impossible due to the hard work of

168
00:07:29,909 --> 00:07:28,270
everyone in the agency NASA exceeded our

169
00:07:33,570 --> 00:07:29,919
small business killers in fiscal year

170
00:07:35,670 --> 00:07:33,580
2011 last year i'm proud to say NASA was

171
00:07:37,889 --> 00:07:35,680
one of only three big seven federal

172
00:07:39,749 --> 00:07:37,899
agencies ones that together spend

173
00:07:42,360 --> 00:07:39,759
approximately ninety percent of small

174
00:07:46,260 --> 00:07:42,370
business dollars that exceeded its small

175
00:07:49,469 --> 00:07:46,270
business goals 2012 currently the only

176
00:07:52,649 --> 00:07:49,479
one of the seven making its goal nasa

177
00:07:54,629 --> 00:07:52,659
awarded approximately 2.5 billion in

178
00:07:57,570 --> 00:07:54,639
prime contracts directly to small

179
00:08:00,659 --> 00:07:57,580
businesses in 2011 and that's up about

180
00:08:02,610 --> 00:08:00,669
75 million from the previous year our

181
00:08:04,529 --> 00:08:02,620
large prime contractors awarded

182
00:08:06,540 --> 00:08:04,539
approximately two billion dollars in

183
00:08:10,259 --> 00:08:06,550
additional some contracts to small

184
00:08:12,809 --> 00:08:10,269
businesses in fiscal year 2011 this year

185
00:08:14,879 --> 00:08:12,819
for the first time we're including space

186
00:08:17,040 --> 00:08:14,889
technology as part of the agency's small

187
00:08:17,999 --> 00:08:17,050
business research opportunities and I

188
00:08:20,429 --> 00:08:18,009

think what you're going to hear from

189
00:08:22,709 --> 00:08:20,439
Mary and her team is is a lot about

190
00:08:24,929 --> 00:08:22,719
their excitement that the space

191
00:08:26,689 --> 00:08:24,939
technology is now being included our

192
00:08:30,360 --> 00:08:26,699
small business innovative research

193
00:08:32,279 --> 00:08:30,370
program or SBIR has added seven select

194
00:08:34,500 --> 00:08:32,289
topics representing unique space

195
00:08:36,600 --> 00:08:34,510
technology development challenges that

196
00:08:38,790 --> 00:08:36,610
the agency believes are well suited to

197
00:08:40,730 --> 00:08:38,800
the innovation and problem-solving

198
00:08:43,500 --> 00:08:40,740
abilities of America's small businesses

199
00:08:45,780 --> 00:08:43,510
as complementing ongoing efforts with

200
00:08:48,300 --> 00:08:45,790
these seven areas NASA is hoping to

201
00:08:50,280 --> 00:08:48,310
improve on an already great program it

202
00:08:53,699 --> 00:08:50,290
benefits the agency and America's

203
00:08:55,590 --> 00:08:53,709
technology technology economy all of

204
00:08:58,329 --> 00:08:55,600
this clearly shows how committed we are

205
00:09:01,689 --> 00:08:58,339
to the small business community and how

206
00:09:03,869 --> 00:09:01,699
they are to our nation continuing to

207
00:09:06,819 --> 00:09:03,879
remain the leader on space exploration

208
00:09:09,819 --> 00:09:06,829
small businesses are critical to net

209
00:09:11,860 --> 00:09:09,829
critical partners to NASA and in our

210
00:09:14,259 --> 00:09:11,870
work to create a dynamic and promising

211
00:09:16,780 --> 00:09:14,269
future in which the US continues to link

212
00:09:20,170 --> 00:09:16,790
and together we're opening the new era

213
00:09:22,569 --> 00:09:20,180

of space explorations again I want to

214
00:09:24,369 --> 00:09:22,579
thank the team at 88 engineering for

215
00:09:27,129 --> 00:09:24,379
your hard work with the Mars Science

216
00:09:29,079 --> 00:09:27,139
Laboratory and curiosity rover on those

217
00:09:31,840 --> 00:09:29,089
missions your contributions are

218
00:09:33,939 --> 00:09:31,850
invaluable and our ongoing partnership

219
00:09:36,840 --> 00:09:33,949
is vital to ensuring that NASA remains

220
00:09:39,670 --> 00:09:36,850
the world leader in space exploration

221
00:09:41,019 --> 00:09:39,680
Thank You administrator Bolden really

222
00:09:42,460 --> 00:09:41,029
appreciate that and now like to

223
00:09:45,100 --> 00:09:42,470
introduce the president of aata

224
00:09:47,230 --> 00:09:45,110
engineering Mary Baker dr. Baker brings

225
00:09:49,900 --> 00:09:47,240
more than 35 years of experience in

226
00:09:52,540 --> 00:09:49,910
project engineering to the 80 18 and in

227
00:09:55,360 --> 00:09:52,550
fact in 2010 ata was awarded the NASA

228
00:09:57,280 --> 00:09:55,370
small business industry award as JPL

229
00:09:59,410 --> 00:09:57,290
small business subcontractor of the year

230
00:10:01,660 --> 00:09:59,420
dr. Baker thanks for walking about

231
00:10:03,160 --> 00:10:01,670
welcoming us to 88 engineering today and

232
00:10:04,929 --> 00:10:03,170
I'll turn it over to you and your team

233
00:10:06,759 --> 00:10:04,939
to tell us a little bit about the work

234
00:10:12,009 --> 00:10:06,769
HEA did for the Mars Science Laboratory

235
00:10:14,009 --> 00:10:12,019
project thank you very much ATA and all

236
00:10:15,999 --> 00:10:14,019
of our employees are honored by

237
00:10:17,710 --> 00:10:16,009
administrator mills and administrator

238
00:10:21,460 --> 00:10:17,720

bolden concertinas it's a very exciting

239
00:10:24,100 --> 00:10:21,470
events for us and we also are incredibly

240
00:10:28,600 --> 00:10:24,110
proud to have been part of the curiosity

241
00:10:30,610 --> 00:10:28,610
development we also appreciate not only

242
00:10:32,860 --> 00:10:30,620
just the events that have happened in

243
00:10:36,309 --> 00:10:32,870
the last few weeks this experiment we

244
00:10:37,840 --> 00:10:36,319
had to work very closely with APL an

245
00:10:39,939 --> 00:10:37,850
integral part of their team and

246
00:10:42,489 --> 00:10:39,949
developing the many subsystems of

247
00:10:44,590 --> 00:10:42,499
curiosity so that experience was

248
00:10:46,689 --> 00:10:44,600
tremendously valuable for us as a

249
00:10:48,369 --> 00:10:46,699
company both and being able to apply our

250
00:10:50,619 --> 00:10:48,379
capabilities and the tools and the

251
00:10:52,869 --> 00:10:50,629
methods that we developed but also to

252
00:10:56,860 --> 00:10:52,879
participate in such an exciting mission

253
00:11:00,160 --> 00:10:56,870
and the culmination of that in the

254
00:11:01,960 --> 00:11:00,170
launch and the landing was something we

255
00:11:04,989 --> 00:11:01,970
were also very appreciative of being

256
00:11:08,230 --> 00:11:04,999
invited to be included with the JPL team

257
00:11:10,749 --> 00:11:08,240
so we got to participate administrator

258
00:11:11,250 --> 00:11:10,759
Bolden was there and we were just a few

259
00:11:14,490 --> 00:11:11,260
feet

260
00:11:19,290 --> 00:11:14,500
he was telling us about it and that some

261
00:11:22,740 --> 00:11:19,300
of our engineers were very lucky to be

262
00:11:25,320 --> 00:11:22,750
invited into that in community so not

263
00:11:28,350 --> 00:11:25,330

only do these programs give us a chance

264
00:11:30,600 --> 00:11:28,360
to apply advanced technology but they

265
00:11:33,120 --> 00:11:30,610
also serve as an inspiration to the next

266
00:11:35,670 --> 00:11:33,130
generations and that we have seen that

267
00:11:37,380 --> 00:11:35,680
not only with the children of engineers

268
00:11:39,810 --> 00:11:37,390
that have worked on that participating

269
00:11:42,800 --> 00:11:39,820
but also in generations of student

270
00:11:45,630 --> 00:11:42,810
interns that have participated with us

271
00:11:47,070 --> 00:11:45,640
it takes a lot of hard work to do these

272
00:11:48,990 --> 00:11:47,080
programs and it takes something like

273
00:11:53,220 --> 00:11:49,000
like such excitement of the Mars

274
00:11:55,920 --> 00:11:53,230
Curiosity rover to motivate that hard

275
00:11:57,870 --> 00:11:55,930
work one of our student interns are

276
00:12:01,020 --> 00:11:57,880
smiling at me about our hard work she

277
00:12:03,690 --> 00:12:01,030
had to do a DA is about a hundred people

278
00:12:06,200 --> 00:12:03,700
in more than 50 ATA engineers have

279
00:12:09,450 --> 00:12:06,210
worked on the Mars Science Laboratory

280
00:12:12,270 --> 00:12:09,460
program and in addition to that 19

281
00:12:14,220 --> 00:12:12,280
student interns work worked on it so two

282
00:12:17,160 --> 00:12:14,230
of the engineers that will tell you

283
00:12:18,840 --> 00:12:17,170
about this program are Jeff tippmann and

284
00:12:20,190 --> 00:12:18,850
Curt knutson there in our San Diego

285
00:12:22,770 --> 00:12:20,200
office and we're going to turn the

286
00:12:24,620 --> 00:12:22,780
program over to them to tell you some of

287
00:12:27,420 --> 00:12:24,630
more details of the work that was done

288
00:12:29,520 --> 00:12:27,430

great thank you Mary we're honored

289
00:12:31,440 --> 00:12:29,530
administrators by your visit in our

290
00:12:32,910 --> 00:12:31,450
conference room in ER oh and here in San

291
00:12:34,980 --> 00:12:32,920
Diego we have many of the engineers that

292
00:12:38,370 --> 00:12:34,990
worked on the Mars Science Lab from 2006

293
00:12:40,680 --> 00:12:38,380
to 2012 18 des design analysis and tests

294
00:12:42,990 --> 00:12:40,690
and we work side-by-side with JPL

295
00:12:46,950 --> 00:12:43,000
providing support to their mechanical

296
00:12:48,660 --> 00:12:46,960
systems division 35 so today we provide

297
00:12:49,710 --> 00:12:48,670
a lot of focus on nalysis and tests and

298
00:12:51,270 --> 00:12:49,720
I think that was very useful to

299
00:12:53,070 --> 00:12:51,280
curiosity today we're going to talk a

300
00:12:55,470 --> 00:12:53,080
little bit about specifically what we

301
00:12:58,950 --> 00:12:55,480
did and I have here a diagram of the

302
00:13:00,750 --> 00:12:58,960
Mars Science Lab curiosity and it has

303
00:13:02,580 --> 00:13:00,760
shown on it highlighted in blue many of

304
00:13:04,110 --> 00:13:02,590
the systems at 88 provided computer

305
00:13:05,430 --> 00:13:04,120
simulation support for and I'm going to

306
00:13:08,490 --> 00:13:05,440
talk briefly about each of these systems

307
00:13:09,990 --> 00:13:08,500
and what an example of our role was so

308
00:13:12,210 --> 00:13:10,000
we have the mobility system which

309
00:13:16,710 --> 00:13:12,220
consists of a wheel rockers and a bogey

310
00:13:18,690 --> 00:13:16,720
and the head of the rover the remote

311
00:13:22,440 --> 00:13:18,700
sensing mass has all these fancy and

312
00:13:24,280 --> 00:13:22,450
fantastic cameras and that system is you

313
00:13:27,490 --> 00:13:24,290

know essentially critical

314
00:13:29,319 --> 00:13:27,500
we have here the arm the arm has you can

315
00:13:32,019 --> 00:13:29,329
think of it like a human arm so it has a

316
00:13:33,730 --> 00:13:32,029
shoulder elbow and wrist and in its

317
00:13:36,939 --> 00:13:33,740
wrist it holds all these fantastic tools

318
00:13:39,189 --> 00:13:36,949
for doing science on Mars so all these

319
00:13:42,129 --> 00:13:39,199
systems they have to arrive on Mars mark

320
00:13:44,439 --> 00:13:42,139
MSL curiosity had extremely challenging

321
00:13:46,150 --> 00:13:44,449
requirements and environments that it is

322
00:13:48,100 --> 00:13:46,160
subjected to it has to survive the

323
00:13:50,319 --> 00:13:48,110
launch it has to arrive on Mars and all

324
00:13:53,019 --> 00:13:50,329
these systems have to work and to give a

325
00:13:55,240 --> 00:13:53,029
brief example on the wheels ata for

326
00:13:57,069 --> 00:13:55,250
exhibit on computer simulation and

327
00:13:58,720 --> 00:13:57,079
engineering the wheels have to be like

328
00:14:00,069 --> 00:13:58,730
they have to get to Mars and they have

329
00:14:01,030 --> 00:14:00,079
to be able to strike a rock or fall off

330
00:14:02,800 --> 00:14:01,040
a rock and we help with computer

331
00:14:04,749 --> 00:14:02,810
simulations for that for the remote

332
00:14:06,819 --> 00:14:04,759
sensing mask the critical example of

333
00:14:08,710 --> 00:14:06,829
critical issues is it stowed and that it

334
00:14:10,420 --> 00:14:08,720
has to deploy once it arrives on Mars so

335
00:14:12,400 --> 00:14:10,430
to be stowed we helped with you know how

336
00:14:14,470 --> 00:14:12,410
should it be supported and and we did

337
00:14:16,420 --> 00:14:14,480
analyses to confirm you know what was

338
00:14:18,100 --> 00:14:16,430

going to happen and for the arm I'm

339
00:14:20,199 --> 00:14:18,110
going to talk about the tools that are

340
00:14:22,120 --> 00:14:20,209
on a little bit more detail not only

341
00:14:24,220 --> 00:14:22,130
does the rover have to survive these

342
00:14:26,139 --> 00:14:24,230
incredible environments but it but once

343
00:14:28,780 --> 00:14:26,149
it gets there it actually produces some

344
00:14:30,160 --> 00:14:28,790
of its own environments so with the hot

345
00:14:31,420 --> 00:14:30,170
and cold temperatures and everything

346
00:14:33,430 --> 00:14:31,430
else that's going on imagine you have

347
00:14:35,170 --> 00:14:33,440
the seven-foot arm and at the end of it

348
00:14:37,660 --> 00:14:35,180
you've got this amazing tool box the

349
00:14:39,579 --> 00:14:37,670
drill is like a jackhammer it's a rotary

350
00:14:41,680 --> 00:14:39,589
percussion drill an 88 did a lot of

351
00:14:43,629 --> 00:14:41,690
simulations with that team on that drill

352
00:14:45,579 --> 00:14:43,639
so you have all this vibration going on

353
00:14:48,850 --> 00:14:45,589
the end of the of the arm and we have

354
00:14:50,920 --> 00:14:48,860
these imaging systems and also x-ray

355
00:14:53,319 --> 00:14:50,930
systems that are attached to the toolbox

356
00:14:54,910 --> 00:14:53,329
that curiosity holds so very important

357
00:14:56,530 --> 00:14:54,920
consideration is being able to do this

358
00:14:58,449 --> 00:14:56,540
drilling and not impact those

359
00:15:00,460 --> 00:14:58,459
instruments another very fantastic

360
00:15:02,139 --> 00:15:00,470
instrument is the camara and the camara

361
00:15:04,300 --> 00:15:02,149
which kind of shown here in this diagram

362
00:15:05,920 --> 00:15:04,310
it also needs to vibrate to move

363
00:15:07,240 --> 00:15:05,930

material and transfer to the drills and

364
00:15:09,040 --> 00:15:07,250
the other systems so these are just

365
00:15:11,679 --> 00:15:09,050
examples of things that a TA worked with

366
00:15:13,269 --> 00:15:11,689
I have also with me Jeff tippmann and

367
00:15:15,220 --> 00:15:13,279
Jeff tippmann is going to describe the

368
00:15:17,139 --> 00:15:15,230
entry descent landing proportions of

369
00:15:18,939 --> 00:15:17,149
things that 80 help them thanks Kerry

370
00:15:21,160 --> 00:15:18,949
yeah I'm really excited to get able to

371
00:15:23,170 --> 00:15:21,170
talk to everyone about the work 88 did

372
00:15:24,879 --> 00:15:23,180
it with the team at JPL that worked on

373
00:15:26,920 --> 00:15:24,889
the entry descent and landing portion of

374
00:15:29,290 --> 00:15:26,930
the mission which is referred to as the

375
00:15:31,090 --> 00:15:29,300
seven minutes of Terror because it took

376
00:15:33,370 --> 00:15:31,100
seven minutes for it to go from the

377
00:15:36,519 --> 00:15:33,380
surface of the atmosphere of Mars down

378
00:15:37,879 --> 00:15:36,529
to the surface of Mars and so there was

379
00:15:38,869 --> 00:15:37,889
a lot of things that happened during

380
00:15:41,030 --> 00:15:38,879
at seven minutes and there was a

381
00:15:43,639 --> 00:15:41,040
particular part of it that a TA was able

382
00:15:45,949 --> 00:15:43,649
to support the team at JPL one of the

383
00:15:47,780 --> 00:15:45,959
particular segment is called the sky

384
00:15:50,539 --> 00:15:47,790
primitive and that's when the rover was

385
00:15:52,189 --> 00:15:50,549
was lowered down on these cables and it

386
00:15:53,749 --> 00:15:52,199
deployed its wheels to get ready for

387
00:15:55,639 --> 00:15:53,759
mine and then actually landed on the

388
00:15:58,129 --> 00:15:55,649

surface of Mars so a lot of tests

389
00:16:00,229 --> 00:15:58,139
happened at JPL and 80s supported the

390
00:16:02,030 --> 00:16:00,239
team at JPL on those tests as well as

391
00:16:04,669 --> 00:16:02,040
providing a lot of computer simulations

392
00:16:06,319 --> 00:16:04,679
for those same advances only talk to you

393
00:16:10,220 --> 00:16:06,329
a little bit about one of the things

394
00:16:12,499 --> 00:16:10,230
that H a design for the team at JPL this

395
00:16:14,900 --> 00:16:12,509
test vehicle right here that I show here

396
00:16:16,849 --> 00:16:14,910
ata was able to design the groper test

397
00:16:19,789 --> 00:16:16,859
chassis the chassis for this and one of

398
00:16:21,199 --> 00:16:19,799
the challenges of working with a vehicle

399
00:16:22,639 --> 00:16:21,209
that's going to land on Mars is that the

400
00:16:24,349 --> 00:16:22,649
Martian gravity is three-eighths of what

401
00:16:26,210 --> 00:16:24,359
it is on earth so when he tests on earth

402
00:16:28,789 --> 00:16:26,220
he got taken a lot of considerations and

403
00:16:30,499 --> 00:16:28,799
in wrote and the team at ATA designed

404
00:16:32,239 --> 00:16:30,509
this chassis for this vehicle which was

405
00:16:33,769 --> 00:16:32,249
called the Scarecrow because it was a

406
00:16:36,049 --> 00:16:33,779
trim down version of the actual

407
00:16:44,650 --> 00:16:36,059
Curiosity rover and this test vehicle

408
00:16:50,740 --> 00:16:48,490
Oh an ETA was able to support JPL on

409
00:16:52,720 --> 00:16:50,750
this test as well as of providing a lot

410
00:16:55,300 --> 00:16:52,730
of computer simulations of that very

411
00:16:56,980 --> 00:16:55,310
touchdown event and NATA actually was

412
00:16:59,139 --> 00:16:56,990
able to use that computer model that

413
00:17:01,540 --> 00:16:59,149

that we worked on with this particular

414
00:17:02,980 --> 00:17:01,550
test to actually simulate it actually

415
00:17:05,079 --> 00:17:02,990
landed on the surface tomorrow since in

416
00:17:07,120 --> 00:17:05,089
a computer model it's very easy easy to

417
00:17:10,000 --> 00:17:07,130
change the gravitational constant and

418
00:17:12,250 --> 00:17:10,010
since even though the team at JPL was

419
00:17:13,809 --> 00:17:12,260
planning to land curiosity and as safe

420
00:17:15,189 --> 00:17:13,819
as possible with there were some

421
00:17:17,230 --> 00:17:15,199
questions what would happen if it

422
00:17:19,689 --> 00:17:17,240
actually landed on a slope and I hit two

423
00:17:21,699 --> 00:17:19,699
rocks and its wheels run even so a TA

424
00:17:24,189 --> 00:17:21,709
used this model to provide thousands of

425
00:17:25,600 --> 00:17:24,199
computer simulations to JPL to help give

426
00:17:27,880 --> 00:17:25,610
them to some information on what would

427
00:17:29,440 --> 00:17:27,890
happen in that particular case and to

428
00:17:32,140 --> 00:17:29,450
build their confidence that it can land

429
00:17:34,419 --> 00:17:32,150
safely in a lot of difficult

430
00:17:36,039 --> 00:17:34,429
environments and so that's a little bit

431
00:17:37,320 --> 00:17:36,049
about the work hea did on the entry

432
00:17:39,940 --> 00:17:37,330
descent and landing portion with the

433
00:17:42,190 --> 00:17:39,950
extraordinary team at JPL one of the

434
00:17:43,659 --> 00:17:42,200
great things about working on all these

435
00:17:45,430 --> 00:17:43,669
computer simulations and helping out

436
00:17:47,890 --> 00:17:45,440
with the testing is that we were very

437
00:17:50,560 --> 00:17:47,900
anxious to see Leah rover get to Mars

438
00:17:54,039 --> 00:17:50,570

and Kurt has a story about that he wants

439
00:17:55,630 --> 00:17:54,049
to share so as a small business working

440
00:17:57,940 --> 00:17:55,640
with JPL you know our role in these

441
00:18:00,700 --> 00:17:57,950
computer simulations was to help reduce

442
00:18:02,260 --> 00:18:00,710
risk and uncertainty with the program

443
00:18:04,419 --> 00:18:02,270
and we took a lot of pride in that and

444
00:18:06,039 --> 00:18:04,429
as a small business were invited to the

445
00:18:07,419 --> 00:18:06,049
launch and I was able to attend the

446
00:18:09,100 --> 00:18:07,429
launch Eric Martin who couldn't be here

447
00:18:11,289 --> 00:18:09,110
today he attended the launch and my

448
00:18:14,230 --> 00:18:11,299
daughter Krystal at age 9 at the time

449
00:18:15,970 --> 00:18:14,240
attended the launch we were able to hear

450
00:18:17,529 --> 00:18:15,980
administrator Bolton's speech of why

451
00:18:19,659 --> 00:18:17,539
curiosity was going to Mars is very

452
00:18:21,220 --> 00:18:19,669
rewarding experience I don't part of a

453
00:18:24,310 --> 00:18:21,230
speech my daughter took the camera away

454
00:18:26,080 --> 00:18:24,320
from me and she filmed the actual launch

455
00:18:27,419 --> 00:18:26,090
segment and it was it was just it was a

456
00:18:30,700 --> 00:18:27,429
very memorable experience so

457
00:18:32,080 --> 00:18:30,710
administrator Bolden you know JPL NASA

458
00:18:34,270 --> 00:18:32,090
headquarters were very grateful to be

459
00:18:36,340 --> 00:18:34,280
invited and to participate on this very

460
00:18:38,520 --> 00:18:36,350
rewarding program and it was great for

461
00:18:41,020 --> 00:18:38,530
us to be able to hang out with you today

462
00:18:43,299 --> 00:18:41,030
great thank you guys so much for that

463
00:18:44,770 --> 00:18:43,309

presentation and and that was really

464
00:18:47,080 --> 00:18:44,780
great we really appreciate it so let's

465
00:18:48,520 --> 00:18:47,090
get into some questions now just a

466
00:18:50,260 --> 00:18:48,530
reminder for those of you who want to

467
00:18:52,720 --> 00:18:50,270
get in on the conversation you can send

468
00:18:55,090 --> 00:18:52,730
questions to us in the Google+ comments

469
00:18:58,240 --> 00:18:55,100
section through Facebook or tweet twist

470
00:18:58,549 --> 00:18:58,250
using the ask NASA hashtag so I think

471
00:19:01,039 --> 00:18:58,559
the

472
00:19:02,419 --> 00:19:01,049
first question goes to dr baker and you

473
00:19:04,759 --> 00:19:02,429
may have talked about this a little bit

474
00:19:06,499 --> 00:19:04,769
but how many months or years did the ATA

475
00:19:10,610 --> 00:19:06,509
engineering team spin working on

476
00:19:13,360 --> 00:19:10,620
curiosity six years we were part of the

477
00:19:16,810 --> 00:19:13,370
team for six years there was as many as

478
00:19:20,149 --> 00:19:16,820
16 people at one time simultaneously

479
00:19:23,720 --> 00:19:20,159
terrific thank you I think this question

480
00:19:25,639 --> 00:19:23,730
is really for administrator Mills how

481
00:19:28,430 --> 00:19:25,649
does how does the Small Business

482
00:19:30,289 --> 00:19:28,440
Administration support businesses that

483
00:19:32,509 --> 00:19:30,299
are in science and develop science

484
00:19:34,159 --> 00:19:32,519
research and technology what are some of

485
00:19:35,899 --> 00:19:34,169
the ways that other small businesses can

486
00:19:38,600 --> 00:19:35,909
get involved in and the type of things

487
00:19:41,180 --> 00:19:38,610
that a TA is doing well there's a number

488
00:19:43,129 --> 00:19:41,190

of ways and one of them is our Small

489
00:19:46,519 --> 00:19:43,139
Business Innovation research program

490
00:19:48,889 --> 00:19:46,529
which ATA has taken advantage of in

491
00:19:53,330 --> 00:19:48,899
multiple occasions and if you go to

492
00:19:56,239 --> 00:19:53,340
sba.gov or and look under SBIR you will

493
00:19:59,330 --> 00:19:56,249
see that every agency that participates

494
00:20:02,269 --> 00:19:59,340
in research sets aside a certain amount

495
00:20:05,560 --> 00:20:02,279
of their research budget to go to small

496
00:20:08,690 --> 00:20:05,570
businesses so they can commercialize and

497
00:20:11,269 --> 00:20:08,700
look at research that really will lead

498
00:20:13,580 --> 00:20:11,279
to products and product development this

499
00:20:15,529 --> 00:20:13,590
is very important because as a base for

500
00:20:17,659 --> 00:20:15,539
our innovation economy we need these

501
00:20:20,359 --> 00:20:17,669
small innovation innovative companies

502
00:20:23,359 --> 00:20:20,369
like a TA to be working on the most

503
00:20:25,999 --> 00:20:23,369
important problems so SBIR is actually

504
00:20:28,489 --> 00:20:26,009
two and a half billion dollars out out

505
00:20:31,700 --> 00:20:28,499
of our national research budget and

506
00:20:34,460 --> 00:20:31,710
that's an important way in addition many

507
00:20:36,529 --> 00:20:34,470
many small businesses participate as

508
00:20:39,320 --> 00:20:36,539
contractors to the federal government

509
00:20:40,820 --> 00:20:39,330
both in the Defense Department and they

510
00:20:42,859 --> 00:20:40,830
are they're working on advanced

511
00:20:45,470 --> 00:20:42,869
technology the Department of Energy and

512
00:20:48,769 --> 00:20:45,480
at NASA this gives the government the

513
00:20:52,850 --> 00:20:48,779

opportunity as i said earlier to get the

514
00:20:55,489 --> 00:20:52,860
best cutting-edge work done and give

515
00:20:57,889 --> 00:20:55,499
small businesses revenue a lot of oxygen

516
00:20:59,930 --> 00:20:57,899
we actually have a hundred billion

517
00:21:02,629 --> 00:20:59,940
dollars a year in that government

518
00:21:05,029 --> 00:21:02,639
contracting program and as a small

519
00:21:07,009 --> 00:21:05,039
business like a TA grows it's a hundred

520
00:21:10,519 --> 00:21:07,019
people at quite a substantial company

521
00:21:11,930 --> 00:21:10,529
with a 12-year history we also have loan

522
00:21:14,299 --> 00:21:11,940
guarantee programs

523
00:21:16,340 --> 00:21:14,309
and advice and counseling programs so

524
00:21:19,070 --> 00:21:16,350
that a small business can develop their

525
00:21:21,470 --> 00:21:19,080
plan for where they want to go and then

526
00:21:24,080 --> 00:21:21,480
access the kind of capital they might

527
00:21:28,129 --> 00:21:24,090
need to get there all of that is on

528
00:21:30,200 --> 00:21:28,139
sba.gov and we can get a small business

529
00:21:34,669 --> 00:21:30,210
connected to a mentor that can help them

530
00:21:36,560 --> 00:21:34,679
walk through it terrific thanks a lot I

531
00:21:38,509 --> 00:21:36,570
think this next question is best

532
00:21:40,190 --> 00:21:38,519
directed at Dave Hunt although if

533
00:21:43,399 --> 00:21:40,200
there's someone else suited to answer

534
00:21:46,759 --> 00:21:43,409
that that's great too we were wondering

535
00:21:49,039 --> 00:21:46,769
how did JPL select a TA to do this work

536
00:21:51,460 --> 00:21:49,049
instead of someone else or just doing it

537
00:21:55,039 --> 00:21:51,470
themselves well thanks for that question

538
00:21:56,480 --> 00:21:55,049

clearly administrator bolden and mills

539
00:21:58,820 --> 00:21:56,490
have talked about the importance of

540
00:22:00,379 --> 00:21:58,830
using small businesses to support

541
00:22:04,580 --> 00:22:00,389
masters program so that was one reason

542
00:22:06,680 --> 00:22:04,590
in terms of why Jake you chose a TA well

543
00:22:09,169 --> 00:22:06,690
we had worked with Jay deal for over two

544
00:22:11,210 --> 00:22:09,179
decades and by the time curiosity

545
00:22:13,909 --> 00:22:11,220
wrapped up in 2006 we were already

546
00:22:17,269 --> 00:22:13,919
supporting a number of other NASA JPL

547
00:22:19,700 --> 00:22:17,279
programs and as such they're engineers

548
00:22:20,840 --> 00:22:19,710
their managers new ATA pretty well they

549
00:22:23,240 --> 00:22:20,850
knew our staff they knew our

550
00:22:26,090 --> 00:22:23,250
capabilities in fact people like Kirk

551
00:22:28,220 --> 00:22:26,100
had temporarily relocated itself his

552
00:22:30,529 --> 00:22:28,230
daughter's life there's family to

553
00:22:34,039 --> 00:22:30,539
Pasadena from San Diego and England's on

554
00:22:36,980 --> 00:22:34,049
site every day working on multiple

555
00:22:40,389 --> 00:22:36,990
programs working long hours so in short

556
00:22:42,470 --> 00:22:40,399
JPL trusted that we could support their

557
00:22:44,810 --> 00:22:42,480
critical areas where they needed

558
00:22:47,330 --> 00:22:44,820
expertise that we would get it done on

559
00:22:49,249 --> 00:22:47,340
time we'd get it done right and support

560
00:22:51,379 --> 00:22:49,259
the program and it's worked well ever

561
00:22:54,169 --> 00:22:51,389
since and one reason we're so honored

562
00:22:57,409 --> 00:22:54,179
that JPL's nominated us for one of

563
00:22:59,509 --> 00:22:57,419

NASA's highest achievement awards great

564
00:23:01,730 --> 00:22:59,519
thank you it was mentioned earlier

565
00:23:03,889 --> 00:23:01,740
administrator Bolden that that nASA has

566
00:23:05,840 --> 00:23:03,899
high marks in terms of its involvement

567
00:23:07,369 --> 00:23:05,850
with small businesses and I wondered if

568
00:23:09,289 --> 00:23:07,379
you could elaborate just a little bit

569
00:23:11,600 --> 00:23:09,299
more on on the importance of small

570
00:23:14,210 --> 00:23:11,610
businesses and working and the work we

571
00:23:15,649 --> 00:23:14,220
do at NASA I think you know it goes

572
00:23:17,629 --> 00:23:15,659
without saying Lauren the small

573
00:23:19,700 --> 00:23:17,639
businesses we feel are absolutely

574
00:23:22,460 --> 00:23:19,710
critical to everything that we do we

575
00:23:24,109 --> 00:23:22,470
generally find that for most of the

576
00:23:25,240 --> 00:23:24,119
technological development that we're

577
00:23:28,360 --> 00:23:25,250
doing the X

578
00:23:31,000 --> 00:23:28,370
is resident in small businesses large

579
00:23:33,100 --> 00:23:31,010
businesses are large Prime's are really

580
00:23:35,200 --> 00:23:33,110
good at integrating contracts and

581
00:23:38,020 --> 00:23:35,210
integrating work but when you get down

582
00:23:40,000 --> 00:23:38,030
to I say where the rubber meets the road

583
00:23:41,290 --> 00:23:40,010
would if you really want the the the

584
00:23:43,060 --> 00:23:41,300
people that are going to do engineering

585
00:23:45,070 --> 00:23:43,070
analysis that are going to do

586
00:23:46,510 --> 00:23:45,080
construction of pieces and parts it's

587
00:23:48,790 --> 00:23:46,520
generally done in the small business

588
00:23:50,530 --> 00:23:48,800

arena another area that I will mention

589
00:23:52,720 --> 00:23:50,540
and I talked to a little bit to the folk

590
00:23:53,740 --> 00:23:52,730
here because it was actually a small

591
00:23:55,510 --> 00:23:53,750
business with which I have been

592
00:23:58,060 --> 00:23:55,520
associated before becoming the NASA

593
00:24:00,430 --> 00:23:58,070
Administrator you would think you know

594
00:24:03,760 --> 00:24:00,440
languages are very important to NASA we

595
00:24:06,250 --> 00:24:03,770
have OG more than 20 international

596
00:24:08,770 --> 00:24:06,260
partners with whom we associate every

597
00:24:10,660 --> 00:24:08,780
day and so we need interpreters and

598
00:24:13,600 --> 00:24:10,670
translators and there is one of our

599
00:24:15,310 --> 00:24:13,610
primes is a small business in houston

600
00:24:17,410 --> 00:24:15,320
texas that provides language services

601
00:24:19,960 --> 00:24:17,420
for us and they do translation and

602
00:24:24,040 --> 00:24:19,970
interpretation so if there if you are a

603
00:24:26,650 --> 00:24:24,050
small business and you do anything nasa

604
00:24:30,100 --> 00:24:26,660
can probably use you because every NASA

605
00:24:32,230 --> 00:24:30,110
Center is is a small city and just

606
00:24:35,080 --> 00:24:32,240
imagine what it's like to work in any

607
00:24:38,500 --> 00:24:35,090
small city we've got traffic cops we've

608
00:24:40,810 --> 00:24:38,510
got nurses doctors a secretary's

609
00:24:42,610 --> 00:24:40,820
administrative personnel so don't think

610
00:24:45,130 --> 00:24:42,620
that because you're a small business and

611
00:24:47,020 --> 00:24:45,140
you're not technical that you can't do

612
00:24:49,510 --> 00:24:47,030
work for NASA we're looking for for

613
00:24:50,710 --> 00:24:49,520

everybody so we we welcome anybody who

614
00:24:53,110 --> 00:24:50,720
is in small business if you're

615
00:24:55,900 --> 00:24:53,120
particularly if you're a veteran zone

616
00:24:58,810 --> 00:24:55,910
small business don't wait for us to come

617
00:25:00,910 --> 00:24:58,820
find you you find us same thing with

618
00:25:03,100 --> 00:25:00,920
women-owned small businesses and hubs

619
00:25:04,630 --> 00:25:03,110
own businesses those are those are three

620
00:25:06,610 --> 00:25:04,640
of the ones that are continually

621
00:25:08,710 --> 00:25:06,620
challenging I think administrator mills

622
00:25:10,150 --> 00:25:08,720
will tell you throughout the government

623
00:25:12,040 --> 00:25:10,160
they represent three that are

624
00:25:14,110 --> 00:25:12,050
challenging to everybody and it's I

625
00:25:15,760 --> 00:25:14,120
think frequently it's just the small

626
00:25:18,040 --> 00:25:15,770
businesses in those particular areas

627
00:25:19,780 --> 00:25:18,050
don't feel they have something to offer

628
00:25:22,180 --> 00:25:19,790
and I would challenge you and say yes

629
00:25:25,420 --> 00:25:22,190
you do so find us if we don't find you

630
00:25:28,120 --> 00:25:25,430
Great Basin straighter Bowman has really

631
00:25:30,670 --> 00:25:28,130
been a leader throughout the whole

632
00:25:33,580 --> 00:25:30,680
administration in achieving the

633
00:25:35,200 --> 00:25:33,590
president's goals of having this hundred

634
00:25:37,510 --> 00:25:35,210
billion dollars get in the hands of

635
00:25:38,530 --> 00:25:37,520
small businesses so that they can create

636
00:25:42,350 --> 00:25:38,540
more job

637
00:25:43,580 --> 00:25:42,360
thank you great thanks and where the

638
00:25:46,400 --> 00:25:43,590

rubber meets the road or where

639
00:25:49,100 --> 00:25:46,410
curiosities tires meet the the dust on

640
00:25:51,590 --> 00:25:49,110
the red planet ray ray charlie one of

641
00:25:54,260 --> 00:25:51,600
the questions but we had was what's next

642
00:25:56,630 --> 00:25:54,270
for curiosity so administrator bolden

643
00:25:58,460 --> 00:25:56,640
maybe you can preview for us what

644
00:26:00,710 --> 00:25:58,470
curiosity is going to be doing next very

645
00:26:03,290 --> 00:26:00,720
quickly curiosity's mission right now is

646
00:26:05,200 --> 00:26:03,300
planned for two years and so we're just

647
00:26:07,880 --> 00:26:05,210
in the checkout phase right now where

648
00:26:10,610 --> 00:26:07,890
everybody mentioned or Kurt mentioned

649
00:26:13,280 --> 00:26:10,620
the the mast with the curious of cameras

650
00:26:16,370 --> 00:26:13,290
the the arm that actually has the drill

651
00:26:17,920 --> 00:26:16,380
on it and and a lot of the chemistry lab

652
00:26:20,930 --> 00:26:17,930
in every if they're actually 10

653
00:26:23,930 --> 00:26:20,940
essentially 10 chemistry labs on on the

654
00:26:25,220 --> 00:26:23,940
Curiosity rover so within a few within a

655
00:26:27,800 --> 00:26:25,230
month or so we're actually going to

656
00:26:29,690 --> 00:26:27,810
start to trek up the mountain and the

657
00:26:31,580 --> 00:26:29,700
story that the example I like to give

658
00:26:33,500 --> 00:26:31,590
this anybody who's ever been to the

659
00:26:35,270 --> 00:26:33,510
Grand Canyon and gone down into the

660
00:26:37,700 --> 00:26:35,280
canyon itself onto the Colorado River

661
00:26:39,680 --> 00:26:37,710
and then start the backpacking trek up

662
00:26:42,080 --> 00:26:39,690
the side of the canyon until you get up

663
00:26:43,700 --> 00:26:42,090

to the to the top that's essentially

664
00:26:45,650 --> 00:26:43,710
what curiosity is going to be doing over

665
00:26:48,350 --> 00:26:45,660
the next two years it's actually going

666
00:26:51,980 --> 00:26:48,360
to traverse from the from the the crater

667
00:26:54,890 --> 00:26:51,990
itself up the mountain and stop along

668
00:26:58,940 --> 00:26:54,900
the way and core take core samples from

669
00:27:00,890 --> 00:26:58,950
various areas of Mount sharp that our

670
00:27:03,170 --> 00:27:00,900
studies have told us will give us

671
00:27:05,780 --> 00:27:03,180
evidence if life ever existed there on

672
00:27:08,360 --> 00:27:05,790
Mars everybody needs to remember why we

673
00:27:11,300 --> 00:27:08,370
go to these places so we go because we

674
00:27:14,120 --> 00:27:11,310
have two burning questions is there life

675
00:27:17,630 --> 00:27:14,130
elsewhere in the universe and are we

676
00:27:20,600 --> 00:27:17,640
alone so you know as technical as we may

677
00:27:22,490 --> 00:27:20,610
seem to be there is this dreamy ethereal

678
00:27:23,990 --> 00:27:22,500
thing about being a NASA and we really

679
00:27:25,700 --> 00:27:24,000
want to know if if there has ever been

680
00:27:27,610 --> 00:27:25,710
life on this planet before and that's

681
00:27:30,560 --> 00:27:27,620
what curiosity is going to help us find

682
00:27:32,840 --> 00:27:30,570
great thank you very much we have just a

683
00:27:34,970 --> 00:27:32,850
few seconds left so I wanted to give

684
00:27:37,010 --> 00:27:34,980
administrator Mills the opportunity to

685
00:27:40,220 --> 00:27:37,020
add anything else we didn't get to in

686
00:27:43,610 --> 00:27:40,230
the chat today well I just want to thank

687
00:27:45,470 --> 00:27:43,620
all of NASA and all of the small

688
00:27:48,020 --> 00:27:45,480

businesses out there that are

689
00:27:49,700 --> 00:27:48,030
participating like most people I always

690
00:27:50,770 --> 00:27:49,710
dreamed that I was going to go up in

691
00:27:52,770 --> 00:27:50,780
space I've had

692
00:27:57,190 --> 00:27:52,780
to live this vicariously by being

693
00:27:59,980 --> 00:27:57,200
associated with Charlie and and all of

694
00:28:02,710 --> 00:27:59,990
the terrific work that NASA is doing but

695
00:28:06,220 --> 00:28:02,720
I really believe that all of the small

696
00:28:09,190 --> 00:28:06,230
businesses and the innovators are adding

697
00:28:12,190 --> 00:28:09,200
both to our dreams about space and also

698
00:28:14,200 --> 00:28:12,200
to our economy here so I'm very very

699
00:28:17,500 --> 00:28:14,210
grateful for this partnership with NASA

700
00:28:21,280 --> 00:28:17,510
and want to congratulate ATA for a

701
00:28:24,940 --> 00:28:21,290
terrific job on on this great project in

702
00:28:26,530 --> 00:28:24,950
Mars thank you and dr. Baker I wanted to

703
00:28:28,090 --> 00:28:26,540
extend the same to you if there's

704
00:28:31,000 --> 00:28:28,100
anything else you wanted to add before

705
00:28:33,070 --> 00:28:31,010
we close that out here you just want to

706
00:28:35,140 --> 00:28:33,080
thank you and appreciate the opportunity

707
00:28:36,490 --> 00:28:35,150
to work with NASA and we've worked with

708
00:28:38,410 --> 00:28:36,500
them for a long time we worked with

709
00:28:39,760 --> 00:28:38,420
unsubtle we worked on Space Station and

710
00:28:41,680 --> 00:28:39,770
now now we're working on the Mars

711
00:28:43,680 --> 00:28:41,690
mission and the James Webb Stella soap

712
00:28:46,660 --> 00:28:43,690
so we really appreciate that partnership

713
00:28:48,460 --> 00:28:46,670

great and before I close it out with the

714
00:28:50,050 --> 00:28:48,470
last comment from a mess traitor bold

715
00:28:51,700 --> 00:28:50,060
and I wanted to let you all know who are

716
00:28:53,650 --> 00:28:51,710
watching today that if you want to know

717
00:28:55,900 --> 00:28:53,660
more about the role small businesses

718
00:28:57,640 --> 00:28:55,910
played in the curiosity mission you can

719
00:29:03,190 --> 00:28:57,650
check out a brand new report that just

720
00:29:04,930 --> 00:29:03,200
came out it's at Oh SBP nasa gov hot off

721
00:29:06,910 --> 00:29:04,940
the presses it's on our website you can

722
00:29:08,080 --> 00:29:06,920
read about hea Engineering's role as

723
00:29:10,180 --> 00:29:08,090
well as many of the other small

724
00:29:12,730 --> 00:29:10,190
businesses that assisted with the

725
00:29:14,620 --> 00:29:12,740
mission to Mars and with that

726
00:29:16,870 --> 00:29:14,630
administrator Bolden any final words

727
00:29:19,420 --> 00:29:16,880
from you lauren only thing I'll say is

728
00:29:21,700 --> 00:29:19,430
it's really a thank you to the team here

729
00:29:24,310 --> 00:29:21,710
at a TA and and the ATA team out there

730
00:29:26,350 --> 00:29:24,320
in San Diego it is an incredible

731
00:29:28,420 --> 00:29:26,360
pleasure to work with you all and and

732
00:29:30,520 --> 00:29:28,430
what brings us joy is just to see the

733
00:29:32,860 --> 00:29:30,530
smile on everybody's face and the

734
00:29:36,250 --> 00:29:32,870
enthusiasm and crystal who's out there

735
00:29:39,340 --> 00:29:36,260
in San Diego is is my new found friend I

736
00:29:41,770 --> 00:29:39,350
would say to anybody who's participating

737
00:29:44,040 --> 00:29:41,780
in this today crystal will be running

738
00:29:47,770 --> 00:29:44,050

her own company here in no time and a

739
00:29:49,540 --> 00:29:47,780
nice woman owned small business we need

740
00:29:52,690 --> 00:29:49,550
all of her help in the help of any of

741
00:29:54,610 --> 00:29:52,700
her classmates because NASA's future the

742
00:29:57,010 --> 00:29:54,620
future of the nation is bright but we

743
00:29:59,200 --> 00:29:57,020
can only make it successful if we can

744
00:30:00,580 --> 00:29:59,210
get our small businesses to come out and

745
00:30:02,850 --> 00:30:00,590
really help us do the great things that

746
00:30:04,010 --> 00:30:02,860
we know can be done by the Americans

747
00:30:07,640 --> 00:30:04,020
thank

748
00:30:09,500 --> 00:30:07,650
everyone who helped make this Google+

749
00:30:11,240 --> 00:30:09,510
Hangout happen today there were a lot of

750
00:30:13,580 --> 00:30:11,250
you we really appreciate it especially

751
00:30:15,380 --> 00:30:13,590
all our friends at ATA engineering and

752
00:30:17,780 --> 00:30:15,390
for all of those who submitted questions

753
00:30:21,860 --> 00:30:17,790
we thank you very much and hope the guys