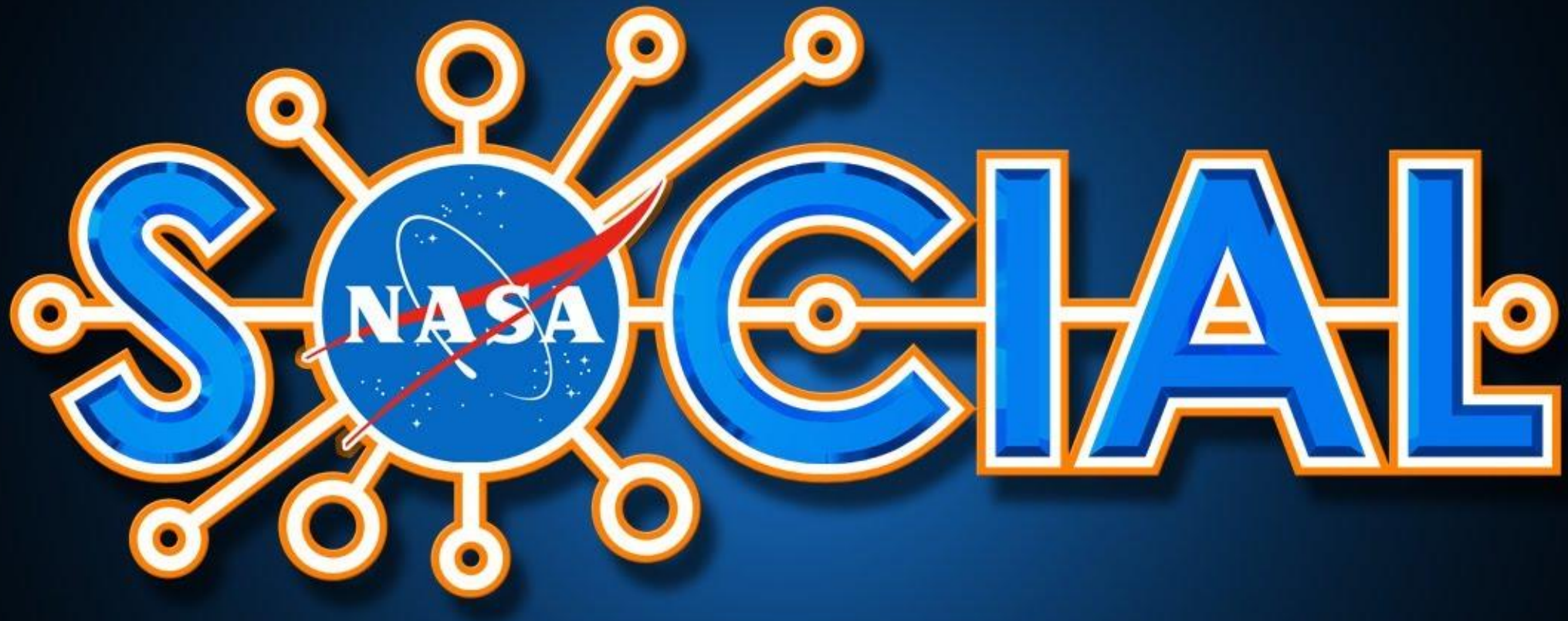
NASA
SOCIAL

1
00:00:11,470 --> 00:00:08,230
hi everybody welcome to today's NASA

2
00:00:14,710 --> 00:00:11,480
social google+ hangout 50 years ago

3
00:00:16,209 --> 00:00:14,720
today President John Kennedy challenged

4
00:00:18,519 --> 00:00:16,219
us to go to the moon within the decade

5
00:00:20,589 --> 00:00:18,529
and to do the other things as he said

6
00:00:23,380 --> 00:00:20,599
not because they are easy but because

7
00:00:25,630 --> 00:00:23,390
they are hard as we remember Neil

8
00:00:28,210 --> 00:00:25,640
Armstrong this week the man who with a

9
00:00:30,849 --> 00:00:28,220
single step realized the hopes of a

10
00:00:33,130 --> 00:00:30,859
president of our nation and of the world

11
00:00:34,750 --> 00:00:33,140
we are recognizing the extraordinary

12
00:00:37,150 --> 00:00:34,760
achievements of the past five decades

13
00:00:39,670 --> 00:00:37,160

achieve by our nation's space agency

14
00:00:42,610 --> 00:00:39,680
NASA and where the passion to explore

15
00:00:44,740 --> 00:00:42,620
will lead us into the future President

16
00:00:47,110 --> 00:00:44,750
Barack Obama has sent NASA on a course

17
00:00:49,209 --> 00:00:47,120
to go way beyond low-earth orbit to

18
00:00:51,490 --> 00:00:49,219
explore the expansive state space around

19
00:00:54,329 --> 00:00:51,500
the earth-moon system near-earth

20
00:00:57,250 --> 00:00:54,339
asteroids the moon and ultimately Mars

21
00:00:59,169 --> 00:00:57,260
this goal by the way is not without some

22
00:01:01,299 --> 00:00:59,179
notable challenges but using the

23
00:01:03,340 --> 00:01:01,309
knowledge the expertise and just the

24
00:01:05,170 --> 00:01:03,350
American ingenuity and spirit that has

25
00:01:07,179 --> 00:01:05,180
been the trademark of NASA scientists

26
00:01:33,240 --> 00:01:07,189
and engineers for the past 50 years and

27
00:01:33,250 --> 00:02:38,230
degrees

28
00:02:43,460 --> 00:02:41,240
he Michael is currently the president of

29
00:02:45,800 --> 00:02:43,470
the commercial spaceflight Federation

30
00:02:47,630 --> 00:02:45,810
but he's also a record-setting astronaut

31
00:02:50,000 --> 00:02:47,640
with he's one of our most experienced

32
00:02:52,970 --> 00:02:50,010
space walkers and has the record for the

33
00:02:56,000 --> 00:02:52,980
single longest space flight mission so

34
00:02:58,120 --> 00:02:56,010
with that I'm going to start with with

35
00:03:00,830 --> 00:02:58,130
Dan and Dan as I mentioned this is a

36
00:03:02,870 --> 00:03:00,840
historic day for us fifty years ago

37
00:03:05,720 --> 00:03:02,880
President Kennedy issued a challenge to

38
00:03:07,550 --> 00:03:05,730

us you're too young to have heard the

39
00:03:09,530 --> 00:03:07,560
speech live but tell me a little bit

40
00:03:12,560 --> 00:03:09,540
about what that speech meant to you and

41
00:03:20,090 --> 00:03:12,570
what Kennedy's missive to the American

42
00:03:22,840 --> 00:03:20,100
people meant for you Lauren you're right

43
00:03:25,910 --> 00:03:22,850
I didn't get to hear the speech live but

44
00:03:29,020 --> 00:03:25,920
i'll start off this way my mother tells

45
00:03:31,670 --> 00:03:29,030
the story that even with the first

46
00:03:33,680 --> 00:03:31,680
launches such as Alan Shepards first

47
00:03:36,500 --> 00:03:33,690
flight for some reason I was sitting in

48
00:03:38,449 --> 00:03:36,510
front of the TV watching it live I don't

49
00:03:41,710 --> 00:03:38,459
remember all that but she claims that I

50
00:03:43,729 --> 00:03:41,720
did it and she sticks to her story and

51
00:03:46,640 --> 00:03:43,739
she's been pretty consistent with that

52
00:03:51,560 --> 00:03:46,650
over the last 50 years President's

53
00:03:53,570 --> 00:03:51,570
speech everything NASA was doing I to be

54
00:03:56,240 --> 00:03:53,580
honest with you I was too young to pay

55
00:03:59,870 --> 00:03:56,250
attention to the politicians what I was

56
00:04:01,920 --> 00:03:59,880
doing was watching where we were going

57
00:04:04,559 --> 00:04:01,930
and what the astronauts were doing and

58
00:04:06,599 --> 00:04:04,569
wanting to be like the astronauts or at

59
00:04:08,339 --> 00:04:06,609
least be part of the or at least be part

60
00:04:13,679 --> 00:04:08,349
of the system and part of the team to go

61
00:04:16,170 --> 00:04:13,689
make it happen so I managed growing up

62
00:04:18,420 --> 00:04:16,180
to be just pulled along because of all

63
00:04:22,260 --> 00:04:18,430

the excitement of Apollo the

64
00:04:27,090 --> 00:04:22,270
apollo-soyuz test program and everything

65
00:04:29,010 --> 00:04:27,100
we were doing Skylab all got some kid

66
00:04:30,390 --> 00:04:29,020
growing up in central Indiana to

67
00:04:32,670 --> 00:04:30,400
actually pay attention to the space

68
00:04:35,129 --> 00:04:32,680
program and I've been lucky enough to be

69
00:04:42,210 --> 00:04:35,139
here since essentially I got out of

70
00:04:45,120 --> 00:04:42,220
college great thanks Dan Ron Garan he's

71
00:04:46,740 --> 00:04:45,130
with us Ron tell me tell me a little bit

72
00:04:49,140 --> 00:04:46,750
about what the kennedy speech meant to

73
00:04:52,170 --> 00:04:49,150
you well I remember it like it was

74
00:04:56,700 --> 00:04:52,180
yesterday um no I don't I was not even

75
00:04:59,760 --> 00:04:56,710
one years old yet so but i do think what

76
00:05:02,870 --> 00:04:59,770
came of that speech had a big impact on

77
00:05:05,490 --> 00:05:02,880
me later in life and i think the first

78
00:05:08,520 --> 00:05:05,500
result of that speech that I that I do

79
00:05:10,649 --> 00:05:08,530
remember is watching the Apollo 11 moon

80
00:05:13,140 --> 00:05:10,659
landing and I remember you know as a

81
00:05:14,670 --> 00:05:13,150
young kid watching that thinking to

82
00:05:16,860 --> 00:05:14,680
myself you know I would have been able

83
00:05:18,750 --> 00:05:16,870
to put in these words but I think at

84
00:05:21,480 --> 00:05:18,760
some level that this this little kid

85
00:05:23,399 --> 00:05:21,490
realized that we just became a different

86
00:05:25,800 --> 00:05:23,409
species we just became a species that

87
00:05:28,469 --> 00:05:25,810
was no longer confined to our earth and

88
00:05:31,710 --> 00:05:28,479

and that was something that really had a

89
00:05:33,330 --> 00:05:31,720
huge impact on me and you know you're

90
00:05:35,370 --> 00:05:33,340
going to hear the same thing from for

91
00:05:38,010 --> 00:05:35,380
many you know many different people who

92
00:05:41,879 --> 00:05:38,020
got into the space business this this

93
00:05:43,950 --> 00:05:41,889
drive in this and this dream of being a

94
00:05:46,980 --> 00:05:43,960
part of that of contributing in some way

95
00:05:48,330 --> 00:05:46,990
to you know spreading humanity through

96
00:05:49,770 --> 00:05:48,340
throughout the solar system and it was

97
00:05:52,260 --> 00:05:49,780
something that really stuck with me my

98
00:05:54,659 --> 00:05:52,270
whole life and it will all started from

99
00:05:57,300 --> 00:05:54,669
from 50 years ago today at Rice

100
00:05:59,339 --> 00:05:57,310
University so at that speech that

101
00:06:01,320 --> 00:05:59,349
President Kennedy made and I think that

102
00:06:05,850 --> 00:06:01,330
was a pivotal moment in our nation's

103
00:06:08,010 --> 00:06:05,860
history thanks Ron and we have michael

104
00:06:09,330 --> 00:06:08,020
lopez all agree with us Michael tell us

105
00:06:15,909 --> 00:06:09,340
a little bit about what the Kennedy

106
00:06:15,919 --> 00:06:24,879
and Michael I think you're muted okay

107
00:06:33,560 --> 00:06:29,860
how about now you here yet we got to now

108
00:06:35,900 --> 00:06:33,570
okay great anyway I like dinner to guess

109
00:06:37,879 --> 00:06:35,910
said Dan and Ron you know I was four

110
00:06:40,550 --> 00:06:37,889
years old so I didn't mean much to me at

111
00:06:43,010 --> 00:06:40,560
the moment either and also like Ron said

112
00:06:46,820 --> 00:06:43,020
it started to mean something more to me

113
00:06:48,500 --> 00:06:46,830

when seven years later of course Neil

114
00:06:51,740 --> 00:06:48,510
Armstrong took his first famous step

115
00:06:53,719 --> 00:06:51,750
onto the lunar surface now I wouldn't

116
00:06:56,779 --> 00:06:53,729
tell you that as an eleven-year-old at

117
00:06:58,730 --> 00:06:56,789
that point I was quite maybe is

118
00:07:04,310 --> 00:06:58,740
cognitively advanced a traffic and a

119
00:07:06,950 --> 00:07:04,320
dork but I will say that I so I was at

120
00:07:09,680 --> 00:07:06,960
the beach watching this or actually

121
00:07:11,300 --> 00:07:09,690
listening on a transistor rate deal with

122
00:07:12,650 --> 00:07:11,310
my family in fact that was in the water

123
00:07:15,170 --> 00:07:12,660
play with the other with the other kids

124
00:07:16,430 --> 00:07:15,180
and all of a sudden people started

125
00:07:18,140 --> 00:07:16,440
getting out of the water you know and I

126
00:07:19,730 --> 00:07:18,150
kind of didn't really figure out was

127
00:07:21,170 --> 00:07:19,740
going on until I remembered that that

128
00:07:23,150 --> 00:07:21,180
was a day that we're supposed to land on

129
00:07:25,190 --> 00:07:23,160
the moon and everybody sort of rushed to

130
00:07:27,980 --> 00:07:25,200
their particular blanket and transistor

131
00:07:31,219 --> 00:07:27,990
radio and I swear that even the waves

132
00:07:35,930 --> 00:07:31,229
could not really at the moment of

133
00:07:38,690 --> 00:07:35,940
touchdown and amazing thing was how the

134
00:07:40,400 --> 00:07:38,700
adults reacted I remember that very well

135
00:07:42,320 --> 00:07:40,410
people who didn't even know each other

136
00:07:43,969 --> 00:07:42,330
or slapping each other on the back and

137
00:07:47,060 --> 00:07:43,979
is like it's like we're all in the same

138
00:07:49,070 --> 00:07:47,070

team it was quite a big moment and of

139
00:07:51,770 --> 00:07:49,080
course later as an astronaut looking

140
00:07:54,230 --> 00:07:51,780
back at that speech again after grew as

141
00:07:56,000 --> 00:07:54,240
Ron did it you know it was really bold

142
00:07:59,360 --> 00:07:56,010
and really quite a thing to say back in

143
00:08:01,490 --> 00:07:59,370
the day very audacious and you know

144
00:08:03,529 --> 00:08:01,500
we're just walking on his shoulders or

145
00:08:07,040 --> 00:08:03,539
riding on his shoulders as we see her

146
00:08:09,080 --> 00:08:07,050
today and and that kind of segues into

147
00:08:10,700 --> 00:08:09,090
you know one of the things we wanted to

148
00:08:12,950 --> 00:08:10,710
talk about today too of course for

149
00:08:15,500 --> 00:08:12,960
remembering the the legacy of Neil

150
00:08:16,850 --> 00:08:15,510
Armstrong and and and Sally Ride who was

151
00:08:19,610 --> 00:08:16,860
at the first American woman in space

152
00:08:23,029 --> 00:08:19,620
who's recently passed as well and and

153
00:08:26,300 --> 00:08:23,039
Dan I wanted to ask ask you you know one

154
00:08:28,250 --> 00:08:26,310
of the things that Neil said was you

155
00:08:30,050 --> 00:08:28,260
know yes while he was the first man to

156
00:08:32,930 --> 00:08:30,060
walk on the moon there were a lot of

157
00:08:34,760 --> 00:08:32,940
people who helped get him there and so I

158
00:08:37,070 --> 00:08:34,770
wondered if you kind of share with us

159
00:08:40,040 --> 00:08:37,080
your impressions of of Neil Armstrong as

160
00:08:44,300 --> 00:08:40,050
as a person but also as a as a world

161
00:08:49,100 --> 00:08:44,310
leader in space exploration well I think

162
00:08:53,150 --> 00:08:49,110
we've all watched Neil over the years be

163
00:08:57,440 --> 00:08:53,160

that leader a leader he showed his

164
00:08:59,810 --> 00:08:57,450
desire for the future after he returned

165
00:09:01,910 --> 00:08:59,820
from the moon by going on and working

166
00:09:04,760 --> 00:09:01,920
for the future with helping to train the

167
00:09:06,230 --> 00:09:04,770
next generation of engineers as a

168
00:09:09,800 --> 00:09:06,240
professor at the University of

169
00:09:12,890 --> 00:09:09,810
Cincinnati so he had that passion to

170
00:09:15,550 --> 00:09:12,900
bring the next generation along and I

171
00:09:19,040 --> 00:09:15,560
think that that sends a key message to

172
00:09:21,830 --> 00:09:19,050
to us now as well as to the future

173
00:09:25,100 --> 00:09:21,840
generations that we need to continue to

174
00:09:26,960 --> 00:09:25,110
grow and to continue to bring along the

175
00:09:29,390 --> 00:09:26,970
next generation because the future is

176
00:09:32,180 --> 00:09:29,400
really there's we are working in the

177
00:09:35,420 --> 00:09:32,190
present to help make the future happen

178
00:09:38,240 --> 00:09:35,430
the other message that you hit on which

179
00:09:44,090 --> 00:09:38,250
is very important Neil always worried

180
00:09:47,750 --> 00:09:44,100
about the team the team he was he would

181
00:09:50,750 --> 00:09:47,760
never take credit for the achievement by

182
00:09:55,520 --> 00:09:50,760
himself he always referred to as the

183
00:09:57,950 --> 00:09:55,530
Apollo team to do that it is what it

184
00:10:00,760 --> 00:09:57,960
took to get the the entire job done and

185
00:10:04,370 --> 00:10:00,770
he and even in some of my own personal

186
00:10:08,240 --> 00:10:04,380
interactions with Neil one particular

187
00:10:11,090 --> 00:10:08,250
story i ran into Neil one day Neil and I

188
00:10:13,130 --> 00:10:11,100

did share in alma mater and we had the

189
00:10:16,270 --> 00:10:13,140
opportunity a couple of times to meet at

190
00:10:20,150 --> 00:10:16,280
that alma mater and right after Katrina

191
00:10:23,960 --> 00:10:20,160
hurricane had had hit the New Orleans

192
00:10:26,300 --> 00:10:23,970
area ran into Neil and we got to talking

193
00:10:28,520 --> 00:10:26,310
and the very first question that he

194
00:10:32,420 --> 00:10:28,530
asked the very first thing he wanted to

195
00:10:35,240 --> 00:10:32,430
know was how was the team atmos you it

196
00:10:41,180 --> 00:10:35,250
was and it was a very telling moment it

197
00:10:43,250 --> 00:10:41,190
was a he very much depended on the team

198
00:10:46,670 --> 00:10:43,260
recognized his role on the team and

199
00:10:48,680 --> 00:10:46,680
cared for the team so and and that's the

200
00:10:53,330 --> 00:10:48,690
one thing I think we all need to realize

201
00:10:54,980 --> 00:10:53,340
a couple of gentlemen here who have been

202
00:10:56,690 --> 00:10:54,990
lucky enough to be the astronauts I

203
00:11:00,110 --> 00:10:56,700
would like to be an astronaut but I

204
00:11:04,190 --> 00:11:00,120
wasn't smart enough nor was I just

205
00:11:07,130 --> 00:11:04,200
wasn't smart enough and but we all can

206
00:11:09,110 --> 00:11:07,140
play a part of the team to be part of

207
00:11:13,070 --> 00:11:09,120
this great expedition of the human

208
00:11:16,580 --> 00:11:13,080
exploration of space and and Neil

209
00:11:20,690 --> 00:11:16,590
exemplified that and I think that is one

210
00:11:24,980 --> 00:11:20,700
of the key messages key remembrances I

211
00:11:28,190 --> 00:11:24,990
have of Neil is just that constant focus

212
00:11:30,470 --> 00:11:28,200
on the future and helping bring the next

213
00:11:33,380 --> 00:11:30,480

generation along and also recognizing

214
00:11:37,820 --> 00:11:33,390
that it's the team that it takes to make

215
00:11:40,070 --> 00:11:37,830
this exploration happen thank you so

216
00:11:42,260 --> 00:11:40,080
much Stan and Ron we were just sharing

217
00:11:44,810 --> 00:11:42,270
memories and stories about Neil

218
00:11:50,210 --> 00:11:44,820
Armstrong both as a as a as a person but

219
00:11:52,160 --> 00:11:50,220
also as as an amazing explorer and in in

220
00:11:53,390 --> 00:11:52,170
our culture nor in our world and I

221
00:11:55,400 --> 00:11:53,400
thought wondered if you could share a

222
00:11:57,230 --> 00:11:55,410
story about Neil Armstrong what his

223
00:11:59,480 --> 00:11:57,240
legacy meant meant to you that's an

224
00:12:00,440 --> 00:11:59,490
astronaut driver but first I want to

225
00:12:03,290 --> 00:12:00,450
apologize we're having some technical

226
00:12:05,030 --> 00:12:03,300
difficulties like we keep dropping off

227
00:12:07,700 --> 00:12:05,040
here so hopefully we'll we'll get that

228
00:12:10,460 --> 00:12:07,710
under control but um you know like I was

229
00:12:13,280 --> 00:12:10,470
saying before I think my most vivid

230
00:12:15,680 --> 00:12:13,290
childhood memory was watching Neil

231
00:12:18,380 --> 00:12:15,690
Armstrong and Buzz Aldrin walking on the

232
00:12:20,750 --> 00:12:18,390
surface of the Moon and you know that's

233
00:12:23,810 --> 00:12:20,760
an image that you know kept with me my

234
00:12:26,329 --> 00:12:23,820
entire life and it's something that I

235
00:12:29,450 --> 00:12:26,339
think served as you know certainly an

236
00:12:32,210 --> 00:12:29,460
inspiration and motivation to study hard

237
00:12:35,510 --> 00:12:32,220
to work hard to go into math and science

238
00:12:37,430 --> 00:12:35,520

and so I think you know that had a big

239
00:12:41,650 --> 00:12:37,440
impact on me and then just the the

240
00:12:44,990 --> 00:12:41,660
person of Neil Armstrong who he was and

241
00:12:47,390 --> 00:12:45,000
you know his humility and his self

242
00:12:51,620 --> 00:12:47,400
sacrifice in the service were you know

243
00:12:53,329 --> 00:12:51,630
something to really be modeled thank you

244
00:12:57,800 --> 00:12:53,339
Ron for sharing that with us and and

245
00:13:02,090 --> 00:12:57,810
Michael same question to you why you

246
00:13:05,270 --> 00:13:02,100
know his legacy is impressive not want

247
00:13:06,800 --> 00:13:05,280
to get out but also for the crisis want

248
00:13:10,160 --> 00:13:06,810
pointed out you know the integrity and

249
00:13:12,530 --> 00:13:10,170
dignity a respectful manner humble

250
00:13:16,520 --> 00:13:12,540
manner which lived his life afterward

251
00:13:18,560 --> 00:13:16,530
and i think i think his family after as

252
00:13:21,550 --> 00:13:18,570
is the case of families and i could go

253
00:13:25,960 --> 00:13:21,560
back to my best hope you the best

254
00:13:29,920 --> 00:13:25,970
contribution is when i win for you worst

255
00:13:33,800 --> 00:13:29,930
call that example i think it on samira

256
00:13:37,130 --> 00:13:33,810
um all right let me live any reversible

257
00:13:38,990 --> 00:13:37,140
thank you so much Michael um and of

258
00:13:40,970 --> 00:13:39,000
course as as everyone here knows Niall

259
00:13:43,640 --> 00:13:40,980
Armstrong was in Ohio and I'm in Ohio

260
00:13:46,520 --> 00:13:43,650
and so that's my connection my little

261
00:13:48,650 --> 00:13:46,530
connection to Neil Neil Armstrong and so

262
00:13:50,180 --> 00:13:48,660
thank you for that we are gonna be

263
00:13:52,250 --> 00:13:50,190

accepting questions so if you haven't

264
00:13:53,990 --> 00:13:52,260
submitted your questions yet please do

265
00:13:55,579 --> 00:13:54,000
so and the team here at NASA

266
00:13:56,870 --> 00:13:55,589
headquarters will be taken those and

267
00:13:59,480 --> 00:13:56,880
we're going to be thrown some of those

268
00:14:02,449 --> 00:13:59,490
out to our to our esteemed panel but i

269
00:14:04,610 --> 00:14:02,459
want to start here with Dan because

270
00:14:07,480 --> 00:14:04,620
we've talked a little bit about about

271
00:14:10,280 --> 00:14:07,490
our past Kennedy's missive to NASA

272
00:14:13,100 --> 00:14:10,290
clearly the legacy of some pioneering

273
00:14:15,500 --> 00:14:13,110
astronauts but we've got a lot happening

274
00:14:16,730 --> 00:14:15,510
here at NASA today and we really want to

275
00:14:19,940 --> 00:14:16,740
share some of that excitement with you

276
00:14:22,970 --> 00:14:19,950
so so Dan is here from our human

277
00:14:24,320 --> 00:14:22,980
exploration and operations program and

278
00:14:25,670 --> 00:14:24,330
Dan I hope you could share with some of

279
00:14:28,160 --> 00:14:25,680
the folks with all the folks here on

280
00:14:32,840 --> 00:14:28,170
Google+ where we're heading what we're

281
00:14:36,640 --> 00:14:32,850
up to well we're doing lots of exciting

282
00:14:39,740 --> 00:14:36,650
things I want us in and it starts with

283
00:14:42,530 --> 00:14:39,750
everything with Space Station and

284
00:14:44,540 --> 00:14:42,540
working in learning to continue to live

285
00:14:47,210 --> 00:14:44,550
and work in space station and do our

286
00:14:50,050 --> 00:14:47,220
experiments they're out to what we're

287
00:14:52,460 --> 00:14:50,060
doing to go beyond low-earth orbit and

288
00:14:56,420 --> 00:14:52,470

start first of all with the space

289
00:14:59,210 --> 00:14:56,430
station we have crew on board there

290
00:15:03,100 --> 00:14:59,220
we've had crew on board space station

291
00:15:05,050 --> 00:15:03,110
for 10 11 years now Herman

292
00:15:08,019 --> 00:15:05,060
ently tended that's a and we are

293
00:15:12,370 --> 00:15:08,029
learning more each day from that

294
00:15:16,569 --> 00:15:12,380
experience we're also developing the

295
00:15:19,540 --> 00:15:16,579
ability to take our cruise with the

296
00:15:21,730 --> 00:15:19,550
commercial spaceflight industry up to

297
00:15:24,400 --> 00:15:21,740
space station as well as the cargo we

298
00:15:26,949 --> 00:15:24,410
have a cargo mission coming up here this

299
00:15:29,889 --> 00:15:26,959
fall we had a demonstration of that

300
00:15:31,449 --> 00:15:29,899
cargo capability a few months ago with

301
00:15:35,769 --> 00:15:31,459
the SpaceX Dragon that was very

302
00:15:38,430 --> 00:15:35,779
successful so we're developing we are

303
00:15:41,680 --> 00:15:38,440
starting NASA is starting to turn over

304
00:15:44,050 --> 00:15:41,690
that first step of going to low-earth

305
00:15:46,150 --> 00:15:44,060
orbit over to the commercial entities

306
00:15:49,810 --> 00:15:46,160
and we're doing that very judiciously

307
00:15:52,660 --> 00:15:49,820
very carefully so that we maintain and

308
00:15:56,170 --> 00:15:52,670
make sure we take the right care of our

309
00:15:58,120 --> 00:15:56,180
crews on the way to space station in

310
00:16:00,130 --> 00:15:58,130
addition to the work that we're doing at

311
00:16:03,130 --> 00:16:00,140
Space Station and getting ourselves

312
00:16:05,170 --> 00:16:03,140
there is what we're doing for beyond

313
00:16:07,870 --> 00:16:05,180

Earth exploration with the Orion

314
00:16:10,990 --> 00:16:07,880
spacecraft that will be able to carry

315
00:16:15,730 --> 00:16:11,000
for crew to Mars and to other

316
00:16:17,500 --> 00:16:15,740
destinations as well as the Space Launch

317
00:16:20,230 --> 00:16:17,510
System the heavy-lift launch vehicle

318
00:16:26,380 --> 00:16:20,240
that we are building to take Orion and

319
00:16:29,650 --> 00:16:26,390
crew beyond low-earth orbit we are once

320
00:16:31,090 --> 00:16:29,660
we get to the final block two of the

321
00:16:32,860 --> 00:16:31,100
Space Launch System we will have a

322
00:16:36,040 --> 00:16:32,870
launch vehicle that's larger than the

323
00:16:38,590 --> 00:16:36,050
Saturn five was and will be able to go

324
00:16:41,620 --> 00:16:38,600
further than the moon we're looking at

325
00:16:44,670 --> 00:16:41,630
destinations of around the around the

326
00:16:47,680 --> 00:16:44,680
moon in lunar orbit Lagrangian points

327
00:16:51,220 --> 00:16:47,690
near-earth asteroids and ultimately

328
00:16:53,889 --> 00:16:51,230
humans on the way to Mars and all of

329
00:16:57,160 --> 00:16:53,899
that work is ongoing with getting our

330
00:16:59,439 --> 00:16:57,170
crews back and cargo back and forth to

331
00:17:01,960 --> 00:16:59,449
station along with our beyond Earth

332
00:17:05,980 --> 00:17:01,970
orbit exploration we have a lot of

333
00:17:10,419 --> 00:17:05,990
exciting things going on within NASA to

334
00:17:12,850 --> 00:17:10,429
to continue to have the human human step

335
00:17:14,510 --> 00:17:12,860
out further and further into the space

336
00:17:18,710 --> 00:17:14,520
frontier

337
00:17:20,270 --> 00:17:18,720
that's it's so exciting okay I can't

338
00:17:22,480 --> 00:17:20,280

even get over it just to put a fine

339
00:17:25,270 --> 00:17:22,490
point on it I mean for the last 12 years

340
00:17:28,040 --> 00:17:25,280
there hasn't been a second that a human

341
00:17:29,600 --> 00:17:28,050
hasn't been in outer that American

342
00:17:31,730 --> 00:17:29,610
hasn't been in outer space and that's

343
00:17:33,890 --> 00:17:31,740
just thrilling and exciting to me and

344
00:17:36,650 --> 00:17:33,900
Dan mentioned that we are transitioning

345
00:17:39,110 --> 00:17:36,660
using commercial entities to take our

346
00:17:40,910 --> 00:17:39,120
astronauts to space SpaceX recently had

347
00:17:43,490 --> 00:17:40,920
a great launch Orbital Sciences is

348
00:17:46,070 --> 00:17:43,500
getting ready to and that's what Michael

349
00:17:47,660 --> 00:17:46,080
does for a living now he works with

350
00:17:49,820 --> 00:17:47,670
these commercial entities so Michael I

351
00:17:51,860 --> 00:17:49,830
wanted to ask you a little bit about so

352
00:17:53,930 --> 00:17:51,870
so so what's going on with these with

353
00:17:55,820 --> 00:17:53,940
these cool companies that are that are

354
00:17:57,590 --> 00:17:55,830
building their own space ships and going

355
00:18:00,110 --> 00:17:57,600
to take our astronauts and other people

356
00:18:03,560 --> 00:18:00,120
to to outer space what's why is that

357
00:18:05,720 --> 00:18:03,570
important and where are we headed well

358
00:18:07,520 --> 00:18:05,730
thanks Lauren I'll let me say that the

359
00:18:10,880 --> 00:18:07,530
commercial spaceflight Federation our

360
00:18:12,680 --> 00:18:10,890
objective is to make human commercial

361
00:18:14,800 --> 00:18:12,690
spaceflight a reality and I think we're

362
00:18:16,700 --> 00:18:14,810
getting closer a partnership with NASA

363
00:18:20,780 --> 00:18:16,710

we have the Commercial Crew program

364
00:18:23,060 --> 00:18:20,790
which as Dan pointed out will be taking

365
00:18:25,100 --> 00:18:23,070
astronauts NASA astronauts and partner

366
00:18:28,400 --> 00:18:25,110
astronauts to the space station to low

367
00:18:29,990 --> 00:18:28,410
Earth orbit and then also we have a lot

368
00:18:31,700 --> 00:18:30,000
of exciting stuff going on in the

369
00:18:33,980 --> 00:18:31,710
suborbital world so we have companies

370
00:18:37,370 --> 00:18:33,990
like Virgin Galactic like explore and

371
00:18:40,040 --> 00:18:37,380
like maths in aerospace like armadillos

372
00:18:42,590 --> 00:18:40,050
and blue origin we're talking about

373
00:18:45,770 --> 00:18:42,600
taking humans to the edge of space is

374
00:18:47,660 --> 00:18:45,780
and then back down a game-changer here

375
00:18:49,580 --> 00:18:47,670
is that it's a lot less expensive to go

376
00:18:51,530 --> 00:18:49,590
to the edge of space but from a human

377
00:18:53,900 --> 00:18:51,540
perspective a lot of the experience is

378
00:18:57,050 --> 00:18:53,910
still pretty fascinating and it can be

379
00:18:59,300 --> 00:18:57,060
done not once a month or once every two

380
00:19:01,490 --> 00:18:59,310
weeks but several times a day and so

381
00:19:02,930 --> 00:19:01,500
what I'm trying to convey to the young

382
00:19:06,020 --> 00:19:02,940
people out there listening is this is

383
00:19:07,460 --> 00:19:06,030
very much within the realm of all of you

384
00:19:09,920 --> 00:19:07,470
listening that in the not-too-distant

385
00:19:11,960 --> 00:19:09,930
future we may be able to take these

386
00:19:15,020 --> 00:19:11,970
things but you know like one might take

387
00:19:18,290 --> 00:19:15,030
a transatlantic airplane flight today or

388
00:19:20,500 --> 00:19:18,300

over to Japan so it's not terribly far

389
00:19:24,020 --> 00:19:20,510
out of reach to think that when you are

390
00:19:26,360 --> 00:19:24,030
a few 10 or 20 years older you'll be

391
00:19:27,860 --> 00:19:26,370
doing this you know as a vacation so

392
00:19:31,640 --> 00:19:27,870
we're really excited about that

393
00:19:35,299 --> 00:19:31,650
boy very cool i'm already planning my

394
00:19:36,890 --> 00:19:35,309
postcards from space um and and so i go

395
00:19:40,520 --> 00:19:36,900
to a guy who spent a lot of time in

396
00:19:42,680 --> 00:19:40,530
space along with my goal Ron Ron tell us

397
00:19:44,540 --> 00:19:42,690
a little bit about where you see NASA

398
00:19:46,160 --> 00:19:44,550
going and you've done a lot of training

399
00:19:48,380 --> 00:19:46,170
and continue to do a lot of training to

400
00:19:51,380 --> 00:19:48,390
prepare for for some of these

401
00:19:52,850 --> 00:19:51,390
long-duration flights and maybe share a

402
00:19:54,470 --> 00:19:52,860
little bit with our Google+ audience

403
00:20:03,140 --> 00:19:54,480
some of the training me that you're

404
00:20:09,660 --> 00:20:06,630
so I I think I can hear you now great um

405
00:20:13,080 --> 00:20:09,670
I think one of the big things that NASA

406
00:20:15,270 --> 00:20:13,090
is trying to do is to push beyond

407
00:20:17,640 --> 00:20:15,280
low-earth orbit so in order to do that

408
00:20:19,200 --> 00:20:17,650
we need to flip center operations in the

409
00:20:21,360 --> 00:20:19,210
Earth orbits commercial activities I

410
00:20:24,030 --> 00:20:21,370
like Mike was just talking about and so

411
00:20:26,250 --> 00:20:24,040
by doing that it enables us to do the

412
00:20:28,770 --> 00:20:26,260
type of things that the big government

413
00:20:30,690 --> 00:20:28,780

space agencies are really try to do and

414
00:20:33,330 --> 00:20:30,700
that's to push the envelope to go

415
00:20:36,690 --> 00:20:33,340
further and further and so um I think

416
00:20:40,220 --> 00:20:36,700
we're about to see the strand of a new

417
00:20:42,330 --> 00:20:40,230
era where we're in space is as calm as

418
00:20:44,100 --> 00:20:42,340
flying on an airplane we're not there

419
00:20:45,810 --> 00:20:44,110
yet they're making the first steps

420
00:20:47,250 --> 00:20:45,820
towards that and I think it's going to

421
00:20:48,840 --> 00:20:47,260
be a really really exciting time because

422
00:20:51,030 --> 00:20:48,850
I think the more people that can have

423
00:20:54,600 --> 00:20:51,040
that experience the better l4l going to

424
00:20:57,390 --> 00:20:54,610
be and where the big federal agencies

425
00:20:59,370 --> 00:20:57,400
the big government agencies what they do

426
00:21:02,010 --> 00:20:59,380
is those things that that commercial

427
00:21:04,050 --> 00:21:02,020
activities can't do they can't invest a

428
00:21:05,910 --> 00:21:04,060
lot of money on payback that we're not

429
00:21:07,680 --> 00:21:05,920
going to see for you know decades down

430
00:21:11,010 --> 00:21:07,690
the road what the government can do that

431
00:21:13,140 --> 00:21:11,020
and so I think by turning over

432
00:21:16,050 --> 00:21:13,150
operations on our athletic to commercial

433
00:21:18,390 --> 00:21:16,060
activities really enables us as a

434
00:21:20,910 --> 00:21:18,400
government agency to do much much more

435
00:21:23,190 --> 00:21:20,920
than we doing before and you know we've

436
00:21:25,110 --> 00:21:23,200
seen the closing of the chapter our

437
00:21:27,750 --> 00:21:25,120
space program with the last special

438
00:21:29,340 --> 00:21:27,760

effect that we had last year and with

439
00:21:31,740 --> 00:21:29,350
that I think we're see an opening of the

440
00:21:33,650 --> 00:21:31,750
new chapter where we will go beyond

441
00:21:36,660 --> 00:21:33,660
low-earth orbit we were once again

442
00:21:39,090 --> 00:21:36,670
goodbye marathon that we were hoping

443
00:21:40,350 --> 00:21:39,100
that an asteroid made the most back to

444
00:21:43,860 --> 00:21:40,360
the mall hopefully and all these things

445
00:21:45,030 --> 00:21:43,870
are opening up because of the patent the

446
00:21:49,140 --> 00:21:45,040
direction that we're going in right now

447
00:21:50,520 --> 00:21:49,150
so it's really exciting very cool we're

448
00:21:52,170 --> 00:21:50,530
starting to get some questions and from

449
00:21:54,560 --> 00:21:52,180
folks who are watching and this first

450
00:21:57,920 --> 00:21:54,570
question I'm going to give to Dan here

451
00:22:00,690 --> 00:21:57,930
and it's it's a it's a question about

452
00:22:03,060 --> 00:22:00,700
related to the use of commercial

453
00:22:06,000 --> 00:22:03,070
spaceflight and that's how long will it

454
00:22:08,880 --> 00:22:06,010
take before we are sending astronauts

455
00:22:11,910 --> 00:22:08,890
using American crafting and we're really

456
00:22:12,990 --> 00:22:11,920
close it's coming up soon what's the

457
00:22:15,909 --> 00:22:13,000
time way

458
00:22:21,060 --> 00:22:15,919
well it's closer than people probably

459
00:22:23,590 --> 00:22:21,070
think we just recently started some new

460
00:22:25,000 --> 00:22:23,600
made some new announcements for the

461
00:22:26,919 --> 00:22:25,010
Commercial Crew activities and

462
00:22:29,620 --> 00:22:26,929
everything is aimed at having our first

463
00:22:32,340 --> 00:22:29,630

commercial crew flight in the 2017

464
00:22:35,220 --> 00:22:32,350
timeframe so it's coming up pretty quick

465
00:22:38,409 --> 00:22:35,230
about the same time we're going to be

466
00:22:39,789 --> 00:22:38,419
doing the flight test for our beyond

467
00:22:41,289 --> 00:22:39,799
Earth orbit spacecraft and launch

468
00:22:45,130 --> 00:22:41,299
vehicle but pretty soon you're going to

469
00:22:49,440 --> 00:22:45,140
see our crew going up and we're

470
00:22:53,110 --> 00:22:49,450
targeting the 2017 of calendar year

471
00:22:54,880 --> 00:22:53,120
terrific great and along those lines you

472
00:22:57,460 --> 00:22:54,890
know we've talked about our mission to

473
00:22:59,200 --> 00:22:57,470
near-earth asteroid we've also talked

474
00:23:01,200 --> 00:22:59,210
about going on to Mars so that

475
00:23:03,490 --> 00:23:01,210
astronauts who are going to go to

476
00:23:05,799 --> 00:23:03,500
fulfill those missions they're probably

477
00:23:08,080 --> 00:23:05,809
in grade schooler or around that age now

478
00:23:11,039 --> 00:23:08,090
and Ron Garan I was wondering if you

479
00:23:14,110 --> 00:23:11,049
could talk a little bit about you know

480
00:23:16,330 --> 00:23:14,120
what are we doing to inspire our next

481
00:23:18,370 --> 00:23:16,340
generation of astronauts but what are

482
00:23:20,950 --> 00:23:18,380
what are we doing out there and and and

483
00:23:23,530 --> 00:23:20,960
then building on that what are we doing

484
00:23:27,190 --> 00:23:23,540
to train them as well well I mean

485
00:23:29,230 --> 00:23:27,200
probably a really good example is in my

486
00:23:31,990 --> 00:23:29,240
own life and how I was inspired about

487
00:23:34,090 --> 00:23:32,000
how inspired i was with the moon landing

488
00:23:37,000 --> 00:23:34,100

but when i was in high school I kind of

489
00:23:39,789 --> 00:23:37,010
masked that dream unless that on that

490
00:23:42,610 --> 00:23:39,799
drive to you know pursue math and

491
00:23:46,030 --> 00:23:42,620
science and to pursue a an ass track

492
00:23:49,180 --> 00:23:46,040
where because as a young kid in in New

493
00:23:51,070 --> 00:23:49,190
York to me I did we didn't have a space

494
00:23:54,250 --> 00:23:51,080
program it was after Skylab it was

495
00:23:55,960 --> 00:23:54,260
before the station at first flew and I

496
00:23:57,789 --> 00:23:55,970
remember distinctly when I was a

497
00:24:00,909 --> 00:23:57,799
sophomore in college was the first

498
00:24:03,010 --> 00:24:00,919
special mission and the very next day I

499
00:24:04,990 --> 00:24:03,020
went in and talked to my advisors and I

500
00:24:07,299 --> 00:24:05,000
started inquiring how to take math and

501
00:24:10,200 --> 00:24:07,309
science courses and that that dream was

502
00:24:12,250 --> 00:24:10,210
was alive again and so one of the

503
00:24:15,100 --> 00:24:12,260
responsibilities that we have as a space

504
00:24:17,230 --> 00:24:15,110
agency is to tell the story on what

505
00:24:19,570 --> 00:24:17,240
we're doing and to make it known because

506
00:24:21,120 --> 00:24:19,580
it's inspiring itself that you don't

507
00:24:23,919 --> 00:24:21,130
have to make it more inspiring it's it

508
00:24:26,269 --> 00:24:23,929
what is being done in a space program

509
00:24:28,190 --> 00:24:26,279
around the world is something

510
00:24:29,389 --> 00:24:28,200
I think inspires everybody but we have

511
00:24:32,209 --> 00:24:29,399
to get the royal we have to tell the

512
00:24:33,919 --> 00:24:32,219
story and that's why things like Google+

513
00:24:36,619 --> 00:24:33,929

and Twitter and Facebook and other

514
00:24:38,959 --> 00:24:36,629
social media platforms are so important

515
00:24:40,849 --> 00:24:38,969
because it enables us not only to just

516
00:24:42,589 --> 00:24:40,859
tell the story and it Mabel's us to

517
00:24:44,479 --> 00:24:42,599
interact with people and bring people

518
00:24:46,609 --> 00:24:44,489
along with us on these missions as

519
00:24:48,409 --> 00:24:46,619
fellow crew members as as people who can

520
00:24:50,389 --> 00:24:48,419
participate with with us on these

521
00:24:52,249 --> 00:24:50,399
missions and share them with us and I

522
00:24:54,529 --> 00:24:52,259
think that that is something that when

523
00:24:57,139 --> 00:24:54,539
you bring that into a classroom is

524
00:25:00,489 --> 00:24:57,149
really very very powerful in a very very

525
00:25:03,109 --> 00:25:00,499
strong motivator for academic excellence

526
00:25:04,549 --> 00:25:03,119
thanks thanks Ron I appreciate that and

527
00:25:07,310 --> 00:25:04,559
and Michael you're working with

528
00:25:09,109 --> 00:25:07,320
commercial companies now but I want to

529
00:25:10,909 --> 00:25:09,119
go back a little bit to your to your

530
00:25:15,950 --> 00:25:10,919
training as an astronaut your experience

531
00:25:17,659 --> 00:25:15,960
as an astronaut and and what should what

532
00:25:20,119 --> 00:25:17,669
are your words of inspiration to people

533
00:25:21,529 --> 00:25:20,129
who are young people were many people

534
00:25:23,089 --> 00:25:21,539
have in my age you still dream of

535
00:25:24,619 --> 00:25:23,099
becoming an astronaut what what should

536
00:25:27,440 --> 00:25:24,629
we be doing what should we be thinking

537
00:25:31,339 --> 00:25:27,450
about and what would you say to us about

538
00:25:32,839 --> 00:25:31,349

our future destinations look I would

539
00:25:36,529 --> 00:25:32,849
give you the same advice that I give to

540
00:25:39,919 --> 00:25:36,539
you know kids of all ages um there are a

541
00:25:41,299 --> 00:25:39,929
few things that you know that are true

542
00:25:43,339 --> 00:25:41,309
no matter what and the first thing is

543
00:25:44,749 --> 00:25:43,349
you don't want to try to be an astronaut

544
00:25:46,219 --> 00:25:44,759
just because it'd be a nest right you

545
00:25:48,200 --> 00:25:46,229
really got to love it but if you decide

546
00:25:50,539 --> 00:25:48,210
one day that you love it you want to be

547
00:25:53,389 --> 00:25:50,549
an astronaut then follow what you're

548
00:25:55,459 --> 00:25:53,399
good at become become an expert in

549
00:25:58,399 --> 00:25:55,469
whatever it is that you really like if

550
00:25:59,629 --> 00:25:58,409
you're a math guy or girl go for that if

551
00:26:01,909 --> 00:25:59,639
you want to be an engineer if you want

552
00:26:04,579 --> 00:26:01,919
to be a scientist or physician even a

553
00:26:07,039 --> 00:26:04,589
veterinarian just do to be the best you

554
00:26:08,450 --> 00:26:07,049
can be in that and there is no career

555
00:26:10,519 --> 00:26:08,460
that you can study to become an

556
00:26:13,909 --> 00:26:10,529
astronaut you can only study to be a

557
00:26:15,560 --> 00:26:13,919
sort of a traditional career but then

558
00:26:18,680 --> 00:26:15,570
there are many careers from which the

559
00:26:21,499 --> 00:26:18,690
astronaut corps is drawn so do the best

560
00:26:23,299 --> 00:26:21,509
you can and like Ron says you know keep

561
00:26:26,690 --> 00:26:23,309
hold of your dream and always follow

562
00:26:28,759 --> 00:26:26,700
it's very important very cool thank you

563
00:26:31,729 --> 00:26:28,769

very much we're getting ready to get

564
00:26:33,320 --> 00:26:31,739
joined by by another one of our special

565
00:26:36,109 --> 00:26:33,330
guests that I'm going to let him get

566
00:26:37,729 --> 00:26:36,119
ready for a second and go back here to

567
00:26:39,169 --> 00:26:37,739
Dan for a second dan I want to talk a

568
00:26:40,040 --> 00:26:39,179
little bit about the International Space

569
00:26:42,170 --> 00:26:40,050
Station

570
00:26:44,240 --> 00:26:42,180
and all the experiments that we're doing

571
00:26:46,550 --> 00:26:44,250
on there now how do these experiments

572
00:26:47,450 --> 00:26:46,560
that that that astronauts are working on

573
00:26:50,180 --> 00:26:47,460
right now on the International Space

574
00:26:52,940 --> 00:26:50,190
Station prepare us to go to an astronaut

575
00:26:55,430 --> 00:26:52,950
to revolve around the moon again and to

576
00:26:59,150 --> 00:26:55,440
go on to Mars what are we learning up

577
00:27:01,210 --> 00:26:59,160
there probably one of the most important

578
00:27:04,220 --> 00:27:01,220
things were we're learning up there is

579
00:27:06,290 --> 00:27:04,230
the long-term duration living and

580
00:27:08,570 --> 00:27:06,300
working in space any of these missions

581
00:27:12,760 --> 00:27:08,580
any of this any of these exploration

582
00:27:16,250 --> 00:27:12,770
missions that that we plan on our major

583
00:27:18,310 --> 00:27:16,260
time duration when we go to Mars we're

584
00:27:22,730 --> 00:27:18,320
going to be measuring the trip in any

585
00:27:25,910 --> 00:27:22,740
months not days and the experience we

586
00:27:27,590 --> 00:27:25,920
get with Space Station and and Ron and

587
00:27:30,080 --> 00:27:27,600
Mike can talk to it much better than I

588
00:27:31,990 --> 00:27:30,090

can but the experience we're getting is

589
00:27:34,750 --> 00:27:32,000
just living and working in space

590
00:27:39,350 --> 00:27:34,760
understanding how the body reacts

591
00:27:42,020 --> 00:27:39,360
physically mentally all of the learning

592
00:27:44,150 --> 00:27:42,030
the aspects of how humans just live and

593
00:27:47,570 --> 00:27:44,160
work and and how that will be applied

594
00:27:50,840 --> 00:27:47,580
and learn how we can apply that to our

595
00:27:52,750 --> 00:27:50,850
longer duration missions that as we go

596
00:27:55,220 --> 00:27:52,760
further and further from the home planet

597
00:27:58,370 --> 00:27:55,230
we're going to have to we're going to

598
00:28:00,830 --> 00:27:58,380
have to learn how humans can can survive

599
00:28:03,620 --> 00:28:00,840
and work with each other and and even

600
00:28:05,570 --> 00:28:03,630
live off the land so to speak and the

601
00:28:08,870 --> 00:28:05,580
space station provides us that first

602
00:28:13,340 --> 00:28:08,880
platform by which we can we can do that

603
00:28:16,430 --> 00:28:13,350
kind of research great thanks Dan a lot

604
00:28:18,500 --> 00:28:16,440
and I think we've been joined by John

605
00:28:23,690 --> 00:28:18,510
Grunsfeld who's more affectionately

606
00:28:27,260 --> 00:28:23,700
known as the Hubble repairman John is

607
00:28:31,100 --> 00:28:27,270
now our AAA excuse me our associate

608
00:28:33,020 --> 00:28:31,110
administrator for science and John we've

609
00:28:34,520 --> 00:28:33,030
got some questions about curiosity for

610
00:28:37,220 --> 00:28:34,530
you but before we get to those questions

611
00:28:40,100 --> 00:28:37,230
I wanted to see if you could just speak

612
00:28:42,950 --> 00:28:40,110
to us for a moment about the the legacy

613
00:29:07,740 --> 00:28:42,960

of Neil Armstrong and the importance

614
00:29:11,350 --> 00:29:10,000
hey John I think we're having a little

615
00:29:12,940 --> 00:29:11,360
technical difficulty with your

616
00:29:17,380 --> 00:29:12,950
microphone there so I'm going to let us

617
00:29:20,620 --> 00:29:17,390
remedy that on your end and then go back

618
00:29:21,880 --> 00:29:20,630
to Michael for a second here and Michael

619
00:29:23,530 --> 00:29:21,890
you're working with commercial companies

620
00:29:26,560 --> 00:29:23,540
so what is what are some of the

621
00:29:28,930 --> 00:29:26,570
challenges for commercial companies that

622
00:29:32,560 --> 00:29:28,940
are that are working at a very quick

623
00:29:33,910 --> 00:29:32,570
pace to build spacecraft to to go to the

624
00:29:35,860 --> 00:29:33,920
International Space Station what are

625
00:29:37,570 --> 00:29:35,870
some of their challenges and then also

626
00:29:40,210 --> 00:29:37,580
what are some of the opportunities by

627
00:29:42,400 --> 00:29:40,220
having a variety of different kinds of

628
00:29:46,270 --> 00:29:42,410
crafts that will eventually be going to

629
00:29:49,060 --> 00:29:46,280
the International Space Station well so

630
00:29:51,190 --> 00:29:49,070
as you know we just completed the CCI

631
00:29:53,710 --> 00:29:51,200
cap round of the lord so that's the

632
00:29:55,750 --> 00:29:53,720
Commercial Crew integrated capability so

633
00:29:58,180 --> 00:29:55,760
this is where the providers are asked to

634
00:30:01,660 --> 00:29:58,190
not only to go the vehicle that is a

635
00:30:04,090 --> 00:30:01,670
capsule if you will but also a launch

636
00:30:07,300 --> 00:30:04,100
vehicle that will take them there so

637
00:30:09,360 --> 00:30:07,310
there were three awards made and all

638
00:30:12,340 --> 00:30:09,370

three companies with their respective

639
00:30:14,460 --> 00:30:12,350
launcher partners are off you know

640
00:30:17,530 --> 00:30:14,470
figuring out how to make it all happen

641
00:30:19,510 --> 00:30:17,540
the goal is to get to something called

642
00:30:22,060 --> 00:30:19,520
critical design review which is kind of

643
00:30:23,920 --> 00:30:22,070
the very last thing before you start

644
00:30:25,510 --> 00:30:23,930
actually cutting metal and making things

645
00:30:27,820 --> 00:30:25,520
of course they will be making some

646
00:30:31,660 --> 00:30:27,830
prototypes and doing a lot of testing in

647
00:30:34,780 --> 00:30:31,670
the meantime of subsystems but the goal

648
00:30:36,850 --> 00:30:34,790
is to have that completed by about 21

649
00:30:39,880 --> 00:30:36,860
months and that's a pretty aggressive

650
00:30:41,740 --> 00:30:39,890
schedule I bye-bye sort of traditional

651
00:30:44,290 --> 00:30:41,750
standards that's probably three to four

652
00:30:46,330 --> 00:30:44,300
times faster then we will do it in a

653
00:30:47,950 --> 00:30:46,340
traditional government program so I'd

654
00:30:50,710 --> 00:30:47,960
say the challenges are doing things

655
00:30:52,390 --> 00:30:50,720
quickly you want to keep the quality

656
00:30:54,880 --> 00:30:52,400
control where it needs to be we need to

657
00:30:57,370 --> 00:30:54,890
take into account a lot of the design

658
00:30:59,680 --> 00:30:57,380
possibilities it's also one of the

659
00:31:01,450 --> 00:30:59,690
opportunities because NASA is not

660
00:31:04,029 --> 00:31:01,460
involved

661
00:31:07,779 --> 00:31:04,039
yeah okay finally recognized just

662
00:31:11,110 --> 00:31:07,789
hopeful often are in a traditionalist as

663
00:31:13,090 --> 00:31:11,120

the contractors can just went to Train

664
00:31:14,500 --> 00:31:13,100
okay we have two choices to make we're

665
00:31:16,389 --> 00:31:14,510
going to decide right now I'm going to

666
00:31:19,480 --> 00:31:16,399
choose choice a and they're off and

667
00:31:21,399 --> 00:31:19,490
running there's a lot of advantage to

668
00:31:23,919 --> 00:31:21,409
that because the companies can be much

669
00:31:26,320 --> 00:31:23,929
more agile and flexible and that

670
00:31:29,200 --> 00:31:26,330
decision speed is what leads them to be

671
00:31:30,610 --> 00:31:29,210
able to achieve these development

672
00:31:33,389 --> 00:31:30,620
schedules that are pretty much unheard

673
00:31:36,279 --> 00:31:33,399
of in a traditional spend additional sex

674
00:31:38,500 --> 00:31:36,289
cool and and when you're having multiple

675
00:31:41,200 --> 00:31:38,510
entities multiple companies coming up

676
00:31:42,430 --> 00:31:41,210
with different ideas to attack a similar

677
00:31:45,340 --> 00:31:42,440
problem we're going to see a lot of

678
00:31:47,230 --> 00:31:45,350
innovation and a lot of spin-off and I

679
00:31:49,750 --> 00:31:47,240
think we've got John Grunsfeld now so

680
00:31:52,149 --> 00:31:49,760
John you were talking a little bit to us

681
00:31:54,279 --> 00:31:52,159
about the legacy of the alarm strong and

682
00:31:56,350 --> 00:31:54,289
the kennedy speech and I'll let you go

683
00:31:58,269 --> 00:31:56,360
for it okay let's see if this works a

684
00:32:00,909 --> 00:31:58,279
little bit better how do you write guys

685
00:32:03,549 --> 00:32:00,919
okay yep so uh you know so I remember

686
00:32:06,519 --> 00:32:03,559
when I was a kid in summer camp seeing

687
00:32:08,919 --> 00:32:06,529
Neil Armstrong step on the moon you know

688
00:32:11,230 --> 00:32:08,929

after being challenged by President

689
00:32:14,049 --> 00:32:11,240
Kennedy to do the moon landing but also

690
00:32:16,870 --> 00:32:14,059
he said we you know we do these things

691
00:32:18,820 --> 00:32:16,880
and the others and of course not

692
00:32:21,669 --> 00:32:18,830
everybody knows not because they are

693
00:32:22,990 --> 00:32:21,679
easy but because they're hard and you

694
00:32:25,090 --> 00:32:23,000
know really that's one of the things

695
00:32:26,919 --> 00:32:25,100
NASA excels and is doing the really hard

696
00:32:29,169 --> 00:32:26,929
things and we don't do them because

697
00:32:31,480 --> 00:32:29,179
they're hard you know it's the science

698
00:32:33,820 --> 00:32:31,490
or the challenge of the engineering of

699
00:32:36,130 --> 00:32:33,830
the exploration that causes us to do

700
00:32:38,710 --> 00:32:36,140
really hard things and you know I found

701
00:32:41,830 --> 00:32:38,720
in in my experiences as an astronaut

702
00:32:44,740 --> 00:32:41,840
with you know with Mike LA and with Ron

703
00:32:46,960 --> 00:32:44,750
and others that when we try these really

704
00:32:49,299 --> 00:32:46,970
hard things that's when as human beings

705
00:32:51,760 --> 00:32:49,309
word our best that's when we provide

706
00:32:53,889 --> 00:32:51,770
into the most benefit for the nation is

707
00:32:56,680 --> 00:32:53,899
by solving really difficult problems and

708
00:32:58,720 --> 00:32:56,690
you know as we showed in the 1960s with

709
00:33:00,909 --> 00:32:58,730
the legacy of Neil Armstrong and the

710
00:33:03,250 --> 00:33:00,919
other Apollo astronauts that when we try

711
00:33:06,010 --> 00:33:03,260
really difficult things and we innovate

712
00:33:07,840 --> 00:33:06,020
and we invent that the benefits to

713
00:33:10,149 --> 00:33:07,850

nation or tremendous all the things that

714
00:33:12,159 --> 00:33:10,159
the legacy of Apollo program has given

715
00:33:13,870 --> 00:33:12,169
us and now we're in an era where we're

716
00:33:15,160 --> 00:33:13,880
doing really hard things like the

717
00:33:17,620 --> 00:33:15,170
Curiosity rover on

718
00:33:19,750 --> 00:33:17,630
ours you know that's something that if

719
00:33:21,430 --> 00:33:19,760
any reasonable person on the street said

720
00:33:23,080 --> 00:33:21,440
well we're going to send a rover to mars

721
00:33:25,330 --> 00:33:23,090
we're going to have it hit the top of

722
00:33:27,310 --> 00:33:25,340
the Martian atmosphere at 13,000 miles

723
00:33:29,980 --> 00:33:27,320
an hour and only seven minutes later

724
00:33:31,930 --> 00:33:29,990
it's going to be a hovering or near

725
00:33:34,930 --> 00:33:31,940
hovering above the surface of Mars under

726
00:33:36,610 --> 00:33:34,940
a sky crane let down set on the surface

727
00:33:38,380 --> 00:33:36,620
and then drive around you'd say well

728
00:33:41,020 --> 00:33:38,390
that's just crazy and it's that

729
00:33:44,110 --> 00:33:41,030
craziness that we excel at is doing hard

730
00:33:45,580 --> 00:33:44,120
problems you know all of that Rover you

731
00:33:49,030 --> 00:33:45,590
know it says made in America on that

732
00:33:52,300 --> 00:33:49,040
Rover and the pieces that make up the

733
00:33:54,220 --> 00:33:52,310
rover are in many cases unique the

734
00:33:56,980 --> 00:33:54,230
motors the power source the you know the

735
00:33:59,350 --> 00:33:56,990
robotic arm the spokes of the wheel are

736
00:34:01,900 --> 00:33:59,360
made out of titanium by a small company

737
00:34:04,210 --> 00:34:01,910
in Chattanooga Tennessee you know

738
00:34:06,610 --> 00:34:04,220

amazing stuff and the rover is now on

739
00:34:09,460 --> 00:34:06,620
the surface driving around and and i can

740
00:34:11,620 --> 00:34:09,470
tell you you know that were just days

741
00:34:13,950 --> 00:34:11,630
weeks and months away from a continuing

742
00:34:16,750 --> 00:34:13,960
stream of incredible discoveries about

743
00:34:20,050 --> 00:34:16,760
what Mars was like billions of years ago

744
00:34:21,970 --> 00:34:20,060
and it looks like from the orbital

745
00:34:24,490 --> 00:34:21,980
reconnaissance that we landed in a place

746
00:34:27,640 --> 00:34:24,500
that had flowing water that was wet and

747
00:34:29,230 --> 00:34:27,650
that could have been a habitat for

748
00:34:30,580 --> 00:34:29,240
ancient life we just don't know and so

749
00:34:34,210 --> 00:34:30,590
those are the kind of investigations

750
00:34:35,800 --> 00:34:34,220
were doing and and that Mars exploration

751
00:34:39,340 --> 00:34:35,810
really is the legacy of those of hollow

752
00:34:42,130 --> 00:34:39,350
years of Neil Armstrong thanks Johnny

753
00:34:43,600 --> 00:34:42,140
and you talked about all the technology

754
00:34:44,560 --> 00:34:43,610
and all the experiments that we're

755
00:34:46,780 --> 00:34:44,570
learning and so I want to go to

756
00:34:48,790 --> 00:34:46,790
astronaut Ron Garan for a second here

757
00:34:51,280 --> 00:34:48,800
because I want to ask him you know

758
00:34:52,690 --> 00:34:51,290
you've you've done experiments on the

759
00:34:55,780 --> 00:34:52,700
shuttle you've done experiments under

760
00:34:58,450 --> 00:34:55,790
water as we simulate going to further

761
00:35:00,370 --> 00:34:58,460
places what technologies are what

762
00:35:02,740 --> 00:35:00,380
discoveries are you most excited about

763
00:35:05,410 --> 00:35:02,750

either discovering when we get to Mars

764
00:35:07,630 --> 00:35:05,420
or one of our other destinations well I

765
00:35:09,520 --> 00:35:07,640
think that the science that we're doing

766
00:35:11,920 --> 00:35:09,530
on a space station in particular kind of

767
00:35:13,570 --> 00:35:11,930
pheasant to two categories and these

768
00:35:16,930 --> 00:35:13,580
categories really that up quite a bit

769
00:35:18,460 --> 00:35:16,940
but the science is designed to a moment

770
00:35:20,200 --> 00:35:18,470
us to go further and further or

771
00:35:25,000 --> 00:35:20,210
exploration of the solar system so that

772
00:35:27,160 --> 00:35:25,010
the enabling technologies whether it's a

773
00:35:28,540 --> 00:35:27,170
study of the human body of the equipment

774
00:35:30,160 --> 00:35:28,550
that we that we have to

775
00:35:32,380 --> 00:35:30,170
to make us go further further but

776
00:35:34,630 --> 00:35:32,390
there's also those scientific

777
00:35:37,260 --> 00:35:34,640
experiments that are specifically

778
00:35:40,000 --> 00:35:37,270
designed to improve life on Earth

779
00:35:42,640 --> 00:35:40,010
research that looks at new medicines new

780
00:35:45,760 --> 00:35:42,650
materials better ways to produce clean

781
00:35:47,680 --> 00:35:45,770
energy ways to purify water the list

782
00:35:50,020 --> 00:35:47,690
goes on and on and on and many of these

783
00:35:52,660 --> 00:35:50,030
technologies of a nap you know and it's

784
00:35:54,670 --> 00:35:52,670
it's a really interesting story in that

785
00:35:57,520 --> 00:35:54,680
those there's a two-way technology

786
00:35:59,080 --> 00:35:57,530
transfer if you will but the science and

787
00:36:00,550 --> 00:35:59,090
the technology that we do on where the

788
00:36:02,110 --> 00:36:00,560

International Space Station that we do

789
00:36:04,840 --> 00:36:02,120
our space program has direct

790
00:36:07,300 --> 00:36:04,850
applications to the earth but the very

791
00:36:09,730 --> 00:36:07,310
engineering approaches that were using

792
00:36:12,430 --> 00:36:09,740
on earth in developing parts of the

793
00:36:15,400 --> 00:36:12,440
world namely that things have to be

794
00:36:17,590 --> 00:36:15,410
socials have to be a robust and simple

795
00:36:19,810 --> 00:36:17,600
not a call that a resupply not require

796
00:36:21,070 --> 00:36:19,820
data maintenance those are the very same

797
00:36:22,330 --> 00:36:21,080
engineering principles that are going to

798
00:36:23,470 --> 00:36:22,340
be needed if we're going to go beyond

799
00:36:25,410 --> 00:36:23,480
low-earth orbit we're going to go to

800
00:36:28,140 --> 00:36:25,420
most we're going to need that type of

801
00:36:32,320 --> 00:36:28,150
philosophy so it's a really good

802
00:36:33,670 --> 00:36:32,330
symbiotic to a technology transfer

803
00:36:37,870 --> 00:36:33,680
service oats or it's really really

804
00:36:39,280 --> 00:36:37,880
exciting thanks a lot I'm new to NASA

805
00:36:41,080 --> 00:36:39,290
I've been on board and the office

806
00:36:42,790 --> 00:36:41,090
communications about a year and so I

807
00:36:44,770 --> 00:36:42,800
want to share with some of the folks in

808
00:36:46,630 --> 00:36:44,780
our Google+ audience today some of the

809
00:36:49,090 --> 00:36:46,640
some of the stuff NASA's doing a lot of

810
00:36:52,210 --> 00:36:49,100
stuff guys basically so right now right

811
00:36:54,640 --> 00:36:52,220
now at this moment we have information

812
00:36:57,760 --> 00:36:54,650
for missions orbiting the Sun Mercury

813
00:37:00,370 --> 00:36:57,770

the moon the asteroid Vesta Mars and

814
00:37:03,340 --> 00:37:00,380
Saturn we have missions on the way to

815
00:37:05,800 --> 00:37:03,350
Jupiter and a Pluto we have 16 earth

816
00:37:08,440 --> 00:37:05,810
science missions currently orbiting the

817
00:37:10,660 --> 00:37:08,450
Earth in a whole integrated system that

818
00:37:13,600 --> 00:37:10,670
send us all kinds of data and just two

819
00:37:16,300 --> 00:37:13,610
weeks ago we launched an ass's radiation

820
00:37:18,670 --> 00:37:16,310
Stokes radiation belt storm probes which

821
00:37:20,710 --> 00:37:18,680
is the first twin spacecraft mission and

822
00:37:23,140 --> 00:37:20,720
it's designed to explore our planets

823
00:37:25,990 --> 00:37:23,150
radiation belts and we also have the

824
00:37:28,030 --> 00:37:26,000
telescope's Hubble Spitzer Chandra and

825
00:37:30,640 --> 00:37:28,040
Fermi which are making all kinds of

826
00:37:32,050 --> 00:37:30,650
groundbreaking discoveries and so I want

827
00:37:34,560 --> 00:37:32,060
to go to John Grunsfeld for a second to

828
00:37:37,120 --> 00:37:34,570
talk about our next telescope though

829
00:37:38,080 --> 00:37:37,130
that's the James Webb telescope it's

830
00:37:40,920 --> 00:37:38,090
going to be the most sophisticated

831
00:37:42,900 --> 00:37:40,930
telescope ever constructed

832
00:37:44,609 --> 00:37:42,910
incredibly exciting John can you tell

833
00:37:47,370 --> 00:37:44,619
our audience here just a little bit

834
00:37:49,530 --> 00:37:47,380
about that that telescope and what we

835
00:37:52,470 --> 00:37:49,540
hope to learn from that sure but of

836
00:37:54,059 --> 00:37:52,480
course I can't help to add to the list

837
00:37:55,470 --> 00:37:54,069
and and I could go on all afternoon

838
00:37:57,059 --> 00:37:55,480

actually if we start listing all the

839
00:37:59,099 --> 00:37:57,069
amazing space you have but we have

840
00:38:02,549 --> 00:37:59,109
spacecraft between the Earth and the Sun

841
00:38:05,190 --> 00:38:02,559
you know as solar weather sentinels we

842
00:38:07,290 --> 00:38:05,200
we actually are participating in a

843
00:38:09,450 --> 00:38:07,300
spacecraft around Venus and of course we

844
00:38:10,770 --> 00:38:09,460
have the two Grail spacecraft going

845
00:38:13,440 --> 00:38:10,780
around the moon as well as the Lunar

846
00:38:16,829 --> 00:38:13,450
Reconnaissance Orbiter just returning

847
00:38:18,960 --> 00:38:16,839
amazing data but for the the James Webb

848
00:38:20,339 --> 00:38:18,970
Space Telescope you know this is a

849
00:38:23,339 --> 00:38:20,349
telescope that's going to look at

850
00:38:27,150 --> 00:38:23,349
beginnings and it really is our Hubble

851
00:38:28,770 --> 00:38:27,160
2.0 if you will in that it's you know

852
00:38:31,349 --> 00:38:28,780
taking all that we've learned from the

853
00:38:35,309 --> 00:38:31,359
Hubble Space Telescope and going into a

854
00:38:37,980 --> 00:38:35,319
completely new dimension which is as an

855
00:38:40,109 --> 00:38:37,990
infrared telescope it can see where no

856
00:38:42,839 --> 00:38:40,119
Hubble has gone before and it's going to

857
00:38:45,140 --> 00:38:42,849
be able to look at us perhaps I mean

858
00:38:47,670 --> 00:38:45,150
this is the goal the very first stars

859
00:38:49,440 --> 00:38:47,680
that appeared in the first galaxies that

860
00:38:51,630 --> 00:38:49,450
appear in the universe so we're going to

861
00:38:55,770 --> 00:38:51,640
pure back just about as far end time as

862
00:38:58,799 --> 00:38:55,780
you can go to see after the Big Bang to

863
00:39:00,240 --> 00:38:58,809

see winded stars start forming galaxies

864
00:39:02,220 --> 00:39:00,250
what were the first stars like were they

865
00:39:04,890 --> 00:39:02,230
very massive stars with very short lives

866
00:39:06,870 --> 00:39:04,900
that that went supernova and seated the

867
00:39:10,049 --> 00:39:06,880
universe with the heavy elements that

868
00:39:12,450 --> 00:39:10,059
were made out of or were they you know

869
00:39:14,730 --> 00:39:12,460
were they just balls of stars do they

870
00:39:16,260 --> 00:39:14,740
start forming two galaxies early and all

871
00:39:19,109 --> 00:39:16,270
of our indications from the Hubble are

872
00:39:21,000 --> 00:39:19,119
that in fact you know they're galaxies

873
00:39:23,069 --> 00:39:21,010
formed very early in the universe and so

874
00:39:25,980 --> 00:39:23,079
we're trying to understand you know the

875
00:39:27,359 --> 00:39:25,990
baby pictures of what the universe look

876
00:39:28,890 --> 00:39:27,369
like so that's the you know the

877
00:39:30,780 --> 00:39:28,900
beginning of stars and galaxies but

878
00:39:33,059 --> 00:39:30,790
we're also interested in the beginnings

879
00:39:36,210 --> 00:39:33,069
of solar systems the NASA Kepler

880
00:39:38,099 --> 00:39:36,220
telescope which is in an earthlike orbit

881
00:39:40,289 --> 00:39:38,109
but staring in one part of the sky near

882
00:39:42,089 --> 00:39:40,299
the constellation Cygnus continues to

883
00:39:44,339 --> 00:39:42,099
amaze us with its discoveries that

884
00:39:46,680 --> 00:39:44,349
almost every star in the night sky that

885
00:39:48,720 --> 00:39:46,690
you look at has a solar system around it

886
00:39:52,530 --> 00:39:48,730
I mean this is brand-new it's fantastic

887
00:39:53,940 --> 00:39:52,540
thousands of new planets the Kepler has

888
00:39:54,700 --> 00:39:53,950

been discovering and so that's okay it's

889
00:39:56,880 --> 00:39:54,710
commonplace

890
00:40:01,089 --> 00:39:56,890
so the James Webb Space Telescope is

891
00:40:02,680 --> 00:40:01,099
trying to help us understand you know

892
00:40:06,490 --> 00:40:02,690
the beginnings of solar systems and

893
00:40:09,270 --> 00:40:06,500
planets it will also allow us to study

894
00:40:12,849 --> 00:40:09,280
the end of stars supernovae and

895
00:40:15,099 --> 00:40:12,859
supernovae and how stars live and die is

896
00:40:16,900 --> 00:40:15,109
structuring in the galaxy so it's it's a

897
00:40:19,660 --> 00:40:16,910
very general purpose telescope it's

898
00:40:21,520 --> 00:40:19,670
going to launch in 2018 the scientific

899
00:40:22,900 --> 00:40:21,530
instruments are coming together at the

900
00:40:25,300 --> 00:40:22,910
Goddard Space Flight Center now and

901
00:40:27,430 --> 00:40:25,310
being integrated and tested it's an

902
00:40:29,460 --> 00:40:27,440
amazing assembly because all of these

903
00:40:32,950 --> 00:40:29,470
instruments the structure the mirrors

904
00:40:35,230 --> 00:40:32,960
have to operate near absolute zero they

905
00:40:37,210 --> 00:40:35,240
operate at 40 Kelvin and so this

906
00:40:39,910 --> 00:40:37,220
telescope is going to go not around the

907
00:40:41,560 --> 00:40:39,920
earth the way Hubble does but out well

908
00:40:44,349 --> 00:40:41,570
beyond the moon a million miles away

909
00:40:47,140 --> 00:40:44,359
from Earth to a place that's a stable

910
00:40:50,349 --> 00:40:47,150
locational Lagrangian point earth moon

911
00:40:53,980 --> 00:40:50,359
Earth's Sun l2 it's called the grounding

912
00:40:56,500 --> 00:40:53,990
point to where where it's very stable in

913
00:40:57,849 --> 00:40:56,510

terms of the gravity that it will stay

914
00:40:58,960 --> 00:40:57,859
there with just a little bit of fuel but

915
00:41:01,690 --> 00:40:58,970
it's far enough away from the earth that

916
00:41:04,150 --> 00:41:01,700
it can get very cold so we're going to

917
00:41:08,650 --> 00:41:04,160
have this wonderful telescope starting

918
00:41:12,760 --> 00:41:08,660
in 2018 to really unravel the mysteries

919
00:41:14,829 --> 00:41:12,770
of the universe great I'm question about

920
00:41:16,300 --> 00:41:14,839
asteroid mining next and I'm not sure if

921
00:41:17,800 --> 00:41:16,310
that should go to Dan or that should go

922
00:41:20,470 --> 00:41:17,810
to John but I'll ask the question and

923
00:41:22,210 --> 00:41:20,480
I'll let you to find over the answer in

924
00:41:24,760 --> 00:41:22,220
and the question that came to us through

925
00:41:27,099 --> 00:41:24,770
one of our audience members here on

926
00:41:30,640 --> 00:41:27,109
Google+ is what are the prospects of

927
00:41:32,950 --> 00:41:30,650
commercial mining of asteroids and I

928
00:41:35,050 --> 00:41:32,960
presume filming more movies with bruce

929
00:41:39,010 --> 00:41:35,060
willis and and ben affleck landing on

930
00:41:44,020 --> 00:41:39,020
them as well uh what's in store for that

931
00:41:48,190 --> 00:41:44,030
kind of commercial mining John you want

932
00:41:51,070 --> 00:41:48,200
that one but let me talk first about

933
00:41:53,829 --> 00:41:51,080
first steps and you know there is you

934
00:41:56,320 --> 00:41:53,839
know you know I read what's on the web

935
00:41:58,000 --> 00:41:56,330
as well in terms of you know some of the

936
00:42:01,000 --> 00:41:58,010
commercial interest but NASA actually

937
00:42:03,760 --> 00:42:01,010
has funded competitively a mission

938
00:42:06,520 --> 00:42:03,770

called osiris-rex and our Cyrus Rex is

939
00:42:08,620 --> 00:42:06,530
not a new dinosaur it's actually a space

940
00:42:11,260 --> 00:42:08,630
mission and it's going to go out to an

941
00:42:13,510 --> 00:42:11,270
asteroid take a sample and send the

942
00:42:16,300 --> 00:42:13,520
sample back to earth so it really is

943
00:42:17,740 --> 00:42:16,310
kind of a precursor to the kind of

944
00:42:19,780 --> 00:42:17,750
missions where you would send out either

945
00:42:21,970 --> 00:42:19,790
a human mission to the asteroid someday

946
00:42:25,660 --> 00:42:21,980
or you know a mission to mine the

947
00:42:27,160 --> 00:42:25,670
asteroids and it may be in it and there

948
00:42:29,140 --> 00:42:27,170
are many proposals that show that this

949
00:42:31,660 --> 00:42:29,150
is actually more viable that you don't

950
00:42:33,700 --> 00:42:31,670
send a mining ship with a Bruce Willis

951
00:42:35,860 --> 00:42:33,710
out to an asteroid but you send a rocket

952
00:42:38,440 --> 00:42:35,870
out probably robotic to bring the

953
00:42:40,000 --> 00:42:38,450
asteroid back near the earth now if you

954
00:42:42,040 --> 00:42:40,010
do such a thing you have to be very

955
00:42:44,860 --> 00:42:42,050
careful you don't want to bring it back

956
00:42:48,010 --> 00:42:44,870
to fast or with the wrong trajectory you

957
00:42:49,720 --> 00:42:48,020
know or it could be a dinosaur story you

958
00:42:51,790 --> 00:42:49,730
know where we're bad things happen when

959
00:42:56,140 --> 00:42:51,800
asteroids hit the earth and become

960
00:42:58,960 --> 00:42:56,150
meteorites but you know that the real

961
00:43:01,900 --> 00:42:58,970
interest i think in you know looking at

962
00:43:04,120 --> 00:43:01,910
a long term exploration of space and

963
00:43:06,550 --> 00:43:04,130

even more importantly utilization of

964
00:43:09,130 --> 00:43:06,560
space is that the really hard part is

965
00:43:11,290 --> 00:43:09,140
getting off the surface of the earth you

966
00:43:13,030 --> 00:43:11,300
know Robert Heinlein said you know to a

967
00:43:15,070 --> 00:43:13,040
journey i think it was Robert Heinlein

968
00:43:16,930 --> 00:43:15,080
said to a journey anywhere out into

969
00:43:19,780 --> 00:43:16,940
space getting to low-earth orbit is

970
00:43:22,390 --> 00:43:19,790
halfway and energetically you know that

971
00:43:24,910 --> 00:43:22,400
that turns out to be true and so if we

972
00:43:28,270 --> 00:43:24,920
have access to resources in space space

973
00:43:30,070 --> 00:43:28,280
resources where we can you know utilize

974
00:43:32,110 --> 00:43:30,080
the maz raw materials to build things

975
00:43:35,110 --> 00:43:32,120
you know ultimately that will be a more

976
00:43:36,580 --> 00:43:35,120
efficient system you know right now it's

977
00:43:38,950 --> 00:43:36,590
hard enough just to maintain an

978
00:43:42,070 --> 00:43:38,960
international space station in low Earth

979
00:43:44,800 --> 00:43:42,080
orbit shuttling supplies you know up

980
00:43:47,380 --> 00:43:44,810
from from Earth that you know we're

981
00:43:49,800 --> 00:43:47,390
still in the very early stages of space

982
00:43:52,990 --> 00:43:49,810
exploration it's hard so so I look at

983
00:43:56,020 --> 00:43:53,000
commercial utilization of in space

984
00:43:57,310 --> 00:43:56,030
resources near the earth as you know

985
00:43:59,080 --> 00:43:57,320
something a little bit further out but

986
00:44:03,220 --> 00:43:59,090
something that NASA should be enabling

987
00:44:05,470 --> 00:44:03,230
now when you talk about spending in a

988
00:44:08,440 --> 00:44:05,480

longer time period on the moon or going

989
00:44:10,270 --> 00:44:08,450
to Mars then Institute for suit Allah

990
00:44:12,310 --> 00:44:10,280
zation you know suddenly becomes an

991
00:44:14,530 --> 00:44:12,320
extremely important piece of the puzzle

992
00:44:16,360 --> 00:44:14,540
if we're going to spend you know any

993
00:44:18,070 --> 00:44:16,370
length of time on Mars you know we ought

994
00:44:19,840 --> 00:44:18,080
to be using the plentiful water that's

995
00:44:21,560 --> 00:44:19,850
there on Mars we ought to be using the

996
00:44:23,480 --> 00:44:21,570
Mars atmosphere

997
00:44:25,100 --> 00:44:23,490
and you know maybe even utilizing the

998
00:44:28,190 --> 00:44:25,110
Mars soil if we're going to try and grow

999
00:44:30,440 --> 00:44:28,200
plants on Mars for for much longer stays

1000
00:44:32,240 --> 00:44:30,450
but that's a critical piece because

1001
00:44:33,920 --> 00:44:32,250
again it's very hard to take your

1002
00:44:36,350 --> 00:44:33,930
supplies all the way to Mars and have

1003
00:44:39,230 --> 00:44:36,360
enough to bring them back so this this

1004
00:44:41,690 --> 00:44:39,240
question of you know pioneering the

1005
00:44:43,340 --> 00:44:41,700
ability to go out beyond low-earth orbit

1006
00:44:45,560 --> 00:44:43,350
and then to use institue resource

1007
00:44:48,940 --> 00:44:45,570
utilization is something that is very

1008
00:44:52,430 --> 00:44:48,950
important for NASA and NASA technology

1009
00:44:55,070 --> 00:44:52,440
we have about 13 minutes left in our in

1010
00:44:56,450 --> 00:44:55,080
our chat today so I want to ask a couple

1011
00:44:58,430 --> 00:44:56,460
more of our questions from Twitter but I

1012
00:45:01,070 --> 00:44:58,440
also want to give our awesome panel a

1013
00:45:03,020 --> 00:45:01,080

chance to maybe add anything in that

1014
00:45:04,850 --> 00:45:03,030
that they might want to add so i'll give

1015
00:45:06,890 --> 00:45:04,860
you fellas a chance to to think about

1016
00:45:08,570 --> 00:45:06,900
that for a second but i'm gonna ask I'm

1017
00:45:10,970 --> 00:45:08,580
gonna stand a question because this is

1018
00:45:13,310 --> 00:45:10,980
something that's on my mind as I as I

1019
00:45:16,480 --> 00:45:13,320
sit on my desk or go to the coffee shop

1020
00:45:19,430 --> 00:45:16,490
you know it's one thing to get a

1021
00:45:21,710 --> 00:45:19,440
spacecraft a shuttle into space it's one

1022
00:45:23,570 --> 00:45:21,720
thing to send curiosity to Mars when we

1023
00:45:25,430 --> 00:45:23,580
talk about sending people to Mars or

1024
00:45:27,650 --> 00:45:25,440
sending people to an asteroid who we got

1025
00:45:29,750 --> 00:45:27,660
to get them back right so there's a lot

1026
00:45:31,520 --> 00:45:29,760
of discussion about engines and

1027
00:45:33,200 --> 00:45:31,530
propellants and that kind of thing maybe

1028
00:45:36,500 --> 00:45:33,210
you can just you don't have to go and

1029
00:45:37,610 --> 00:45:36,510
lab erate too far on all the discussions

1030
00:45:39,800 --> 00:45:37,620
but what are some of the things we've

1031
00:45:44,180 --> 00:45:39,810
got to investigate before we can get our

1032
00:45:45,590 --> 00:45:44,190
astro our astronauts out there Lauren

1033
00:45:47,900 --> 00:45:45,600
you just hit on one of the key reasons

1034
00:45:52,220 --> 00:45:47,910
why we've got two flight tests coming up

1035
00:45:54,320 --> 00:45:52,230
one in 2014 and one in one in 2017 is to

1036
00:45:57,340 --> 00:45:54,330
be able to demonstrate our ability to

1037
00:46:00,050 --> 00:45:57,350
return from the high-velocity

1038
00:46:03,170 --> 00:46:00,060

trajectories that we will have from our

1039
00:46:05,540 --> 00:46:03,180
exploration missions in 2014 will be

1040
00:46:08,060 --> 00:46:05,550
able to test out the heat shield on

1041
00:46:10,520 --> 00:46:08,070
Orion for the first time in those

1042
00:46:13,340 --> 00:46:10,530
reentry environments get about eighty

1043
00:46:15,020 --> 00:46:13,350
percent of the energy get it tested

1044
00:46:17,870 --> 00:46:15,030
about eighty percent of the energy and

1045
00:46:20,810 --> 00:46:17,880
then in 2017 it'll be coming back from

1046
00:46:23,480 --> 00:46:20,820
lunar space the vicinity of lunar space

1047
00:46:26,060 --> 00:46:23,490
at something on the order of eleven

1048
00:46:29,930 --> 00:46:26,070
eleven point two kilometers per second

1049
00:46:33,080 --> 00:46:29,940
so that kind of we haven't done that in

1050
00:46:35,359 --> 00:46:33,090
a while the materials are different we

1051
00:46:38,480 --> 00:46:35,369
can't use as bestest like we did back

1052
00:46:41,210 --> 00:46:38,490
in the Apollo days so we have to be able

1053
00:46:42,529 --> 00:46:41,220
to so we've got those flight tests

1054
00:46:44,269 --> 00:46:42,539
coming and those are some of the key

1055
00:46:47,529 --> 00:46:44,279
objectives is to be able to do that and

1056
00:46:50,989 --> 00:46:47,539
our and frankly our whole architecture

1057
00:46:53,599 --> 00:46:50,999
because of the cost of taking weight all

1058
00:46:55,519 --> 00:46:53,609
the way out to wherever we're going and

1059
00:46:59,960 --> 00:46:55,529
to bring it all the way back that's why

1060
00:47:02,480 --> 00:46:59,970
we use a passive system like the reentry

1061
00:47:04,700 --> 00:47:02,490
heat shield so that we minimize the wait

1062
00:47:06,829 --> 00:47:04,710
for the overall launch vehicle and the

1063
00:47:09,559 --> 00:47:06,839

overall system but we got some major

1064
00:47:11,599 --> 00:47:09,569
challenges ahead of us on that front and

1065
00:47:12,710 --> 00:47:11,609
we're we're looking forward to getting

1066
00:47:16,279 --> 00:47:12,720
some flight test and getting some

1067
00:47:19,609 --> 00:47:16,289
information back on those awesome well

1068
00:47:21,049 --> 00:47:19,619
look forward to that damn so I gave this

1069
00:47:22,849 --> 00:47:21,059
is like the end of wait wait don't tell

1070
00:47:25,539 --> 00:47:22,859
me I gave our panelist a second to think

1071
00:47:27,829 --> 00:47:25,549
about some some thoughts for us uh

1072
00:47:29,599 --> 00:47:27,839
there's no Carl castles voice on your

1073
00:47:32,269 --> 00:47:29,609
home answering machine but i'll start

1074
00:47:33,859 --> 00:47:32,279
with the with michael here Michael any

1075
00:47:35,720 --> 00:47:33,869
lasting thoughts you want to leave with

1076
00:47:40,729 --> 00:47:35,730
our with our audience out here on

1077
00:47:42,349 --> 00:47:40,739
google+ today thanks Lauren look I think

1078
00:47:46,720 --> 00:47:42,359
what I would like to say to people is

1079
00:47:49,579 --> 00:47:46,730
that the notion that NASA is dead is

1080
00:47:52,069 --> 00:47:49,589
completely mistaken I have had people

1081
00:47:53,870 --> 00:47:52,079
come up and and correlate the end of the

1082
00:47:56,390 --> 00:47:53,880
shuttle program with the demise of NASA

1083
00:47:57,499 --> 00:47:56,400
and clearly that's not the case first of

1084
00:48:00,289 --> 00:47:57,509
all you look at all the great work that

1085
00:48:03,920 --> 00:48:00,299
the folks in John's Directorate are

1086
00:48:06,099 --> 00:48:03,930
doing in terms of science in all the

1087
00:48:08,839 --> 00:48:06,109
places that he mentioned that's

1088
00:48:10,999 --> 00:48:08,849

incredible stuff if you haven't seen it

1089
00:48:13,670 --> 00:48:11,009
i highly suggest looking up on the

1090
00:48:16,279 --> 00:48:13,680
YouTube the seven minutes of Terror

1091
00:48:17,960 --> 00:48:16,289
great video about the complicated things

1092
00:48:19,989 --> 00:48:17,970
that John was describing about getting

1093
00:48:23,150 --> 00:48:19,999
curiosity on the surface of Mars

1094
00:48:25,009 --> 00:48:23,160
secondly on the human side even though

1095
00:48:28,039 --> 00:48:25,019
the space shuttles retired we still have

1096
00:48:30,979 --> 00:48:28,049
Americans on our bed 24-7 just like you

1097
00:48:33,049 --> 00:48:30,989
said Lauren we're going up and down on

1098
00:48:35,870 --> 00:48:33,059
the Soyuz rocket from Kazakhstan right

1099
00:48:38,180 --> 00:48:35,880
now but I hope that is dan said in 2017

1100
00:48:40,339 --> 00:48:38,190
if not sooner we'll be using American

1101
00:48:42,499 --> 00:48:40,349
Rockets launch it from American soil and

1102
00:48:46,130 --> 00:48:42,509
then that's a great place for us to

1103
00:48:47,599 --> 00:48:46,140
target our efforts and in the summer all

1104
00:48:48,890 --> 00:48:47,609
over the world as I mentioned before we

1105
00:48:51,260 --> 00:48:48,900
have a lot going on and

1106
00:48:52,760 --> 00:48:51,270
even if you know it's a little bit of a

1107
00:48:54,620 --> 00:48:52,770
stretch for some of us to consider

1108
00:48:56,660 --> 00:48:54,630
riding on one of those tickets which

1109
00:48:58,700 --> 00:48:56,670
despite them being a lot cheaper than

1110
00:49:01,040 --> 00:48:58,710
the orbital ride that's still a little

1111
00:49:03,410 --> 00:49:01,050
bit pricey they get involved as a

1112
00:49:06,080 --> 00:49:03,420
technician as an engineer as an intern

1113
00:49:08,300 --> 00:49:06,090

there plenty of companies all over this

1114
00:49:10,220 --> 00:49:08,310
country that are involved in suborbital

1115
00:49:12,080 --> 00:49:10,230
spaceflight and it's going to happen

1116
00:49:13,640 --> 00:49:12,090
we've been on the doorstep for a while

1117
00:49:15,680 --> 00:49:13,650
but I really think that things are going

1118
00:49:17,480 --> 00:49:15,690
to break loose here the next year or two

1119
00:49:20,650 --> 00:49:17,490
and it really on the cusp of something

1120
00:49:23,540 --> 00:49:20,660
very exciting in human space well

1121
00:49:28,040 --> 00:49:23,550
awesome thanks thanks might appreciate

1122
00:49:30,050 --> 00:49:28,050
it and to to dan dan who's a tear the

1123
00:49:31,490 --> 00:49:30,060
room with me any anything I didn't ask

1124
00:49:33,700 --> 00:49:31,500
you that you want to get out there and

1125
00:49:37,070 --> 00:49:33,710
share with our team out there watching

1126
00:49:39,560 --> 00:49:37,080
well I think I want to share I'll just

1127
00:49:41,960 --> 00:49:39,570
echo the words Mike head there there is

1128
00:49:44,420 --> 00:49:41,970
a perception out there I've run run into

1129
00:49:46,730 --> 00:49:44,430
it across the country that once the

1130
00:49:49,790 --> 00:49:46,740
shuttle program was done NASA was done I

1131
00:49:51,590 --> 00:49:49,800
think what you've heard today from the

1132
00:49:54,050 --> 00:49:51,600
science side from the human exploration

1133
00:49:56,150 --> 00:49:54,060
side NASA's not done we have a long way

1134
00:49:59,660 --> 00:49:56,160
to go and a lot of challenging exciting

1135
00:50:01,850 --> 00:49:59,670
things to go do and I think for for

1136
00:50:04,280 --> 00:50:01,860
those of us that have been around for a

1137
00:50:07,370 --> 00:50:04,290
while and those that are looking forward

1138
00:50:10,670 --> 00:50:07,380

to longer careers in exploration the

1139
00:50:14,780 --> 00:50:10,680
future is bright there will be plenty to

1140
00:50:16,850 --> 00:50:14,790
go do and and I I remember a story I ran

1141
00:50:19,340 --> 00:50:16,860
across a couple weeks ago several weeks

1142
00:50:21,260 --> 00:50:19,350
ago in a little town of Rock Falls

1143
00:50:24,080 --> 00:50:21,270
Illinois which is just across the

1144
00:50:26,390 --> 00:50:24,090
Mississippi River border from from Iowa

1145
00:50:27,860 --> 00:50:26,400
and a little girl and her dad were

1146
00:50:31,610 --> 00:50:27,870
standing there in a fast food restaurant

1147
00:50:33,860 --> 00:50:31,620
wearing an sts-135 t-shirt and and I was

1148
00:50:35,900 --> 00:50:33,870
kind of surprised to find that in rock

1149
00:50:39,050 --> 00:50:35,910
falls Illinois that's not a typical

1150
00:50:41,450 --> 00:50:39,060
place you see NASA stuff but in the

1151
00:50:43,970 --> 00:50:41,460
conversation they had been to the last

1152
00:50:46,550 --> 00:50:43,980
shuttle launch they thought that was the

1153
00:50:48,590 --> 00:50:46,560
end but then when they heard that we

1154
00:50:51,550 --> 00:50:48,600
were doing the other things and talked

1155
00:50:56,390 --> 00:50:51,560
about curiosity and all of that the the

1156
00:50:59,000 --> 00:50:56,400
10 year old girl her eyes lit up and you

1157
00:51:00,830 --> 00:50:59,010
could see that her dream like we've

1158
00:51:02,660 --> 00:51:00,840
talked about with Neil and others that

1159
00:51:06,050 --> 00:51:02,670
got this group

1160
00:51:08,150 --> 00:51:06,060
often going she was starting to light up

1161
00:51:09,890 --> 00:51:08,160
because there's more launches there's

1162
00:51:14,030 --> 00:51:09,900
more excitement there's more exploration

1163
00:51:16,730 --> 00:51:14,040

to go do and that's the there is a

1164
00:51:19,850 --> 00:51:16,740
future there and we have lots to look

1165
00:51:23,090 --> 00:51:19,860
forward to and lots to go accomplish and

1166
00:51:25,670 --> 00:51:23,100
we're ready to get going well we're

1167
00:51:28,370 --> 00:51:25,680
going to close up soon so we can all get

1168
00:51:31,580 --> 00:51:28,380
back to work here I'm gonna go John

1169
00:51:34,400 --> 00:51:31,590
Grunsfeld uh John and thanks for joining

1170
00:51:36,590 --> 00:51:34,410
us today get some some parting words for

1171
00:51:38,990 --> 00:51:36,600
our audience out there done well I think

1172
00:51:42,230 --> 00:51:39,000
Michael I said it well and the Curiosity

1173
00:51:46,130 --> 00:51:42,240
rover landing on Mars was not a science

1174
00:51:48,800 --> 00:51:46,140
event it was a NASA event we had 50

1175
00:51:50,120 --> 00:51:48,810
million people following us at midnight

1176
00:51:52,880 --> 00:51:50,130
to one in the morning depending upon

1177
00:51:55,280 --> 00:51:52,890
your time zone following this seven

1178
00:51:56,810 --> 00:51:55,290
minutes of Terror till we land us

1179
00:51:58,610 --> 00:51:56,820
successfully on the surface and I hope

1180
00:51:59,990 --> 00:51:58,620
everybody stays with the mission for the

1181
00:52:02,480 --> 00:52:00,000
next couple of years as it makes its

1182
00:52:04,730 --> 00:52:02,490
discoveries and it had contributions

1183
00:52:06,980 --> 00:52:04,740
from nearly every NASA Center I in one

1184
00:52:08,480 --> 00:52:06,990
way or another and all of NASA involved

1185
00:52:09,890 --> 00:52:08,490
we had human space flight experiments

1186
00:52:13,220 --> 00:52:09,900
and we do have experiments on the

1187
00:52:14,690 --> 00:52:13,230
surface leading to hopefully you know in

1188
00:52:17,030 --> 00:52:14,700

the not-too-distant future a human

1189
00:52:20,660 --> 00:52:17,040
mission to Mars and and looking here on

1190
00:52:22,670 --> 00:52:20,670
on the google plus social here i see two

1191
00:52:24,950 --> 00:52:22,680
individuals who have each spent you know

1192
00:52:27,350 --> 00:52:24,960
six months in space on the International

1193
00:52:30,380 --> 00:52:27,360
Space Station and that's halfway to Mars

1194
00:52:32,840 --> 00:52:30,390
and they look pretty healthy to me and

1195
00:52:35,960 --> 00:52:32,850
so we are pioneering every time we send

1196
00:52:37,970 --> 00:52:35,970
a crew to orbit you know we simulate the

1197
00:52:39,890 --> 00:52:37,980
human effects other than radiation of

1198
00:52:42,980 --> 00:52:39,900
the trip to Mars and I think when we

1199
00:52:45,110 --> 00:52:42,990
present individuals we present explorers

1200
00:52:47,600 --> 00:52:45,120
with high-performance challenges like

1201
00:52:51,020 --> 00:52:47,610
sending a crew to mars that we easily

1202
00:52:52,910 --> 00:52:51,030
will overcome the psychological barriers

1203
00:52:54,800 --> 00:52:52,920
that some perceive the health barriers

1204
00:52:57,170 --> 00:52:54,810
you know that the best thing you can do

1205
00:52:58,850 --> 00:52:57,180
in space as we recently learned his diet

1206
00:53:01,610 --> 00:52:58,860
and exercise and that applies on earth

1207
00:53:04,250 --> 00:53:01,620
too and so we have a few challenges in

1208
00:53:06,320 --> 00:53:04,260
the human performance area but as I say

1209
00:53:08,420 --> 00:53:06,330
take a look at Ron Garan here and

1210
00:53:10,610 --> 00:53:08,430
Michael a and they're both smiling I

1211
00:53:12,350 --> 00:53:10,620
think we have a very bright future ahead

1212
00:53:14,330 --> 00:53:12,360
for all of our exploration and all of

1213
00:53:15,950 --> 00:53:14,340

our science activities so I keep

1214
00:53:18,470 --> 00:53:15,960
following NASA

1215
00:53:20,089 --> 00:53:18,480
thanks thanks John and and so I want to

1216
00:53:22,730 --> 00:53:20,099
get the final word here to ron garan

1217
00:53:25,880 --> 00:53:22,740
whoo-hoo above the group here has the

1218
00:53:30,050 --> 00:53:25,890
most followers on Google+ so he's an

1219
00:53:33,140 --> 00:53:30,060
avid user of this of this medium and run

1220
00:53:36,200 --> 00:53:33,150
close us out here and and give it some

1221
00:53:38,030 --> 00:53:36,210
thought oh it's okay I appreciate that

1222
00:53:39,290 --> 00:53:38,040
up to you and I think it's really is

1223
00:53:41,359 --> 00:53:39,300
important that we have these platforms

1224
00:53:43,190 --> 00:53:41,369
to tell the story and just go back to

1225
00:53:45,320 --> 00:53:43,200
the end of the space shuttle program for

1226
00:53:46,490 --> 00:53:45,330
a second i was on the space station I

1227
00:53:48,859 --> 00:53:46,500
was on the International Space Station

1228
00:53:50,390 --> 00:53:48,869
when we you know close the hatch on the

1229
00:53:52,760 --> 00:53:50,400
last space shuttle to come back and

1230
00:53:55,250 --> 00:53:52,770
there were some very concerned citizens

1231
00:53:57,200 --> 00:53:55,260
that are outraged that we left our

1232
00:54:00,859 --> 00:53:57,210
astronauts in space with no way to get

1233
00:54:02,810 --> 00:54:00,869
home and so the Restless perception in

1234
00:54:04,550 --> 00:54:02,820
the public that the space program was

1235
00:54:07,930 --> 00:54:04,560
only as you've heard it's anything but

1236
00:54:11,300 --> 00:54:07,940
over we've got terabytes of data

1237
00:54:13,190 --> 00:54:11,310
streaming back every single day on and

1238
00:54:16,550 --> 00:54:13,200

so one of the ways that we tell the

1239
00:54:18,770 --> 00:54:16,560
story and keep everybody engaged and

1240
00:54:20,000 --> 00:54:18,780
keep everybody up to speed with what

1241
00:54:21,920 --> 00:54:20,010
we're doing is through these social

1242
00:54:23,630 --> 00:54:21,930
media platforms this is a this is a new

1243
00:54:25,339 --> 00:54:23,640
way for us to tell the spirits and new

1244
00:54:26,660 --> 00:54:25,349
way for us to communicate and it's an

1245
00:54:28,490 --> 00:54:26,670
interactive road and I think that's

1246
00:54:30,140 --> 00:54:28,500
really exciting and you know like I

1247
00:54:31,579 --> 00:54:30,150
haven't seen John and it seemed like in

1248
00:54:32,930 --> 00:54:31,589
a long time and now I'm saying for the

1249
00:54:34,820 --> 00:54:32,940
first time in a long time I'll google

1250
00:54:38,390 --> 00:54:34,830
plus and this is great but in addition

1251
00:54:41,870 --> 00:54:38,400
to tell them astray um you know over

1252
00:54:43,670 --> 00:54:41,880
static coming back is is great we've got

1253
00:54:45,410 --> 00:54:43,680
other scientific information but we have

1254
00:54:47,570 --> 00:54:45,420
to it's not worth anything that we don't

1255
00:54:50,930 --> 00:54:47,580
do anything with it so we are working

1256
00:54:53,000 --> 00:54:50,940
really hard at NASA at opening up all

1257
00:54:54,230 --> 00:54:53,010
the data that we have making whatever

1258
00:54:55,970 --> 00:54:54,240
you can make a van will make it

1259
00:54:59,060 --> 00:54:55,980
available to the public and make it

1260
00:55:00,710 --> 00:54:59,070
available in a row that's usable aware

1261
00:55:02,960 --> 00:55:00,720
that they don't have to fight and think

1262
00:55:04,760 --> 00:55:02,970
and know that all the incidents and

1263
00:55:06,890 --> 00:55:04,770

secrets of getting a data it's all out

1264
00:55:09,320 --> 00:55:06,900
there in a very very usable format so

1265
00:55:11,810 --> 00:55:09,330
that citizen scientists and and later

1266
00:55:14,470 --> 00:55:11,820
citizens can just go out and use this

1267
00:55:17,390 --> 00:55:14,480
data and make the most of it and help

1268
00:55:18,680 --> 00:55:17,400
multiply the benefit that we have in the

1269
00:55:21,230 --> 00:55:18,690
space program through their

1270
00:55:23,060 --> 00:55:21,240
participation and again social media and

1271
00:55:26,780 --> 00:55:23,070
these open data platforms that we're

1272
00:55:28,730 --> 00:55:26,790
engaging allow people to participate in

1273
00:55:29,720 --> 00:55:28,740
the missions that we're doing not just

1274
00:55:31,760 --> 00:55:29,730
aspect

1275
00:55:33,470 --> 00:55:31,770
but as fellow crew members espero

1276
00:55:36,109 --> 00:55:33,480
scientists and it's I think it's going

1277
00:55:37,700 --> 00:55:36,119
to really lead to send announcements

1278
00:55:39,380 --> 00:55:37,710
that that would not have been available

1279
00:55:40,760 --> 00:55:39,390
otherwise and it's a really really

1280
00:55:43,550 --> 00:55:40,770
exciting time to be in the space

1281
00:55:45,260 --> 00:55:43,560
business and it's a really exciting time

1282
00:55:46,609 --> 00:55:45,270
to fire what we're doing and to

1283
00:55:50,120 --> 00:55:46,619
participate in what we're doing in this

1284
00:55:51,440 --> 00:55:50,130
in the space program so I just like to

1285
00:55:54,140 --> 00:55:51,450
see this trend continue because it's

1286
00:55:55,760 --> 00:55:54,150
really really exciting awesome well

1287
00:55:57,470 --> 00:55:55,770
we're going to we're going to keep doing

1288
00:56:00,620 --> 00:55:57,480

it as well and I just want to give a

1289
00:56:03,320 --> 00:56:00,630
couple quick thank yous to Steve Coll to

1290
00:56:05,150 --> 00:56:03,330
Thomas Duncan to John Yemm Burke and

1291
00:56:07,070 --> 00:56:05,160
especially to Jason Townsend who helped

1292
00:56:10,010 --> 00:56:07,080
make this all happen today our friends

1293
00:56:11,690 --> 00:56:10,020
over at Google you guys rock this this

1294
00:56:14,060 --> 00:56:11,700
we could have done all this without you

1295
00:56:15,470 --> 00:56:14,070
and if you're watching today and even if

1296
00:56:19,040 --> 00:56:15,480
you're not we want to invite you to

1297
00:56:21,500 --> 00:56:19,050
circle us to circle NASA here on on

1298
00:56:23,810 --> 00:56:21,510
google+ to follow us on twitter at NASA

1299
00:56:25,430 --> 00:56:23,820
to like us on Facebook and if you've got

1300
00:56:27,230 --> 00:56:25,440
any questions about anything in the

1301
00:56:30,830 --> 00:56:27,240
universe you can probably find the

1302
00:56:33,050 --> 00:56:30,840
answer at nasa.gov I'm Lauren Worley and

1303
00:56:34,970 --> 00:56:33,060
on behalf of all the team here at NASA

1304
00:56:36,980 --> 00:56:34,980
and our awesome panelists I want to

1305
00:56:39,080 --> 00:56:36,990
thank you for joining us today and we'll