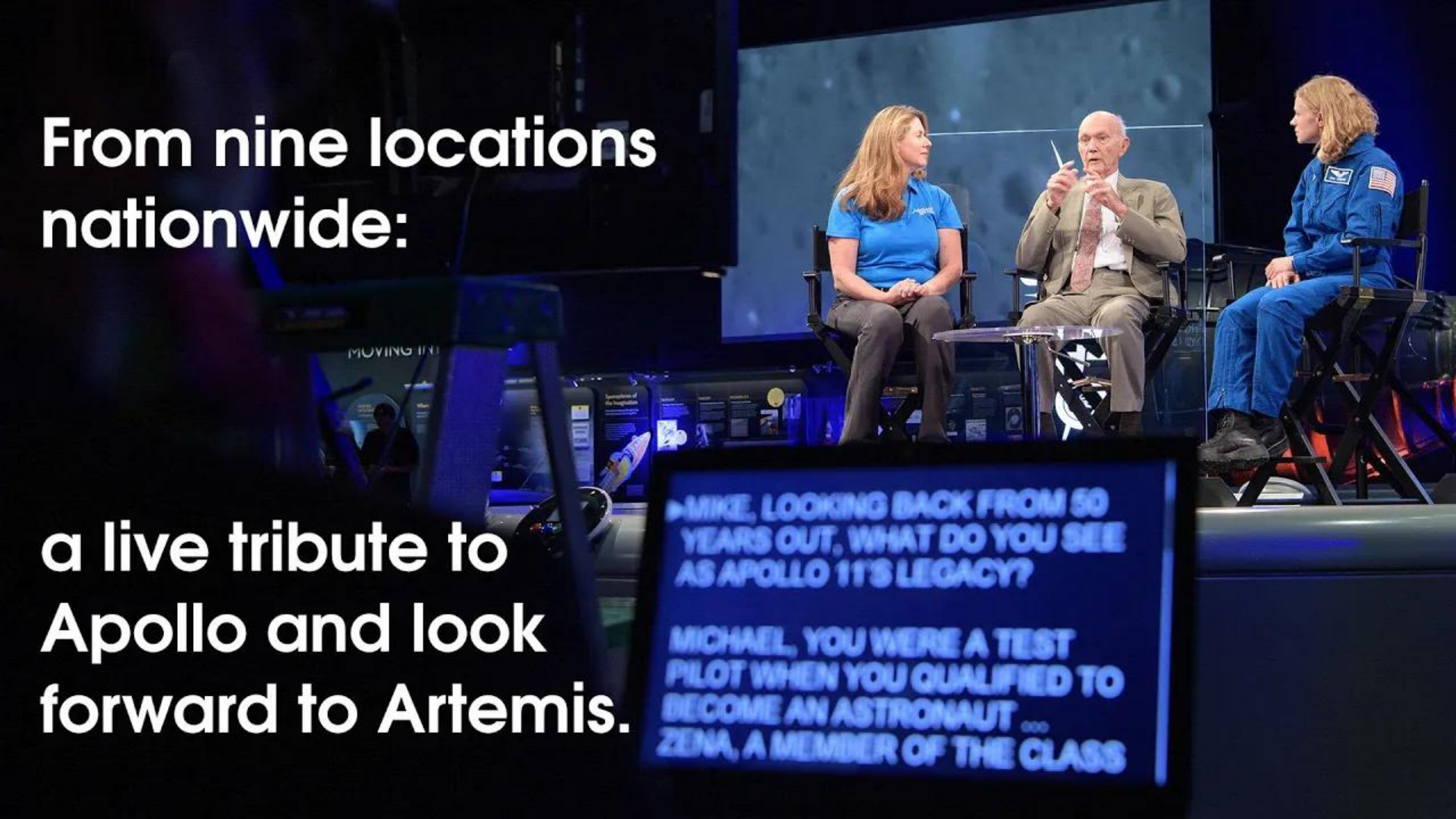
From nine locations nationwide:
a live tribute to Apollo and look forward to Artemis.
MIKE, LOOKING BACK FROM 50 YEARS OUT, WHAT DO YOU SEE AS APOLLO 11'S LEGACY?
MICHAEL, YOU WERE A TEST PILOT WHEN YOU QUALIFIED TO BECOME AN ASTRONAUT ... ZENA, A MEMBER OF THE CLASS

1
00:00:05,780 --> 00:00:05,300
just past a two-minute mark in the

2
00:00:08,629 --> 00:00:05,790
countdown

3
00:00:09,350 --> 00:00:08,639
t-minus one minute 54 seconds and

4
00:00:11,530 --> 00:00:09,360
counting

5
00:00:13,820 --> 00:00:11,540
our status board indicates that the

6
00:00:16,790 --> 00:00:13,830
oxidizer tanks in the second and third

7
00:00:18,550 --> 00:00:16,800
stages now have pressurized we continue

8
00:00:21,650 --> 00:00:18,560
to build up pressure in all three stages

9
00:00:27,230 --> 00:00:21,660
here at the last minute to prepare it

10
00:00:30,560 --> 00:00:27,240
for liftoff t minus 1 minute 35 seconds

11
00:00:32,930 --> 00:00:30,570
on the Apollo mission flight to land the

12
00:00:35,360 --> 00:00:32,940
first men on the moon all indications

13
00:00:37,160 --> 00:00:35,370

are coming in to the control center at

14
00:00:39,530 --> 00:00:37,170
this time indicate the earth roll 1

15
00:00:41,389 --> 00:00:39,540
minute 25 seconds and counting our

16
00:00:43,639 --> 00:00:41,399
status board indicates the third stage

17
00:00:46,069 --> 00:00:43,649
completely pressurized waiting second

18
00:00:48,889 --> 00:00:46,079
mark has now been cast was on full

19
00:00:51,290 --> 00:00:48,899
internal power at the 52nd month in the

20
00:00:54,049 --> 00:00:51,300
compound garden system third one in

21
00:00:55,790 --> 00:00:54,059
Phillips 17 seconds leading up to the

22
00:00:58,430 --> 00:00:55,800
ignition sequence at eight point nine

23
00:01:01,819 --> 00:00:58,440
seconds they're approaching the 62nd

24
00:01:03,439 --> 00:01:01,829
month on the Apollo 11 mission t-minus

25
00:01:07,100 --> 00:01:03,449
50 seconds and counting

26
00:01:08,230 --> 00:01:07,110
we've had P minus 50 55 seconds and

27
00:01:10,609 --> 00:01:08,240
counting

28
00:01:12,260 --> 00:01:10,619
Neil Armstrong District where the bat

29
00:01:15,170 --> 00:01:12,270
that's been a real smooth compound we

30
00:01:17,870 --> 00:01:15,180
passed the 52nd month power transfer is

31
00:01:21,170 --> 00:01:17,880
complete for on internal power with the

32
00:01:24,180 --> 00:01:21,180
launch vehicle at the time forty seconds

33
00:01:41,070 --> 00:01:24,190
away on the Apollo 11 football

34
00:01:44,950 --> 00:01:43,000
20 seconds mentality

35
00:01:48,240 --> 00:01:44,960
[Music]

36
00:02:06,050 --> 00:01:48,250
t-minus 15 seconds guidance is internal

37
00:02:06,060 --> 00:02:14,960
[Music]

38
00:02:23,010 --> 00:02:19,350

hi I'm Mike Collins 50 years ago Neil

39
00:02:25,350 --> 00:02:23,020
Armstrong Buzz Aldrin and I suited up in

40
00:02:29,430 --> 00:02:25,360
this very room at that time we were on

41
00:02:31,670 --> 00:02:29,440
our way to make history with Apollo 11

42
00:02:44,970 --> 00:02:31,680
the first lunar landing

43
00:02:48,540 --> 00:02:44,980
[Music]

44
00:02:51,520 --> 00:02:48,550
and there they are the men of Apollo 11

45
00:02:54,430 --> 00:02:51,530
immortalized in bronze a seven-foot-tall

46
00:02:56,070 --> 00:02:54,440
statue outside the Saturn 5 Center at

47
00:02:59,200 --> 00:02:56,080
the Kennedy Space Center in Florida

48
00:03:01,510 --> 00:02:59,210
meanwhile inside the Saturn 5 Center we

49
00:03:04,120 --> 00:03:01,520
welcome you to our show about NASA's

50
00:03:06,460 --> 00:03:04,130
giant leaps past and present hello

51
00:03:08,410 --> 00:03:06,470
everyone I'm Darryl nail and I'm Murray

52
00:03:10,750 --> 00:03:08,420
Lewis and we are sitting underneath the

53
00:03:13,660 --> 00:03:10,760
Saturn 5 rocket just behind us it's the

54
00:03:16,870 --> 00:03:13,670
most powerful ever flown the Saturn 5

55
00:03:19,420 --> 00:03:16,880
7.6 million pounds of thrust propelled

56
00:03:21,610 --> 00:03:19,430
Apollo 11 and a total of 24 American

57
00:03:23,380 --> 00:03:21,620
astronauts to the moon and America's

58
00:03:25,750 --> 00:03:23,390
next giant leap to the moon will blast

59
00:03:28,060 --> 00:03:25,760
off from right here in Florida and we

60
00:03:30,310 --> 00:03:28,070
have teams of Broadcasters astronauts

61
00:03:32,050 --> 00:03:30,320
and other guests across the country to

62
00:03:33,850 --> 00:03:32,060
help us honor history you see them there

63
00:03:35,770 --> 00:03:33,860

they will also help us project the

64
00:03:37,960 --> 00:03:35,780
future we'll take you to the Johnson

65
00:03:40,570 --> 00:03:37,970
Space Center in Houston the US Space and

66
00:03:42,670 --> 00:03:40,580
Rocket Center in Huntsville Alabama to

67
00:03:45,310 --> 00:03:42,680
Neil Armstrong's hometown of Wapakoneta

68
00:03:48,370 --> 00:03:45,320
Ohio to the Museum of Flight in Seattle

69
00:03:50,890 --> 00:03:48,380
and to some special guests hey is that

70
00:03:53,740 --> 00:03:50,900
Adam Savage there yeah for Mythbusters

71
00:03:57,070 --> 00:03:53,750
oh I see him there and they are on the

72
00:04:00,160 --> 00:03:57,080
National Mall in Washington DC and I'm

73
00:04:02,440 --> 00:04:00,170
Karen Fox from NASA just a few minutes

74
00:04:04,690 --> 00:04:02,450
we'll be talking live with Apollo 11

75
00:04:11,229 --> 00:04:04,700
astronauts Buzz Aldrin and Michael

76
00:04:13,479 --> 00:04:11,239
Collins hi everyone

77
00:04:15,610 --> 00:04:13,489
Danyelle Dallas Russa and I'm beyond

78
00:04:17,650 --> 00:04:15,620
thrilled to be here at the Kennedy Space

79
00:04:19,659 --> 00:04:17,660
Center to be celebrating the Apollo 11

80
00:04:21,940 --> 00:04:19,669
anniversary where we're gonna be

81
00:04:24,100 --> 00:04:21,950
celebrating and taking your questions

82
00:04:25,900 --> 00:04:24,110
and comments on social media we're even

83
00:04:27,760 --> 00:04:25,910
going to be interviewing people live at

84
00:04:29,620 --> 00:04:27,770
this Center if we don't get around to

85
00:04:32,110 --> 00:04:29,630
your questions or comments on this show

86
00:04:34,150 --> 00:04:32,120
don't worry we have a team on standby

87
00:04:36,820 --> 00:04:34,160
ready to respond to you all you have to

88
00:04:42,580 --> 00:04:36,830

do is remember to the hashtag Apollo

89
00:04:44,950 --> 00:04:42,590
50th all right thanks Danielle the 50th

90
00:04:47,440 --> 00:04:44,960
anniversary of Apollo 11 is of course

91
00:04:49,690 --> 00:04:47,450
why we're here today we begin with our

92
00:04:51,400 --> 00:04:49,700
first look at the remarkable historic

93
00:04:52,420 --> 00:04:51,410
achievement that the whole world is

94
00:04:54,490 --> 00:04:52,430
celebrating

95
00:05:05,070 --> 00:04:54,500
that giant leap changed history and

96
00:05:09,430 --> 00:05:08,680
okay retro go fight Oh guide go control

97
00:05:16,290 --> 00:05:09,440
go

98
00:05:20,440 --> 00:05:16,300
undocking Armstrong Aldrin and Collins

99
00:05:23,020 --> 00:05:20,450
arrived at the moon on Saturday July 19

100
00:05:25,930 --> 00:05:23,030
when we did get close and we rolled out

101
00:05:28,200 --> 00:05:25,940
and saw it for the first time it was it

102
00:05:33,220 --> 00:05:28,210
was a revelation it was gigantic it

103
00:05:39,040 --> 00:05:36,130
the next day Sunday July 20th was

104
00:05:42,220 --> 00:05:39,050
landing and a lot of anticipation we

105
00:05:45,220 --> 00:05:42,230
finally come to the day the moment that

106
00:05:47,650 --> 00:05:45,230
this is about to commence landing on the

107
00:05:50,440 --> 00:05:47,660
moon was absolutely the most difficult

108
00:05:53,890 --> 00:05:50,450
piece of any Apollo mission okay think

109
00:05:57,040 --> 00:05:53,900
about it as a controlled fall out of

110
00:05:59,830 --> 00:05:57,050
lunar orbit the problem is in this

111
00:06:06,910 --> 00:05:59,840
controlled fall out of orbit you only

112
00:06:09,520 --> 00:06:06,920
have enough fuel for one fry the

113
00:06:12,280 --> 00:06:09,530

trajectory had been wrong with they were

114
00:06:15,850 --> 00:06:12,290
targeted into this inhospitable place

115
00:06:19,660 --> 00:06:15,860
then it had to fly over this area at a

116
00:06:21,940 --> 00:06:19,670
high ford velocity then pitch up to slow

117
00:06:25,600 --> 00:06:21,950
down so they killed at forward velocity

118
00:06:28,750 --> 00:06:25,610
and then start down like a helicopter so

119
00:06:32,110 --> 00:06:28,760
now we're critical fuel state and that's

120
00:06:41,020 --> 00:06:32,120
why the 60 second call was given and in

121
00:06:43,260 --> 00:06:41,030
the thirty second call 20 seconds

122
00:06:45,190 --> 00:06:43,270
[Music]

123
00:06:48,490 --> 00:06:45,200
okay engine stop

124
00:06:51,600 --> 00:06:48,500
ACA out of detent tokoto both autos even

125
00:06:57,100 --> 00:06:51,610
a command override off and then I'm off

126
00:07:03,870 --> 00:06:57,110
for 13 events we copy you down eagle

127
00:07:07,990 --> 00:07:06,490
tranquility we copy on the ground you

128
00:07:11,410 --> 00:07:08,000
got a bunch of guys about to turn blue

129
00:07:13,480 --> 00:07:11,420
we're breathing again thanks a lot the

130
00:07:18,790 --> 00:07:13,490
landing to me was a great celebration

131
00:07:30,670 --> 00:07:18,800
the nation was almost euphoric the

132
00:07:33,160 --> 00:07:30,680
United States Apollo 11 commander Neil

133
00:07:36,610 --> 00:07:33,170
Armstrong is forever known as the first

134
00:07:39,190 --> 00:07:36,620
man he passed away in 2012 but his small

135
00:07:55,690 --> 00:07:39,200
step on the lunar surface continues to

136
00:08:09,770 --> 00:08:07,220
[Music]

137
00:08:15,550 --> 00:08:09,780
our knowledge of the universe around us

138
00:08:15,560 --> 00:08:19,000

[Music]

139
00:08:24,020 --> 00:08:21,590
this is the new ocean and we must sail

140
00:08:30,710 --> 00:08:24,030
upon it and we must be a leader on it

141
00:08:32,210 --> 00:08:30,720
and that caught people's imagination and

142
00:08:34,640 --> 00:08:32,220
later will speak to some Apollo

143
00:08:37,580 --> 00:08:34,650
astronauts live and we'll also hear from

144
00:08:39,800 --> 00:08:37,590
Neil Armstrong son mark Darrell look

145
00:08:42,050 --> 00:08:39,810
forward to that Neil Armstrong son looks

146
00:08:43,760 --> 00:08:42,060
just like it - doesn't he I love

147
00:08:45,410 --> 00:08:43,770
listening to his great guy we've got our

148
00:08:46,970 --> 00:08:45,420
own astronauts here - three

149
00:08:49,520 --> 00:08:46,980
talk to us Stan love in just a little

150
00:08:51,620 --> 00:08:49,530
bit even as we celebrate the historic

151
00:08:53,900 --> 00:08:51,630
milestone of Apollo 11 we're working

152
00:08:56,090 --> 00:08:53,910
hard to return humans to the moon in the

153
00:08:58,970 --> 00:08:56,100
next five years as we plot an eventual

154
00:09:02,060 --> 00:08:58,980
course to Mars we call it the Artemis

155
00:09:06,470 --> 00:09:02,070
program a 21st century successor to

156
00:09:08,210 --> 00:09:06,480
Apollo Artemis was Apollo's twin sister

157
00:09:10,550 --> 00:09:08,220
and goddess of the moon in Greek

158
00:09:12,980 --> 00:09:10,560
mythology we'll carry that name with us

159
00:09:16,250 --> 00:09:12,990
to the moon again landing astronauts by

160
00:09:19,850 --> 00:09:16,260
2024 and establishing sustainable lunar

161
00:09:21,830 --> 00:09:19,860
exploration by 2028 to get there we're

162
00:09:24,500 --> 00:09:21,840
building a powerful rocket the Space

163
00:09:26,840 --> 00:09:24,510

Launch System to send astronauts aboard

164
00:09:29,780 --> 00:09:26,850
our new Orion spacecraft to the gateway

165
00:09:31,790 --> 00:09:29,790
in lunar orbit from the Gateway we'll be

166
00:09:34,400 --> 00:09:31,800
able to land astronauts in places we've

167
00:09:36,890 --> 00:09:34,410
never been before including the lunar

168
00:09:39,530 --> 00:09:36,900
South Pole we'll have a human Lander

169
00:09:41,600 --> 00:09:39,540
system staged at the gateway but before

170
00:09:44,180 --> 00:09:41,610
then we'll already be back on the moon

171
00:09:46,190 --> 00:09:44,190
with robotic commercial Landers carrying

172
00:09:48,410 --> 00:09:46,200
science instruments and Technology

173
00:09:50,860 --> 00:09:48,420
demonstrations to the moon beginning in

174
00:09:52,960 --> 00:09:50,870
September of next year and will

175
00:09:55,510 --> 00:09:52,970
generation of spacesuits as we send the

176
00:09:58,630 --> 00:09:55,520
first woman and the next man to the moon

177
00:10:00,430 --> 00:09:58,640
as we do this we gain more scientific

178
00:10:02,680 --> 00:10:00,440
knowledge about the solar system in

179
00:10:05,020 --> 00:10:02,690
which we live an American companies

180
00:10:07,150 --> 00:10:05,030
large and small are developing advanced

181
00:10:10,330 --> 00:10:07,160
technologies to realize these space

182
00:10:12,610 --> 00:10:10,340
exploration dreams for NASA and as with

183
00:10:14,800 --> 00:10:12,620
Apollo many of these technologies will

184
00:10:19,300 --> 00:10:14,810
later grow into every day parts of life

185
00:10:21,100 --> 00:10:19,310
here on earth and stay tuned to the end

186
00:10:23,830 --> 00:10:21,110
of our show we'll have a fun reveal

187
00:10:26,140 --> 00:10:23,840
about Artemis now joining us live is

188
00:10:28,120 --> 00:10:26,150

astronaut Stan Love who flew on space

189
00:10:29,830 --> 00:10:28,130
shuttle mission STS 122 to the

190
00:10:31,600 --> 00:10:29,840
International Space Station and he's

191
00:10:34,660 --> 00:10:31,610
currently working on the development of

192
00:10:35,980 --> 00:10:34,670
future human spacecraft Stan 12

193
00:10:40,960 --> 00:10:35,990
astronauts walked on the moon between

194
00:10:42,910 --> 00:10:40,970
1969 and 1972 did Neil Armstrong inspire

195
00:10:44,980 --> 00:10:42,920
you in any way at any level well

196
00:10:46,870 --> 00:10:44,990
absolutely I think anybody my age was

197
00:10:49,240 --> 00:10:46,880
interested in science or technology or

198
00:10:51,250 --> 00:10:49,250
exploration held the Apollo 11

199
00:10:53,230 --> 00:10:51,260
astronauts as heroes I remember when I

200
00:10:55,540 --> 00:10:53,240
was in grade school six years old my

201
00:10:57,790 --> 00:10:55,550
little tin lunchbox had the astronauts

202
00:10:59,620 --> 00:10:57,800
in the Apollo spacecraft so I had that

203
00:11:01,570 --> 00:10:59,630
in there from the beginning and I

204
00:11:03,430 --> 00:11:01,580
remember coming to work on my very first

205
00:11:05,500 --> 00:11:03,440
day as an astronaut driving in the gate

206
00:11:08,080 --> 00:11:05,510
at Johnson Space Center and thinking oh

207
00:11:09,850 --> 00:11:08,090
my goodness this is where it happened

208
00:11:11,770 --> 00:11:09,860
this is where we landed people on the

209
00:11:13,660 --> 00:11:11,780
moon for the very first time there's

210
00:11:15,220 --> 00:11:13,670
sort of this sense of awe and an

211
00:11:17,200 --> 00:11:15,230
incredible sense of honor to be able to

212
00:11:19,960 --> 00:11:17,210
join that effort especially as a crew

213
00:11:22,240 --> 00:11:19,970

member and then some trepidation really

214
00:11:23,970 --> 00:11:22,250
hoping I was up to the task and indeed

215
00:11:26,110 --> 00:11:23,980
you were we got some video of you

216
00:11:28,480 --> 00:11:26,120
launching in the Space Shuttle with a

217
00:11:29,830 --> 00:11:28,490
camera that had like an inside view it

218
00:11:31,630 --> 00:11:29,840
doesn't exciting right oh yeah

219
00:11:33,340 --> 00:11:31,640
absolutely when they launch are like

220
00:11:34,630 --> 00:11:33,350
those solid rocket motors on the shuttle

221
00:11:36,400 --> 00:11:34,640
you know you're going somewhere in a big

222
00:11:38,290 --> 00:11:36,410
hurry it's like two strong guys shaking

223
00:11:40,900 --> 00:11:38,300
their your chair as hard as they can and

224
00:11:43,780 --> 00:11:40,910
it's it's pretty amazing now you're

225
00:11:45,400 --> 00:11:43,790
working on future human spacecraft tell

226
00:11:47,860 --> 00:11:45,410
me a little bit about that involvement

227
00:11:49,870 --> 00:11:47,870
so I'm working on the cockpit for the

228
00:11:52,270 --> 00:11:49,880
Orion spacecraft that is going to be the

229
00:11:54,760 --> 00:11:52,280
backbone the main transportation device

230
00:11:56,290 --> 00:11:54,770
to get people off to the moon to lunar

231
00:11:58,240 --> 00:11:56,300
vicinity and then bring them back safely

232
00:12:00,160 --> 00:11:58,250
to earth and I'm working on the displays

233
00:12:02,080 --> 00:12:00,170
and the controls that the crew are going

234
00:12:04,390 --> 00:12:02,090
to use to see how their systems are

235
00:12:07,330 --> 00:12:04,400
doing guide that vehicle and fly it

236
00:12:09,010 --> 00:12:07,340
so it's up to me and the folks I work

237
00:12:10,240 --> 00:12:09,020
with to make sure that the crews getting

238
00:12:11,830 --> 00:12:10,250

all the information they need and that

239
00:12:13,120 --> 00:12:11,840
the commands they send out go correctly

240
00:12:15,130 --> 00:12:13,130
to the vehicle well that is exciting

241
00:12:17,620 --> 00:12:15,140
work and Stan thank you so much for

242
00:12:18,610 --> 00:12:17,630
joining us all right send it back over

243
00:12:20,800 --> 00:12:18,620
to you Murray

244
00:12:22,600 --> 00:12:20,810
all right thanks Darrell and Stan and

245
00:12:24,910 --> 00:12:22,610
thank you we'll be hearing more from

246
00:12:27,370 --> 00:12:24,920
current and former astronauts throughout

247
00:12:30,010 --> 00:12:27,380
this program including Buzz Aldrin and

248
00:12:32,320 --> 00:12:30,020
Michael Collins from Apollo 11 and other

249
00:12:34,329 --> 00:12:32,330
Apollo astronauts as well now let's head

250
00:12:39,040 --> 00:12:34,339
over to Houston and Apollo's famous

251
00:12:41,050 --> 00:12:39,050
Mission Control from the historic

252
00:12:43,240 --> 00:12:41,060
Mission Control Center NASA conducted

253
00:12:46,240 --> 00:12:43,250
some of its most legendary space

254
00:12:48,760 --> 00:12:46,250
missions the first u.s. spacewalk the

255
00:12:50,940 --> 00:12:48,770
Apollo moon landings and even the dawn

256
00:12:56,019 --> 00:12:50,950
of the Space Shuttle era of exploration

257
00:12:58,120 --> 00:12:56,029
in this room from 1965 until 1992 flight

258
00:13:00,510 --> 00:12:58,130
controllers monitored every aspect of

259
00:13:02,890 --> 00:13:00,520
the mission power navigation

260
00:13:05,110 --> 00:13:02,900
communications and even the health of

261
00:13:06,820 --> 00:13:05,120
the astronauts with all that happened

262
00:13:09,730 --> 00:13:06,830
here it's no wonder this flight control

263
00:13:13,120 --> 00:13:09,740

room was designated a National Historic

264
00:13:15,930 --> 00:13:13,130
Landmark but after years of inactivity

265
00:13:19,090 --> 00:13:15,940
the historic room fell into disrepair

266
00:13:21,940 --> 00:13:19,100
until a new mission was launched to save

267
00:13:24,820 --> 00:13:21,950
it a restoration effort set out to bring

268
00:13:26,560 --> 00:13:24,830
back every detail of the room as it

269
00:13:29,290 --> 00:13:26,570
would have been during the time of the

270
00:13:30,850 --> 00:13:29,300
Apollo moon landings this is kind of the

271
00:13:34,210 --> 00:13:30,860
crowning achievement that happened

272
00:13:36,940 --> 00:13:34,220
during in 1969 and so for us to recreate

273
00:13:38,920 --> 00:13:36,950
that and get that feel and to honor that

274
00:13:41,079 --> 00:13:38,930
time and that success that was really

275
00:13:42,790 --> 00:13:41,089
important to us finding the original

276
00:13:44,650 --> 00:13:42,800
wallpaper and then recreating that

277
00:13:47,110 --> 00:13:44,660
finding the original carpet and

278
00:13:49,390 --> 00:13:47,120
recreating out and then just getting the

279
00:13:50,860 --> 00:13:49,400
seats restored and put back together and

280
00:13:52,840 --> 00:13:50,870
then just all the little details you

281
00:13:54,670 --> 00:13:52,850
know what was on the consoles what was

282
00:13:57,160 --> 00:13:54,680
particular to that flight controller so

283
00:13:59,470 --> 00:13:57,170
it's very personalized so it's very

284
00:14:01,269 --> 00:13:59,480
historically accurate the work has

285
00:14:02,920 --> 00:14:01,279
brought the room back to life

286
00:14:05,470 --> 00:14:02,930
capturing a moment

287
00:14:08,050 --> 00:14:05,480
time for flight director Gene Kranz the

288
00:14:12,400 --> 00:14:08,060

effort goes beyond switches and monitors

289
00:14:14,019 --> 00:14:12,410
this room has a has an aura to it but

290
00:14:16,329 --> 00:14:14,029
people have worked here they've lived

291
00:14:18,880 --> 00:14:16,339
there they made the decisions there each

292
00:14:22,210 --> 00:14:18,890
one of these controllers basically left

293
00:14:25,389 --> 00:14:22,220
a legacy here in the restoration I think

294
00:14:32,790 --> 00:14:25,399
that recognizes the work done in Mission

295
00:14:37,750 --> 00:14:35,650
I'm Garrett Jordon in that historic

296
00:14:39,190 --> 00:14:37,760
Mission Control and with me is Gene

297
00:14:41,320 --> 00:14:39,200
Kranz one of the flight directors of

298
00:14:43,150 --> 00:14:41,330
Apollo 11 who you just heard he's at the

299
00:14:45,519 --> 00:14:43,160
very same console he was at fifty years

300
00:14:47,560 --> 00:14:45,529
ago when Eagle landed on the moon we

301
00:14:49,269 --> 00:14:47,570
also have Charlie Duke the Capcom the

302
00:14:52,449 --> 00:14:49,279
capsule communicator coming right from

303
00:14:53,949 --> 00:14:52,459
his console when Apollo 11 landed he was

304
00:14:55,329 --> 00:14:53,959
the voice between the teams here in the

305
00:14:57,130 --> 00:14:55,339
room and the astronauts of the historic

306
00:14:58,960 --> 00:14:57,140
mission later walked on the moon himself

307
00:15:01,690 --> 00:14:58,970
during Apollo 16 gentlemen it's pleasure

308
00:15:05,110 --> 00:15:01,700
to have you both here thank you

309
00:15:07,300 --> 00:15:05,120
very cool Charlie your famous words back

310
00:15:08,920 --> 00:15:07,310
to Neil I believe part of that quote was

311
00:15:12,070 --> 00:15:08,930
you got a bunch of guys about the term

312
00:15:13,510 --> 00:15:12,080
blue we're redoing it yeah so this was

313
00:15:15,790 --> 00:15:13,520

coming right after Neil Armstrong

314
00:15:17,050 --> 00:15:15,800
confirmed that the eagle has landed how

315
00:15:17,949 --> 00:15:17,060
did it feel to hear that hear those

316
00:15:20,769 --> 00:15:17,959
words from the moon

317
00:15:22,000 --> 00:15:20,779
well very exciting very close we were

318
00:15:24,699 --> 00:15:22,010
almost out of gas

319
00:15:26,470 --> 00:15:24,709
and so The Heretic contact engine

320
00:15:29,680 --> 00:15:26,480
stopped we did was a great relief

321
00:15:32,079 --> 00:15:29,690
contention was really high that's right

322
00:15:34,000 --> 00:15:32,089
that gene that conversation followed one

323
00:15:35,590 --> 00:15:34,010
of the densest parts of the entire

324
00:15:37,960 --> 00:15:35,600
mission really the powered descent of

325
00:15:40,150 --> 00:15:37,970
Eagle down to the surface of the Moon

326
00:15:42,250 --> 00:15:40,160
the flight control was here seems so

327
00:15:44,530 --> 00:15:42,260
calm how did they stay that way and so

328
00:15:46,720 --> 00:15:44,540
focused during that tense time that's a

329
00:15:48,340 --> 00:15:46,730
process of training room discipline the

330
00:15:50,530 --> 00:15:48,350
basically these are consummate

331
00:15:52,390 --> 00:15:50,540
professionals of the very early age they

332
00:15:54,190 --> 00:15:52,400
learn the discipline necessary to

333
00:15:56,500 --> 00:15:54,200
accomplish difficult tasks that's right

334
00:15:59,130 --> 00:15:56,510
there's not a lot of celebrating in this

335
00:16:03,490 --> 00:15:59,140
room right after they landed right so

336
00:16:05,170 --> 00:16:03,500
Charlie why not well first off we had to

337
00:16:07,540 --> 00:16:05,180
make sure that the lunar module was

338
00:16:10,090 --> 00:16:07,550

secure that you sprung a leak when you

339
00:16:12,579 --> 00:16:10,100
touchdown or battery dropped off or a

340
00:16:16,030 --> 00:16:12,589
lot of things could happen you had to be

341
00:16:17,550 --> 00:16:16,040
ready to lift off so we stayed Jean got

342
00:16:20,290 --> 00:16:17,560
us all back to

343
00:16:24,220 --> 00:16:20,300
attention after a few little smiles and

344
00:16:28,330 --> 00:16:24,230
said we go 41 and so we had a set time

345
00:16:31,600 --> 00:16:28,340
t1 t2 t3 and I don't remember exactly

346
00:16:33,370 --> 00:16:31,610
how long those were but we were focused

347
00:16:36,610 --> 00:16:33,380
on making sure this lunar module was

348
00:16:39,100 --> 00:16:36,620
safe and secure and ready to go if we

349
00:16:41,020 --> 00:16:39,110
had to liftoff that's right gene the

350
00:16:43,240 --> 00:16:41,030
flight controllers in this room were not

351
00:16:44,830 --> 00:16:43,250
much older than myself I'm about 27

352
00:16:46,420 --> 00:16:44,840
which i think is that about the average

353
00:16:48,400 --> 00:16:46,430
age of flight controllers tell me about

354
00:16:50,500 --> 00:16:48,410
the level of trust that was needed in

355
00:16:52,330 --> 00:16:50,510
the team to make that mission a reality

356
00:16:55,180 --> 00:16:52,340
basically it's trust that exists between

357
00:16:57,190 --> 00:16:55,190
myself and the team between my team and

358
00:16:59,380 --> 00:16:57,200
their stock we got and with a program

359
00:17:01,180 --> 00:16:59,390
office I think Trust is essential

360
00:17:03,130 --> 00:17:01,190
commodity for successful manned

361
00:17:04,900 --> 00:17:03,140
spaceflight and I think one of the

362
00:17:07,150 --> 00:17:04,910
things that Charlie mentioned here was

363
00:17:10,000 --> 00:17:07,160

the t3 stay no stay yeah we had to wait

364
00:17:11,530 --> 00:17:10,010
two hours to join the celebration but

365
00:17:13,809 --> 00:17:11,540
the rest of the world we're on the

366
00:17:16,210 --> 00:17:13,819
console doing our job two hours after

367
00:17:19,150 --> 00:17:16,220
landing we could celebrate all right now

368
00:17:20,949 --> 00:17:19,160
charlie when those those first steps of

369
00:17:24,370 --> 00:17:20,959
Neil Armstrong on the moon and those

370
00:17:26,350 --> 00:17:24,380
famous words he said for all mankind did

371
00:17:27,880 --> 00:17:26,360
you get to celebrate immediately or when

372
00:17:29,860 --> 00:17:27,890
it when it actually hit you the

373
00:17:33,490 --> 00:17:29,870
significance of the accomplishment well

374
00:17:35,800 --> 00:17:33,500
after we we were off duty after t3 and

375
00:17:37,360 --> 00:17:35,810
we went to a press conference if I

376
00:17:39,610 --> 00:17:37,370
remember we went and celebrated with a

377
00:17:42,670 --> 00:17:39,620
few beers at that point and then I went

378
00:17:44,860 --> 00:17:42,680
home and was with my family watching it

379
00:17:47,530 --> 00:17:44,870
on TV as he stepped took those first

380
00:17:50,530 --> 00:17:47,540
steps out and then it hit me about we

381
00:17:53,350 --> 00:17:50,540
were on the moon well I hope we get to

382
00:17:56,350 --> 00:17:53,360
have that feeling once again do we have

383
00:17:57,910 --> 00:17:56,360
just a c'mere here joining us now she's

384
00:17:59,890 --> 00:17:57,920
an astronaut such a launch to the

385
00:18:02,200 --> 00:17:59,900
International Space Station here in just

386
00:18:04,600 --> 00:18:02,210
a few short months she was selected as

387
00:18:05,590 --> 00:18:04,610
an astronaut in 2013 and Jessica you're

388
00:18:07,600 --> 00:18:05,600

going through some training right now

389
00:18:09,100 --> 00:18:07,610
for a long-duration stay aboard the

390
00:18:11,140 --> 00:18:09,110
International Space Station just about

391
00:18:13,180 --> 00:18:11,150
six months that's actually more time

392
00:18:14,920 --> 00:18:13,190
than all the Apollo missions combined

393
00:18:17,380 --> 00:18:14,930
tell me what you're gonna be doing on

394
00:18:18,880 --> 00:18:17,390
the International Space Station how is

395
00:18:20,800 --> 00:18:18,890
that going to help us for our future

396
00:18:22,810 --> 00:18:20,810
missions going back to the moon and on

397
00:18:24,460 --> 00:18:22,820
to Mars so I'll be up there for

398
00:18:26,230 --> 00:18:24,470
six-month mission as you mentioned and

399
00:18:28,180 --> 00:18:26,240
really the Space Station is a

400
00:18:30,250 --> 00:18:28,190
world-class laboratory right now it's a

401
00:18:30,820 --> 00:18:30,260
US National Lab and of course we are

402
00:18:32,259 --> 00:18:30,830
working with

403
00:18:34,539 --> 00:18:32,269
all of our international partners as

404
00:18:36,430 --> 00:18:34,549
well the Russian Space Agency the

405
00:18:38,769 --> 00:18:36,440
Canadian Japanese and European Space

406
00:18:40,659 --> 00:18:38,779
Agency's so we are conducting all kinds

407
00:18:42,730 --> 00:18:40,669
of sin tight scientific investigations

408
00:18:44,529 --> 00:18:42,740
and technology demonstrations that are

409
00:18:46,539 --> 00:18:44,539
really critical toward our path for

410
00:18:48,220 --> 00:18:46,549
future exploration so just to name a few

411
00:18:50,080 --> 00:18:48,230
for example of course we need to

412
00:18:52,090 --> 00:18:50,090
understand how space flight and the

413
00:18:54,310 --> 00:18:52,100

microgravity environment affect us and

414
00:18:57,669 --> 00:18:54,320
our human our bodies and our physiology

415
00:18:59,380 --> 00:18:57,679
so we have decades of research now from

416
00:19:00,789 --> 00:18:59,390
all of this scientific research that

417
00:19:03,039 --> 00:19:00,799
we've been conducting on the space

418
00:19:04,690 --> 00:19:03,049
station and then the programs before we

419
00:19:06,759 --> 00:19:04,700
know a lot how to maintain our muscle

420
00:19:08,590 --> 00:19:06,769
mass and maintain our bone density we

421
00:19:10,600 --> 00:19:08,600
have a few hot topics right now really

422
00:19:12,789 --> 00:19:10,610
the the vision our vision and the health

423
00:19:14,740 --> 00:19:12,799
of our eyes also what's happening to our

424
00:19:16,210 --> 00:19:14,750
blood vessels looking at our carotid

425
00:19:18,490 --> 00:19:16,220
arteries and some changes that we're

426
00:19:20,590 --> 00:19:18,500
actually seeing in astronauts that are

427
00:19:23,289 --> 00:19:20,600
very similar to the process of aging so

428
00:19:25,060 --> 00:19:23,299
we need to really better understand what

429
00:19:27,279 --> 00:19:25,070
is happening here to make sure that we

430
00:19:28,779 --> 00:19:27,289
can get astronauts safely to their

431
00:19:30,340 --> 00:19:28,789
destination and make sure of course that

432
00:19:32,379 --> 00:19:30,350
we can bring them safely back there and

433
00:19:35,049 --> 00:19:32,389
you'll get to do that firsthand as an

434
00:19:36,820 --> 00:19:35,059
astronaut now as I know it actually

435
00:19:38,080 --> 00:19:36,830
Charlie Duke here actually inspired you

436
00:19:40,269 --> 00:19:38,090
to become an astronaut in the first

437
00:19:42,279 --> 00:19:40,279
place yeah he actually was the very

438
00:19:44,409 --> 00:19:42,289

first astronaut I ever met so it is

439
00:19:45,700 --> 00:19:44,419
pretty amazing it's really an incredible

440
00:19:47,919 --> 00:19:45,710
experience to be standing in this room

441
00:19:49,690 --> 00:19:47,929
with these two people when I was in high

442
00:19:51,549 --> 00:19:49,700
school Charlie was speaking at the

443
00:19:53,950 --> 00:19:51,559
neighboring town I grew up in a really

444
00:19:55,389 --> 00:19:53,960
small town in northern Maine and we did

445
00:19:56,740 --> 00:19:55,399
not have a lot of astronauts coming

446
00:19:58,930 --> 00:19:56,750
through I'd never met anybody that

447
00:20:00,700 --> 00:19:58,940
worked at NASA or an astronaut so I went

448
00:20:04,210 --> 00:20:00,710
to hear him talk and I'm sure he doesn't

449
00:20:05,919 --> 00:20:04,220
remember this but he I did talk to him

450
00:20:07,509 --> 00:20:05,929
afterward he gave me his card I told him

451
00:20:09,850 --> 00:20:07,519
that my dream was to become an astronaut

452
00:20:11,350 --> 00:20:09,860
like him and I wrote him a letter and I

453
00:20:12,940 --> 00:20:11,360
thought you know he's so busy I'm sure

454
00:20:15,039 --> 00:20:12,950
he gets lots of these but he did

455
00:20:16,840 --> 00:20:15,049
actually write back to me and this is

456
00:20:19,000 --> 00:20:16,850
the actual letter I found it when I

457
00:20:21,100 --> 00:20:19,010
moved a couple years ago this is the

458
00:20:23,919 --> 00:20:21,110
letter that you wrote to me back in 1996

459
00:20:25,930 --> 00:20:23,929
when I was a freshman in college so

460
00:20:27,490 --> 00:20:25,940
maybe that'll jog your memory but thank

461
00:20:29,169 --> 00:20:27,500
you so much for doing that it really

462
00:20:32,440 --> 00:20:29,179
really was inspiring and it does make a

463
00:20:34,830 --> 00:20:32,450

difference thank you yes always good to

464
00:20:38,480 --> 00:20:34,840
expose somebody inspire somebody like

465
00:20:42,149 --> 00:20:38,490
what's typewritten I love that all right

466
00:20:43,950 --> 00:20:42,159
now a gene when we're thinking about our

467
00:20:46,049 --> 00:20:43,960
future missions you use the phrase tough

468
00:20:47,999 --> 00:20:46,059
and competent thinking about inspiring

469
00:20:49,799 --> 00:20:48,009
those next generations do you think

470
00:20:50,879 --> 00:20:49,809
those same values will apply to the

471
00:20:52,919 --> 00:20:50,889
folks that are gonna carry us to

472
00:20:54,869 --> 00:20:52,929
business okay well because a tough and

473
00:20:56,960 --> 00:20:54,879
confident really address the

474
00:20:59,129 --> 00:20:56,970
accountability of a Mission Control team

475
00:21:01,710 --> 00:20:59,139
basically to take the actions necessary

476
00:21:03,749 --> 00:21:01,720
to protect the crew and accomplish the

477
00:21:05,519 --> 00:21:03,759
mission tough meetings that you're

478
00:21:07,919 --> 00:21:05,529
forever accountable for what you do and

479
00:21:10,529 --> 00:21:07,929
this was done after the Apollo 1 what we

480
00:21:12,450 --> 00:21:10,539
fails to do confident was ever in never

481
00:21:14,639 --> 00:21:12,460
again take anything for granted we'll

482
00:21:18,060 --> 00:21:14,649
never stop learning from now that teams

483
00:21:19,739 --> 00:21:18,070
and Mission Control will be perfect no

484
00:21:21,450 --> 00:21:19,749
Charlie what can astronauts today like

485
00:21:24,649 --> 00:21:21,460
Jessica do to inspire the next

486
00:21:27,480 --> 00:21:24,659
generation well I think what she said

487
00:21:29,249 --> 00:21:27,490
just her performance and what she's

488
00:21:35,580 --> 00:21:29,259

doing and being out there being able to

489
00:21:40,590 --> 00:21:35,590
before the public and and just telling

490
00:21:42,269 --> 00:21:40,600
her story writing a letter so all right

491
00:21:44,519 --> 00:21:42,279
well thanks to all three of you for

492
00:21:46,889 --> 00:21:44,529
taking the time to be with us here today

493
00:21:47,580 --> 00:21:46,899
in the historic Apollo Mission Control

494
00:21:49,680 --> 00:21:47,590
in Houston

495
00:21:52,139 --> 00:21:49,690
NASA's giant leaps continues at

496
00:21:54,090 --> 00:21:52,149
Wapakoneta Ohio the hometown of Neil

497
00:21:56,190 --> 00:21:54,100
Armstrong we'll go there in a moment but

498
00:21:59,399 --> 00:21:56,200
first some thoughts about explorers from

499
00:22:01,139 --> 00:21:59,409
a different kind of rocket man they want

500
00:22:03,210 --> 00:22:01,149
adventure and I really admire those kind

501
00:22:05,190 --> 00:22:03,220
of people they they're so brave and

502
00:22:06,830 --> 00:22:05,200
intrepid they're pioneers and you know

503
00:22:09,509 --> 00:22:06,840
without Christopher Columbus Magellan

504
00:22:12,509 --> 00:22:09,519
Marco Polo we wouldn't know Sir Francis

505
00:22:19,759 --> 00:22:12,519
Drake all those kind of people the world

506
00:22:26,490 --> 00:22:24,149
and welcome to Wapakoneta Ohio which is

507
00:22:29,639 --> 00:22:26,500
proud to be the hometown of Neil

508
00:22:32,880 --> 00:22:29,649
Armstrong I'm ty Bateman an anchor with

509
00:22:34,830 --> 00:22:32,890
hometown stations in Lima Ohio and we

510
00:22:36,960 --> 00:22:34,840
are located at the Armstrong Air and

511
00:22:39,180 --> 00:22:36,970
Space Museum which is about an hour

512
00:22:42,029 --> 00:22:39,190
north of Dayton Ohio

513
00:22:43,980 --> 00:22:42,039

now that of course is the home of the

514
00:22:47,879 --> 00:22:43,990
Wright brothers who invented power

515
00:22:50,100 --> 00:22:47,889
flight more than 115 years ago now Ohio

516
00:22:53,159 --> 00:22:50,110
is also the home of NASA's Glenn

517
00:22:55,830 --> 00:22:53,169
Research Center named for another space

518
00:22:58,019 --> 00:22:55,840
pioneer John Glenn and we are in the

519
00:23:00,480 --> 00:22:58,029
midst of the summer moon Festival which

520
00:23:04,409 --> 00:23:00,490
is an annual celebration of the Apollo

521
00:23:08,310 --> 00:23:04,419
moon landing and right now we actually

522
00:23:11,820 --> 00:23:08,320
have one of our 25 astronauts who hail

523
00:23:14,850 --> 00:23:11,830
from Ohio and is also a native of

524
00:23:17,159 --> 00:23:14,860
Cleveland and a veteran of four Space

525
00:23:18,629 --> 00:23:17,169
Shuttle missions Don Thomas thank you so

526
00:23:20,519 --> 00:23:18,639
much for being with us hi it's great to

527
00:23:23,340 --> 00:23:20,529
be here today well let's get right into

528
00:23:25,889 --> 00:23:23,350
it Don you of course have been inspired

529
00:23:27,509 --> 00:23:25,899
by so many astronauts but how did Neil

530
00:23:29,340 --> 00:23:27,519
Armstrong and the other Apollo

531
00:23:32,129 --> 00:23:29,350
astronauts inspire you you know it was

532
00:23:33,899 --> 00:23:32,139
the first astronauts launching in 1961

533
00:23:35,940 --> 00:23:33,909
that first inspired me to be an

534
00:23:38,039 --> 00:23:35,950
astronaut I watched their launch on a

535
00:23:38,490 --> 00:23:38,049
small TV and I just said I want to do

536
00:23:40,680 --> 00:23:38,500
that

537
00:23:42,450 --> 00:23:40,690
and so all the early astronauts John

538
00:23:44,730 --> 00:23:42,460

Glenn ed white who did the first

539
00:23:47,759 --> 00:23:44,740
spacewalk and then Neil Armstrong they

540
00:23:50,399 --> 00:23:47,769
were huge influences on my career well

541
00:23:53,580 --> 00:23:50,409
done that's awesome so you watched the

542
00:23:55,860 --> 00:23:53,590
Apollo 11 launch on TV and I understand

543
00:23:57,539 --> 00:23:55,870
that you also invited Neil Armstrong to

544
00:23:59,490 --> 00:23:57,549
watch one of your launches I did you

545
00:24:01,350 --> 00:23:59,500
know we're allowed to invite a few VIPs

546
00:24:03,600 --> 00:24:01,360
to our launches and I wrote Neil

547
00:24:05,610 --> 00:24:03,610
Armstrong a letter said I was one of the

548
00:24:08,340 --> 00:24:05,620
Ohio astronauts I told him he was one of

549
00:24:09,990 --> 00:24:08,350
my heroes as a young boy and I invited

550
00:24:11,639 --> 00:24:10,000
him to come to the launch he wrote back

551
00:24:13,560 --> 00:24:11,649
said I'll be there and I was like wow

552
00:24:15,509 --> 00:24:13,570
Neil Armstrong's coming to my launch I

553
00:24:17,909 --> 00:24:15,519
was so excited and it was the day before

554
00:24:19,620 --> 00:24:17,919
launch I got a call from NASA management

555
00:24:21,090 --> 00:24:19,630
down at the Kennedy Space Center and

556
00:24:23,580 --> 00:24:21,100
they said mr. Armstrong wanted to meet

557
00:24:25,560 --> 00:24:23,590
with me so my wife and I Neil Armstrong

558
00:24:27,029 --> 00:24:25,570
and his wife Carol we got to spend about

559
00:24:28,200 --> 00:24:27,039
an hour together in the crew quarters

560
00:24:30,420 --> 00:24:28,210
just

561
00:24:32,580 --> 00:24:30,430
and I'm showing him around and at the

562
00:24:34,170 --> 00:24:32,590
end of our hour I had a great moment I

563
00:24:36,150 --> 00:24:34,180

was shaking his hand saying thank you

564
00:24:37,620 --> 00:24:36,160
for being here I really appreciate you

565
00:24:39,510 --> 00:24:37,630
coming to the launch and I asked him how

566
00:24:40,950 --> 00:24:39,520
long are you staying in town for meaning

567
00:24:42,960 --> 00:24:40,960
how long are you gonna be in Florida for

568
00:24:44,520 --> 00:24:42,970
and he looking right back in the eye he

569
00:24:46,140 --> 00:24:44,530
said how long are you in town for

570
00:24:48,300 --> 00:24:46,150
meaning I'm gonna stay here until you

571
00:24:50,520 --> 00:24:48,310
launch and we launched right on time the

572
00:24:51,930 --> 00:24:50,530
next day and it was a thrill of my life

573
00:24:54,060 --> 00:24:51,940
to have him there for the launch

574
00:24:56,460 --> 00:24:54,070
incredible Don thank you for those

575
00:24:59,760 --> 00:24:56,470
memories well let's take a look back at

576
00:25:01,800 --> 00:24:59,770
Neil Armstrong the man Neil Armstrong

577
00:25:04,350 --> 00:25:01,810
was born in his grandparents farm house

578
00:25:06,690 --> 00:25:04,360
on the outskirts of Wapakoneta we sat

579
00:25:08,190 --> 00:25:06,700
down with Neil's brother and sister and

580
00:25:11,040 --> 00:25:08,200
asked them to share some personal

581
00:25:15,600 --> 00:25:11,050
memories of their famous brother he was

582
00:25:18,360 --> 00:25:15,610
very good at telling jokes and accent in

583
00:25:21,360 --> 00:25:18,370
the accent a Scottish Scottish accent

584
00:25:23,790 --> 00:25:21,370
right and a little bit of German

585
00:25:26,280 --> 00:25:23,800
sometimes also but depending on what

586
00:25:29,250 --> 00:25:26,290
story was telling but he was good at it

587
00:25:31,770 --> 00:25:29,260
because he tells the story and he has

588
00:25:35,700 --> 00:25:31,780

this you know just a little bit of smile

589
00:25:39,420 --> 00:25:35,710
on his face and then everybody laughs

590
00:25:43,620 --> 00:25:39,430
and he laughs because he thought it was

591
00:25:49,950 --> 00:25:43,630
funny too the legacy hasn't yet been

592
00:25:53,490 --> 00:25:49,960
determined in science the doors are

593
00:25:58,920 --> 00:25:53,500
still so wide open and I really feel

594
00:26:02,100 --> 00:25:58,930
like that it helped inspire the

595
00:26:05,520 --> 00:26:02,110
technical aspect of this country you

596
00:26:08,940 --> 00:26:05,530
know we had many big technical

597
00:26:12,380 --> 00:26:08,950
breakthroughs with the program NASA

598
00:26:14,090 --> 00:26:12,390
programming and now you can see that

599
00:26:18,070 --> 00:26:14,100
continuing

600
00:26:21,440 --> 00:26:18,080
I think my dad would be very pleased

601
00:26:24,130 --> 00:26:21,450
with where we are now because we are on

602
00:26:27,140 --> 00:26:24,140
the cusp of another age of exploration

603
00:26:29,480 --> 00:26:27,150
taking those next steps going back to

604
00:26:31,910 --> 00:26:29,490
the moon because that's the place where

605
00:26:35,270 --> 00:26:31,920
we can learn the things that we need

606
00:26:39,590 --> 00:26:35,280
when we go beyond if we can remind

607
00:26:41,960 --> 00:26:39,600
everyone of how the world was uplifted

608
00:26:45,200 --> 00:26:41,970
by the Apollo program and by these

609
00:26:48,080 --> 00:26:45,210
endeavors I think that we have a good

610
00:26:50,060 --> 00:26:48,090
chance of staying the course and

611
00:26:53,660 --> 00:26:50,070
continuing that exploration forward

612
00:26:56,000 --> 00:26:53,670
being an astronaut was our father's way

613
00:26:58,460 --> 00:26:56,010

of life that was dad's job and and we

614
00:26:59,690 --> 00:26:58,470
were all supportive and excited the

615
00:27:01,910 --> 00:26:59,700
astronauts the guys when they were up

616
00:27:04,040 --> 00:27:01,920
there they they the last thing they

617
00:27:06,710 --> 00:27:04,050
wanted to do was to worry about what was

618
00:27:09,200 --> 00:27:06,720
happening at home I think the wives just

619
00:27:10,520 --> 00:27:09,210
tried to make sure that the family

620
00:27:13,850 --> 00:27:10,530
wasn't one of those things that they

621
00:27:16,120 --> 00:27:13,860
they had in their checklist of of things

622
00:27:19,910 --> 00:27:16,130
to be concerned about the Apollo program

623
00:27:24,320 --> 00:27:19,920
inspired a generation to want to be

624
00:27:26,870 --> 00:27:24,330
better to want to work hard apply

625
00:27:29,600 --> 00:27:26,880
themselves and pursue their dreams

626
00:27:32,240 --> 00:27:29,610
because Apollo made it clear that dreams

627
00:27:35,780 --> 00:27:32,250
were possible and I think that made the

628
00:27:37,430 --> 00:27:35,790
world a better place now as you drive

629
00:27:39,590 --> 00:27:37,440
through town or stroll down the

630
00:27:42,830 --> 00:27:39,600
sidewalks you'll see just how over the

631
00:27:45,170 --> 00:27:42,840
moon everyone is in Wapakoneta more than

632
00:27:48,080 --> 00:27:45,180
a dozen restaurants are offering special

633
00:27:51,680 --> 00:27:48,090
moon themed items such as cinnamon

634
00:27:56,030 --> 00:27:51,690
pancakes and a Buckeye on the moon

635
00:28:00,080 --> 00:27:56,040
Sunday it seems every shop is selling

636
00:28:04,790 --> 00:28:00,090
first on the moon merchandise souvenirs

637
00:28:08,420 --> 00:28:04,800
and memorabilia and history is all

638
00:28:10,580 --> 00:28:08,430

around us it's a part of history that I

639
00:28:13,700 --> 00:28:10,590
want to be able to say that I helped to

640
00:28:16,760 --> 00:28:13,710
preserve it's not so much you know what

641
00:28:19,130 --> 00:28:16,770
was it like when he lived here for me

642
00:28:20,510 --> 00:28:19,140
personally but to be able to preserve

643
00:28:23,360 --> 00:28:20,520
part of history

644
00:28:24,900 --> 00:28:23,370
and keep it intact for future

645
00:28:28,870 --> 00:28:24,910
generations

646
00:28:31,840 --> 00:28:28,880
and with me now is Dante Centauri with

647
00:28:33,280 --> 00:28:31,850
the Armstrong Museum Dante welcome so

648
00:28:34,330 --> 00:28:33,290
let's get straight into it tell me a

649
00:28:35,890 --> 00:28:34,340
little bit about what people can

650
00:28:37,900 --> 00:28:35,900
experience if they were to visit the

651
00:28:39,670 --> 00:28:37,910
museum sure well the Armstrong Guerin

652
00:28:43,120 --> 00:28:39,680
Space Museum opened three years to the

653
00:28:44,710 --> 00:28:43,130
day after Apollo 11 landed in 1972 we

654
00:28:46,570 --> 00:28:44,720
have artifacts from Neil Armstrong's

655
00:28:48,010 --> 00:28:46,580
early life and career the airplane he

656
00:28:49,660 --> 00:28:48,020
learned to fly in right next to the

657
00:28:52,120 --> 00:28:49,670
Gemini 8 capsule and he flew his first

658
00:28:54,910 --> 00:28:52,130
spaceflight in as well as the Apollo

659
00:28:57,820 --> 00:28:54,920
backup suit from Apollo 11 actual suit

660
00:28:59,350 --> 00:28:57,830
that was part of his mission and to top

661
00:29:01,780 --> 00:28:59,360
it all off we also have a moon rock

662
00:29:03,330 --> 00:29:01,790
collected from Apollo 11 collected by

663
00:29:05,980 --> 00:29:03,340

Neil Armstrong himself on that mission

664
00:29:08,350 --> 00:29:05,990
awesome now how does it feel for you to

665
00:29:09,670 --> 00:29:08,360
be entrusted with preserving the legacy

666
00:29:12,760 --> 00:29:09,680
of an American Hero

667
00:29:14,380 --> 00:29:12,770
well it's very humbling but the best

668
00:29:16,840 --> 00:29:14,390
part here is there's a tremendous team

669
00:29:18,550 --> 00:29:16,850
there's staff the the board everyone

670
00:29:21,400 --> 00:29:18,560
supports in the community is such a

671
00:29:23,440 --> 00:29:21,410
wonderful support for the museum and and

672
00:29:26,200 --> 00:29:23,450
Neil Armstrong's legacy right here in

673
00:29:27,940 --> 00:29:26,210
Wapakoneta right Dante thank you so much

674
00:29:30,310 --> 00:29:27,950
thank you and now I would like to

675
00:29:33,670 --> 00:29:30,320
welcome Sonny Williams another Ohio

676
00:29:36,190 --> 00:29:33,680
astronaut she's a native of Euclid and a

677
00:29:39,280 --> 00:29:36,200
veteran of two Space Station missions

678
00:29:41,020 --> 00:29:39,290
including seven spacewalks welcome sunny

679
00:29:43,210 --> 00:29:41,030
hi ty it's great to be here in my pack

680
00:29:45,400 --> 00:29:43,220
Aneta yes it's awesome here so how does

681
00:29:48,670 --> 00:29:45,410
research aboard the International Space

682
00:29:51,100 --> 00:29:48,680
Station help us expand exploration not

683
00:29:53,890 --> 00:29:51,110
only on the moon but also later getting

684
00:29:55,750 --> 00:29:53,900
to Mars right so I've had the luxury of

685
00:29:57,490 --> 00:29:55,760
being on the space station two times and

686
00:29:59,430 --> 00:29:57,500
I've seen we we're doing all sorts of

687
00:30:01,630 --> 00:29:59,440
experiments on propulsion systems

688
00:30:03,610 --> 00:30:01,640

life-support systems even spacesuit

689
00:30:05,230 --> 00:30:03,620
systems that will help us on our next

690
00:30:07,390 --> 00:30:05,240
endeavors back to the moon and even

691
00:30:10,600 --> 00:30:07,400
further out of ler low-earth orbit

692
00:30:13,120 --> 00:30:10,610
beyond into Mars well you're also set to

693
00:30:15,010 --> 00:30:13,130
return to space on one of NASA's

694
00:30:15,700 --> 00:30:15,020
upcoming Commercial Crew missions tell

695
00:30:17,920 --> 00:30:15,710
me more about that

696
00:30:20,590 --> 00:30:17,930
yeah I'm scheduled to be on one of the

697
00:30:21,940 --> 00:30:20,600
first Boeing Starliner flights to go to

698
00:30:25,540 --> 00:30:21,950
the International Space Station

699
00:30:27,160 --> 00:30:25,550
along with SpaceX is gret Dragon 2 which

700
00:30:29,470 --> 00:30:27,170
will take some of our colleagues up to

701
00:30:31,240 --> 00:30:29,480
the space station and this contract to

702
00:30:33,160 --> 00:30:31,250
allow these other companies to be able

703
00:30:35,320 --> 00:30:33,170
to take people up will allow NASA to

704
00:30:36,770 --> 00:30:35,330
refocus on getting out of low Earth

705
00:30:38,360 --> 00:30:36,780
orbit back to the moon and

706
00:30:40,310 --> 00:30:38,370
potentially onto Mars for the next

707
00:30:41,990 --> 00:30:40,320
generation so all of the work that's

708
00:30:43,940 --> 00:30:42,000
going on the International Space Station

709
00:30:46,250 --> 00:30:43,950
including these commercial companies

710
00:30:48,050 --> 00:30:46,260
will help us enable us to go further so

711
00:30:50,600 --> 00:30:48,060
are you scheduled to conduct any more

712
00:30:52,430 --> 00:30:50,610
spacewalks honey well you know the space

713
00:30:54,290 --> 00:30:52,440

station is about 20 years old it's like

714
00:30:57,110 --> 00:30:54,300
an old house and things need to be fixed

715
00:30:59,420 --> 00:30:57,120
and we're doing new things to add on to

716
00:31:00,830 --> 00:30:59,430
it so that's it's pretty probable and I

717
00:31:02,630 --> 00:31:00,840
would be looking forward to doing that

718
00:31:04,940 --> 00:31:02,640
all right sunny thank you for that and

719
00:31:11,420 --> 00:31:04,950
thanks from here in Wapakoneta let's

720
00:31:12,710 --> 00:31:11,430
head to DC thanks ty NASA and the

721
00:31:14,810 --> 00:31:12,720
Smithsonian National Air and Space

722
00:31:17,060 --> 00:31:14,820
Museum are hosting this celebration of

723
00:31:17,840 --> 00:31:17,070
the 50th anniversary of the first man on

724
00:31:19,580 --> 00:31:17,850
the moon

725
00:31:21,710 --> 00:31:19,590
we've a lot going on here right here on

726
00:31:24,140 --> 00:31:21,720
the mall there are tents highlighting

727
00:31:27,200 --> 00:31:24,150
both the Apollo program and today's moon

728
00:31:29,750 --> 00:31:27,210
to Mars plans Lego has an incredible

729
00:31:34,850 --> 00:31:29,760
Apollo 11 display that took days to

730
00:31:36,290 --> 00:31:34,860
build and Snoopy is here of course

731
00:31:38,840 --> 00:31:36,300
Snoopy was the name of the lunar module

732
00:31:41,690 --> 00:31:38,850
on Apollo 10 the dress rehearsal for the

733
00:31:43,640 --> 00:31:41,700
actual moon landing and as you've

734
00:31:45,200 --> 00:31:43,650
probably seen people in the National

735
00:31:47,360 --> 00:31:45,210
Mall have been wowed this week by a

736
00:31:50,420 --> 00:31:47,370
high-def projection of the Saturn 5

737
00:31:52,160 --> 00:31:50,430
rocket on the Washington Monument we'll

738
00:31:54,610 --> 00:31:52,170

actually be able to see a recreation of

739
00:31:57,200 --> 00:31:54,620
a launch here tonight and tomorrow night

740
00:32:01,550 --> 00:31:57,210
it really just gives you a sense of the

741
00:32:03,170 --> 00:32:01,560
scale of that massive rocket Apollo 11

742
00:32:05,300 --> 00:32:03,180
was the culmination of an incredible

743
00:32:08,630 --> 00:32:05,310
national effort but started with a

744
00:32:16,670 --> 00:32:08,640
promise from President John F Kennedy to

745
00:32:21,690 --> 00:32:19,590
we choose to go to the moon in this

746
00:32:24,480 --> 00:32:21,700
decade and do the other things not

747
00:32:27,390 --> 00:32:24,490
because they are easy but because they

748
00:32:29,790 --> 00:32:27,400
are hard at the direction of the

749
00:32:33,090 --> 00:32:29,800
President of the United States it is the

750
00:32:35,420 --> 00:32:33,100
stated policy of this administration and

751
00:32:38,640 --> 00:32:35,430
the United States of America to return

752
00:32:50,340 --> 00:32:38,650
American astronauts to the moon within

753
00:32:52,560 --> 00:32:50,350
the next five years so now NASA is

754
00:32:55,200 --> 00:32:52,570
facing another bold challenge and this

755
00:32:57,420 --> 00:32:55,210
time the ultimate goal isn't just JFK's

756
00:32:59,610 --> 00:32:57,430
goal of land on the moon and return

757
00:33:01,680 --> 00:32:59,620
safely to earth but establishing a

758
00:33:05,490 --> 00:33:01,690
sustainable presence on the moon and

759
00:33:06,420 --> 00:33:05,500
eventually heading off to Mars so we are

760
00:33:08,490 --> 00:33:06,430
going to be doing some interesting

761
00:33:09,720 --> 00:33:08,500
science when we're there and that's one

762
00:33:11,940 --> 00:33:09,730
of the really exciting things for

763
00:33:14,820 --> 00:33:11,950

example we will be able to look in the

764
00:33:17,070 --> 00:33:14,830
giant craters these deep craters in the

765
00:33:18,510 --> 00:33:17,080
southern pole region of the Moon their

766
00:33:19,920 --> 00:33:18,520
places down there that never gets

767
00:33:21,210 --> 00:33:19,930
sunlight and we think there's water

768
00:33:25,260 --> 00:33:21,220
there so we're gonna be going and

769
00:33:27,720 --> 00:33:25,270
checking that out now let's go to Adam

770
00:33:36,690 --> 00:33:27,730
Savage with astronaut Randy Bresnik

771
00:33:38,670 --> 00:33:36,700
inside the Air and Space Museum Randy

772
00:33:40,290 --> 00:33:38,680
you've flown the shuttle you've flown on

773
00:33:42,840 --> 00:33:40,300
the shuttle and spent time on the

774
00:33:45,000 --> 00:33:42,850
International Space Station I'm curious

775
00:33:47,250 --> 00:33:45,010
the first time you open the hatch to get

776
00:33:49,380 --> 00:33:47,260
on the ISS given all the training you

777
00:33:52,380 --> 00:33:49,390
had already had him till that point what

778
00:33:54,810 --> 00:33:52,390
what surprised you and what felt exactly

779
00:33:57,090 --> 00:33:54,820
like you expected it surprised me the

780
00:33:58,890 --> 00:33:57,100
most was the fact that there were some

781
00:34:00,690 --> 00:33:58,900
crew members on Space Station I hadn't

782
00:34:01,710 --> 00:34:00,700
met yet I had trained with you know they

783
00:34:04,170 --> 00:34:01,720
were up there doing the long-duration

784
00:34:05,340 --> 00:34:04,180
mission and so it turns out I have a

785
00:34:06,270 --> 00:34:05,350
callsign come from the Marine Corps

786
00:34:09,690 --> 00:34:06,280
being a fighter pilot

787
00:34:11,100 --> 00:34:09,700
it's comrade and so it was interesting

788
00:34:12,780 --> 00:34:11,110

we found the space station

789
00:34:14,160 --> 00:34:12,790
you know these Russian crew members who

790
00:34:17,670 --> 00:34:14,170
I had man who had been you know

791
00:34:21,350 --> 00:34:17,680
adversaries of my f-18 and Marika they

792
00:34:23,670 --> 00:34:21,360
here Michael hey comrade come over here

793
00:34:25,800 --> 00:34:23,680
well shock to me when they heard

794
00:34:27,720 --> 00:34:25,810
you know somebody used that in such a

795
00:34:29,970 --> 00:34:27,730
normal term home from the crew members

796
00:34:31,380 --> 00:34:29,980
but what was neat about it was even

797
00:34:33,900 --> 00:34:31,390
though these were folks are heading it

798
00:34:35,790 --> 00:34:33,910
all that flowed across the hatch and it

799
00:34:37,650 --> 00:34:35,800
was big bear hugs as if we were like

800
00:34:39,540 --> 00:34:37,660
long-lost family members who hadn't seen

801
00:34:42,150 --> 00:34:39,550
each other you know in a few weeks and

802
00:34:43,380 --> 00:34:42,160
we're just catching up and cook me in

803
00:34:44,880 --> 00:34:43,390
because I only had you know two and a

804
00:34:47,550 --> 00:34:44,890
half days three days on orbit at that

805
00:34:49,380 --> 00:34:47,560
point that here we are now the crew from

806
00:34:51,870 --> 00:34:49,390
Atlantis the crew those on station 12

807
00:34:53,880 --> 00:34:51,880
human beings in this magnificent

808
00:34:56,610 --> 00:34:53,890
orbiting laboratory 250 miles above the

809
00:34:57,840 --> 00:34:56,620
earth going 17,000 miles an hour and we

810
00:34:59,520 --> 00:34:57,850
were that was it that was all of

811
00:35:01,830 --> 00:34:59,530
humanity in orbit right we were there

812
00:35:03,420 --> 00:35:01,840
doing the shared mission and and just

813
00:35:04,620 --> 00:35:03,430

how that made us all just part of this

814
00:35:06,510 --> 00:35:04,630
one thing didn't matter what language we

815
00:35:08,610 --> 00:35:06,520
spoke or where we came from there we

816
00:35:08,910 --> 00:35:08,620
were just one family all of it doing the

817
00:35:11,790 --> 00:35:08,920
work

818
00:35:13,440 --> 00:35:11,800
amazing I know you you've we were

819
00:35:16,680 --> 00:35:13,450
talking before and you said you spent 32

820
00:35:18,630 --> 00:35:16,690
hours in space during spacewalks um what

821
00:35:20,760 --> 00:35:18,640
do you get used to and what always

822
00:35:22,980 --> 00:35:20,770
surprises you about getting into and

823
00:35:24,630 --> 00:35:22,990
going outside the spacecraft we'll start

824
00:35:26,700 --> 00:35:24,640
with that part first because I don't

825
00:35:28,980 --> 00:35:26,710
think literature first your fifth or you

826
00:35:32,190 --> 00:35:28,990
know I'm like Mike la your generosity on

827
00:35:34,440 --> 00:35:32,200
your ninth or tenth when you open that

828
00:35:36,690 --> 00:35:34,450
hatch which Ana space station opens yeah

829
00:35:38,160 --> 00:35:36,700
right you know you open it up you're

830
00:35:41,910 --> 00:35:38,170
inside a steel mill cocoon the whole

831
00:35:44,310 --> 00:35:41,920
time and you open the hatch and it is

832
00:35:46,920 --> 00:35:44,320
250 miles or 400 kilometres straight out

833
00:35:49,230 --> 00:35:46,930
and so Frank anybody you know has a fear

834
00:35:50,610 --> 00:35:49,240
of heights you know it's it's daunting

835
00:35:51,930 --> 00:35:50,620
but for anybody who doesn't have a fear

836
00:35:53,730 --> 00:35:51,940
of heights if you look the edge of a

837
00:35:55,620 --> 00:35:53,740
tall building and you stay on the edge

838
00:35:58,050 --> 00:35:55,630

and put your toes on lean over your body

839
00:35:59,910 --> 00:35:58,060
tells you get back yeah I mean that you

840
00:36:01,950 --> 00:35:59,920
have that intense really intense feeling

841
00:36:07,500 --> 00:36:01,960
except type times a thousand two or 50

842
00:36:08,850 --> 00:36:07,510
miles up okay I know I'm not gonna fall

843
00:36:10,530 --> 00:36:08,860
I'm gonna float even though I mean this

844
00:36:12,540 --> 00:36:10,540
massive you know my own personal space

845
00:36:14,010 --> 00:36:12,550
suit going out the door I know that if I

846
00:36:15,870 --> 00:36:14,020
go out there let go I'm not gonna fall

847
00:36:17,670 --> 00:36:15,880
but your brain your whole life has told

848
00:36:18,690 --> 00:36:17,680
you that you it yeah you go out there

849
00:36:21,330 --> 00:36:18,700
and just like we practiced in the

850
00:36:22,770 --> 00:36:21,340
neutral buoyancy laboratory when we pull

851
00:36:25,170 --> 00:36:22,780
down in Houston where we have a space

852
00:36:26,370 --> 00:36:25,180
station do you train you reach out you

853
00:36:27,390 --> 00:36:26,380
put your hand on the handrails you don't

854
00:36:29,490 --> 00:36:27,400
you turn your body the way you normally

855
00:36:31,740 --> 00:36:29,500
do you put out your waste tether you put

856
00:36:34,050 --> 00:36:31,750
out your you know a lot of your strength

857
00:36:35,140 --> 00:36:34,060
tether and you go ahead and you know do

858
00:36:36,849 --> 00:36:35,150
what you trained for

859
00:36:39,009 --> 00:36:36,859
it's just a view instead of being you

860
00:36:40,120 --> 00:36:39,019
know concrete 40 feet below you in the

861
00:36:42,700 --> 00:36:40,130
bottom of the pool you now have the

862
00:36:43,839 --> 00:36:42,710
earth going by at five miles a second to

863
00:36:45,549 --> 00:36:43,849

distract you while you're out there oh

864
00:36:47,829 --> 00:36:45,559
my goodness I'm curious about your

865
00:36:50,259 --> 00:36:47,839
thoughts about how apollo-era technology

866
00:36:52,479 --> 00:36:50,269
led to the technology that got you into

867
00:36:55,120 --> 00:36:52,489
space well there was a basis for

868
00:36:56,589 --> 00:36:55,130
everything I mean that it's I am in awe

869
00:36:58,120 --> 00:36:56,599
just like you and everybody else

870
00:36:59,650 --> 00:36:58,130
especially today it takes time to

871
00:37:03,459 --> 00:36:59,660
remember and commemorate this amazing

872
00:37:06,999 --> 00:37:03,469
you know historic achievement I mean we

873
00:37:08,739 --> 00:37:07,009
had not overhead but 15 minutes in space

874
00:37:11,589 --> 00:37:08,749
when the President Kennedy challenged us

875
00:37:14,109 --> 00:37:11,599
to go to the moon and within a decade we

876
00:37:17,259 --> 00:37:14,119
had the O'Neill buzz and my calls there

877
00:37:18,789 --> 00:37:17,269
on Apollo 9 apart sorry Apollo 11 that

878
00:37:20,170 --> 00:37:18,799
is astounding and everything we've done

879
00:37:23,049 --> 00:37:20,180
since then has been based on those

880
00:37:24,759 --> 00:37:23,059
amazing investments in technology and

881
00:37:27,999 --> 00:37:24,769
the capabilities to live and work in

882
00:37:30,309 --> 00:37:28,009
space and and the suit on space o'clock

883
00:37:31,539 --> 00:37:30,319
is the grandson of the suit that was on

884
00:37:34,930 --> 00:37:31,549
Apollo on a lunar surface

885
00:37:36,969 --> 00:37:34,940
well famously a Buzz Aldrin was not able

886
00:37:39,219 --> 00:37:36,979
to be here but we do have a buzz tribute

887
00:37:41,870 --> 00:37:39,229
video which we can run let's run this

888
00:38:06,230 --> 00:37:41,880

and see a little bit about Buzz

889
00:38:27,489 --> 00:38:14,480
[Music]

890
00:38:32,479 --> 00:38:30,289
ready are you excited about the future

891
00:38:33,739 --> 00:38:32,489
of space travel absolutely in the 15

892
00:38:35,749 --> 00:38:33,749
years I've met NASA there's never been a

893
00:38:37,459 --> 00:38:35,759
more exciting time we have got you know

894
00:38:38,839 --> 00:38:37,469
two commercial vehicles they're getting

895
00:38:40,189 --> 00:38:38,849
ready to launch up and put people on the

896
00:38:41,380 --> 00:38:40,199
space station we've had 19 years of

897
00:38:44,839 --> 00:38:41,390
continuous presence on the space station

898
00:38:46,339 --> 00:38:44,849
we've got you know Artemis getting set

899
00:38:48,019 --> 00:38:46,349
up or we have got the Orion space pickle

900
00:38:49,130 --> 00:38:48,029
board the world's largest rocket the SLS

901
00:38:51,259 --> 00:38:49,140
and then we're going to start launching

902
00:38:52,969 --> 00:38:51,269
humans on in two years amazing you know

903
00:38:54,829 --> 00:38:52,979
around the moon again and they've never

904
00:38:56,149 --> 00:38:54,839
been a better time for it Brandi thank

905
00:39:05,830 --> 00:38:56,159
you so much for joining us here today I

906
00:39:09,460 --> 00:39:07,810
Neil Armstrong and Buzz Aldrin were

907
00:39:12,190 --> 00:39:09,470
almost stuck on the surface of the Moon

908
00:39:13,720 --> 00:39:12,200
as the crew was coming back in they had

909
00:39:15,550 --> 00:39:13,730
to take off their looks large space

910
00:39:17,590 --> 00:39:15,560
suits and they were pretty big and the

911
00:39:19,510 --> 00:39:17,600
lunar module was pretty small and the

912
00:39:21,460 --> 00:39:19,520
process of doing that was bumped up

913
00:39:23,410 --> 00:39:21,470

against the engine arm switch the switch

914
00:39:25,090 --> 00:39:23,420
that was critical to turning on the

915
00:39:27,460 --> 00:39:25,100
rocket motor that wouldn't allow them to

916
00:39:30,070 --> 00:39:27,470
launch off the surface of a moon the

917
00:39:31,990 --> 00:39:30,080
switch broke off and so when the time

918
00:39:33,670 --> 00:39:32,000
came to flip that switch to get ready to

919
00:39:35,230 --> 00:39:33,680
launch off the surface of the Moon there

920
00:39:37,510 --> 00:39:35,240
was no switch there to flip what's he

921
00:39:40,180 --> 00:39:37,520
gonna do buzz was thinking fast he pulls

922
00:39:42,220 --> 00:39:40,190
out a felt-tip pen and jams it in to

923
00:39:45,010 --> 00:39:42,230
that spot and is able to use the felt

924
00:39:46,300 --> 00:39:45,020
tip pen as a pseudo switch and they

925
00:39:48,940 --> 00:39:46,310
successfully get off the surface of the

926
00:39:54,470 --> 00:39:48,950
moon and come home

927
00:39:59,370 --> 00:39:57,210
my grandfather President Kennedy

928
00:40:01,320 --> 00:39:59,380
challenged Americans to send a man to

929
00:40:03,390 --> 00:40:01,330
the moon not because it would be easy

930
00:40:05,940 --> 00:40:03,400
but because it would be so hard

931
00:40:07,860 --> 00:40:05,950
NASA and our entire nation answered his

932
00:40:10,740 --> 00:40:07,870
call to action and made that dream a

933
00:40:12,780 --> 00:40:10,750
reality today we salute the men and

934
00:40:14,580 --> 00:40:12,790
women of the Apollo generation and look

935
00:40:24,760 --> 00:40:14,590
forward to the future and the new

936
00:40:30,710 --> 00:40:27,830
and looking now over the water we're

937
00:40:32,810 --> 00:40:30,720
coming up on launch complex 39 here at

938
00:40:35,150 --> 00:40:32,820

Kennedy Space Center the two pads that

939
00:40:36,410 --> 00:40:35,160
you see in the distance there Pat B is

940
00:40:38,780 --> 00:40:36,420
where we're going to launch the first

941
00:40:41,180 --> 00:40:38,790
woman to the moon and the next man to

942
00:40:44,990 --> 00:40:41,190
the moon right there actually pad a

943
00:40:47,570 --> 00:40:45,000
which is SpaceX's pad which is currently

944
00:40:49,580 --> 00:40:47,580
of course launching their rockets the

945
00:40:52,700 --> 00:40:49,590
heavy and the Falcon but it's a

946
00:40:55,610 --> 00:40:52,710
beautiful shot as we fly over the Banana

947
00:40:58,760 --> 00:40:55,620
River and into that launch complex they

948
00:41:03,110 --> 00:40:58,770
are 39a where of course many a historic

949
00:41:04,520 --> 00:41:03,120
launch happened here and we continue to

950
00:41:06,740 --> 00:41:04,530
celebrate as well yeah absolutely

951
00:41:09,380 --> 00:41:06,750
beautiful and the mood here is just

952
00:41:12,050 --> 00:41:09,390
euphoric I mean so many people in awe of

953
00:41:12,530 --> 00:41:12,060
this nation's amazing achievement fifty

954
00:41:15,980 --> 00:41:12,540
years ago

955
00:41:17,780 --> 00:41:15,990
indeed and it's a warm day here in

956
00:41:21,200 --> 00:41:17,790
Florida you can see the clouds bubbling

957
00:41:24,320 --> 00:41:21,210
up over 39a on the crew access arm that

958
00:41:26,150 --> 00:41:24,330
extends out from that pad it's not quite

959
00:41:27,980 --> 00:41:26,160
as hot as the rest of the country though

960
00:41:30,560 --> 00:41:27,990
because there's a heat wave that's

961
00:41:32,420 --> 00:41:30,570
currently got the grip of the nation

962
00:41:34,070 --> 00:41:32,430
most of the nation but we're still

963
00:41:36,560 --> 00:41:34,080

pretty toasty here in Florida and in

964
00:41:37,730 --> 00:41:36,570
fact Murray we're celebrating moon fest

965
00:41:39,980 --> 00:41:37,740
at this time

966
00:41:42,640 --> 00:41:39,990
a celebration of course of the 50th

967
00:41:47,210 --> 00:41:42,650
anniversary of Apollo where our own

968
00:41:49,940 --> 00:41:47,220
employees got to go out and to the

969
00:41:52,730 --> 00:41:49,950
gantry eat moon pies and dress up in

970
00:41:54,710 --> 00:41:52,740
1960s attire I think they're already out

971
00:41:58,370 --> 00:41:54,720
of the moon pies so we didn't I don't

972
00:41:59,840 --> 00:41:58,380
know if anybody saved any for us but I

973
00:42:01,850 --> 00:41:59,850
they did they gave him away for free

974
00:42:04,490 --> 00:42:01,860
that was uh that was a nice gesture yes

975
00:42:06,710 --> 00:42:04,500
on this historic day yes absolutely and

976
00:42:09,650 --> 00:42:06,720
as we continue to celebrate the historic

977
00:42:11,510 --> 00:42:09,660
achievement of 1969 we look ahead to

978
00:42:14,870 --> 00:42:11,520
traveling back to the moon and on to

979
00:42:16,850 --> 00:42:14,880
Mars just as in the Apollo area era we

980
00:42:19,130 --> 00:42:16,860
need many elements to get there from

981
00:42:21,350 --> 00:42:19,140
rockets and spacecraft to astronaut life

982
00:42:23,450 --> 00:42:21,360
support and more all in support of

983
00:42:25,520 --> 00:42:23,460
science and exploration on the surface

984
00:42:27,560 --> 00:42:25,530
there's a lot of work already being done

985
00:42:29,780 --> 00:42:27,570
to make that happen with our Artemis

986
00:42:32,240 --> 00:42:29,790
program we're preparing to launch our

987
00:42:34,400 --> 00:42:32,250
new Space Launch System rocket and the

988
00:42:36,470 --> 00:42:34,410

Orion which is an entirely new space

989
00:42:38,359 --> 00:42:36,480
capsule we're also developing a

990
00:42:40,760 --> 00:42:38,369
eight-way at the moon will have new

991
00:42:43,070 --> 00:42:40,770
robotic and human landers and new

992
00:42:45,590 --> 00:42:43,080
spacesuits all this is happening while

993
00:42:47,480 --> 00:42:45,600
advances in science and technology will

994
00:42:50,480 --> 00:42:47,490
expand our knowledge and enrich life

995
00:42:52,070 --> 00:42:50,490
back here on earth and there's that list

996
00:42:53,450 --> 00:42:52,080
there those items I was just telling you

997
00:42:54,950 --> 00:42:53,460
about and we'll be telling you more

998
00:42:56,990 --> 00:42:54,960
about each of those elements you see

999
00:42:58,970 --> 00:42:57,000
there on your screen throughout the show

1000
00:43:00,920 --> 00:42:58,980
today and it's important each one of

1001
00:43:03,440 --> 00:43:00,930
those elements as they come together to

1002
00:43:07,160 --> 00:43:03,450
form this program of the future artemis

1003
00:43:09,650 --> 00:43:07,170
is a very complex program but we want to

1004
00:43:13,099 --> 00:43:09,660
go back to the moon sustainably and

1005
00:43:15,200 --> 00:43:13,109
printable and permanently - in order to

1006
00:43:18,020 --> 00:43:15,210
test our technology to go onto Mars so

1007
00:43:19,670 --> 00:43:18,030
it's all very key absolutely and we're

1008
00:43:21,650 --> 00:43:19,680
going to see coming up after this show

1009
00:43:23,599 --> 00:43:21,660
today starting at 3 o'clock we've got a

1010
00:43:25,490 --> 00:43:23,609
show called our stem show that's going

1011
00:43:27,890 --> 00:43:25,500
to show you how students are breaking

1012
00:43:29,300 --> 00:43:27,900
down a mission to the moon that's gonna

1013
00:43:31,609 --> 00:43:29,310

be a great show make sure you stay tuned

1014
00:43:34,970 --> 00:43:31,619
for that at 3 o'clock right here on NASA

1015
00:43:58,290 --> 00:43:34,980
TV forward to the moon our stem show

1016
00:44:02,860 --> 00:44:00,520
did you know that one of the most

1017
00:44:04,500 --> 00:44:02,870
valuable samples brought back from the

1018
00:44:06,100 --> 00:44:04,510
moon by Neil Armstrong and Buzz Aldrin

1019
00:44:08,350 --> 00:44:06,110
almost didn't happen

1020
00:44:10,180 --> 00:44:08,360
neela buzz had a series of containers

1021
00:44:11,320 --> 00:44:10,190
that they put their lunar samples in and

1022
00:44:13,270 --> 00:44:11,330
they mostly went around and picked up

1023
00:44:16,150 --> 00:44:13,280
rocks but right near the end of their

1024
00:44:17,860 --> 00:44:16,160
walk on the moon as Neil was preparing

1025
00:44:20,320 --> 00:44:17,870
the boxes that shipped back up to the

1026
00:44:22,090 --> 00:44:20,330
lunar module for returned back to earth

1027
00:44:23,470 --> 00:44:22,100
Neil looked into one of the boxes I

1028
00:44:26,560 --> 00:44:23,480
realized that there wasn't a whole lot

1029
00:44:28,480 --> 00:44:26,570
in there he thought that's not right we

1030
00:44:30,550 --> 00:44:28,490
should be bringing more back so he took

1031
00:44:32,020 --> 00:44:30,560
the box and scooped it along the surface

1032
00:44:34,480 --> 00:44:32,030
and pulled a whole bunch of dirt from

1033
00:44:37,480 --> 00:44:34,490
the surface of the moon into the box it

1034
00:44:39,640 --> 00:44:37,490
turns out that that dirt the lunar

1035
00:44:42,160 --> 00:44:39,650
regolith was really important to helping

1036
00:44:43,630 --> 00:44:42,170
us understand the solar wind and other

1037
00:44:44,800 --> 00:44:43,640
properties of moon and that was

1038
00:44:47,410 --> 00:44:44,810

information that we didn't get from

1039
00:44:48,850 --> 00:44:47,420
rocks so that impromptu sample

1040
00:44:50,470 --> 00:44:48,860
collection is actually one of the most

1041
00:44:52,560 --> 00:44:50,480
valuable samples that we brought back

1042
00:44:59,430 --> 00:44:52,570
from the moon Apollo

1043
00:45:04,130 --> 00:45:01,770
welcome to the u.s. bass know that the

1044
00:45:06,599 --> 00:45:04,140
Apollo guidance computer

1045
00:45:08,819 --> 00:45:06,609
I'm the Karla friend and this is the

1046
00:45:10,650 --> 00:45:08,829
official visitor center for NASA's

1047
00:45:12,299 --> 00:45:10,660
Marshall Space Flight Center now

1048
00:45:14,339 --> 00:45:12,309
Marshall has been designing and building

1049
00:45:18,210 --> 00:45:14,349
the rockets that send astronauts into

1050
00:45:21,059 --> 00:45:18,220
space since 1960 in fact this machine

1051
00:45:23,220 --> 00:45:21,069
here is an authentic f1 engine that

1052
00:45:25,799 --> 00:45:23,230
powered the Saturn five the vehicle they

1053
00:45:27,839 --> 00:45:25,809
launched the Apollo missions the Saturn

1054
00:45:30,000 --> 00:45:27,849
fives chief architect was Marshalls

1055
00:45:33,120 --> 00:45:30,010
first director Werner von Braun and

1056
00:45:35,970 --> 00:45:33,130
throughout the 1950s von Braun promoted

1057
00:45:38,250 --> 00:45:35,980
space travel he also helps spur much of

1058
00:45:41,339 --> 00:45:38,260
the technology that first took Americans

1059
00:45:43,230 --> 00:45:41,349
into space and now America is ready for

1060
00:45:45,720 --> 00:45:43,240
the next wave of human exploration

1061
00:45:47,730 --> 00:45:45,730
NASA's Artemis mission which will take

1062
00:45:49,700 --> 00:45:47,740
Americans to the moon and will set the

1063
00:45:52,289 --> 00:45:49,710

stage for putting humans on Mars

1064
00:45:54,059 --> 00:45:52,299
Marshall is again working on the rocket

1065
00:45:57,599 --> 00:45:54,069
to get them there the Space Launch

1066
00:46:00,359 --> 00:45:57,609
System or SLS and Marshall we are proud

1067
00:46:05,420 --> 00:46:00,369
of our heritage of fire and smoke here's

1068
00:46:52,360 --> 00:46:27,200
[Music]

1069
00:46:58,400 --> 00:46:55,670
joining me now is astronaut Rex Walheim

1070
00:47:00,380 --> 00:46:58,410
now he flew three different space

1071
00:47:04,010 --> 00:47:00,390
shuttle missions including the very last

1072
00:47:06,170 --> 00:47:04,020
one sts-135 hi Rex how are you Carl it's

1073
00:47:08,570 --> 00:47:06,180
great to be here now you didn't get a

1074
00:47:10,880 --> 00:47:08,580
chance to ride on a Saturn 5 but tell us

1075
00:47:13,220 --> 00:47:10,890
what it's like as an astronaut to be in

1076
00:47:14,690 --> 00:47:13,230
a rocket at liftoff well probably the

1077
00:47:16,190 --> 00:47:14,700
most remember one is your first time and

1078
00:47:17,600 --> 00:47:16,200
you're loaded into the rocket about a

1079
00:47:18,710 --> 00:47:17,610
couple hours of for launch and you're

1080
00:47:20,990 --> 00:47:18,720
strapped in it feels like you're sitting

1081
00:47:22,760 --> 00:47:21,000
in this very high-rise building solid as

1082
00:47:24,650 --> 00:47:22,770
a rock then about six seconds before

1083
00:47:25,880 --> 00:47:24,660
launch the main engine start up and even

1084
00:47:27,500 --> 00:47:25,890
though you're still bolted the pad it

1085
00:47:28,700 --> 00:47:27,510
shakes like it's coming apart it's

1086
00:47:30,230 --> 00:47:28,710
really amazing and then if the engines

1087
00:47:31,880 --> 00:47:30,240
outfit great for six seconds and the

1088
00:47:33,740 --> 00:47:31,890

solid rocket boosters light and then you

1089
00:47:36,080 --> 00:47:33,750
feel that jolt and you lift off and it's

1090
00:47:37,400 --> 00:47:36,090
an incredible ride from zero to 17,500

1091
00:47:40,520 --> 00:47:37,410
miles an hour and eight and a half

1092
00:47:41,930 --> 00:47:40,530
minutes that sounds incredible now as we

1093
00:47:43,760 --> 00:47:41,940
look back on Apollo 11

1094
00:47:45,920 --> 00:47:43,770
what are your thoughts as an astronaut

1095
00:47:47,960 --> 00:47:45,930
about re-establishing a human presence

1096
00:47:49,520 --> 00:47:47,970
beyond Earth orbit well I think it's so

1097
00:47:51,320 --> 00:47:49,530
important cuz the Apollo program they

1098
00:47:52,820 --> 00:47:51,330
went to the frontier to the moon farther

1099
00:47:54,710 --> 00:47:52,830
than any humans has ever traveled in

1100
00:47:55,940 --> 00:47:54,720
history and we need to get back there so

1101
00:47:57,260 --> 00:47:55,950
we can learn how to do that again

1102
00:47:59,000 --> 00:47:57,270
because it's very difficult to get there

1103
00:47:59,480 --> 00:47:59,010
we haven't done it in decades we want to

1104
00:48:01,040 --> 00:47:59,490
go there

1105
00:48:04,430 --> 00:48:01,050
learn how to do it and go beyond and go

1106
00:48:07,430 --> 00:48:04,440
to Mars now we actually have a social

1107
00:48:09,980 --> 00:48:07,440
media question one Manesh on twitter

1108
00:48:11,510 --> 00:48:09,990
asks what is NASA's plan for future

1109
00:48:13,130 --> 00:48:11,520
astronaut programs

1110
00:48:14,420 --> 00:48:13,140
well first future astronaut program is

1111
00:48:15,740 --> 00:48:14,430
similar to the ones today we'll select

1112
00:48:17,360 --> 00:48:15,750
the best and the brightest the folks

1113
00:48:18,950 --> 00:48:17,370

from all across the country the most

1114
00:48:20,420 --> 00:48:18,960
diverse backgrounds we can get the

1115
00:48:21,830 --> 00:48:20,430
people who've shown that they can excel

1116
00:48:23,390 --> 00:48:21,840
in various different types of functions

1117
00:48:24,380 --> 00:48:23,400
and we'll bring them all over on the

1118
00:48:25,850 --> 00:48:24,390
Johnson Space Center and try to

1119
00:48:27,650 --> 00:48:25,860
interview - who's gonna work the best

1120
00:48:28,940 --> 00:48:27,660
it'll be very similar now except there's

1121
00:48:30,950 --> 00:48:28,950
gonna be a different dimension with the

1122
00:48:32,570 --> 00:48:30,960
the autonomy that we're gonna need and

1123
00:48:33,830 --> 00:48:32,580
more of the expeditionary behavior where

1124
00:48:35,060 --> 00:48:33,840
where people are going farther than

1125
00:48:37,100 --> 00:48:35,070
we've ever gone before and they'll be

1126
00:48:38,360 --> 00:48:37,110
far from so far from Earth that'll take

1127
00:48:40,010 --> 00:48:38,370
minutes and minutes for just

1128
00:48:41,210 --> 00:48:40,020
communications go back and forth so we

1129
00:48:42,980 --> 00:48:41,220
have to become four operating by

1130
00:48:44,180 --> 00:48:42,990
themselves but for the most part it

1131
00:48:46,610 --> 00:48:44,190
would be very similar to the way we pick

1132
00:48:48,710 --> 00:48:46,620
astronauts today thanks Rex

1133
00:48:51,500 --> 00:48:48,720
you know today thousands of NASA

1134
00:48:54,650 --> 00:48:51,510
employees contractors and suppliers are

1135
00:48:57,140 --> 00:48:54,660
working in all 50 states to turn our

1136
00:48:58,089 --> 00:48:57,150
plans into reality the Apollo program

1137
00:49:00,130 --> 00:48:58,099
also

1138
00:49:03,160 --> 00:49:00,140

was a nationwide effort on a giant scale

1139
00:49:05,769 --> 00:49:03,170
with so many unsung heroes behind the

1140
00:49:07,660 --> 00:49:05,779
famous names and faces and many Apollo

1141
00:49:09,940 --> 00:49:07,670
era veterans are right here in

1142
00:49:13,660 --> 00:49:09,950
Huntsville let's hear from a few of them

1143
00:49:15,069 --> 00:49:13,670
about their era most of us were just out

1144
00:49:17,950 --> 00:49:15,079
of college didn't have much of a

1145
00:49:19,450 --> 00:49:17,960
experience but here's what challenge

1146
00:49:21,370 --> 00:49:19,460
we're gonna do something in ten months

1147
00:49:24,579 --> 00:49:21,380
it's never been done before I mean you

1148
00:49:26,829 --> 00:49:24,589
never went home with your desk cleaned

1149
00:49:29,680 --> 00:49:26,839
off it was just so much to do well you

1150
00:49:31,390 --> 00:49:29,690
were just all heads down trying to get

1151
00:49:33,519 --> 00:49:31,400
ready and you know it didn't matter that

1152
00:49:36,370 --> 00:49:33,529
I was a co-op it didn't matter that I

1153
00:49:38,620 --> 00:49:36,380
was 19 years old didn't mind working 80

1154
00:49:39,609 --> 00:49:38,630
bucks eight hours a week because when

1155
00:49:42,489 --> 00:49:39,619
you were gonna do something different

1156
00:49:44,950 --> 00:49:42,499
you didn't go home until you finished

1157
00:49:47,109 --> 00:49:44,960
her work that was pretty standard in

1158
00:49:50,680 --> 00:49:47,119
those days late to bed early to rise

1159
00:49:55,160 --> 00:49:50,690
work like hell and advertise and we were

1160
00:49:55,170 --> 00:50:13,620
[Music]

1161
00:50:17,730 --> 00:50:15,420
the thing about the moon that I thought

1162
00:50:19,680 --> 00:50:17,740
was peculiar was when the Sun was almost

1163
00:50:21,120 --> 00:50:19,690

overhead and it was nude down below the

1164
00:50:23,670 --> 00:50:21,130
moon appeared to be a warm and a

1165
00:50:26,980 --> 00:50:23,680
friendly place near dawn or dusk place

1166
00:50:42,920 --> 00:50:26,990
looked distinctly unfriendly

1167
00:50:49,170 --> 00:50:45,990
what a great tribute to Apollo 11

1168
00:50:51,510 --> 00:50:49,180
command module pilot Mike Collins who

1169
00:50:54,690 --> 00:50:51,520
joins me now live along with astronaut

1170
00:50:56,760 --> 00:50:54,700
candidate Zeena Cartman welcome thank

1171
00:50:58,590 --> 00:50:56,770
you Karen Thank You Xena yeah I'm

1172
00:51:00,900 --> 00:50:58,600
looking forward to hearing from both of

1173
00:51:03,540 --> 00:51:00,910
you yes likewise it's good to have you

1174
00:51:05,370 --> 00:51:03,550
here now Mike uh people may not know

1175
00:51:07,620 --> 00:51:05,380
that after your NASA career you were the

1176
00:51:10,350 --> 00:51:07,630
first director of this very Smithsonian

1177
00:51:11,940 --> 00:51:10,360
Air and Space Museum taking charge while

1178
00:51:13,170 --> 00:51:11,950
the building was under construction and

1179
00:51:16,470 --> 00:51:13,180
then being here when the doors first

1180
00:51:18,810 --> 00:51:16,480
opened in 1976 it's been one of the most

1181
00:51:22,920 --> 00:51:18,820
visited tourist sites in Washington ever

1182
00:51:25,500 --> 00:51:22,930
since so director Collins welcome back

1183
00:51:28,470 --> 00:51:25,510
thank you it's so nice to be back

1184
00:51:33,720 --> 00:51:28,480
the Smithsonian's always and one of my

1185
00:51:36,990 --> 00:51:33,730
most favorite buildings anywhere in the

1186
00:51:39,600 --> 00:51:37,000
world and I used to go to the Museum of

1187
00:51:42,300 --> 00:51:39,610
Natural History and when I was perhaps

1188
00:51:45,480 --> 00:51:42,310

10 years old I would watch snails

1189
00:51:49,110 --> 00:51:45,490
now they had these were not live snails

1190
00:51:52,350 --> 00:51:49,120
they were snail shells but they had like

1191
00:51:55,080 --> 00:51:52,360
37 of them all in a row and I used to

1192
00:51:56,910 --> 00:51:55,090
for some reason I was totally fascinated

1193
00:51:59,400 --> 00:51:56,920
by that display I used to count them and

1194
00:52:01,860 --> 00:51:59,410
figure out why they were big and little

1195
00:52:04,590 --> 00:52:01,870
and what colors they were and all of

1196
00:52:06,480 --> 00:52:04,600
those things so that's my upbringing is

1197
00:52:08,970 --> 00:52:06,490
Smithsonian and

1198
00:52:12,690 --> 00:52:08,980
Aaron's face of course came much later

1199
00:52:15,420 --> 00:52:12,700
and I had a lot of help with people like

1200
00:52:17,780 --> 00:52:15,430
Barry Goldwater who was a senator on the

1201
00:52:20,670 --> 00:52:17,790
right committees who helped me get money

1202
00:52:23,160 --> 00:52:20,680
you get the forty million dollars a mass

1203
00:52:24,810 --> 00:52:23,170
that we needed to dig the hole and bring

1204
00:52:26,910 --> 00:52:24,820
the building up it was an interesting

1205
00:52:29,849 --> 00:52:26,920
time well it's a wonderful place to be

1206
00:52:32,450 --> 00:52:29,859
now let's take us back in time a little

1207
00:52:35,460 --> 00:52:32,460
bit you were up

1208
00:52:38,790 --> 00:52:35,470
orbiting the moon during that Apollo 11

1209
00:52:41,099 --> 00:52:38,800
you went around some 30 times alone over

1210
00:52:42,300 --> 00:52:41,109
about 24 hours take us there tell us

1211
00:52:44,730 --> 00:52:42,310
what you were feeling and what that was

1212
00:52:46,200 --> 00:52:44,740
like you know I was amazed I was always

1213
00:52:48,210 --> 00:52:46,210

asked weren't you the loneliest person

1214
00:52:50,160 --> 00:52:48,220
and the whole lonely universe when you

1215
00:52:51,750 --> 00:52:50,170
were in that lonely command Mazal all by

1216
00:52:56,640 --> 00:52:51,760
your lonely self flowing around the

1217
00:53:00,750 --> 00:52:56,650
lonely mode weren't you lonely no no I

1218
00:53:03,690 --> 00:53:00,760
was at home this was my my little place

1219
00:53:07,920 --> 00:53:03,700
that Columbia the command module was I

1220
00:53:10,650 --> 00:53:07,930
had hot coffee I had music if I want her

1221
00:53:13,680 --> 00:53:10,660
dad if I had some problem or question I

1222
00:53:15,210 --> 00:53:13,690
just got on them on the radio with

1223
00:53:17,940 --> 00:53:15,220
Mission Control and they were always

1224
00:53:21,200 --> 00:53:17,950
very helpful they even tried to talk to

1225
00:53:24,450 --> 00:53:21,210
me when I was by myself behind the moon

1226
00:53:28,200 --> 00:53:24,460
haha couldn't get to me in that

1227
00:53:29,580 --> 00:53:28,210
situation so down on the ground was Neil

1228
00:53:31,470 --> 00:53:29,590
Armstrong who obviously is a

1229
00:53:33,240 --> 00:53:31,480
larger-than-life historic figure

1230
00:53:38,900 --> 00:53:33,250
tell us what you'd like people to

1231
00:53:47,730 --> 00:53:44,760
about the crew mate oh really

1232
00:53:51,599 --> 00:53:47,740
no personal Neil he was he was an

1233
00:53:55,620 --> 00:53:51,609
all-american person in in many ways Neil

1234
00:54:00,270 --> 00:53:55,630
was very intelligent he he had interests

1235
00:54:03,900 --> 00:54:00,280
in science on both sides of the kind of

1236
00:54:06,780 --> 00:54:03,910
work that NASA does he he was he was

1237
00:54:09,660 --> 00:54:06,790
modest he didn't like the spotlight on

1238
00:54:13,560 --> 00:54:09,670

him but when he was caught in its glare

1239
00:54:15,200 --> 00:54:13,570
he knew exactly what to say after the

1240
00:54:18,440 --> 00:54:15,210
flight of Apollo 11

1241
00:54:20,710 --> 00:54:18,450
we were very fortunate to have an

1242
00:54:25,220 --> 00:54:20,720
around-the-world trip that meal was our

1243
00:54:27,410 --> 00:54:25,230
spokesperson and he just did a masterful

1244
00:54:30,170 --> 00:54:27,420
job he had done his homework everywhere

1245
00:54:32,270 --> 00:54:30,180
we went he he knew the background of the

1246
00:54:34,609 --> 00:54:32,280
country he knew what to say to the local

1247
00:54:39,109 --> 00:54:34,619
people by the time he finished one of

1248
00:54:40,970 --> 00:54:39,119
his short five ten minute speeches half

1249
00:54:43,820 --> 00:54:40,980
of the audience was ready to climb on

1250
00:54:50,450 --> 00:54:43,830
board Columbia and go with us he was

1251
00:54:52,010 --> 00:54:50,460
just masterful and all right we are we

1252
00:54:54,589 --> 00:54:52,020
have two people hoping to ask questions

1253
00:54:57,620 --> 00:54:54,599
to Xena and to Michael Colin social

1254
00:54:59,030 --> 00:54:57,630
media though I just realized we may not

1255
00:55:02,300 --> 00:54:59,040
have the access to the social media

1256
00:55:04,400 --> 00:55:02,310
questions so I am instead going to turn

1257
00:55:06,200 --> 00:55:04,410
to a question to Xena who I wouldn't ask

1258
00:55:09,500 --> 00:55:06,210
a question of as well obviously Michael

1259
00:55:11,390 --> 00:55:09,510
when you qualified an astronaut you were

1260
00:55:13,849 --> 00:55:11,400
a pilot and Xena have took a very

1261
00:55:15,500 --> 00:55:13,859
different path into this so tell us a

1262
00:55:17,660 --> 00:55:15,510
little bit about your path here my

1263
00:55:20,570 --> 00:55:17,670

background is actually in microbiology I

1264
00:55:22,820 --> 00:55:20,580
studied biology in college my thesis was

1265
00:55:25,250 --> 00:55:22,830
in poetry believe it or not and then I

1266
00:55:27,920 --> 00:55:25,260
did research in marine microbiology for

1267
00:55:30,230 --> 00:55:27,930
my master's degree but to me one of the

1268
00:55:33,050 --> 00:55:30,240
most exciting parts of being in the

1269
00:55:35,390 --> 00:55:33,060
space program now is just how different

1270
00:55:37,970 --> 00:55:35,400
a background everyone's come from we are

1271
00:55:40,490 --> 00:55:37,980
test pilots we're also microbiologists

1272
00:55:42,920 --> 00:55:40,500
we are geologists we're submarine errs

1273
00:55:46,040 --> 00:55:42,930
it's a really interesting and diverse

1274
00:55:47,359 --> 00:55:46,050
group to get to work with and so we are

1275
00:55:48,440 --> 00:55:47,369
still taking social media questions

1276
00:55:50,030 --> 00:55:48,450
we're sorry we can't answer them right

1277
00:55:52,099 --> 00:55:50,040
here and now but certainly will continue

1278
00:55:52,970 --> 00:55:52,109
to take them throughout throughout the

1279
00:55:54,980 --> 00:55:52,980
show

1280
00:55:57,079 --> 00:55:54,990
Xena give us your perspective on Apollo

1281
00:55:58,190 --> 00:55:57,089
11 what what is the legacy Impala van

1282
00:55:59,980 --> 00:55:58,200
action I'll toss that to both of you

1283
00:56:03,260 --> 00:55:59,990
tell us about your perspective on the

1284
00:56:05,060 --> 00:56:03,270
legacy of Apollo 11 sure it's it's a

1285
00:56:07,490 --> 00:56:05,070
part of the world that I grew up and I

1286
00:56:10,700 --> 00:56:07,500
you know I I never knew a world before

1287
00:56:12,230 --> 00:56:10,710
men had left this planet and so I have

1288
00:56:14,270 --> 00:56:12,240

to ask the people who lived through that

1289
00:56:16,670 --> 00:56:14,280
themselves what that means to them and

1290
00:56:18,260 --> 00:56:16,680
they can tell me where they were when

1291
00:56:20,120 --> 00:56:18,270
they saw that happen they can tell me

1292
00:56:22,790 --> 00:56:20,130
the exact chair they were sitting in it

1293
00:56:25,609 --> 00:56:22,800
was just this monumental pivotal moment

1294
00:56:29,100 --> 00:56:25,619
in human history and so to me that's

1295
00:56:30,660 --> 00:56:29,110
just it's so touching to know that

1296
00:56:33,540 --> 00:56:30,670
part of the world that I'm in now and

1297
00:56:35,730 --> 00:56:33,550
it's this hugely inspiring challenge to

1298
00:56:37,590 --> 00:56:35,740
my generation what would be our Apollo

1299
00:56:41,090 --> 00:56:37,600
what will be this thing that people

1300
00:56:45,960 --> 00:56:41,100
around the world will feel a part of a

1301
00:56:49,170 --> 00:56:45,970
little bit about the legacy I I'm not

1302
00:56:51,450 --> 00:56:49,180
big on legacies I'm not sure I think

1303
00:56:54,690 --> 00:56:51,460
maybe 50 years is not enough time to

1304
00:56:58,110 --> 00:56:54,700
give it a proper spacing for it but I

1305
00:57:02,310 --> 00:56:58,120
was really taken by something Dina said

1306
00:57:05,760 --> 00:57:02,320
with her minor is in poetry I love that

1307
00:57:07,560 --> 00:57:05,770
idea it's great I go to MIT from time to

1308
00:57:10,860 --> 00:57:07,570
time and talk to the students up there

1309
00:57:13,260 --> 00:57:10,870
and of course the great push in this

1310
00:57:16,530 --> 00:57:13,270
country today and rightfully so is

1311
00:57:18,570 --> 00:57:16,540
science technology engineering math stem

1312
00:57:22,350 --> 00:57:18,580
and I say now that's not a complete

1313
00:57:25,230 --> 00:57:22,360

education poetry in there we are going

1314
00:57:27,240 --> 00:57:25,240
to now toss back to the mall to Adam

1315
00:57:29,700 --> 00:57:27,250
Savage who has a message not about

1316
00:57:36,720 --> 00:57:29,710
poetry but for those people who still

1317
00:57:39,120 --> 00:57:36,730
know thanks Karen amazingly there are

1318
00:57:42,180 --> 00:57:39,130
still people who choose not to believe

1319
00:57:43,800 --> 00:57:42,190
that we went to the moon even though to

1320
00:57:46,800 --> 00:57:43,810
perpetrate such a hoax would have taken

1321
00:57:49,620 --> 00:57:46,810
far more energy than actually just going

1322
00:57:52,290 --> 00:57:49,630
to the moon and on Mythbusters early in

1323
00:57:55,200 --> 00:57:52,300
our tenure my co-hosts Jamie Kari grant

1324
00:57:58,530 --> 00:57:55,210
and Tory and I busted this conspiracy

1325
00:58:00,690 --> 00:57:58,540
theory in pretty much every way we could

1326
00:58:02,670 --> 00:58:00,700
have possibly tested it we built

1327
00:58:05,010 --> 00:58:02,680
miniature models we rode the vomit comet

1328
00:58:08,820 --> 00:58:05,020
we wore spacesuits we tried everything

1329
00:58:10,980 --> 00:58:08,830
and in fact our episode is used by

1330
00:58:12,570 --> 00:58:10,990
moon-landing deniers to bolster their

1331
00:58:15,390 --> 00:58:12,580
argument they thought that our miniature

1332
00:58:18,150 --> 00:58:15,400
model of the moon scape looked so good

1333
00:58:19,740 --> 00:58:18,160
it helped convince them that the moon

1334
00:58:21,660 --> 00:58:19,750
landing might have been faked by Stanley

1335
00:58:23,850 --> 00:58:21,670
Kubrick at some secret soundstage in the

1336
00:58:25,140 --> 00:58:23,860
desert which is total Buncombe and when

1337
00:58:26,910 --> 00:58:25,150
I am confronted with that sort of

1338
00:58:30,030 --> 00:58:26,920

willful ignorance well I don't have any

1339
00:58:32,550 --> 00:58:30,040
answer but apparently Tahira has a

1340
00:58:36,450 --> 00:58:32,560
question from the crowd out on the mall

1341
00:58:37,319 --> 00:58:36,460
to hear oh hi I'm Tahira and I'm out

1342
00:58:39,870 --> 00:58:37,329
here on the

1343
00:58:42,209 --> 00:58:39,880
no mall in Washington DC it is a

1344
00:58:44,759 --> 00:58:42,219
beautiful day out here to celebrate the

1345
00:58:47,039 --> 00:58:44,769
50th anniversary of the Apollo 11 moon

1346
00:58:49,559 --> 00:58:47,049
landing right now I'm following the

1347
00:58:51,779 --> 00:58:49,569
conversation on social media and Twitter

1348
00:58:53,609 --> 00:58:51,789
user David says it would have been

1349
00:58:55,469 --> 00:58:53,619
harder to fake it than to do it in

1350
00:58:57,870 --> 00:58:55,479
regards to the Apollo 11 moon landing

1351
00:59:01,469 --> 00:58:57,880
Adam you broke it down on Mythbusters

1352
00:59:03,479 --> 00:59:01,479
what do you think Oh without a doubt one

1353
00:59:05,849 --> 00:59:03,489
of the great pleasures of my life to

1354
00:59:07,680 --> 00:59:05,859
here is that I get to talk to people at

1355
00:59:09,150 --> 00:59:07,690
NASA and meet astronauts and come to

1356
00:59:11,910 --> 00:59:09,160
places like the Smithsonian Air and

1357
00:59:14,039 --> 00:59:11,920
Space Museum the fact is is the pride

1358
00:59:16,170 --> 00:59:14,049
that all of the incredible men and women

1359
00:59:18,029 --> 00:59:16,180
and engineers and scientists who

1360
00:59:20,549 --> 00:59:18,039
executed this incredible feat and

1361
00:59:23,249 --> 00:59:20,559
continue to execute it on a daily basis

1362
00:59:25,410 --> 00:59:23,259
that pride is based in reality not in

1363
00:59:28,229 --> 00:59:25,420

fantasy and it is my honor to be able to

1364
00:59:30,690 --> 00:59:28,239
meet and talk to these folks when NASA's

1365
00:59:35,620 --> 00:59:30,700
giant leap continues it'll be with fire

1366
01:00:02,300 --> 00:59:44,900
[Music]

1367
01:00:02,310 --> 01:00:07,560
[Applause]

1368
01:00:14,110 --> 01:00:10,990
welcome back to Wapakoneta and the

1369
01:00:17,080 --> 01:00:14,120
Armstrong Air and Space Museum I'm Ty

1370
01:00:20,500 --> 01:00:17,090
Bateman an anchor with hometown stations

1371
01:00:22,990 --> 01:00:20,510
and Lima Ohio and I'm here with a team

1372
01:00:26,080 --> 01:00:23,000
from the Glenn Research Center that not

1373
01:00:29,410 --> 01:00:26,090
only developed liquid hydrogen as rocket

1374
01:00:31,810 --> 01:00:29,420
fuel but also developed electric

1375
01:00:34,950 --> 01:00:31,820
propulsion and the team is also working

1376
01:00:39,670 --> 01:00:34,960
on a new generation electric propulsion

1377
01:00:42,280 --> 01:00:39,680
system that will power our gateway an

1378
01:00:45,520 --> 01:00:42,290
outpost for astronauts in lunar orbit

1379
01:00:48,280 --> 01:00:45,530
that will give access to the surface and

1380
01:00:51,430 --> 01:00:48,290
joining me now from the Glenn Research

1381
01:00:53,470 --> 01:00:51,440
Center is Mike Barrett hello Mike hi

1382
01:00:55,750 --> 01:00:53,480
and how does electric propulsion work

1383
01:00:57,700 --> 01:00:55,760
and how is it different from chemical

1384
01:01:00,340 --> 01:00:57,710
rockets well traditional chemical

1385
01:01:02,170 --> 01:01:00,350
propulsion burns a fuel and that

1386
01:01:03,850 --> 01:01:02,180
generates a high temperature gas that

1387
01:01:05,470 --> 01:01:03,860
gets pushed out of the spacecraft in one

1388
01:01:06,960 --> 01:01:05,480

direction and that propels the

1389
01:01:09,730 --> 01:01:06,970
spacecraft in the opposite direction

1390
01:01:12,670 --> 01:01:09,740
electric propulsion instead of burning a

1391
01:01:15,010 --> 01:01:12,680
fuel uses electricity to charge or

1392
01:01:17,320 --> 01:01:15,020
ionize a gas and then that excel is

1393
01:01:19,240 --> 01:01:17,330
accelerated out of the spacecraft and

1394
01:01:21,640 --> 01:01:19,250
that provides that propulsive push now

1395
01:01:23,380 --> 01:01:21,650
where does the power come from well for

1396
01:01:26,140 --> 01:01:23,390
solar electric propulsion the power

1397
01:01:28,750 --> 01:01:26,150
comes from the Sun we use solar panels

1398
01:01:30,310 --> 01:01:28,760
to convert sunlight into electricity and

1399
01:01:31,960 --> 01:01:30,320
then that electricity is used to power

1400
01:01:34,210 --> 01:01:31,970
both the spacecraft and the electric

1401
01:01:36,760 --> 01:01:34,220
propulsion system so how we roll solar

1402
01:01:38,110 --> 01:01:36,770
electric propulsion helped NASA get to

1403
01:01:40,150 --> 01:01:38,120
the moon and eventually to Mars

1404
01:01:42,100 --> 01:01:40,160
well since solar electric propulsion

1405
01:01:44,410 --> 01:01:42,110
doesn't have to take all that fuel with

1406
01:01:47,260 --> 01:01:44,420
it and it uses the sunlight for energy

1407
01:01:48,760 --> 01:01:47,270
then that spacecraft instead of having

1408
01:01:50,770 --> 01:01:48,770
to take all that fuel can take things

1409
01:01:52,930 --> 01:01:50,780
like oxygen water communications

1410
01:01:54,520 --> 01:01:52,940
equipment science experiments anything

1411
01:01:56,530 --> 01:01:54,530
else the astronauts need to complete the

1412
01:01:58,720 --> 01:01:56,540
mission that makes the build and design

1413
01:01:59,920 --> 01:01:58,730

of that spacecraft a lot easier and the

1414
01:02:01,510 --> 01:01:59,930
efficiency of the electric propulsion

1415
01:02:03,790 --> 01:02:01,520
helps us make the mission more

1416
01:02:06,490 --> 01:02:03,800
achievable Mike very exciting thank you

1417
01:02:09,540 --> 01:02:06,500
so much thank you and NASA's giant leaps

1418
01:02:12,370 --> 01:02:09,550
continue down at Space Center Houston

1419
01:02:14,710 --> 01:02:12,380
but first as you see from our show today

1420
01:02:17,140 --> 01:02:14,720
NASA really is everywhere with

1421
01:02:18,430 --> 01:02:17,150
technological and economic impacts all

1422
01:02:20,829 --> 01:02:18,440
across the country

1423
01:02:23,410 --> 01:02:20,839
innovation for exploration has an

1424
01:02:35,830 --> 01:02:23,420
impact on our daily lives just as it did

1425
01:02:53,390 --> 01:02:43,450
[Music]

1426
01:02:54,660 --> 01:02:53,400
all engine running liftoff we have a

1427
01:03:02,310 --> 01:02:54,670
liftoff

1428
01:03:18,940 --> 01:03:05,990
Nathan extraordinary television

1429
01:03:23,740 --> 01:03:20,890
this nation should commit itself to

1430
01:03:27,180 --> 01:03:23,750
achieving the goal of

1431
01:03:52,890 --> 01:03:27,190
returning him safely to the earth

1432
01:04:11,120 --> 01:03:59,630
[Music]

1433
01:04:16,040 --> 01:04:11,130
I think landing on the moon changed the

1434
01:04:18,440 --> 01:04:16,050
sky from a barrier into a doorway it

1435
01:04:22,400 --> 01:04:18,450
turned the sort of this the backdrop of

1436
01:04:24,890 --> 01:04:22,410
all of human history the sky into an

1437
01:04:27,380 --> 01:04:24,900
invitation I would give anything to

1438
01:04:32,090 --> 01:04:27,390

remember that moment my mom rhombuses I

1439
01:04:33,140 --> 01:04:32,100
saw it but I don't remember a thing it

1440
01:04:34,370 --> 01:04:33,150
might be one of the reasons where I'm a

1441
01:04:36,320 --> 01:04:34,380
little obsessed with the moon landing I

1442
01:04:37,850 --> 01:04:36,330
have have the special New York Times

1443
01:04:39,950 --> 01:04:37,860
edition when they were on their way to

1444
01:04:42,920 --> 01:04:39,960
the moon July 17th

1445
01:04:45,260 --> 01:04:42,930
the models of the moon that's where are

1446
01:04:48,530 --> 01:04:45,270
we that's that there it is

1447
01:04:52,970 --> 01:04:48,540
that's Sea of Tranquility that's that's

1448
01:04:55,070 --> 01:04:52,980
where they landed right there can I

1449
01:04:58,010 --> 01:04:55,080
bring my family with me yes yes I would

1450
01:04:59,540 --> 01:04:58,020
go to Mars they got water there and

1451
01:05:09,120 --> 01:04:59,550
everything and methane what more do you

1452
01:05:13,410 --> 01:05:11,550
hi we're at Johnson Space Center's

1453
01:05:15,240 --> 01:05:13,420
official visitor center joined by

1454
01:05:17,850 --> 01:05:15,250
president & CEO Space Center Houston

1455
01:05:19,770 --> 01:05:17,860
William Harris thanks Brandi welcome to

1456
01:05:21,240 --> 01:05:19,780
Space Center Houston we're a dynamic

1457
01:05:23,580 --> 01:05:21,250
learning destination where we share what

1458
01:05:25,320 --> 01:05:23,590
NASA is doing every day where we spire

1459
01:05:28,220 --> 01:05:25,330
people of all ages through the wonders

1460
01:05:32,070 --> 01:05:30,510
thanks William for hosting this segment

1461
01:05:34,970 --> 01:05:32,080
for us and we are joined here today by

1462
01:05:39,000 --> 01:05:34,980
Apollo 7 astronaut walk Cunningham

1463
01:05:41,940 --> 01:05:39,010

Walter was on the first manned command

1464
01:05:43,890 --> 01:05:41,950
the man's mission of Apollo and I gave

1465
01:05:45,540 --> 01:05:43,900
us the first live views of astronauts

1466
01:05:47,370 --> 01:05:45,550
from space as well as performing some

1467
01:05:50,100 --> 01:05:47,380
critical checkouts of the command module

1468
01:05:51,810 --> 01:05:50,110
thanks for joining us Walt it was really

1469
01:05:55,100 --> 01:05:51,820
a pleasure to be with you people here

1470
01:05:58,350 --> 01:05:55,110
after all of these years we appreciate

1471
01:06:03,000 --> 01:05:58,360
it was like living and working on that

1472
01:06:05,490 --> 01:06:03,010
command module for 11 days well in

1473
01:06:10,200 --> 01:06:05,500
retrospect that that 11 days was

1474
01:06:12,480 --> 01:06:10,210
probably the best 11 days of my life we

1475
01:06:16,380 --> 01:06:12,490
had worked actually I had worked five

1476
01:06:18,180 --> 01:06:16,390
years to get after that there was three

1477
01:06:20,970 --> 01:06:18,190
different scheduled flights and

1478
01:06:23,490 --> 01:06:20,980
overcoming various obstacles and to this

1479
01:06:25,530 --> 01:06:23,500
day that's still a longest most

1480
01:06:29,580 --> 01:06:25,540
ambitious most successful first test

1481
01:06:32,910 --> 01:06:29,590
flight of any new flying machine ever so

1482
01:06:35,340 --> 01:06:32,920
I I feel very fortunate to have been

1483
01:06:37,650 --> 01:06:35,350
there we're fortunate to have you here

1484
01:06:39,330 --> 01:06:37,660
with us having had the longest most

1485
01:06:42,180 --> 01:06:39,340
successful flight test of a new

1486
01:06:43,650 --> 01:06:42,190
spacecraft do you have any advice for

1487
01:06:45,990 --> 01:06:43,660
the astronauts are going to be going up

1488
01:06:48,660 --> 01:06:46,000

on those first missions for Orion and

1489
01:06:51,510 --> 01:06:48,670
Artemis well I probably would have some

1490
01:06:56,060 --> 01:06:51,520
advice but I I don't believe that the

1491
01:06:58,620 --> 01:06:56,070
astronauts have as much authority in

1492
01:07:01,800 --> 01:06:58,630
preparing for these things today as we

1493
01:07:04,770 --> 01:07:01,810
did 50 years ago that means a lot of a

1494
01:07:07,950 --> 01:07:04,780
lot of things have been perfected at the

1495
01:07:10,680 --> 01:07:07,960
same time the Society has changed and

1496
01:07:14,290 --> 01:07:10,690
the astronauts are not driving

1497
01:07:15,520 --> 01:07:14,300
everything like we used to get away with

1498
01:07:17,410 --> 01:07:15,530
as you can see there's a lot of

1499
01:07:18,910 --> 01:07:17,420
excitement here about the about the

1500
01:07:21,040 --> 01:07:18,920
follow anniversary that's what you're

1501
01:07:23,200 --> 01:07:21,050
hearing in the background but also here

1502
01:07:24,820 --> 01:07:23,210
with Walt and I we have Laura Curie who

1503
01:07:26,290 --> 01:07:24,830
is one of the people in charge of some

1504
01:07:29,440 --> 01:07:26,300
of the new technology we're developing

1505
01:07:31,630 --> 01:07:29,450
to send people to the moon Laura is the

1506
01:07:33,660 --> 01:07:31,640
deputy program manager of gateway so

1507
01:07:35,950 --> 01:07:33,670
that is what a key part of getting

1508
01:07:37,750 --> 01:07:35,960
astronauts to the moon will be in lunar

1509
01:07:40,840 --> 01:07:37,760
orbit so tell us a little bit about what

1510
01:07:43,540 --> 01:07:40,850
that is Laura sure the Gateway is gonna

1511
01:07:46,390 --> 01:07:43,550
be an orbiting platform basically the

1512
01:07:48,580 --> 01:07:46,400
circles the moon it will provide

1513
01:07:51,430 --> 01:07:48,590

basically an aggregation point where

1514
01:07:53,470 --> 01:07:51,440
lunar landers can go from the earth to

1515
01:07:55,810 --> 01:07:53,480
the Gateway and they can aggregate there

1516
01:07:57,910 --> 01:07:55,820
and will be able to fly missions to and

1517
01:07:59,560 --> 01:07:57,920
from the moon the great thing about the

1518
01:08:02,260 --> 01:07:59,570
gateway is it's going to give us access

1519
01:08:03,100 --> 01:08:02,270
to the entire surface of the Moon how

1520
01:08:05,440 --> 01:08:03,110
will it be different from the

1521
01:08:07,330 --> 01:08:05,450
International Space Station it will be

1522
01:08:08,830 --> 01:08:07,340
different in a few ways for one thing

1523
01:08:10,990 --> 01:08:08,840
it's going to be much smaller than the

1524
01:08:13,480 --> 01:08:11,000
International Space Station the space

1525
01:08:15,760 --> 01:08:13,490
station is it's basically the size of a

1526
01:08:17,530 --> 01:08:15,770
football field roughly the gateways

1527
01:08:21,039 --> 01:08:17,540
going to be much smaller maybe a tenth

1528
01:08:23,550 --> 01:08:21,049
of the size so just a fraction we also

1529
01:08:27,789 --> 01:08:23,560
where the space station is inhabited

1530
01:08:30,070 --> 01:08:27,799
24/7 365 the gateway will only have

1531
01:08:32,470 --> 01:08:30,080
people on it when Orion is visiting so

1532
01:08:34,349 --> 01:08:32,480
one to start out it'll be about once a

1533
01:08:36,940 --> 01:08:34,359
year maybe 30 days at a time

1534
01:08:39,190 --> 01:08:36,950
so our spacecraft is gonna have to be a

1535
01:08:40,480 --> 01:08:39,200
lot more autonomous than today's space

1536
01:08:42,880 --> 01:08:40,490
station and then of course the obvious

1537
01:08:44,680 --> 01:08:42,890
we're gonna be much farther away and

1538
01:08:46,180 --> 01:08:44,690

this is a pretty new program for us so

1539
01:08:48,400 --> 01:08:46,190
where are we in the development of

1540
01:08:50,829 --> 01:08:48,410
Gateway you know we are really making a

1541
01:08:52,360 --> 01:08:50,839
lot of progress really fast the first

1542
01:08:55,480 --> 01:08:52,370
elements that make up what we're calling

1543
01:08:58,269 --> 01:08:55,490
phase one of the Gateway should all be

1544
01:09:00,820 --> 01:08:58,279
in place in order for us to make and

1545
01:09:03,130 --> 01:09:00,830
support that 2024 boots on the moon

1546
01:09:05,620 --> 01:09:03,140
mandate that we have so our first

1547
01:09:09,190 --> 01:09:05,630
element is the parent propulsion module

1548
01:09:11,320 --> 01:09:09,200
and it should launch in 2022 we just

1549
01:09:12,789 --> 01:09:11,330
announced the contractor that's going to

1550
01:09:15,130 --> 01:09:12,799
help us to build that module max our

1551
01:09:17,440 --> 01:09:15,140
technologies so they are well on their

1552
01:09:19,510 --> 01:09:17,450
way the second module that we put up

1553
01:09:20,769 --> 01:09:19,520
will be a habitation module it will dock

1554
01:09:24,309 --> 01:09:20,779
with that power

1555
01:09:26,740 --> 01:09:24,319
an element and we are very very close to

1556
01:09:28,660 --> 01:09:26,750
getting that modulo in contract and on

1557
01:09:30,970 --> 01:09:28,670
its way here in probably the next month

1558
01:09:33,430 --> 01:09:30,980
or two and then the third element that

1559
01:09:35,829 --> 01:09:33,440
will be part of that first 2024 phase

1560
01:09:38,109 --> 01:09:35,839
one is our logistics module and we ought

1561
01:09:40,329 --> 01:09:38,119
to have it on contract by the end of

1562
01:09:42,430 --> 01:09:40,339
this calendar year so a lot of progress

1563
01:09:45,279 --> 01:09:42,440

is happening really fast yeah lots of

1564
01:09:47,260 --> 01:09:45,289
balls moving now well is there anything

1565
01:09:50,379 --> 01:09:47,270
that you know hearing about gateway you

1566
01:09:52,839 --> 01:09:50,389
wish you had on Apollo 7 or that having

1567
01:09:54,069 --> 01:09:52,849
had 11 days in space on Apollo 7 that

1568
01:09:57,640 --> 01:09:54,079
you would recommend having on the

1569
01:10:02,859 --> 01:09:57,650
Gateway personally I find it very

1570
01:10:06,970 --> 01:10:02,869
difficult to compare things today and

1571
01:10:09,490 --> 01:10:06,980
what they were then 50 years ago it's

1572
01:10:12,939 --> 01:10:09,500
because the organization's become more

1573
01:10:16,209 --> 01:10:12,949
organized many of the problems we have

1574
01:10:20,560 --> 01:10:16,219
been I won't say solved but are like 98

1575
01:10:23,819 --> 01:10:20,570
99 percent compared to 50 percent but I

1576
01:10:26,350 --> 01:10:23,829
do see a difference in attitude in

1577
01:10:30,310 --> 01:10:26,360
exploring space today for what it was

1578
01:10:33,299 --> 01:10:30,320
back 50 years ago when everybody was a

1579
01:10:35,680 --> 01:10:33,309
fighter pilot test pilot and we saw

1580
01:10:39,669 --> 01:10:35,690
basically as an opportunity to stick our

1581
01:10:42,069 --> 01:10:39,679
necks out a little to do it and what's

1582
01:10:45,819 --> 01:10:42,079
amazing for me when I look at that is

1583
01:10:48,399 --> 01:10:45,829
here we are 50 years later and I never

1584
01:10:54,819 --> 01:10:48,409
in my life could have projected this

1585
01:10:58,029 --> 01:10:54,829
amount of interest and association was

1586
01:11:02,310 --> 01:10:58,039
what we were doing back then and also at

1587
01:11:06,189 --> 01:11:02,320
the same time since it's a civilian

1588
01:11:08,680 --> 01:11:06,199

operation wasn't military if we had all

1589
01:11:11,200 --> 01:11:08,690
military trained fighter pilots but

1590
01:11:13,299 --> 01:11:11,210
what's going to happen is a hundred

1591
01:11:15,390 --> 01:11:13,309
years from now two hundred five hundred

1592
01:11:18,430 --> 01:11:15,400
years from now there's only going to be

1593
01:11:20,529 --> 01:11:18,440
probably one thing they remember about

1594
01:11:24,700 --> 01:11:20,539
the 20th century and that's a man went

1595
01:11:27,720 --> 01:11:24,710
to the moon and Neil Armstrong he's

1596
01:11:30,030 --> 01:11:27,730
going to be going down in history

1597
01:11:32,130 --> 01:11:30,040
we also appreciate your role in helping

1598
01:11:34,160 --> 01:11:32,140
us get to where we are today and we're

1599
01:11:37,710 --> 01:11:34,170
thankful that you're celebrating with us

1600
01:11:39,870 --> 01:11:37,720
well I I feel very fortunate I feel more

1601
01:11:42,810 --> 01:11:39,880
fortunate today because what I was

1602
01:11:44,430 --> 01:11:42,820
taking for granted back on Apollo 7

1603
01:11:47,370 --> 01:11:44,440
which to this day is still the longest

1604
01:11:50,640 --> 01:11:47,380
most ambitious most successful first

1605
01:11:53,490 --> 01:11:50,650
Test flight back in those days it was a

1606
01:11:55,050 --> 01:11:53,500
challenging job to do we were committed

1607
01:11:58,140 --> 01:11:55,060
to it we've got to do whatever was

1608
01:12:01,260 --> 01:11:58,150
necessary to make that a success and now

1609
01:12:03,350 --> 01:12:01,270
50 years later I look at it in

1610
01:12:07,200 --> 01:12:03,360
perspective with our overall

1611
01:12:10,920 --> 01:12:07,210
accomplishment Apollo and frankly I am

1612
01:12:13,620 --> 01:12:10,930
proud to played one small step in that

1613
01:12:15,240 --> 01:12:13,630

with Apollo 7 thank you so much we are

1614
01:12:16,950 --> 01:12:15,250
looking forward to also having some big

1615
01:12:19,500 --> 01:12:16,960
milestones to celebrate in the upcoming

1616
01:12:21,930 --> 01:12:19,510
years the good part of that and getting

1617
01:12:23,340 --> 01:12:21,940
people back onto the moon is going to be

1618
01:12:24,510 --> 01:12:23,350
gateway it's gonna be cutting edge

1619
01:12:27,450 --> 01:12:24,520
technology and that's saying something

1620
01:12:32,580 --> 01:12:27,460
since we had cutting edge technology 50

1621
01:12:34,860 --> 01:12:32,590
years ago you probably know that the

1622
01:12:36,840 --> 01:12:34,870
spacecraft to get us to the moon was

1623
01:12:38,880 --> 01:12:36,850
incredibly complicated but you realized

1624
01:12:41,490 --> 01:12:38,890
that there were six point 1 million

1625
01:12:43,200 --> 01:12:41,500
parts in the saturn v launch vehicle in

1626
01:12:44,790 --> 01:12:43,210
the apollo spacecraft that had to be

1627
01:12:46,980 --> 01:12:44,800
assembled and it all had to work

1628
01:12:53,290 --> 01:12:46,990
correctly for us to get to the moon in

1629
01:12:58,150 --> 01:12:56,140
and welcome back to the Saturn 5 Center

1630
01:13:00,940 --> 01:12:58,160
at the Kennedy Space Center in Florida a

1631
01:13:02,980 --> 01:13:00,950
look at the lunar module it was supposed

1632
01:13:04,510 --> 01:13:02,990
to be for Apollo 15 but actually never

1633
01:13:07,450 --> 01:13:04,520
flew once they decided they were gonna

1634
01:13:08,890 --> 01:13:07,460
take moon Rovers up to the moon but they

1635
01:13:09,400 --> 01:13:08,900
say it works and it could have gone to

1636
01:13:12,160 --> 01:13:09,410
the moon

1637
01:13:13,810 --> 01:13:12,170
yeah and it's it's it's one thing to see

1638
01:13:15,970 --> 01:13:13,820

it you know the pictures of it are

1639
01:13:17,560 --> 01:13:15,980
magnificent on camera but when you're up

1640
01:13:19,420 --> 01:13:17,570
close and personal right next to it you

1641
01:13:21,340 --> 01:13:19,430
really see you know all those little

1642
01:13:22,870 --> 01:13:21,350
details and it's just amazing that we

1643
01:13:24,610 --> 01:13:22,880
what we were able to accomplish together

1644
01:13:26,860 --> 01:13:24,620
as a nation you're absolutely right and

1645
01:13:28,060 --> 01:13:26,870
back here at the Kennedy Space Center if

1646
01:13:30,340 --> 01:13:28,070
you're just joining us we are of course

1647
01:13:32,530 --> 01:13:30,350
celebrating the fiftieth anniversary of

1648
01:13:34,990 --> 01:13:32,540
Apollo and looking forward to our plans

1649
01:13:37,030 --> 01:13:35,000
for the next giant leap to the moon and

1650
01:13:38,830 --> 01:13:37,040
on to Mars and a reminder that we're

1651
01:13:41,350 --> 01:13:38,840
taking your questions online using the

1652
01:13:42,910 --> 01:13:41,360
hashtag Apollo 50th and that will have a

1653
01:13:45,100 --> 01:13:42,920
fun reveal coming up a little later

1654
01:13:47,260 --> 01:13:45,110
about our Artemis program at the end of

1655
01:13:49,000 --> 01:13:47,270
the show a fun reveal yeah you tell me

1656
01:13:51,160 --> 01:13:49,010
now well know then it wouldn't be a

1657
01:13:53,140 --> 01:13:51,170
reveal show you got away all right I'm

1658
01:13:55,000 --> 01:13:53,150
gonna wait well if you want to follow us

1659
01:13:58,480 --> 01:13:55,010
you can just join us right now online

1660
01:14:01,060 --> 01:13:58,490
and explore our subscription right there

1661
01:14:02,170 --> 01:14:01,070
at nasa.gov forward slash subscribe and

1662
01:14:04,780 --> 01:14:02,180
we'll keep you updated with our

1663
01:14:06,570 --> 01:14:04,790

newsletter for weekly updates as we go

1664
01:14:09,610 --> 01:14:06,580
forward to the moon and on to Mars

1665
01:14:12,970 --> 01:14:09,620
subscribe again at nasa.gov forward

1666
01:14:14,770 --> 01:14:12,980
slash subscribe now keep in mind we

1667
01:14:16,360 --> 01:14:14,780
didn't just develop technology in the

1668
01:14:18,430 --> 01:14:16,370
Apollo years you're looking at the

1669
01:14:21,190 --> 01:14:18,440
gantry right now at launch complex 39

1670
01:14:23,350 --> 01:14:21,200
where folks like to gather to watch the

1671
01:14:25,870 --> 01:14:23,360
launches from pad a and be there and

1672
01:14:27,910 --> 01:14:25,880
we've got a special live guest out there

1673
01:14:29,860 --> 01:14:27,920
one of the last two people to walk on

1674
01:14:31,780 --> 01:14:29,870
the moon and we've got someone out there

1675
01:14:33,190 --> 01:14:31,790
to talk to him Amanda Griffin Amanda I

1676
01:14:35,260 --> 01:14:33,200
don't know if your if you're out there

1677
01:14:37,750 --> 01:14:35,270
I'm not sure which level are you on out

1678
01:14:39,430 --> 01:14:37,760
there at the tippy-top it's a beautiful

1679
01:14:41,380 --> 01:14:39,440
day but it is breezy up here so

1680
01:14:45,040 --> 01:14:41,390
hopefully you can get us loud and clear

1681
01:14:46,480 --> 01:14:45,050
here so behind us is pad 39a currently

1682
01:14:48,340 --> 01:14:46,490
it is being used for missions to the

1683
01:14:50,770 --> 01:14:48,350
space station and beyond by commercial

1684
01:14:52,390 --> 01:14:50,780
entities but 50 years ago the first men

1685
01:14:55,090 --> 01:14:52,400
to walk on the moon launched from there

1686
01:14:56,500 --> 01:14:55,100
just a few years later Apollo 17

1687
01:14:58,540 --> 01:14:56,510
launched the last man who walked on the

1688
01:15:00,580 --> 01:14:58,550

moon and one of them was dr. Harrison

1689
01:15:01,570 --> 01:15:00,590
Schmitt dr. Smith thanks so much for

1690
01:15:03,220 --> 01:15:01,580
being with us today

1691
01:15:05,010 --> 01:15:03,230
it's great to be with you I sort of miss

1692
01:15:06,600 --> 01:15:05,020
seen a Saturn 5 out there

1693
01:15:09,750 --> 01:15:06,610
no but hopefully soon you'll see and

1694
01:15:11,700 --> 01:15:09,760
that's the last thing Kennedy Space

1695
01:15:14,280 --> 01:15:11,710
Center's doing a remarkable job getting

1696
01:15:16,830 --> 01:15:14,290
ready for that we're excited so can you

1697
01:15:19,230 --> 01:15:16,840
tell us you were NASA's first astronaut

1698
01:15:20,820 --> 01:15:19,240
scientist why was it so important that

1699
01:15:24,030 --> 01:15:20,830
you were on that mission on Apollo 17

1700
01:15:26,370 --> 01:15:24,040
well by the time Neil Armstrong had

1701
01:15:30,330 --> 01:15:26,380
completed his activities along with Buzz

1702
01:15:32,550 --> 01:15:30,340
and Mike Holland it became clear that we

1703
01:15:34,170 --> 01:15:32,560
had the capability to explore in fact it

1704
01:15:37,050 --> 01:15:34,180
was clear even before that if we were

1705
01:15:39,270 --> 01:15:37,060
successful in Apollo 11 we would be able

1706
01:15:41,730 --> 01:15:39,280
to explore and so the last missions and

1707
01:15:44,550 --> 01:15:41,740
particularly my mission were designed to

1708
01:15:46,560 --> 01:15:44,560
be exploration missions and so we all

1709
01:15:48,450 --> 01:15:46,570
know that on Apollo 11 they collected

1710
01:15:50,730 --> 01:15:48,460
maybe 40 pounds of moon rocks but I

1711
01:15:52,650 --> 01:15:50,740
understand you kind of beat them how

1712
01:15:55,530 --> 01:15:52,660
much did you like well we did set the

1713
01:15:59,240 --> 01:15:55,540

record at 240 pounds but the total of

1714
01:16:01,830 --> 01:15:59,250
six landings brought back 850 pounds of

1715
01:16:03,270 --> 01:16:01,840
lunar rocks and those rocks are really

1716
01:16:05,310 --> 01:16:03,280
the Apollo mission that continues

1717
01:16:07,590 --> 01:16:05,320
because the lunar scientists and

1718
01:16:08,790 --> 01:16:07,600
planetary scientists continue to work on

1719
01:16:10,590 --> 01:16:08,800
those and almost certainly will

1720
01:16:12,570 --> 01:16:10,600
indefinitely yeah and I understand that

1721
01:16:14,730 --> 01:16:12,580
earlier this month you and an astronaut

1722
01:16:17,580 --> 01:16:14,740
candidate what was her name Jessica

1723
01:16:21,000 --> 01:16:17,590
Watkins I had a great time in the rock

1724
01:16:24,180 --> 01:16:21,010
lab Johnson Space Center the old man

1725
01:16:26,640 --> 01:16:24,190
spacecraft Center and we were narrating

1726
01:16:30,150 --> 01:16:26,650
a great deal of activity there about the

1727
01:16:34,830 --> 01:16:30,160
samples for NASA yeah let's take a look

1728
01:16:36,930 --> 01:16:34,840
real quick so all of these these samples

1729
01:16:38,790 --> 01:16:36,940
are very different and of course the we

1730
01:16:43,260 --> 01:16:38,800
just talked about the sampling strategy

1731
01:16:45,090 --> 01:16:43,270
from Neil Armstrong on Paul 11 but by 17

1732
01:16:47,400 --> 01:16:45,100
the sampling strategy was a little bit

1733
01:16:48,580 --> 01:16:47,410
different can you talk about kind of

1734
01:16:50,830 --> 01:16:48,590
what the

1735
01:16:52,899 --> 01:16:50,840
what went into your sampling strategy

1736
01:16:55,540 --> 01:16:52,909
and how you chose which samples to bring

1737
01:16:57,850 --> 01:16:55,550
back well the whole background for

1738
01:17:00,520 --> 01:16:57,860

Apollo 17 was to since we knew it was

1739
01:17:02,589 --> 01:17:00,530
going to be the final Apollo mission was

1740
01:17:04,990 --> 01:17:02,599
to fill in as many of the gaps as we

1741
01:17:08,000 --> 01:17:05,000
could both in the sample collection and

1742
01:17:10,670 --> 01:17:08,010
in the kinds of features

1743
01:17:12,080 --> 01:17:10,680
and that turned out pretty well yes so

1744
01:17:15,200 --> 01:17:12,090
there are all sorts of stories that come

1745
01:17:19,989 --> 01:17:15,210
out of these rocks about the evolution

1746
01:17:23,109 --> 01:17:19,999
of particular materials particular rocks

1747
01:17:25,149 --> 01:17:23,119
just so they have what I consider one of

1748
01:17:28,120 --> 01:17:25,159
the one other they're not the most

1749
01:17:30,129 --> 01:17:28,130
important sample Armstrong collected

1750
01:17:31,870 --> 01:17:30,139
when he thought the rock voxel in theory

1751
01:17:35,680 --> 01:17:31,880
and so he just filled it up with this

1752
01:17:43,270 --> 01:17:35,690
material is the numbers 1008 for all of

1753
01:17:46,120 --> 01:17:43,280
us nerds what gave us was our first real

1754
01:17:48,430 --> 01:17:46,130
definitive look at what the resources at

1755
01:17:50,950 --> 01:17:48,440
the surface of the Moon might be for

1756
01:17:53,229 --> 01:17:50,960
either owner basis or their settlements

1757
01:17:55,569 --> 01:17:53,239
bars exploration that's going to need

1758
01:17:58,029 --> 01:17:55,579
resources radiation protection these

1759
01:18:00,759 --> 01:17:58,039
water and you can heat this material up

1760
01:18:02,319 --> 01:18:00,769
and make water anywhere on the moon you

1761
01:18:04,569 --> 01:18:02,329
don't have to call the polos make water

1762
01:18:09,970 --> 01:18:04,579
from ice you can make it you have heated

1763
01:18:16,630 --> 01:18:14,080

sample came still giving it is they all

1764
01:18:19,600 --> 01:18:16,640
are it's as if the Apollo program never

1765
01:18:21,820 --> 01:18:19,610
ended right because there are hundreds

1766
01:18:23,530 --> 01:18:21,830
have been thousands now people who have

1767
01:18:26,020 --> 01:18:23,540
worked on the samples and still work on

1768
01:18:28,300 --> 01:18:26,030
the samples the advance of analytical

1769
01:18:34,120 --> 01:18:28,310
technology means that you can go back to

1770
01:18:36,669 --> 01:18:34,130
an old sample and get the right dr.

1771
01:18:37,870 --> 01:18:36,679
Schmidt I love that the samples that we

1772
01:18:40,360 --> 01:18:37,880
took fifty years ago are still

1773
01:18:42,669 --> 01:18:40,370
benefiting us today and in our future

1774
01:18:44,650 --> 01:18:42,679
endeavors thank you so much for all that

1775
01:18:46,180 --> 01:18:44,660
you've done for NASA and for the world

1776
01:18:48,280 --> 01:18:46,190
and thanks for joining us here today

1777
01:18:50,050 --> 01:18:48,290
well it's been my privilege and thank

1778
01:18:51,550 --> 01:18:50,060
you for the opportunity to talk to you

1779
01:18:53,890 --> 01:18:51,560
absolutely we're gonna send it back

1780
01:18:55,479 --> 01:18:53,900
inside we're gonna hear more about what

1781
01:18:57,130 --> 01:18:55,489
we still have to learn from the moon

1782
01:18:59,110 --> 01:18:57,140
all right thanks to both of you it's so

1783
01:19:01,060 --> 01:18:59,120
incredible to hear about these moon

1784
01:19:02,800 --> 01:19:01,070
rocks they brought back you know fifty

1785
01:19:04,600 --> 01:19:02,810
years ago and they're still teaching us

1786
01:19:06,939 --> 01:19:04,610
things today the astronaut from Apollo

1787
01:19:08,650 --> 01:19:06,949
teaching the up-and-coming geologist I

1788
01:19:10,630 --> 01:19:08,660

mean it's what a great story that yes

1789
01:19:12,400 --> 01:19:10,640
it's really awesome and unlocking those

1790
01:19:14,500 --> 01:19:12,410
scientific mysteries is one of the main

1791
01:19:16,990 --> 01:19:14,510
reasons we explore whether it's at the

1792
01:19:18,760 --> 01:19:17,000
moon or our home planet or even the

1793
01:19:20,530 --> 01:19:18,770
farthest reaches of our solar system

1794
01:19:22,270 --> 01:19:20,540
yeah Kelsey Young a scientist from our

1795
01:19:24,580 --> 01:19:22,280
Goddard Space Flight Center in Maryland

1796
01:19:26,950 --> 01:19:24,590
has more on what we already know and

1797
01:19:31,510 --> 01:19:26,960
what we hope to learn about our closest

1798
01:19:33,160 --> 01:19:31,520
celestial neighbor the six Apollo lunar

1799
01:19:34,510 --> 01:19:33,170
surface missions were able to collect an

1800
01:19:36,310 --> 01:19:34,520
incredible amount of samples that are

1801
01:19:38,770 --> 01:19:36,320
continuing to yield exciting scientific

1802
01:19:40,150 --> 01:19:38,780
discoveries even today through analyzing

1803
01:19:41,709 --> 01:19:40,160
these samples and through missions like

1804
01:19:43,540 --> 01:19:41,719
the lunar reconnaissance orbiter and the

1805
01:19:45,100 --> 01:19:43,550
L cross mission we're actually able to

1806
01:19:46,840 --> 01:19:45,110
discover that there's water on the moon

1807
01:19:48,790 --> 01:19:46,850
but we haven't been able to determine

1808
01:19:50,320 --> 01:19:48,800
just how much water is there we know

1809
01:19:51,250 --> 01:19:50,330
it's there in quantities great enough

1810
01:19:52,390 --> 01:19:51,260
that we can actually start thinking

1811
01:19:53,979 --> 01:19:52,400
about what to do with it

1812
01:19:55,990 --> 01:19:53,989
through Institute resource utilization

1813
01:19:57,910 --> 01:19:56,000

we'll be able to turn this water into

1814
01:20:00,160 --> 01:19:57,920
usable products like drinking water or

1815
01:20:01,959 --> 01:20:00,170
fuel which will enable us to establish a

1816
01:20:02,590 --> 01:20:01,969
long-term sustainable presence on the

1817
01:20:04,570 --> 01:20:02,600
lunar surface

1818
01:20:06,310 --> 01:20:04,580
it's absolutely critical that future

1819
01:20:08,260 --> 01:20:06,320
human and robotic missions to the moon

1820
01:20:10,150 --> 01:20:08,270
will help quantify just how much water

1821
01:20:11,560 --> 01:20:10,160
is there as well as to just continue

1822
01:20:13,090 --> 01:20:11,570
answering they're really exciting and

1823
01:20:16,300 --> 01:20:13,100
important science questions we have left

1824
01:20:21,280 --> 01:20:18,640
education has always been a part of the

1825
01:20:23,680 --> 01:20:21,290
NASA mission stay with us on NASA TV at

1826
01:20:26,500 --> 01:20:23,690
3:00 Eastern for our next show called

1827
01:20:28,300 --> 01:20:26,510
stem forward to the moon we visited

1828
01:20:30,760 --> 01:20:28,310
students across the country taking the

1829
01:20:32,980 --> 01:20:30,770
science behind a mission to the moon and

1830
01:20:35,650 --> 01:20:32,990
breaking it down into activities you can

1831
01:20:37,900 --> 01:20:35,660
do at home stay with us for that coming

1832
01:20:39,970 --> 01:20:37,910
up at 3 and next up we want to go to

1833
01:20:41,440 --> 01:20:39,980
Danielle Rousseau she's been mingling

1834
01:20:44,110 --> 01:20:41,450
with out here in Danielle have you

1835
01:20:46,990 --> 01:20:44,120
meeting some interesting folks thanks

1836
01:20:49,150 --> 01:20:47,000
marine 11 it's personal to a lot of

1837
01:20:51,190 --> 01:20:49,160
people whether that be actually watching

1838
01:20:53,200 --> 01:20:51,200

the launch reading about it or just

1839
01:20:55,960 --> 01:20:53,210
being an overall space enthusiasts but

1840
01:20:57,820 --> 01:20:55,970
for me it's about family my grandfather

1841
01:21:00,760 --> 01:20:57,830
was the command module pilot on Apollo

1842
01:21:03,070 --> 01:21:00,770
14 and his capsule is actually here at

1843
01:21:05,800 --> 01:21:03,080
Kennedy Space Center to be in the same

1844
01:21:07,870 --> 01:21:05,810
place capsule is truly inspiring and I'm

1845
01:21:09,460 --> 01:21:07,880
beyond grateful to be here but today I

1846
01:21:11,080 --> 01:21:09,470
have a very special guest

1847
01:21:12,970 --> 01:21:11,090
Keenen why don't you come in here he's

1848
01:21:15,670 --> 01:21:12,980
10 years old he's visiting Kennedy Space

1849
01:21:18,130 --> 01:21:15,680
Center so what is the longest car ride

1850
01:21:21,010 --> 01:21:18,140
you've been on honey about six hours six

1851
01:21:23,050 --> 01:21:21,020
hours Wow okay imagine being in a

1852
01:21:25,780 --> 01:21:23,060
capsule with two other people squished

1853
01:21:29,020 --> 01:21:25,790
together for nine days how does that

1854
01:21:30,430 --> 01:21:29,030
sound aah and squished over heated and

1855
01:21:33,040 --> 01:21:30,440
squished and there's probably not any

1856
01:21:35,710 --> 01:21:33,050
white button okay and what is your

1857
01:21:38,080 --> 01:21:35,720
favorite planet what is the main tip

1858
01:21:40,210 --> 01:21:38,090
nuts like cheese the moon because it

1859
01:21:41,620 --> 01:21:40,220
looks like cheese great and are you

1860
01:21:42,880 --> 01:21:41,630
enjoying your day here at Kennedy Space

1861
01:21:44,890 --> 01:21:42,890
Center yes

1862
01:21:46,750 --> 01:21:44,900
all right great well that's all I have

1863
01:21:49,390 --> 01:21:46,760

right now and we'll be circling back

1864
01:21:51,640 --> 01:21:49,400
soon all right thanks Daniel it's great

1865
01:21:53,650 --> 01:21:51,650
to see those young kids being so excited

1866
01:21:55,000 --> 01:21:53,660
about seeing how we went to the moon and

1867
01:21:57,220 --> 01:21:55,010
you know they're dreaming about being

1868
01:21:58,720 --> 01:21:57,230
the next generation to go up there and

1869
01:22:00,100 --> 01:21:58,730
there's so many of them here inside the

1870
01:22:01,420 --> 01:22:00,110
Saturn five seven you can hear them in

1871
01:22:03,220 --> 01:22:01,430
the background yeah just fill in this

1872
01:22:06,070 --> 01:22:03,230
place up which is great well now the

1873
01:22:07,750 --> 01:22:06,080
Apollo 11 command module is on tour and

1874
01:22:11,470 --> 01:22:07,760
right now it's out in Seattle that's the

1875
01:22:14,050 --> 01:22:11,480
one that was a piloted by the Apollo 11

1876
01:22:16,810 --> 01:22:14,060
astronauts and it's out with Natalie's

1877
01:22:24,119 --> 01:22:16,820
with Natalie Joseph of NASA out in

1878
01:22:30,080 --> 01:22:26,459
hi we're at the Museum of Flight in

1879
01:22:33,270 --> 01:22:30,090
Seattle the largest independently owned

1880
01:22:36,000 --> 01:22:33,280
nonprofit air museum in the world it's

1881
01:22:39,000 --> 01:22:36,010
also the temporary home to Apollo 11

1882
01:22:40,799 --> 01:22:39,010
command module Columbia the only part of

1883
01:22:44,459 --> 01:22:40,809
the spacecraft to return back to earth

1884
01:22:46,560 --> 01:22:44,469
and more than 55,000 people have already

1885
01:22:48,750 --> 01:22:46,570
been here to see it in Seattle and the

1886
01:22:51,929 --> 01:22:48,760
festivities continue as more visitors

1887
01:22:54,330 --> 01:22:51,939
roll in to celebrate the Apollo 50th

1888
01:22:56,520 --> 01:22:54,340

anniversary one thing that visitors

1889
01:22:58,919 --> 01:22:56,530
can't easily see though is an

1890
01:23:02,009 --> 01:22:58,929
interesting piece of graffiti inside

1891
01:23:04,529 --> 01:23:02,019
Columbia after splashdown command module

1892
01:23:06,929 --> 01:23:04,539
pilot Mike Collins scribbled a quick

1893
01:23:09,810 --> 01:23:06,939
tribute inside the lower equipment Bay

1894
01:23:12,569 --> 01:23:09,820
praising Columbia as the best ship to

1895
01:23:15,449 --> 01:23:12,579
come down the line now nASA has a new

1896
01:23:17,159 --> 01:23:15,459
ship coming down the line Orion a new

1897
01:23:20,369 --> 01:23:17,169
capsule that will send humans farther

1898
01:23:22,799 --> 01:23:20,379
than ever before astronaut Randy Bresnik

1899
01:23:25,679 --> 01:23:22,809
compares Orion to Apollo

1900
01:23:27,899 --> 01:23:25,689
Oh Ryan is the vehicle that's gonna take

1901
01:23:30,750 --> 01:23:27,909
and put the next man and the first woman

1902
01:23:32,040 --> 01:23:30,760
on the moon by 2024 it's the vehicle

1903
01:23:34,319 --> 01:23:32,050
that has to take us out of Earth's

1904
01:23:36,899 --> 01:23:34,329
atmosphere safely across the expanse of

1905
01:23:38,580 --> 01:23:36,909
250,000 miles to the moon put us in a

1906
01:23:40,830 --> 01:23:38,590
lunar orbit the Gateway Space Station

1907
01:23:42,089 --> 01:23:40,840
and then sit there and wait while the

1908
01:23:44,849 --> 01:23:42,099
astronauts go down to the lunar surface

1909
01:23:46,139 --> 01:23:44,859
for the first time since 1972 then the

1910
01:23:47,639 --> 01:23:46,149
mass rocks going to come back up the

1911
01:23:49,500 --> 01:23:47,649
Gateway get on a ride come back home

1912
01:23:51,089 --> 01:23:49,510
reenter verse atmosphere aligns to be

1913
01:23:53,580 --> 01:23:51,099

the ones to go get us back safely on the

1914
01:23:55,500 --> 01:23:53,590
ground now the laws of physics still

1915
01:23:58,319 --> 01:23:55,510
apply the same as they did back in the

1916
01:24:01,379 --> 01:23:58,329
1960s we had to come back from lunar

1917
01:24:02,969 --> 01:24:01,389
return velocities among 32 and dissipate

1918
01:24:04,859 --> 01:24:02,979
all that energy so that's shape of the

1919
01:24:05,310 --> 01:24:04,869
capsule you see behind us is pretty much

1920
01:24:06,779 --> 01:24:05,320
the same

1921
01:24:08,069 --> 01:24:06,789
we got a heat shield underneath that

1922
01:24:10,319 --> 01:24:08,079
allows us to get a readout of the

1923
01:24:13,739 --> 01:24:10,329
atmosphere the big thing is when you get

1924
01:24:15,929 --> 01:24:13,749
inside it's 30% larger Orion can carry

1925
01:24:18,089 --> 01:24:15,939
four crew for 21 days where Apollo was

1926
01:24:19,619 --> 01:24:18,099
three crew for 14 days now it's also

1927
01:24:21,299 --> 01:24:19,629
taking a lot of advantage of technology

1928
01:24:23,459 --> 01:24:21,309
developments where now we've got the

1929
01:24:25,529 --> 01:24:23,469
last cockpit we've got digital displays

1930
01:24:26,819 --> 01:24:25,539
to control all the systems and able to

1931
01:24:28,379 --> 01:24:26,829
give that to us in a digital format pull

1932
01:24:31,290 --> 01:24:28,389
up our electronic procedures and

1933
01:24:33,389 --> 01:24:31,300
emergency function it also has a lot of

1934
01:24:33,869 --> 01:24:33,399
better computing power and comparison to

1935
01:24:39,150 --> 01:24:33,879
Apollo

1936
01:24:41,550 --> 01:24:39,160
less computing power than we have in our

1937
01:24:42,780 --> 01:24:41,560
watches these days a lot more safety

1938
01:24:44,940 --> 01:24:42,790

redundancies

1939
01:24:46,590 --> 01:24:44,950
it also has composite materials were

1940
01:24:48,270 --> 01:24:46,600
able to make it lighter or also be able

1941
01:24:49,860 --> 01:24:48,280
to use 3d printing to make things that

1942
01:24:51,840 --> 01:24:49,870
we couldn't make before so it's really

1943
01:24:54,000 --> 01:24:51,850
really going to be the next generation

1944
01:24:56,160 --> 01:24:54,010
vehicle that says allow us to have that

1945
01:24:57,630 --> 01:24:56,170
returned to the moon in 2024 and then

1946
01:24:59,700 --> 01:24:57,640
keep going back every year after that

1947
01:25:01,710 --> 01:24:59,710
and make that sustained presence on that

1948
01:25:03,720 --> 01:25:01,720
south pole it allows it do all the

1949
01:25:05,580 --> 01:25:03,730
things we need to to be able to be ready

1950
01:25:13,350 --> 01:25:05,590
to go from the moon to Mars shortly

1951
01:25:16,410 --> 01:25:13,360
thereafter I'm joined by NASA astronaut

1952
01:25:18,690 --> 01:25:16,420
and physician dr. Michael Barrett hey

1953
01:25:20,670 --> 01:25:18,700
Mike how does it feel to be back in your

1954
01:25:22,140 --> 01:25:20,680
home state well it's great to be back in

1955
01:25:24,330 --> 01:25:22,150
the great state of Washington and here

1956
01:25:26,220 --> 01:25:24,340
at the Museum of Flight and one special

1957
01:25:28,320 --> 01:25:26,230
thing for me is I launched on the Soyuz

1958
01:25:30,300 --> 01:25:28,330
which is across the street right over

1959
01:25:32,130 --> 01:25:30,310
here the last time I had seen it was

1960
01:25:33,840 --> 01:25:32,140
smoking for re-entry in the desert of

1961
01:25:36,120 --> 01:25:33,850
Kazakhstan and now it's here so it's

1962
01:25:37,800 --> 01:25:36,130
great that is awesome so you mentioned

1963
01:25:40,950 --> 01:25:37,810

you've launched on a Soyuz but you've

1964
01:25:42,930 --> 01:25:40,960
also launched on a shuttle and so how

1965
01:25:45,870 --> 01:25:42,940
would you feel about taking a ride in

1966
01:25:47,580 --> 01:25:45,880
Orion well I think the Soyuz in the

1967
01:25:49,140 --> 01:25:47,590
shuttle have been fabulous spacecraft

1968
01:25:50,790 --> 01:25:49,150
and they have done their job and getting

1969
01:25:52,470 --> 01:25:50,800
people to low Earth orbit for years and

1970
01:25:54,300 --> 01:25:52,480
they've done that magnificently but the

1971
01:25:56,100 --> 01:25:54,310
Orion is a very different beast it is

1972
01:25:57,570 --> 01:25:56,110
designed to take us away from low Earth

1973
01:25:59,400 --> 01:25:57,580
orbit and out into missions of

1974
01:26:00,930 --> 01:25:59,410
exploration of the moon and beyond all

1975
01:26:02,880 --> 01:26:00,940
of us would love that and there's

1976
01:26:04,260 --> 01:26:02,890
something more in that we've all had a

1977
01:26:06,330 --> 01:26:04,270
hand in the astronaut office in

1978
01:26:09,000 --> 01:26:06,340
designing and building the Orion we have

1979
01:26:10,620 --> 01:26:09,010
a berth connection if you will that we

1980
01:26:11,820 --> 01:26:10,630
really haven't seen between crew members

1981
01:26:13,800 --> 01:26:11,830
and their spaceships for a couple of

1982
01:26:15,840 --> 01:26:13,810
decades so how would I fly it I'd fly it

1983
01:26:17,250 --> 01:26:15,850
like I'm going somewhere awesome and I'd

1984
01:26:18,750 --> 01:26:17,260
fly it like it belongs to all of us

1985
01:26:21,420 --> 01:26:18,760
that's awesome

1986
01:26:24,330 --> 01:26:21,430
and so one of orion's jobs is also to

1987
01:26:26,730 --> 01:26:24,340
sustain the crew so what are some human

1988
01:26:28,950 --> 01:26:26,740

factors issues that humans in space may

1989
01:26:30,860 --> 01:26:28,960
face during long-duration flights and as

1990
01:26:33,030 --> 01:26:30,870
we get closer to sending humans to Mars

1991
01:26:34,800 --> 01:26:33,040
that's a great question we're pretty

1992
01:26:36,330 --> 01:26:34,810
good at flying for six months in

1993
01:26:38,520 --> 01:26:36,340
weightlessness and the human has shown

1994
01:26:40,650 --> 01:26:38,530
just an incredible capacity to adapt to

1995
01:26:42,090 --> 01:26:40,660
that but when you break orbit and you

1996
01:26:44,430 --> 01:26:42,100
head to Mars and you may be gone for

1997
01:26:46,740 --> 01:26:44,440
three years the earth gets smaller and

1998
01:26:48,360 --> 01:26:46,750
you can't evacuate to earth if something

1999
01:26:50,960 --> 01:26:48,370
medical happens so you have to be

2000
01:26:52,130 --> 01:26:50,970
totally autonomous and self Cabell

2001
01:26:54,020 --> 01:26:52,140
and we're looking at the cumulative

2002
01:26:55,850 --> 01:26:54,030
effects of months and years of

2003
01:26:57,320 --> 01:26:55,860
weightlessness or the fractional gravity

2004
01:26:59,480 --> 01:26:57,330
on Mars and there's a little bit more

2005
01:27:01,070 --> 01:26:59,490
radiation there's nutritional aspects of

2006
01:27:03,350 --> 01:27:01,080
it all now we have shown tremendous

2007
01:27:05,360 --> 01:27:03,360
capacity to adapt and we will see that

2008
01:27:07,280 --> 01:27:05,370
we just have to approach this I would

2009
01:27:08,840 --> 01:27:07,290
say methodically and thoughtfully and

2010
01:27:10,340 --> 01:27:08,850
document as we go but there's no

2011
01:27:11,840 --> 01:27:10,350
question that we'll meet these

2012
01:27:14,120 --> 01:27:11,850
challenges that will be great explorers

2013
01:27:18,020 --> 01:27:14,130

well thank you Mike and happy Apollo

2014
01:27:19,670 --> 01:27:18,030
50th thanks and now we're joined by some

2015
01:27:21,950 --> 01:27:19,680
visitors of the museum come on

2016
01:27:24,140 --> 01:27:21,960
come join me what is your name what are

2017
01:27:26,150 --> 01:27:24,150
your names and where are you from my

2018
01:27:28,700 --> 01:27:26,160
name is Jeremiah Jones and I am from

2019
01:27:30,950 --> 01:27:28,710
Tacoma Washington I'm Dan Miller I'm

2020
01:27:34,940 --> 01:27:30,960
from Federal Way Washington awesome so

2021
01:27:38,000 --> 01:27:34,950
you guys saw Columbia right it's amazing

2022
01:27:40,430 --> 01:27:38,010
to see it on the ground but to remember

2023
01:27:42,740 --> 01:27:40,440
seeing it when it landed and when it

2024
01:27:46,190 --> 01:27:42,750
launched it's just an amazing thing to

2025
01:27:49,820 --> 01:27:46,200
see and how was it for you Jeremiah

2026
01:27:53,120 --> 01:27:49,830
it was great I really loved it it was um

2027
01:27:55,340 --> 01:27:53,130
the first time I actually like I really

2028
01:27:57,950 --> 01:27:55,350
got to experience something like this

2029
01:28:01,060 --> 01:27:57,960
and I really loved it I really would

2030
01:28:04,010 --> 01:28:01,070
recommend for anyone to come and see it

2031
01:28:06,170 --> 01:28:04,020
alright well thank you so much and thank

2032
01:28:09,230 --> 01:28:06,180
you for joining us here in Seattle back

2033
01:28:11,390 --> 01:28:09,240
to the Saturn 5 Center thank you very

2034
01:28:14,510 --> 01:28:11,400
much Natalie all the way from Seattle

2035
01:28:17,000 --> 01:28:14,520
Washington to here in Florida 3,000

2036
01:28:21,440 --> 01:28:17,010
miles away you're looking live at pad

2037
01:28:23,420 --> 01:28:21,450
39b here in Florida the future of Orion

2038
01:28:26,900 --> 01:28:23,430

where it will launch back into space

2039
01:28:29,030 --> 01:28:26,910
aboard an SLS rocket once complete the

2040
01:28:31,100 --> 01:28:29,040
most powerful rocket in the world well

2041
01:28:34,280 --> 01:28:31,110
we've been looking at Apollo 11 then

2042
01:28:36,500 --> 01:28:34,290
Apollo 11 now we celebrate Apollo 11

2043
01:28:39,260 --> 01:28:36,510
forever just hours ago in this gallery

2044
01:28:41,810 --> 01:28:39,270
the US Postal Service issued a 50th

2045
01:28:44,120 --> 01:28:41,820
anniversary commemorative stamp to

2046
01:28:46,970 --> 01:28:44,130
forever stamps in fact one stamp

2047
01:28:49,340 --> 01:28:46,980
featuring Armstrong's iconic photograph

2048
01:28:51,680 --> 01:28:49,350
of Aldrin in his spacesuit on the

2049
01:28:53,780 --> 01:28:51,690
surface of the Moon the other stamp that

2050
01:28:56,150 --> 01:28:53,790
you see there on the right a photograph

2051
01:28:58,490 --> 01:28:56,160
of the moon showing the landing site of

2052
01:29:00,710 --> 01:28:58,500
the lunar module eagle in the Sea of

2053
01:29:03,350 --> 01:29:00,720
Tranquility a nice moment right here in

2054
01:29:04,640 --> 01:29:03,360
the Saturn fives Center now it was in

2055
01:29:06,560 --> 01:29:04,650
that spot that

2056
01:29:08,900 --> 01:29:06,570
50 years ago today Neil Armstrong took

2057
01:29:10,880 --> 01:29:08,910
the first steps by any human onto

2058
01:29:13,010 --> 01:29:10,890
another world and those moments held

2059
01:29:27,980 --> 01:29:13,020
people transfixed in front of the

2060
01:29:29,810 --> 01:29:27,990
television sets around the world we

2061
01:29:39,760 --> 01:29:29,820
could see it as it was happening we

2062
01:29:46,100 --> 01:29:43,760
and the fact that 600 million people

2063
01:29:49,130 --> 01:29:46,110

around the world were either watching or

2064
01:29:51,710 --> 01:29:49,140
listening on radio and TV as it happened

2065
01:29:58,850 --> 01:29:51,720
is a measure of the impact that this

2066
01:30:05,450 --> 01:30:03,319
the surface as as we said what was fine

2067
01:30:06,770 --> 01:30:05,460
grain with lots of rocks and if it took

2068
01:30:12,859 --> 01:30:06,780
the footprints very well and the

2069
01:30:16,700 --> 01:30:12,869
footprints stayed in place the the lamb

2070
01:30:19,569 --> 01:30:16,710
was in in good shape and exhibited no

2071
01:30:39,439 --> 01:30:19,579
damage from the landing or the descent

2072
01:30:43,100 --> 01:30:39,449
picture of the ladder with the flight of

2073
01:30:46,850 --> 01:30:43,110
Apollo 11 Neil Armstrong Buzz Aldrin I

2074
01:30:48,049 --> 01:30:46,860
had an around-the-world tour and every

2075
01:30:51,439 --> 01:30:48,059
place we went

2076
01:30:53,390 --> 01:30:51,449
I thought they in some places have the

2077
01:30:56,510 --> 01:30:53,400
attitude of oh well you Americans

2078
01:30:59,330 --> 01:30:56,520
finally did this not at all an attitude

2079
01:31:02,810 --> 01:30:59,340
every country regardless of their

2080
01:31:06,470 --> 01:31:02,820
internal politics they all said we did

2081
01:31:09,919 --> 01:31:06,480
it we humans everything before July 20th

2082
01:31:12,919 --> 01:31:09,929
1969 humans only had experience on one

2083
01:31:15,319 --> 01:31:12,929
planetary body from that moment on we

2084
01:31:17,839 --> 01:31:15,329
were at least in some measure a

2085
01:31:20,689 --> 01:31:17,849
multiplanetary species when Neil and

2086
01:31:22,160 --> 01:31:20,699
Buzz walked on the moon they did it of

2087
01:31:24,200 --> 01:31:22,170
course without weapons the only thing

2088
01:31:27,830 --> 01:31:24,210

they brought was cameras so it was a

2089
01:31:32,990 --> 01:31:27,840
very it was a peaceful enterprise and

2090
01:31:37,800 --> 01:31:35,820
of course before we explore the lunar

2091
01:31:40,050 --> 01:31:37,810
surface we have to get to the surface

2092
01:31:42,660 --> 01:31:40,060
and for decades nASA has shown how

2093
01:31:44,640 --> 01:31:42,670
robotic and human exploration can work

2094
01:31:46,860 --> 01:31:44,650
together to understand this distant

2095
01:32:05,580 --> 01:31:46,870
world and our future plans are no

2096
01:32:09,210 --> 01:32:05,590
different as we look back on crude

2097
01:32:11,810 --> 01:32:09,220
robotic observers open our eyes to new

2098
01:32:14,940 --> 01:32:11,820
frontiers cameras and instruments

2099
01:32:22,590 --> 01:32:14,950
prepare the way for future human

2100
01:32:26,340 --> 01:32:22,600
explorers robotic satellites test

2101
01:32:32,750 --> 01:32:26,350
missions and landing craft paved the way

2102
01:32:32,760 --> 01:32:37,640
[Music]

2103
01:32:44,520 --> 01:32:41,489
today NASA and our international

2104
01:32:47,399 --> 01:32:44,530
partners watch our lunar neighbor from

2105
01:32:51,620 --> 01:32:47,409
above as we prepare commercial Landers

2106
01:32:55,200 --> 01:32:51,630
for new science missions to the moon

2107
01:32:58,560 --> 01:32:55,210
it's been said choosing to go to the

2108
01:33:03,029 --> 01:32:58,570
moon as part and we've done that now

2109
01:33:07,739 --> 01:33:03,039
we're going back sustainably and on to

2110
01:33:09,989 --> 01:33:07,749
Mars early Landers laid the groundwork

2111
01:33:12,029 --> 01:33:09,999
for putting us on the moon now the

2112
01:33:14,489 --> 01:33:12,039
director of NASA's human lunar

2113
01:33:16,649 --> 01:33:14,499

exploration programs explains what's

2114
01:33:19,620 --> 01:33:16,659
next for Landers of the artemis

2115
01:33:21,330 --> 01:33:19,630
generation i'm standing in front of the

2116
01:33:22,919 --> 01:33:21,340
power lunar module although this one

2117
01:33:24,540 --> 01:33:22,929
never flew it's exactly the same size

2118
01:33:26,759 --> 01:33:24,550
and scale as the one Neil and Buzz used

2119
01:33:28,560 --> 01:33:26,769
to fly to the surface of the Moon 50

2120
01:33:30,359 --> 01:33:28,570
years ago the Apollo lunar module is

2121
01:33:32,399 --> 01:33:30,369
actually two vehicles together as one

2122
01:33:33,989 --> 01:33:32,409
the crew boarded the vehicle in orbit

2123
01:33:35,850 --> 01:33:33,999
and they landed on the surface of the

2124
01:33:36,959 --> 01:33:35,860
moon once they landed and completed

2125
01:33:38,850 --> 01:33:36,969
their mission the top part of the

2126
01:33:40,290 --> 01:33:38,860
vehicle would then leave and go back to

2127
01:33:42,060 --> 01:33:40,300
orbit where they would board the command

2128
01:33:43,739 --> 01:33:42,070
module to return home to earth the

2129
01:33:45,419 --> 01:33:43,749
Artemis human landing system will work

2130
01:33:47,520 --> 01:33:45,429
very similar to the Apollo will have a

2131
01:33:49,319 --> 01:33:47,530
asset and decent stage that will land on

2132
01:33:51,060 --> 01:33:49,329
the surface of the moon however it's

2133
01:33:52,770 --> 01:33:51,070
going to be updated to 21st century

2134
01:33:54,479 --> 01:33:52,780
technology we're going to have advanced

2135
01:33:56,669 --> 01:33:54,489
flight computers we will have lighter

2136
01:33:58,169 --> 01:33:56,679
components and systems and most

2137
01:34:00,629 --> 01:33:58,179
importantly will be able to carry up to

2138
01:34:02,250 --> 01:34:00,639

four astronauts and it will allow us to

2139
01:34:03,630 --> 01:34:02,260
land the first woman in the next man on

2140
01:34:06,120 --> 01:34:03,640
the surface

2141
01:34:07,830 --> 01:34:06,130
the gateways the place where the landing

2142
01:34:09,300 --> 01:34:07,840
system and the Orion crew that's

2143
01:34:11,130 --> 01:34:09,310
delivered by the Orion will come

2144
01:34:12,600 --> 01:34:11,140
together and the crew will actually

2145
01:34:14,610 --> 01:34:12,610
board the human the Artemus human

2146
01:34:16,110 --> 01:34:14,620
landing system will go to the surface of

2147
01:34:17,760 --> 01:34:16,120
the Moon when the mission is complete

2148
01:34:19,290 --> 01:34:17,770
then we'll return to the gateway the

2149
01:34:21,120 --> 01:34:19,300
Gateway actually allows us to go

2150
01:34:22,530 --> 01:34:21,130
anywhere on the surface of the Moon and

2151
01:34:24,150 --> 01:34:22,540
we really want to go to the South Pole

2152
01:34:26,160 --> 01:34:24,160
because we believe there's water there

2153
01:34:28,590 --> 01:34:26,170
and we can use water to learn how to

2154
01:34:30,570 --> 01:34:28,600
live and operate on other planets the

2155
01:34:31,950 --> 01:34:30,580
systems we're developing to take us to

2156
01:34:34,020 --> 01:34:31,960
the interaction the systems we're going

2157
01:34:35,490 --> 01:34:34,030
to use to go to Mars and beyond taking

2158
01:34:38,209 --> 01:34:35,500
humans further and farther than we've

2159
01:34:42,570 --> 01:34:40,800
and rejoining us now is an astronaut

2160
01:34:43,830 --> 01:34:42,580
who's done two spacewalks at the

2161
01:34:47,430 --> 01:34:43,840
International Space Station

2162
01:34:49,919 --> 01:34:47,440
Stanley welcome back thank you so you

2163
01:34:51,870 --> 01:34:49,929

flew in a glider the shuttle when it

2164
01:34:53,550 --> 01:34:51,880
landed you've ever thought about what if

2165
01:35:02,970 --> 01:34:53,560
you like to be in a spacecraft landing

2166
01:35:03,990 --> 01:35:02,980
on the moon or possibly even Mars yep so

2167
01:35:05,040 --> 01:35:04,000
it would be a different kind of landing

2168
01:35:06,990 --> 01:35:05,050
of course you know the shuttle landed

2169
01:35:08,820 --> 01:35:07,000
like an airplane but of course it landed

2170
01:35:10,830 --> 01:35:08,830
as a glider you got exactly one chance

2171
01:35:13,200 --> 01:35:10,840
to put it on the concrete rather than in

2172
01:35:14,400 --> 01:35:13,210
the swamp with the alligators so it's

2173
01:35:17,070 --> 01:35:14,410
important to get things right and that

2174
01:35:21,689 --> 01:35:17,080
will go for landing on rockets on the

2175
01:35:23,250 --> 01:35:21,699
planet as well the Moon and Mars don't

2176
01:35:24,990 --> 01:35:23,260
have an atmosphere you can't use wings

2177
01:35:27,120 --> 01:35:25,000
for land on the thrust of a rocket

2178
01:35:28,680 --> 01:35:27,130
engine this brings up an interesting

2179
01:35:30,179 --> 01:35:28,690
difference between landing on the moon

2180
01:35:34,649 --> 01:35:30,189
and

2181
01:35:36,869 --> 01:35:34,659
we're probably gonna have a two-part

2182
01:35:40,049 --> 01:35:36,879
spacecraft part with the crew in it and

2183
01:35:41,879 --> 01:35:40,059
a part with engines and legs for landing

2184
01:35:45,179 --> 01:35:41,889
and you'll be burning that little engine

2185
01:35:47,879 --> 01:35:45,189
on your way down and however the part

2186
01:35:49,379 --> 01:35:47,889
that you're in as the crew has its own

2187
01:35:50,969 --> 01:35:49,389
propulsion to take you back up away from

2188
01:35:52,709 --> 01:35:50,979

the moon and into orbit which means that

2189
01:35:55,319 --> 01:35:52,719
if something bad happens on the way down

2190
01:35:56,579 --> 01:35:55,329
that engine quits or you land and a leg

2191
01:35:58,859 --> 01:35:56,589
collapses and you're about to tip over

2192
01:36:00,599 --> 01:35:58,869
you can just pop off and go back up to

2193
01:36:03,750 --> 01:36:00,609
orbit and sort out what you're going to

2194
01:36:07,020 --> 01:36:03,760
do next but you are in your own asset

2195
01:36:09,179 --> 01:36:07,030
module already the whole way down on

2196
01:36:11,239 --> 01:36:09,189
Mars however Mars is a planet it's hard

2197
01:36:13,770 --> 01:36:11,249
to get off planets that's why a gigantic

2198
01:36:15,299 --> 01:36:13,780
rockets to get us off of Earth Mars a

2199
01:36:18,389 --> 01:36:15,309
lot bigger than the moon not as big as

2200
01:36:21,449 --> 01:36:18,399
here bigger than the moon so that a sent

2201
01:36:25,889 --> 01:36:21,459
vehicle is too big for a decent module

2202
01:36:28,049 --> 01:36:25,899
to carry so you are in your descent

2203
01:36:30,419 --> 01:36:28,059
module and you'll probably land and walk

2204
01:36:32,339 --> 01:36:30,429
over to your asset module and launching

2205
01:36:33,659 --> 01:36:32,349
that when it's time to go home but that

2206
01:36:35,099 --> 01:36:33,669
means you don't have that backup

2207
01:36:37,409 --> 01:36:35,109
spacecraft with you when you're doing

2208
01:36:38,969 --> 01:36:37,419
your landing so you absolutely have to

2209
01:36:40,500 --> 01:36:38,979
get it right on the first time you can't

2210
01:36:43,109 --> 01:36:40,510
hit a boulder the engine can't quit the

2211
01:36:44,369 --> 01:36:43,119
landing leg can't collapse so that's

2212
01:36:45,959 --> 01:36:44,379
another reason why the moon is a great

2213
01:36:48,359 --> 01:36:45,969

place to practice before we're ready to

2214
01:36:50,489 --> 01:36:48,369
go on good moving ground indeed yep

2215
01:36:51,929 --> 01:36:50,499
thank you so much stamina I know there's

2216
01:36:53,579 --> 01:36:51,939
a lot of young people looking up to you

2217
01:36:56,669 --> 01:36:53,589
today so thank you so much for being

2218
01:36:59,009 --> 01:36:56,679
with us Thanks all right as we continue

2219
01:37:01,759 --> 01:36:59,019
our coverage we want to take you to a

2220
01:37:04,290 --> 01:37:01,769
video from Lancaster Pennsylvania

2221
01:37:05,790 --> 01:37:04,300
showing a corn maze there if you look

2222
01:37:08,069 --> 01:37:05,800
closely on the left side of your screen

2223
01:37:16,319 --> 01:37:08,079
you can see the outline of an astronaut

2224
01:37:17,939 --> 01:37:16,329
Stan is that you over there yeah and

2225
01:37:20,009 --> 01:37:17,949
there right there is the world's largest

2226
01:37:22,169 --> 01:37:20,019
moon pie that made an appearance at the

2227
01:37:24,270 --> 01:37:22,179
visitors center over at the Marshall

2228
01:37:25,709 --> 01:37:24,280
Space Flight Center in Alabama and some

2229
01:37:27,029 --> 01:37:25,719
of our employees not those here at

2230
01:37:28,500 --> 01:37:27,039
Kennedy but over a Marshall got to

2231
01:37:30,779 --> 01:37:28,510
sample it looks like they enjoyed it

2232
01:37:33,089 --> 01:37:30,789
over there and now we want to send it

2233
01:37:35,099 --> 01:37:33,099
back over to Danielle Russa she's at the

2234
01:37:37,139 --> 01:37:35,109
Apollo Saturn Saturn v Center just

2235
01:37:40,359 --> 01:37:37,149
upstairs Danielle how are some folks out

2236
01:37:42,589 --> 01:37:40,369
here celebrating the 50th anniversary

2237
01:37:44,449 --> 01:37:42,599
while I'm back here at Kennedy Space

2238
01:37:46,310 --> 01:37:44,459

Center and I am reading some of the

2239
01:37:49,549 --> 01:37:46,320
social media comments that you guys have

2240
01:37:51,830 --> 01:37:49,559
sent to us using hashtag Apollo 50th one

2241
01:37:54,469 --> 01:37:51,840
of which is Twitter user Adi observes

2242
01:37:56,810 --> 01:37:54,479
that 50 years ago NASA's Apollo 11

2243
01:37:59,390 --> 01:37:56,820
mission changed our world and ideas of

2244
01:38:01,040 --> 01:37:59,400
what is possible by successfully landing

2245
01:38:03,169 --> 01:38:01,050
humans on the moon's surface and

2246
01:38:05,870 --> 01:38:03,179
bringing them home safely for the first

2247
01:38:07,939 --> 01:38:05,880
time in history if you truly think about

2248
01:38:09,739 --> 01:38:07,949
how many things had to have gone right

2249
01:38:13,219 --> 01:38:09,749
for us to successfully land on the moon

2250
01:38:15,560 --> 01:38:13,229
it is truly mind-blowing three Vox on

2251
01:38:17,509 --> 01:38:15,570
Twitter writes the Apollo 11 mission was

2252
01:38:19,399 --> 01:38:17,519
an immense feat of engineering and

2253
01:38:21,859 --> 01:38:19,409
completely changed our understanding of

2254
01:38:24,259 --> 01:38:21,869
the solar system couldn't be more true

2255
01:38:26,689 --> 01:38:24,269
look at the Apollo 8 earth rise image

2256
01:38:30,439 --> 01:38:26,699
the way that we saw the earth totally

2257
01:38:32,449 --> 01:38:30,449
transformed in that one photo all right

2258
01:38:33,620 --> 01:38:32,459
well thanks so much we look forward to

2259
01:38:36,020 --> 01:38:33,630
hearing more of your social media

2260
01:38:39,560 --> 01:38:36,030
comments send them over hashtag up

2261
01:38:41,359 --> 01:38:39,570
hollow 50th all right sounds good thanks

2262
01:38:45,800 --> 01:38:41,369
Danielle now let's go back over to

2263
01:39:19,799 --> 01:38:45,810

Washington DC for a look at spacesuits

2264
01:39:23,970 --> 01:39:22,379
man I am so obsessed with spacesuits I

2265
01:39:26,459 --> 01:39:23,980
love seeing all those pictures of

2266
01:39:28,529 --> 01:39:26,469
spacesuits over the years of course

2267
01:39:31,799 --> 01:39:28,539
inside the National Air and Space Museum

2268
01:39:35,189 --> 01:39:31,809
right now the og original spacesuit that

2269
01:39:37,680 --> 01:39:35,199
Neil Armstrong wore on as when the Eagle

2270
01:39:40,200 --> 01:39:37,690
landed back in 1969 has been restored

2271
01:39:41,970 --> 01:39:40,210
and went on display this week

2272
01:39:44,160 --> 01:39:41,980
restoration was funded by the public

2273
01:39:46,740 --> 01:39:44,170
through a Kickstarter campaign and

2274
01:39:49,500 --> 01:39:46,750
museum goers can now see it for the

2275
01:39:51,720 --> 01:39:49,510
first time in 13 years I am here with

2276
01:39:54,410 --> 01:39:51,730
NASA spacesuit engineered Lindsey

2277
01:39:57,120 --> 01:39:54,420
Aitchison and astronaut Randy Bresnik

2278
01:39:58,950 --> 01:39:57,130
Lindsey what are the key differences

2279
01:40:00,870 --> 01:39:58,960
between the legacy suits that you guys

2280
01:40:03,149 --> 01:40:00,880
are currently using the so called aces

2281
01:40:05,339 --> 01:40:03,159
the EMU and the new generation of suits

2282
01:40:06,779 --> 01:40:05,349
one of our biggest changes for the EBA

2283
01:40:08,520 --> 01:40:06,789
suits is we're trying to make them an

2284
01:40:10,020 --> 01:40:08,530
evolvable architecture so you have one

2285
01:40:12,359 --> 01:40:10,030
single at core architecture that means

2286
01:40:14,250 --> 01:40:12,369
every destination from low-earth orbit

2287
01:40:17,010 --> 01:40:14,260
and ISS all the way to the surface of

2288
01:40:18,930 --> 01:40:17,020

Mars oh really so not separate suits for

2289
01:40:20,189 --> 01:40:18,940
each stage exactly so if you think about

2290
01:40:21,540 --> 01:40:20,199
our life support system it's kind of

2291
01:40:22,830 --> 01:40:21,550
like the motherboard on your computer is

2292
01:40:24,240 --> 01:40:22,840
you had new technologies you can just

2293
01:40:26,040 --> 01:40:24,250
pluck out the old bit and plug in a new

2294
01:40:28,260 --> 01:40:26,050
piece so that's really a great way to

2295
01:40:30,180 --> 01:40:28,270
keep going so we do a new suit for every

2296
01:40:32,339 --> 01:40:30,190
mission and Randy you are actually

2297
01:40:34,080 --> 01:40:32,349
testing these new generations of suits

2298
01:40:35,399 --> 01:40:34,090
for Artemis is that correct it's great

2299
01:40:37,500 --> 01:40:35,409
we've gone testing on how would it

2300
01:40:39,540 --> 01:40:37,510
actually have the suit fit where do we

2301
01:40:41,189 --> 01:40:39,550
need the mobility are we able to use

2302
01:40:42,689 --> 01:40:41,199
things like suit ports and be able to

2303
01:40:44,279 --> 01:40:42,699
leave the suit outside and be able to

2304
01:40:46,319 --> 01:40:44,289
come inside through a little hatch way

2305
01:40:47,910 --> 01:40:46,329
in the back of the suit it's my favorite

2306
01:40:51,000 --> 01:40:47,920
new thing how are you testing that in

2307
01:40:53,010 --> 01:40:51,010
giant vacuum chambers in fact we are we

2308
01:40:54,689 --> 01:40:53,020
have giant vacuum chamber at the Johnson

2309
01:40:57,000 --> 01:40:54,699
Space Center a couple years ago we took

2310
01:40:59,189 --> 01:40:57,010
one of the prototype suits called z1 and

2311
01:41:01,140 --> 01:40:59,199
we actually had it inside the vacuum

2312
01:41:03,600 --> 01:41:01,150
chamber and so this is the chambers a

2313
01:41:05,520 --> 01:41:03,610

vacuum inside I'm in getting ready to

2314
01:41:07,709 --> 01:41:05,530
hop in it you know with like 10.2 psi

2315
01:41:08,939 --> 01:41:07,719
and so the suits all stiff like it's out

2316
01:41:10,770 --> 01:41:08,949
in the spacewalk and you got to crawl

2317
01:41:13,109 --> 01:41:10,780
inside the back of the suit get your

2318
01:41:15,270 --> 01:41:13,119
arms and legs into it they close up the

2319
01:41:17,069 --> 01:41:15,280
back of the suit and then we close the

2320
01:41:18,990 --> 01:41:17,079
hatch and then actually detach the suit

2321
01:41:20,669 --> 01:41:19,000
and vacuum and did a bunch of mobility

2322
01:41:22,529 --> 01:41:20,679
translations around the area

2323
01:41:24,720 --> 01:41:22,539
what can we reach like we touch but then

2324
01:41:28,529 --> 01:41:24,730
the key point of the sea port testing

2325
01:41:30,029 --> 01:41:28,539
was actually backing up getting back in

2326
01:41:32,419 --> 01:41:30,039
because obviously you need to get hooked

2327
01:41:33,709 --> 01:41:32,429
back up to go get inside the doorway and

2328
01:41:35,930 --> 01:41:33,719
working on the different ways to be able

2329
01:41:37,550 --> 01:41:35,940
to see or be able to feel or or make

2330
01:41:39,140 --> 01:41:37,560
little look guides so to guide you back

2331
01:41:42,680 --> 01:41:39,150
in to be able okay back up and crawl

2332
01:41:45,110 --> 01:41:42,690
back out I know to here has a question

2333
01:41:46,300 --> 01:41:45,120
from a fan out on the mall to hero what

2334
01:41:49,189 --> 01:41:46,310
what have we got

2335
01:41:51,439 --> 01:41:49,199
hi it's to here again from the National

2336
01:41:53,720 --> 01:41:51,449
Mall right now I just got done checking

2337
01:41:55,250 --> 01:41:53,730
out some of these amazing exhibits that

2338
01:41:57,169 --> 01:41:55,260

are here celebrating the fiftieth

2339
01:41:59,630 --> 01:41:57,179
anniversary of Apollo but also

2340
01:42:01,550 --> 01:41:59,640
showcasing some of our future plans for

2341
01:42:03,830 --> 01:42:01,560
our Artemis missions to return to the

2342
01:42:06,770 --> 01:42:03,840
moon and eventually go farther beyond to

2343
01:42:08,240 --> 01:42:06,780
Mars joining us right now are Carly and

2344
01:42:10,250 --> 01:42:08,250
some of her friends from Maryland and

2345
01:42:13,340 --> 01:42:10,260
they have a question for Randy and

2346
01:42:15,110 --> 01:42:13,350
Lindsey so what does it mean for the

2347
01:42:18,470 --> 01:42:15,120
u.s. space program to be able to go back

2348
01:42:20,450 --> 01:42:18,480
to the moon Randy the question is what

2349
01:42:23,360 --> 01:42:20,460
does it mean for the u.s. space program

2350
01:42:25,010 --> 01:42:23,370
to go back to the moon well we look is

2351
01:42:26,510 --> 01:42:25,020
it going forward to the moon I mean the

2352
01:42:28,729 --> 01:42:26,520
moon is a stepping stone you know the

2353
01:42:30,500 --> 01:42:28,739
way the lights the path to Mars but it's

2354
01:42:33,320 --> 01:42:30,510
the important part because we need to

2355
01:42:35,240 --> 01:42:33,330
test out all the Rovers all these suits

2356
01:42:36,590 --> 01:42:35,250
all the habitats all the hatches and

2357
01:42:38,270 --> 01:42:36,600
make sure that everything can work

2358
01:42:39,919 --> 01:42:38,280
because when we go to Mars we're not

2359
01:42:41,689 --> 01:42:39,929
three days away from Earth and just can

2360
01:42:43,790 --> 01:42:41,699
come on back if we need to we are

2361
01:42:45,380 --> 01:42:43,800
literally over a year away I mean it's

2362
01:42:47,090 --> 01:42:45,390
the transit time and the fact we have to

2363
01:42:48,560 --> 01:42:47,100

wait till Mars gets closer to Earth to

2364
01:42:50,060 --> 01:42:48,570
be able to come back and so we have to

2365
01:42:51,709 --> 01:42:50,070
make sure everything and all the risk is

2366
01:42:53,240 --> 01:42:51,719
bought down on the hardware the moon is

2367
01:42:54,649 --> 01:42:53,250
where we test that out and that's just

2368
01:42:56,330 --> 01:42:54,659
one of the many reasons that we go back

2369
01:42:58,220 --> 01:42:56,340
to the moon there's a scientific aspect

2370
01:42:59,780 --> 01:42:58,230
there's the energy aspect I mean the

2371
01:43:03,820 --> 01:42:59,790
moons it's just a great treasure trove

2372
01:43:06,680 --> 01:43:03,830
of scientific and energy types of

2373
01:43:08,209 --> 01:43:06,690
opportunities for us to go explore and

2374
01:43:09,709 --> 01:43:08,219
learn more because the last time we were

2375
01:43:11,120 --> 01:43:09,719
there fifty years ago it was just for a

2376
01:43:14,689 --> 01:43:11,130
few days at a time we're going there to

2377
01:43:17,270 --> 01:43:14,699
stay now thank you guys so much

2378
01:43:19,669 --> 01:43:17,280
Karen Fox is inside the National Air and

2379
01:43:25,160 --> 01:43:19,679
Space Museum right now with another

2380
01:43:27,979 --> 01:43:25,170
special guest I am here with General Tom

2381
01:43:30,050 --> 01:43:27,989
Stafford he was commander of Apollo 10

2382
01:43:32,330 --> 01:43:30,060
that mission was a dress rehearsal for

2383
01:43:33,890 --> 01:43:32,340
Apollo 11 the crew orbited the moon it

2384
01:43:36,950 --> 01:43:33,900
descended close to the surface but

2385
01:43:37,760 --> 01:43:36,960
without actually landing general

2386
01:43:39,919 --> 01:43:37,770
Stafford

2387
01:43:42,470 --> 01:43:39,929
tell us a little bit about the legacy of

2388
01:43:44,990 --> 01:43:42,480

the Apollo program for today

2389
01:43:47,090 --> 01:43:45,000
well the legacy of Apollo

2390
01:43:49,400 --> 01:43:47,100
was we started with nearly the

2391
01:43:51,950 --> 01:43:49,410
impossible that we did it in such an

2392
01:43:57,200 --> 01:43:51,960
impossible short period of time and slow

2393
01:43:59,720 --> 01:43:57,210
successfully the the lessons learned if

2394
01:44:02,689 --> 01:43:59,730
we think we could do something new

2395
01:44:04,130 --> 01:44:02,699
innovative or I don't think you could

2396
01:44:06,470 --> 01:44:04,140
probably get much better as far as

2397
01:44:10,090 --> 01:44:06,480
management how we did that program you

2398
01:44:12,800 --> 01:44:10,100
know President Kennedy on May the 25th

2399
01:44:16,910 --> 01:44:12,810
1961 so we'll go to the moon and the

2400
01:44:19,310 --> 01:44:16,920
safely return which is great and but the

2401
01:44:23,780 --> 01:44:19,320
question is how do we go through it was

2402
01:44:26,060 --> 01:44:23,790
until 12 months later that it was

2403
01:44:29,540 --> 01:44:26,070
decided how we'll go to the moon which

2404
01:44:31,729 --> 01:44:29,550
is a lunar orbit rendezvous and if we

2405
01:44:34,430 --> 01:44:31,739
had two major decisions and all the

2406
01:44:36,320 --> 01:44:34,440
maidens leaders and NASA had different

2407
01:44:38,090 --> 01:44:36,330
ideas that was floating around like you

2408
01:44:41,510 --> 01:44:38,100
have different ideas today what you can

2409
01:44:44,240 --> 01:44:41,520
do but he came out to a senior engineer

2410
01:44:48,830 --> 01:44:44,250
at Langley John Huebel and his team said

2411
01:44:50,540 --> 01:44:48,840
you proved to dr. Stevens a great deputy

2412
01:44:53,420 --> 01:44:50,550
administrator former dean of Aero and

2413
01:44:56,450 --> 01:44:53,430

Astro at MIT that the lunar orbit

2414
01:44:59,870 --> 01:44:56,460
rendezvous to do it in a way that to be

2415
01:45:03,080 --> 01:44:59,880
a smaller vehicle to be you do it faster

2416
01:45:05,900 --> 01:45:03,090
far less cost and it would be safer and

2417
01:45:07,700 --> 01:45:05,910
so that was so Steven stuck and not the

2418
01:45:09,560 --> 01:45:07,710
other people's head CEO so this is the

2419
01:45:11,330 --> 01:45:09,570
way we're going to go and then I was

2420
01:45:13,880 --> 01:45:11,340
fortunate I came on board the program

2421
01:45:14,720 --> 01:45:13,890
with the second group of astronauts two

2422
01:45:16,640 --> 01:45:14,730
months later

2423
01:45:17,810 --> 01:45:16,650
thank you so much you were also the

2424
01:45:21,080 --> 01:45:17,820
commander of the apollo-soyuz test

2425
01:45:23,479 --> 01:45:21,090
project in 1975 when American astronauts

2426
01:45:26,510 --> 01:45:23,489
and Soviet cosmonauts met in space for

2427
01:45:29,120 --> 01:45:26,520
the first time we are going to have an

2428
01:45:31,430 --> 01:45:29,130
example of a real time international

2429
01:45:33,950 --> 01:45:31,440
space partnership tomorrow on the 50th

2430
01:45:36,590 --> 01:45:33,960
anniversary of Apollo 11s landing NASA

2431
01:45:39,350 --> 01:45:36,600
astronaut drew Morgan and European Space

2432
01:45:41,320 --> 01:45:39,360
Agency astronaut Luca parmitano will

2433
01:45:43,100 --> 01:45:41,330
launch alongside Russian cosmonaut

2434
01:45:44,479 --> 01:45:43,110
Alexander Skvortsov

2435
01:45:46,220 --> 01:45:44,489
on a Soyuz rocket to the International

2436
01:45:48,920 --> 01:45:46,230
Space Station

2437
01:45:51,200 --> 01:45:48,930
I think that it's a huge honor for both

2438
01:45:53,030 --> 01:45:51,210

my crew my Soyuz crew as well as the

2439
01:45:55,370 --> 01:45:53,040
entire crew of expedition 60 that will

2440
01:46:00,500 --> 01:45:55,380
be joining the Apollo program proved

2441
01:46:03,490 --> 01:46:00,510
that if humans put their ingenuity to to

2442
01:46:06,860 --> 01:46:03,500
a scope then really anything is possible

2443
01:46:09,140 --> 01:46:06,870
we want to explore we want to improve

2444
01:46:11,390 --> 01:46:09,150
our technology and improve our science

2445
01:46:13,370 --> 01:46:11,400
and this is gonna enable us to go

2446
01:46:15,170 --> 01:46:13,380
further into the solar system and the

2447
01:46:17,870 --> 01:46:15,180
moon is a stepping point along the way

2448
01:46:19,820 --> 01:46:17,880
as we go deeper and we head to Mars and

2449
01:46:22,610 --> 01:46:19,830
we love to see a program that takes us

2450
01:46:24,770 --> 01:46:22,620
to the moon for science for more

2451
01:46:27,050 --> 01:46:24,780
technological advance my mission up to

2452
01:46:29,330 --> 01:46:27,060
the ISS is a stepping stone in that

2453
01:46:33,650 --> 01:46:29,340
direction and I'm very very excited and

2454
01:46:35,390 --> 01:46:33,660
honored to be serving this way and our

2455
01:46:37,550 --> 01:46:35,400
current station crew members Nick Hague

2456
01:46:41,780 --> 01:46:37,560
and Christina cook also shared their

2457
01:46:44,090 --> 01:46:41,790
thoughts about Apollo's legacy you know

2458
01:46:47,240 --> 01:46:44,100
growing up in a generation such as we

2459
01:46:48,860 --> 01:46:47,250
did post Apollo we never knew a world

2460
01:46:51,080 --> 01:46:48,870
where people had not walked on the moon

2461
01:46:53,000 --> 01:46:51,090
when we looked at the moon at night it

2462
01:46:55,010 --> 01:46:53,010
didn't seem as distant as it may have

2463
01:46:56,750 --> 01:46:55,020

seemed to the generation prior to the

2464
01:46:58,790 --> 01:46:56,760
Apollo mission these spacesuits

2465
01:47:01,640 --> 01:46:58,800
take their heritage from the Apollo

2466
01:47:03,920 --> 01:47:01,650
program and the equipment the technology

2467
01:47:06,980 --> 01:47:03,930
that was proven out then we continue to

2468
01:47:09,200 --> 01:47:06,990
refine as we get ready to embark on our

2469
01:47:13,780 --> 01:47:09,210
journey back to the moon so going back

2470
01:47:18,020 --> 01:47:13,790
to the moon in so many ways is going to

2471
01:47:19,640 --> 01:47:18,030
inspire this next generation one of the

2472
01:47:22,070 --> 01:47:19,650
reasons it's so important on a

2473
01:47:25,580 --> 01:47:22,080
generational level is to demonstrate

2474
01:47:27,380 --> 01:47:25,590
that as humans as a country or as an

2475
01:47:29,660 --> 01:47:27,390
international partnership when we come

2476
01:47:31,580 --> 01:47:29,670
together to achieve something great we

2477
01:47:33,500 --> 01:47:31,590
can be successful it's going to take

2478
01:47:35,150 --> 01:47:33,510
international partners it's going to

2479
01:47:37,460 --> 01:47:35,160
take commercial partners it's going to

2480
01:47:39,890 --> 01:47:37,470
bring us together the goal of landing

2481
01:47:42,260 --> 01:47:39,900
the first woman on the moon means so

2482
01:47:44,060 --> 01:47:42,270
very much to me it's wonderful to be

2483
01:47:46,370 --> 01:47:44,070
participating in the space program

2484
01:47:49,070 --> 01:47:46,380
especially as an astronaut but as any

2485
01:47:51,940 --> 01:47:49,080
person participating at a time when we

2486
01:47:55,490 --> 01:47:51,950
are harnessing all of the talents skills

2487
01:47:57,500 --> 01:47:55,500
ideas and innovation from everyone who

2488
01:48:00,250 --> 01:47:57,510

wants to participate not just to select

2489
01:48:02,990 --> 01:48:00,260
few the Apollo astronauts

2490
01:48:04,940 --> 01:48:03,000
they're the ones that set everything in

2491
01:48:06,980 --> 01:48:04,950
motion to get us back to today and it

2492
01:48:08,990 --> 01:48:06,990
may seem like we've come to the moon a

2493
01:48:11,180 --> 01:48:09,000
second time or we've returned to the

2494
01:48:14,840 --> 01:48:11,190
moon but really our space program has

2495
01:48:17,450 --> 01:48:14,850
been moving forward from day one and and

2496
01:48:21,410 --> 01:48:17,460
the the next crew that steps on the moon

2497
01:48:23,570 --> 01:48:21,420
is just another step in that long line

2498
01:48:25,910 --> 01:48:23,580
of the program moving things forward

2499
01:48:28,430 --> 01:48:25,920
we're the stone age' but I think I'm

2500
01:48:30,950 --> 01:48:28,440
just so much we don't know so much but

2501
01:48:32,990 --> 01:48:30,960
you've got to keep exploring I'm you I

2502
01:48:35,330 --> 01:48:33,000
have to advocate the greatest thing a

2503
01:48:37,460 --> 01:48:35,340
human mind can do is explore whether

2504
01:48:39,710 --> 01:48:37,470
it's reading creating painting or you

2505
01:48:42,860 --> 01:48:39,720
know and these guys are pioneers and

2506
01:48:45,320 --> 01:48:42,870
they're exploring for the benefit or our

2507
01:48:46,850 --> 01:48:45,330
knowledge and with the thirst for

2508
01:48:51,560 --> 01:48:46,860
knowledge is the most important thing in

2509
01:48:54,200 --> 01:48:51,570
the world welcome back to Kennedy Space

2510
01:48:57,110 --> 01:48:54,210
Center's launch complex 39 joining us

2511
01:48:59,180 --> 01:48:57,120
now is Regina Spellman pad B's senior

2512
01:49:01,940 --> 01:48:59,190
project manager who's overseeing all the

2513
01:49:04,160 --> 01:49:01,950

modernization of pad B as we prepare to

2514
01:49:05,930 --> 01:49:04,170
return to the moon so Regina it's both

2515
01:49:07,340 --> 01:49:05,940
of these pads were built for Apollo 50

2516
01:49:09,770 --> 01:49:07,350
years ago how are they holding up

2517
01:49:10,850 --> 01:49:09,780
they're doing a great these these pads

2518
01:49:12,590 --> 01:49:10,860
were built with some of the best

2519
01:49:14,960 --> 01:49:12,600
engineering back in the 60s and they

2520
01:49:17,330 --> 01:49:14,970
have withstood now to do whole programs

2521
01:49:19,490 --> 01:49:17,340
of spaceflight and they're ready for the

2522
01:49:21,680 --> 01:49:19,500
third the pad pad Bane has got a

2523
01:49:23,300 --> 01:49:21,690
complete makeover we have modernized her

2524
01:49:25,160 --> 01:49:23,310
and refurbished her and she is ready for

2525
01:49:26,510 --> 01:49:25,170
Space Flight what are some of the things

2526
01:49:28,700 --> 01:49:26,520
that you've been doing out there they're

2527
01:49:30,830 --> 01:49:28,710
modernized pad B so for SLS and Orion

2528
01:49:32,120 --> 01:49:30,840
we're going to a clean pad architecture

2529
01:49:33,470 --> 01:49:32,130
so one of the first things that we did

2530
01:49:35,240 --> 01:49:33,480
was to get rid of some of the old

2531
01:49:36,950 --> 01:49:35,250
shuttle infrastructure and go to a clean

2532
01:49:38,990 --> 01:49:36,960
pad so we have minimal permanent

2533
01:49:40,880 --> 01:49:39,000
infrastructure out the pad we have over

2534
01:49:42,620 --> 01:49:40,890
the last 10 years gone in and modernized

2535
01:49:43,820 --> 01:49:42,630
every system out there I can't think of

2536
01:49:45,020 --> 01:49:43,830
a single system out there that we

2537
01:49:46,940 --> 01:49:45,030
haven't touched in some way or another

2538
01:49:48,740 --> 01:49:46,950

everything has been updated and

2539
01:49:50,690 --> 01:49:48,750
modernized taking out old Apollo era

2540
01:49:52,640 --> 01:49:50,700
some Shuttle era and putting in new

2541
01:49:54,620 --> 01:49:52,650
technologies taking what was old and was

2542
01:49:56,300 --> 01:49:54,630
useful and really good and building upon

2543
01:49:57,890 --> 01:49:56,310
it and I love it I love that we're

2544
01:49:59,960 --> 01:49:57,900
taking these pads this pad that was

2545
01:50:01,760 --> 01:49:59,970
built to go to the moon and we're now

2546
01:50:03,080 --> 01:50:01,770
gonna go to the moon again I saw I love

2547
01:50:04,370 --> 01:50:03,090
it's coming full circle to be really

2548
01:50:05,900 --> 01:50:04,380
exciting thanks so much for being us

2549
01:50:08,129 --> 01:50:05,910
Regina I think we're gonna head it back

2550
01:50:10,290 --> 01:50:08,139
to Danielle

2551
01:50:12,570 --> 01:50:10,300
guys were right behind the Saturn 5 here

2552
01:50:15,149 --> 01:50:12,580
we have two very exciting KSC guests we

2553
01:50:17,820 --> 01:50:15,159
have dev and Akash so what inspired this

2554
01:50:20,399 --> 01:50:17,830
trip well when I was six I remember

2555
01:50:22,050 --> 01:50:20,409
watching the moon landing on TV and it

2556
01:50:23,220 --> 01:50:22,060
would it was such an or inspiring event

2557
01:50:25,770 --> 01:50:23,230
I wanted to bring the family here

2558
01:50:26,340 --> 01:50:25,780
amazing so is this your first time yes

2559
01:50:27,870 --> 01:50:26,350
it is

2560
01:50:29,070 --> 01:50:27,880
well what exhibit are you looking

2561
01:50:30,510 --> 01:50:29,080
forward to saying or have already seen

2562
01:50:32,459 --> 01:50:30,520
well I'm really looking forward to

2563
01:50:33,899 --> 01:50:32,469

seeing the take off tomorrow to

2564
01:50:36,030 --> 01:50:33,909
celebrate the 50th anniversary that

2565
01:50:38,609 --> 01:50:36,040
would be yeah I take off so do you want

2566
01:50:40,859 --> 01:50:38,619
to go to space all right now so you got

2567
01:50:43,140 --> 01:50:40,869
your next astronaut right here all right

2568
01:50:45,149 --> 01:50:43,150
back to you guys thank you so much

2569
01:50:47,910 --> 01:50:45,159
Danielle well it's been great being with

2570
01:50:50,580 --> 01:50:47,920
you for the Saturn 5 center here where

2571
01:50:52,950 --> 01:50:50,590
we hosted our NASA show a look ahead and

2572
01:50:55,439 --> 01:50:52,960
look behind it Apollo 11 now just ahead

2573
01:50:57,419 --> 01:50:55,449
our stem she'll forward to the moon is

2574
01:50:59,459 --> 01:50:57,429
coming up and we'll have a fun reveal

2575
01:51:01,379 --> 01:50:59,469
about the Artemis program so make sure

2576
01:51:03,600 --> 01:51:01,389
you stay tuned for that yes that's right

2577
01:51:13,830 --> 01:51:03,610
but first the final word today on Apollo

2578
01:51:19,020 --> 01:51:16,200
at this time I like to introduce to all

2579
01:51:24,570 --> 01:51:19,030
11th through astronauts Neil Armstrong

2580
01:51:29,940 --> 01:51:24,580
Michael Collins Edmund old it was the

2581
01:51:31,050 --> 01:51:29,950
ultimate peaceful competition USA versus

2582
01:51:35,280 --> 01:51:31,060
USSR

2583
01:51:37,410 --> 01:51:35,290
I'll not assert that it was a diversion

2584
01:51:40,410 --> 01:51:37,420
which prevented a war nonetheless it was

2585
01:51:42,780 --> 01:51:40,420
a diversion it was intense and it did

2586
01:51:45,480 --> 01:51:42,790
allowed to both sides to take the high

2587
01:51:48,500 --> 01:51:45,490
road with the objectives of science of

2588
01:51:51,210 --> 01:51:48,510

learning and exploration eventually

2589
01:51:54,960 --> 01:51:51,220
provided a mechanism for

2590
01:51:57,870 --> 01:51:54,970
engendering cooperation between former

2591
01:52:00,270 --> 01:51:57,880
adversaries in that sense among others

2592
01:52:07,710 --> 01:52:00,280
it was an exceptional national

2593
01:52:10,380 --> 01:52:07,720
investment for both sides welcome back

2594
01:52:13,470 --> 01:52:10,390
to DC I am here with NASA Administrator

2595
01:52:16,230 --> 01:52:13,480
Jim bridenstine it has been so inspiring

2596
01:52:19,500 --> 01:52:16,240
to be here with you all Jim tell us

2597
01:52:20,910 --> 01:52:19,510
about the next giant leap absolutely

2598
01:52:22,710 --> 01:52:20,920
you've heard a lot today about the

2599
01:52:25,260 --> 01:52:22,720
incredible accomplishments of Apollo

2600
01:52:26,610 --> 01:52:25,270
there are now several generations of

2601
01:52:28,740 --> 01:52:26,620
Americans who have dreamed about

2602
01:52:29,130 --> 01:52:28,750
returning to the moon and going beyond

2603
01:52:31,530 --> 01:52:29,140
it

2604
01:52:34,110 --> 01:52:31,540
many were born well after the Apollo

2605
01:52:37,140 --> 01:52:34,120
program ended now we're charged with

2606
01:52:39,720 --> 01:52:37,150
sending humans to Mars and first we'll

2607
01:52:41,610 --> 01:52:39,730
prepare for that journey at the moon we

2608
01:52:44,370 --> 01:52:41,620
call this that we call this program

2609
01:52:46,500 --> 01:52:44,380
Artemis and today I'm proud to share

2610
01:52:55,569 --> 01:52:46,510
with you for the very first time the

2611
01:53:00,220 --> 01:52:57,669
this is the image of exploration that

2612
01:53:03,520 --> 01:53:00,230
will carry us as we once again sent

2613
01:53:05,799 --> 01:53:03,530

humans beyond Earth orbit we invite all

2614
01:53:10,120 --> 01:53:05,809
of you to join us and follow the story

2615
01:53:12,129 --> 01:53:10,130
at nasa.gov slash artemis there is much

2616
01:53:14,439 --> 01:53:12,139
work to be done and many great stories

2617
01:53:17,069 --> 01:53:14,449
to tell along the way stories of

2618
01:53:20,379 --> 01:53:17,079
perseverance exploration and discovery

2619
01:53:24,490 --> 01:53:20,389
stories of humanity once again pressing

2620
01:53:27,339 --> 01:53:24,500
outward into the unknown we are going

2621
01:53:30,250 --> 01:53:27,349
and as we go I hope that women and men

2622
01:53:33,370 --> 01:53:30,260
of all ages and all backgrounds will

2623
01:53:36,939 --> 01:53:33,380
consider themselves part of this the

2624
01:53:40,799 --> 01:53:36,949
Artemis generation fifty years ago we

2625
01:53:43,120 --> 01:53:40,809
went to the moon we called it Apollo

2626
01:53:47,169 --> 01:53:43,130
well many people don't know is that

2627
01:53:51,540 --> 01:53:47,179
Apollo had a twin she was a woman named

2628
01:53:58,030 --> 01:53:54,850
we are returning to the men as a new

2629
01:54:00,880 --> 01:53:58,040
generation of explorers this time to

2630
01:54:03,610 --> 01:54:00,890
stay and to prepare to achieve

2631
01:54:07,120 --> 01:54:03,620
humanity's next child of sending the

2632
01:54:09,550 --> 01:54:07,130
first human missions to Mars we believe

2633
01:54:11,650 --> 01:54:09,560
our course will redefine what is

2634
01:54:14,290 --> 01:54:11,660
possible that we would discover life

2635
01:54:15,700 --> 01:54:14,300
saving earth changing science and but

2636
01:54:19,990 --> 01:54:15,710
the challenges ahead will inspire

2637
01:54:23,710 --> 01:54:20,000
generations this is our manifest for all

2638
01:54:26,319 --> 01:54:23,720

who wondered if we could return from

2639
01:54:29,060 --> 01:54:26,329
dream discussing beyond

2640
01:54:33,950 --> 01:54:29,070
this is your calling

2641
01:54:36,940 --> 01:54:33,960
we go for all of America we go

2642
01:54:38,959 --> 01:54:36,950
we go as the Artemis generation

2643
01:54:40,210 --> 01:54:38,969
[Music]

2644
01:55:10,780 --> 01:54:40,220
we go

2645
01:56:10,420 --> 01:55:16,500
[Music]

2646
01:56:10,430 --> 01:56:20,570
[Laughter]

2647
02:05:11,250 --> 01:56:30,750
[Music]

2648
02:05:20,620 --> 02:05:15,970
we've been there before we're going

2649
02:05:23,590 --> 02:05:20,630
again this time to stay visionaries and

2650
02:05:27,100 --> 02:05:23,600
dreamers imagine the future engineers

2651
02:05:30,160 --> 02:05:27,110
and scientists build it using math and

2652
02:05:33,130 --> 02:05:30,170
science as forms of art creating

2653
02:05:37,510 --> 02:05:33,140
technologies transforming societies

2654
02:05:40,540 --> 02:05:37,520
now we take civilization to the Stars on

2655
02:05:52,180 --> 02:05:40,550
a journey to explore and build a gateway

2656
02:05:53,050 --> 02:05:52,190
an outpost good afternoon and welcome to

2657
02:05:55,810 --> 02:05:53,060
our show

2658
02:05:57,730 --> 02:05:55,820
stem forge the moon we're live from the

2659
02:06:00,130 --> 02:05:57,740
Apollo Saturn 5 Center at NASA's Kennedy

2660
02:06:01,870 --> 02:06:00,140
Space Center in Florida where we just

2661
02:06:03,760 --> 02:06:01,880
wrapped up a two hour celebration

2662
02:06:05,980 --> 02:06:03,770
commemorating the 50th anniversary of

2663
02:06:08,380 --> 02:06:05,990

the first ever walk on the surface of

2664
02:06:11,020 --> 02:06:08,390
the Moon we turn now to the future of

2665
02:06:13,900 --> 02:06:11,030
space exploration to you the students

2666
02:06:15,100 --> 02:06:13,910
and educators thanks for joining us and

2667
02:06:17,200 --> 02:06:15,110
welcome to our show

2668
02:06:19,060 --> 02:06:17,210
I'm Stephanie Martin from NASA's office

2669
02:06:21,610 --> 02:06:19,070
of communications and I'm here with my

2670
02:06:24,370 --> 02:06:21,620
co-host and friend nila firangee from

2671
02:06:26,200 --> 02:06:24,380
NASA's office of stem engagements we are

2672
02:06:28,390 --> 02:06:26,210
part of the Artemis generation of

2673
02:06:31,000 --> 02:06:28,400
explorers we're going back to the moon

2674
02:06:33,220 --> 02:06:31,010
and this time to stay we just saw the

2675
02:06:35,500 --> 02:06:33,230
new Artemis branding which is truly a

2676
02:06:38,590 --> 02:06:35,510
nod to the Apollo missions what many

2677
02:06:41,200 --> 02:06:38,600
people don't know is Apollo had twin she

2678
02:06:44,110 --> 02:06:41,210
was a woman named Artemis goddess of the

2679
02:06:46,870 --> 02:06:44,120
moon as the Artemis generation we need

2680
02:06:49,600 --> 02:06:46,880
to develop the skills to get us to the

2681
02:06:52,060 --> 02:06:49,610
moon and beyond NASA's office of stem

2682
02:06:55,090 --> 02:06:52,070
engagement works with educators schools

2683
02:06:56,980 --> 02:06:55,100
and other organizations like museums to

2684
02:06:59,650 --> 02:06:56,990
immerse students in NASA's work and

2685
02:07:02,440 --> 02:06:59,660
enhance literacy in science technology

2686
02:07:05,080 --> 02:07:02,450
engineering and math generally we're

2687
02:07:07,840 --> 02:07:05,090
here to inspire the next generation to

2688
02:07:09,610 --> 02:07:07,850

explore coming up we'll see an Artemis

2689
02:07:11,740 --> 02:07:09,620
mission through the eyes of middle

2690
02:07:13,870 --> 02:07:11,750
school students from museums across the

2691
02:07:14,380 --> 02:07:13,880
country we'll also see those same

2692
02:07:16,570 --> 02:07:14,390
student

2693
02:07:20,170 --> 02:07:16,580
perform experiments that show how you

2694
02:07:21,580 --> 02:07:20,180
can recreate them from your home using

2695
02:07:24,040 --> 02:07:21,590
things that you can find around the

2696
02:07:26,040 --> 02:07:24,050
house later in the show we'll also have

2697
02:07:29,080 --> 02:07:26,050
a message from a special celebrity guest

2698
02:07:31,510 --> 02:07:29,090
we want everyone to join the forward to

2699
02:07:34,240 --> 02:07:31,520
the moon conversation using the hashtag

2700
02:07:36,370 --> 02:07:34,250
NASA stem on Twitter my team is standing

2701
02:07:38,170 --> 02:07:36,380
by to answer your questions on social

2702
02:07:42,010 --> 02:07:38,180
media I hope you join our conversation

2703
02:07:43,870 --> 02:07:42,020
online let's get started as Stephanie

2704
02:07:45,880 --> 02:07:43,880
mentioned I caught up with middle school

2705
02:07:49,300 --> 02:07:45,890
students across the country this summer

2706
02:07:51,400 --> 02:07:49,310
who use their imagination to see what it

2707
02:07:53,560 --> 02:07:51,410
would what it would be like if they took

2708
02:07:55,990 --> 02:07:53,570
over an artemis moon mission they

2709
02:07:57,850 --> 02:07:56,000
simulated a launch arrived at the lunar

2710
02:07:59,860 --> 02:07:57,860
gateway took their first steps on the

2711
02:08:02,230 --> 02:07:59,870
moon and even collected samples on the

2712
02:08:03,880 --> 02:08:02,240
lunar surface first up we'll take you

2713
02:08:10,390 --> 02:08:03,890

inside Mission Control from the

2714
02:08:12,520 --> 02:08:10,400
Cosmosphere in Kansas welcome to the

2715
02:08:14,050 --> 02:08:12,530
Space Launch Artemis three crew you will

2716
02:08:15,910 --> 02:08:14,060
have been training many months for the

2717
02:08:17,860 --> 02:08:15,920
greatest adventure of your whole life I

2718
02:08:20,020 --> 02:08:17,870
know you're a little bit nervous but

2719
02:08:21,520 --> 02:08:20,030
that is normal you'll be exploring our

2720
02:08:24,760 --> 02:08:21,530
sources though beginning with the mood

2721
02:08:28,060 --> 02:08:24,770
and eventually onto Mars when you hear

2722
02:08:30,310 --> 02:08:28,070
the words go for launch all systems will

2723
02:08:32,680 --> 02:08:30,320
be a go t-minus three minutes and

2724
02:08:35,530 --> 02:08:32,690
Counting I think it's important for NASA

2725
02:08:37,690 --> 02:08:35,540
to send people to the moon and to Mars

2726
02:08:40,240 --> 02:08:37,700
because they can do experiments to help

2727
02:08:42,640 --> 02:08:40,250
people back on earth what excites me

2728
02:08:45,580 --> 02:08:42,650
about Artemis is that it's gonna have

2729
02:08:47,170 --> 02:08:45,590
the first woman on the moon and there

2730
02:08:49,030 --> 02:08:47,180
hasn't been one before and that's really

2731
02:08:53,580 --> 02:08:49,040
cool all right Lister you are going to

2732
02:09:00,820 --> 02:08:53,590
watch main engine start ten nine eight

2733
02:09:01,940 --> 02:09:00,830
seven six five four three two one solid

2734
02:09:05,300 --> 02:09:01,950
rocket booster

2735
02:09:07,280 --> 02:09:05,310
and lids on argument is clear the towers

2736
02:09:08,900 --> 02:09:07,290
welcome to the sword system Artemis 3

2737
02:09:10,520 --> 02:09:08,910
you just passed the International Space

2738
02:09:12,500 --> 02:09:10,530

Station and should see the gunner

2739
02:09:15,140 --> 02:09:12,510
gateway and moon in this thing soon

2740
02:09:17,870 --> 02:09:15,150
navigator fire rockets on lunar orbit

2741
02:09:20,060 --> 02:09:17,880
insertion now Thank You Capcom we will

2742
02:09:22,460 --> 02:09:20,070
check in as we near gateway and are

2743
02:09:24,770 --> 02:09:22,470
getting ready to dock at Astra this is

2744
02:09:34,989 --> 02:09:24,780
one step closer to a future where better

2745
02:09:40,989 --> 02:09:37,270
so here at Kennedy Space Center we have

2746
02:09:43,299 --> 02:09:40,999
launch complex 39 that is where pad 39a

2747
02:09:45,129 --> 02:09:43,309
and 39b were used for the Apollo

2748
02:09:47,969 --> 02:09:45,139
missions and our key to the future

2749
02:09:51,279 --> 02:09:47,979
exploration of human spaceflight

2750
02:09:52,629 --> 02:09:51,289
pad 39a is where SpaceX will launch our

2751
02:09:54,609 --> 02:09:52,639
astronauts in the future to the

2752
02:09:56,080 --> 02:09:54,619
International Space Station and you can

2753
02:09:58,989 --> 02:09:56,090
see that on the left-hand side of your

2754
02:10:01,419 --> 02:09:58,999
screen pad 39b is on the right and that

2755
02:10:03,459 --> 02:10:01,429
is where our heavy lift rocket known as

2756
02:10:06,100 --> 02:10:03,469
the Space Launch System will carry the

2757
02:10:08,589 --> 02:10:06,110
Orion spacecraft for Artemis missions to

2758
02:10:10,479 --> 02:10:08,599
the moon and on to Mars we've been

2759
02:10:12,219 --> 02:10:10,489
hearing a lot about Artemis today

2760
02:10:14,439 --> 02:10:12,229
Stephanie can you tell us a little more

2761
02:10:15,669 --> 02:10:14,449
to really simplify it our Apollo

2762
02:10:17,680 --> 02:10:15,679
missions were focused on getting

2763
02:10:19,719 --> 02:10:17,690

astronauts safely to and from the moon

2764
02:10:21,459 --> 02:10:19,729
for Artemis we're going to send our

2765
02:10:23,379 --> 02:10:21,469
astronauts back to the moon and there

2766
02:10:25,689 --> 02:10:23,389
they will explore and they will utilize

2767
02:10:27,609 --> 02:10:25,699
that experience to prepare us to take

2768
02:10:29,770 --> 02:10:27,619
the next giant leap to send our

2769
02:10:32,020 --> 02:10:29,780
astronauts to Mars and Artemis will

2770
02:10:34,479 --> 02:10:32,030
require a heavy lift vehicle the Space

2771
02:10:36,609 --> 02:10:34,489
Launch System the students we met at the

2772
02:10:39,489 --> 02:10:36,619
Cosmosphere also conducted an experiment

2773
02:10:41,950 --> 02:10:39,499
using balloons as air powered rockets to

2774
02:10:43,959 --> 02:10:41,960
launch the largest payload possible this

2775
02:10:45,759 --> 02:10:43,969
science activity teaches students what

2776
02:10:48,339 --> 02:10:45,769
it takes to launch a payload into orbit

2777
02:10:54,870 --> 02:10:48,349
and even how slight variations in weight

2778
02:10:58,899 --> 02:10:57,160
here with me we have Alyssa from the

2779
02:11:00,160 --> 02:10:58,909
Cosmosphere at Hutchinson Kansas and

2780
02:11:02,290 --> 02:11:00,170
she's going to talk to us about next

2781
02:11:05,620 --> 02:11:02,300
Avenue these guys are doing it started

2782
02:11:09,189 --> 02:11:05,630
doing the NASA activity heavy lifting it

2783
02:11:11,620 --> 02:11:09,199
is a payload activity to test the amount

2784
02:11:14,649 --> 02:11:11,630
of payload they can evenly distribute

2785
02:11:18,430 --> 02:11:14,659
and how to distribute it onto their

2786
02:11:21,800 --> 02:11:18,440
rocket ship each paper clip is equal to

2787
02:11:24,840 --> 02:11:21,810
two grams of weight and there

2788
02:11:28,200 --> 02:11:24,850

challengers to get as many paper clips

2789
02:11:30,600 --> 02:11:28,210
onto the rocket as possible and be able

2790
02:11:33,320 --> 02:11:30,610
to reach the ceilings you just need an

2791
02:11:36,450 --> 02:11:33,330
elongated balloon some paper clips and a

2792
02:11:38,130 --> 02:11:36,460
clothespin to stop the airflow and some

2793
02:11:39,690 --> 02:11:38,140
masking tape all right so why don't we

2794
02:11:41,880 --> 02:11:39,700
check out what we have going on on this

2795
02:11:43,410 --> 02:11:41,890
side it looks like Drew and I'm over

2796
02:11:46,770 --> 02:11:43,420
here have some of their activities

2797
02:11:49,680 --> 02:11:46,780
started yes drew drew has a strategy

2798
02:11:52,320 --> 02:11:49,690
where he's going to convince up his

2799
02:11:54,630 --> 02:11:52,330
payload into a into a baggie and

2800
02:11:57,090 --> 02:11:54,640
distributed onto the rocket and

2801
02:11:59,750 --> 02:11:57,100
experiment with the best location to put

2802
02:12:02,910 --> 02:11:59,760
his payload for the maximum height and

2803
02:12:06,600 --> 02:12:02,920
Emma it has a different strategy where

2804
02:12:09,060 --> 02:12:06,610
she is chaining the paper clips and will

2805
02:12:12,210 --> 02:12:09,070
evenly distribute them onto and tape

2806
02:12:14,910 --> 02:12:12,220
them on to her rocket to maximize her

2807
02:12:16,980 --> 02:12:14,920
payload in and the height of her rocket

2808
02:12:19,710 --> 02:12:16,990
right and then the idea is to test the

2809
02:12:22,350 --> 02:12:19,720
different payloads to see what happens

2810
02:12:24,210 --> 02:12:22,360
or which one launches exactly so they're

2811
02:12:27,780 --> 02:12:24,220
gonna start with a very light payload

2812
02:12:30,360 --> 02:12:27,790
and I increase their test each time by a

2813
02:12:32,790 --> 02:12:30,370

few grams until they maximize their

2814
02:12:33,960 --> 02:12:32,800
payload excellent so why don't we see

2815
02:12:36,660 --> 02:12:33,970
what it looks like to launch this thing

2816
02:12:40,050 --> 02:12:36,670
so it looks like Madelyn and David have

2817
02:12:42,420 --> 02:12:40,060
finished their products yes and we have

2818
02:12:44,460 --> 02:12:42,430
a couple different design ideas this one

2819
02:12:47,070 --> 02:12:44,470
is to keep the payload up together and

2820
02:12:51,450 --> 02:12:47,080
at the bottom and then the other design

2821
02:12:52,830 --> 02:12:51,460
is to change the payload and distribute

2822
02:12:55,920 --> 02:12:52,840
the weight all the way down the length

2823
02:12:57,330 --> 02:12:55,930
of the rocket okay very nice so are you

2824
02:12:59,900 --> 02:12:57,340
able to watch one of these get launched

2825
02:13:02,490 --> 02:12:59,910
sure let's try it out

2826
02:13:05,140 --> 02:13:02,500
okay so we're gonna launch ready is

2827
02:13:12,020 --> 02:13:05,150
everyone counting three

2828
02:13:16,650 --> 02:13:14,070
so why don't we try this with another

2829
02:13:18,480 --> 02:13:16,660
payload all right so Madeline and our

2830
02:13:20,820 --> 02:13:18,490
partner have put an additional paper

2831
02:13:22,140 --> 02:13:20,830
clip on to this balloon I'm really

2832
02:13:25,500 --> 02:13:22,150
excited to see what happens with this

2833
02:13:35,070 --> 02:13:25,510
one are you guys excited let's count it

2834
02:13:36,540 --> 02:13:35,080
out ready three so for those of you who

2835
02:13:38,340 --> 02:13:36,550
would like to try this activity at home

2836
02:13:39,870 --> 02:13:38,350
please feel free to visit the website at

2837
02:13:41,400 --> 02:13:39,880
the bottom of the screen and you're more

2838
02:13:45,930 --> 02:13:41,410

than welcome to partake in this really

2839
02:13:47,910 --> 02:13:45,940
awesome exercise the heavy lift

2840
02:13:49,790 --> 02:13:47,920
experiment and many others are in our

2841
02:13:52,380 --> 02:13:49,800
stem forage of the Moon activity guide

2842
02:13:54,720 --> 02:13:52,390
parents educators and students can go to

2843
02:13:57,090 --> 02:13:54,730
the website and download the book there

2844
02:13:58,860 --> 02:13:57,100
is a ton of really fun kitchen science

2845
02:14:00,690 --> 02:13:58,870
in there I had a lot of fun with them

2846
02:14:02,760 --> 02:14:00,700
myself in fact the water filtration

2847
02:14:05,010 --> 02:14:02,770
activity you will see coming up was my

2848
02:14:07,470 --> 02:14:05,020
favorite and Stephanie all of these

2849
02:14:10,260 --> 02:14:07,480
activities can be done at home using the

2850
02:14:12,860 --> 02:14:10,270
activity guide from launching to living

2851
02:14:15,510 --> 02:14:12,870
on the moon there's a lot to learn

2852
02:14:17,310 --> 02:14:15,520
museums across the country are hosting

2853
02:14:19,200 --> 02:14:17,320
watch parties just like the one that is

2854
02:14:20,160 --> 02:14:19,210
in national in the National Mall in

2855
02:14:22,620 --> 02:14:20,170
Washington DC

2856
02:14:24,930 --> 02:14:22,630
it was coordinated by NASA and the

2857
02:14:26,730 --> 02:14:24,940
Smithsonian's Air and Space Museum here

2858
02:14:28,290 --> 02:14:26,740
you can see the monument in the

2859
02:14:31,170 --> 02:14:28,300
background with all of the exhibits

2860
02:14:32,910 --> 02:14:31,180
along both sides many of them have big

2861
02:14:34,620 --> 02:14:32,920
events that are being hosted even

2862
02:14:37,890 --> 02:14:34,630
tomorrow to commemorate the big Apollo

2863
02:14:40,350 --> 02:14:37,900

11 mission and each night this week an

2864
02:14:42,030 --> 02:14:40,360
image of a Saturn 5 rocket was being

2865
02:14:44,280 --> 02:14:42,040
projected onto the side of the

2866
02:14:47,160 --> 02:14:44,290
Washington Monument and starting tonight

2867
02:14:49,380 --> 02:14:47,170
in tomorrow a 17 minute animated show

2868
02:14:52,200 --> 02:14:49,390
will tell the story of the launch in

2869
02:14:54,330 --> 02:14:52,210
landing of Apollo 11 that's happening at

2870
02:14:56,070 --> 02:14:54,340
the National Mall in Washington DC if

2871
02:14:57,720 --> 02:14:56,080
you're in the nation's capitol this week

2872
02:15:00,090 --> 02:14:57,730
it sounds like something really worth

2873
02:15:02,400 --> 02:15:00,100
seeing it really does as you can see

2874
02:15:04,440 --> 02:15:02,410
with that that rocket on the pad as its

2875
02:15:07,260 --> 02:15:04,450
displayed on the monument it's just

2876
02:15:08,760 --> 02:15:07,270
amazing I wish I was in DC if I wasn't

2877
02:15:10,770 --> 02:15:08,770
actually able to be here with all of you

2878
02:15:12,960 --> 02:15:10,780
today exactly and despite the heat index

2879
02:15:15,870 --> 02:15:12,970
it would have been a great adventure it

2880
02:15:17,490 --> 02:15:15,880
sure would have so a few moments ago we

2881
02:15:19,050 --> 02:15:17,500
saw a mission simulation

2882
02:15:21,210 --> 02:15:19,060
the Cosmosphere where we had students

2883
02:15:23,610 --> 02:15:21,220
actually in a mission simulator I'm

2884
02:15:25,590 --> 02:15:23,620
amazed how interactive these museums are

2885
02:15:27,720 --> 02:15:25,600
right and it's so great to have these

2886
02:15:29,850 --> 02:15:27,730
experiences available to the students

2887
02:15:32,550 --> 02:15:29,860
NASA partnerships are crucial in

2888
02:15:33,720 --> 02:15:32,560

engaging students in NASA's mission not

2889
02:15:35,820 --> 02:15:33,730
only do they provide learning

2890
02:15:38,430 --> 02:15:35,830
opportunities for students they also

2891
02:15:41,040 --> 02:15:38,440
enhance the capabilities of educational

2892
02:15:42,960 --> 02:15:41,050
institutions and support educators to

2893
02:15:44,610 --> 02:15:42,970
better engage the students at the

2894
02:15:46,470 --> 02:15:44,620
Columbia Memorial Space Center in

2895
02:15:48,960 --> 02:15:46,480
California for example students can

2896
02:15:50,400 --> 02:15:48,970
return to the moon or voyage to Mars and

2897
02:15:52,230 --> 02:15:50,410
their interactive space mission

2898
02:15:53,610 --> 02:15:52,240
simulator there are a challenger

2899
02:15:54,780 --> 02:15:53,620
Learning Center where students can

2900
02:15:57,750 --> 02:15:54,790
experience the journey of exploration

2901
02:15:59,910 --> 02:15:57,760
and teamwork exactly and students there

2902
02:16:01,650 --> 02:15:59,920
took their imagination to new heights as

2903
02:16:03,870 --> 02:16:01,660
they thought through what it might be

2904
02:16:05,400 --> 02:16:03,880
like to be aboard the lunar gateway the

2905
02:16:07,500 --> 02:16:05,410
station that will orbit the moon and

2906
02:16:09,930 --> 02:16:07,510
become a rest stop as we travel further

2907
02:16:11,760 --> 02:16:09,940
to Mars someday I was there with our

2908
02:16:13,980 --> 02:16:11,770
camera crew as these middle schoolers

2909
02:16:19,819 --> 02:16:13,990
prepared to land on the moon they had a

2910
02:16:26,720 --> 02:16:22,399
Gateway tracking your orbit how do you

2911
02:16:28,669 --> 02:16:26,730
read for landing Mission Control orbit

2912
02:16:30,859 --> 02:16:28,679
established for landing on the moon

2913
02:16:33,290 --> 02:16:30,869

South Pole I think it's important to

2914
02:16:37,429 --> 02:16:33,300
send people to the moon and on to Mars

2915
02:16:39,459 --> 02:16:37,439
because discovery is a big thing and the

2916
02:16:42,469 --> 02:16:39,469
more you explore the more you know

2917
02:16:45,669 --> 02:16:42,479
initiating system checks on lunar lander

2918
02:16:48,860 --> 02:16:45,679
power systems power systems go

2919
02:16:50,419 --> 02:16:48,870
communications comms go I've always

2920
02:16:52,040 --> 02:16:50,429
wanted to go to the moon I wanted to be

2921
02:16:54,400 --> 02:16:52,050
one of the first women on the moon I

2922
02:16:56,540 --> 02:16:54,410
wanted to be first so that could be like

2923
02:16:59,389 --> 02:16:56,550
big dream come true that we're going

2924
02:17:02,599 --> 02:16:59,399
back during my time environmental

2925
02:17:04,370 --> 02:17:02,609
controls environment controls go I think

2926
02:17:07,009 --> 02:17:04,380
the most important experiment to do on

2927
02:17:09,320 --> 02:17:07,019
the moon would most likely be seeing if

2928
02:17:11,750 --> 02:17:09,330
we could find some way to make people

2929
02:17:13,339 --> 02:17:11,760
able to live on their it's gonna be the

2930
02:17:15,589 --> 02:17:13,349
first woman to go on and it's showing

2931
02:17:17,599 --> 02:17:15,599
just how much things have changed since

2932
02:17:20,809 --> 02:17:17,609
the first line element flight systems

2933
02:17:22,759 --> 02:17:20,819
flight systems go Lander system is

2934
02:17:26,419 --> 02:17:22,769
responding with green across the board

2935
02:17:28,580 --> 02:17:26,429
confirm Houston confirmed gateway lander

2936
02:17:31,490 --> 02:17:28,590
systems green proceed with descent

2937
02:17:34,610 --> 02:17:31,500
operations Roger Mission Control

2938
02:17:37,219 --> 02:17:34,620

proceeding with the sent operations what

2939
02:17:40,730 --> 02:17:37,229
excites me the most about going forward

2940
02:17:43,490 --> 02:17:40,740
to the moon is like creating a whole new

2941
02:17:44,599 --> 02:17:43,500
life and being able to discover more

2942
02:17:46,839 --> 02:17:44,609
than we thought

2943
02:17:49,910 --> 02:17:46,849
lunar expedition suits a secured

2944
02:17:52,669 --> 02:17:49,920
expedition team moving to lander what

2945
02:17:53,720 --> 02:17:52,679
excites me the most about going forward

2946
02:17:55,880 --> 02:17:53,730
to the moon

2947
02:17:58,640 --> 02:17:55,890
so learning opportunity I think it's

2948
02:18:00,980 --> 02:17:58,650
amazing that during my lifetime and

2949
02:18:03,170 --> 02:18:00,990
during like especially me at this age

2950
02:18:05,600 --> 02:18:03,180
I'll be able to experience something

2951
02:18:09,260 --> 02:18:05,610
like this expedition tooms has entered

2952
02:18:12,291 --> 02:18:09,270
the Lander hatch is secured across the

2953
02:18:15,951 --> 02:18:12,301
track on lander pressure good holding

2954
02:18:19,791 --> 02:18:15,961
nominal in the shading release seals

2955
02:18:25,161 --> 02:18:19,801
released plan they're backing away two

2956
02:18:27,650 --> 02:18:25,171
meters four meters six meters you are

2957
02:18:30,230 --> 02:18:27,660
clear expedition Lander Godspeed

2958
02:18:34,850 --> 02:18:30,240
Chloe and Lenora safe travels expedition

2959
02:18:36,590 --> 02:18:34,860
and don't forget our souvenirs the lunar

2960
02:18:38,690 --> 02:18:36,600
gateway that these young women just

2961
02:18:40,100 --> 02:18:38,700
shared with us it is such a different

2962
02:18:42,081 --> 02:18:40,110
approach from what we had during Apollo

2963
02:18:43,730 --> 02:18:42,091

that's right Stephanie it's a huge

2964
02:18:45,621 --> 02:18:43,740
innovation gateway gives us the

2965
02:18:47,840 --> 02:18:45,631
opportunity to land anywhere on the

2966
02:18:49,640 --> 02:18:47,850
surface of the Moon it will also be a

2967
02:18:52,130 --> 02:18:49,650
rest stop and staging area as we

2968
02:18:54,560 --> 02:18:52,140
continue to go on to Mars now a journey

2969
02:18:56,990 --> 02:18:54,570
to the moon takes about three days each

2970
02:18:59,451 --> 02:18:57,000
way and a great way to pass the time is

2971
02:19:01,850 --> 02:18:59,461
with music Stephanie music has actually

2972
02:19:03,740 --> 02:19:01,860
been part of trot space travel from the

2973
02:19:04,970 --> 02:19:03,750
beginning right it really has there were

2974
02:19:07,070 --> 02:19:04,980
pre-launch songs

2975
02:19:09,020 --> 02:19:07,080
shuttle crew wake-up songs and some

2976
02:19:10,400 --> 02:19:09,030
astronauts he's even played instruments

2977
02:19:12,440 --> 02:19:10,410
on the International Space Station to

2978
02:19:14,780 --> 02:19:12,450
bring a part of home to this space

2979
02:19:17,570 --> 02:19:14,790
station with them with NASA returning to

2980
02:19:19,640 --> 02:19:17,580
the moon by 2024 we asked people what

2981
02:19:21,831 --> 02:19:19,650
they thought should be on the playlist

2982
02:19:23,990 --> 02:19:21,841
for the journey and created moon tunes

2983
02:19:26,390 --> 02:19:24,000
you can listen on 3rd rock radio or use

2984
02:19:29,030 --> 02:19:26,400
the hashtag NASA moon tunes to learn

2985
02:19:31,161 --> 02:19:29,040
more one of the tunes that made the

2986
02:19:34,070 --> 02:19:31,171
playlist is the song moon in the water

2987
02:19:35,720 --> 02:19:34,080
by DAWs but for our astronauts when they

2988
02:19:37,400 --> 02:19:35,730

travel to the moon one important aspect

2989
02:19:40,340 --> 02:19:37,410
is going to be making sure they have

2990
02:19:42,201 --> 02:19:40,350
clean water on the moon no effort you've

2991
02:19:44,810 --> 02:19:42,211
recently worked with students on a water

2992
02:19:47,180 --> 02:19:44,820
filtration experiment that's right I did

2993
02:19:48,621 --> 02:19:47,190
this activity gets students thinking

2994
02:19:50,690 --> 02:19:48,631
about some of the necessities of

2995
02:19:52,911 --> 02:19:50,700
survival when it comes to living and

2996
02:19:54,711 --> 02:19:52,921
working in space in this case we looked

2997
02:19:56,900 --> 02:19:54,721
at some of the science behind cleaning

2998
02:19:58,970 --> 02:19:56,910
water and and creating a water

2999
02:20:00,711 --> 02:19:58,980
filtration system let's go back to the

3000
02:20:02,770 --> 02:20:00,721
Columbia Memorial Space Center and see

3001
02:20:04,970 --> 02:20:02,780
how it went

3002
02:20:06,411 --> 02:20:04,980
we're with Breanna at the Columbia

3003
02:20:07,520 --> 02:20:06,421
Memorial Space Center and today we're

3004
02:20:10,430 --> 02:20:07,530
going to be doing a cleaning

3005
02:20:13,100 --> 02:20:10,440
activity yeah so cleaning water is so

3006
02:20:14,900 --> 02:20:13,110
important right so I thought you know we

3007
02:20:16,490 --> 02:20:14,910
can make a water filter activity and

3008
02:20:19,580 --> 02:20:16,500
just really get the importance of water

3009
02:20:20,900 --> 02:20:19,590
and why we need exactly and as the

3010
02:20:23,511 --> 02:20:20,910
astronauts say on the International

3011
02:20:25,370 --> 02:20:23,521
Space Station tomorrow's coffee was

3012
02:20:28,280 --> 02:20:25,380
yesterday's coffee got to recycle

3013
02:20:30,711 --> 02:20:28,290

everything we can exactly and so right

3014
02:20:32,900 --> 02:20:30,721
here I have some necessary materials

3015
02:20:34,730 --> 02:20:32,910
that we do for the filter great I have

3016
02:20:37,040 --> 02:20:34,740
some beans two different kind of beans

3017
02:20:40,190 --> 02:20:37,050
some aquarium gravel because it's very

3018
02:20:42,980 --> 02:20:40,200
colorful I have some peas and also rice

3019
02:20:45,560 --> 02:20:42,990
and our favorite cotton balls excellent

3020
02:20:48,140 --> 02:20:45,570
also just to organize some things I have

3021
02:20:49,370 --> 02:20:48,150
you know a filter to filter it through

3022
02:20:53,211 --> 02:20:49,380
some goggles

3023
02:20:56,450 --> 02:20:53,221
safety first exactly and also I got some

3024
02:20:58,580 --> 02:20:56,460
pH papers so we can actually see if our

3025
02:21:00,770 --> 02:20:58,590
water is filtered awesome so we have

3026
02:21:02,780 --> 02:21:00,780
Jackie and navei continuing the activity

3027
02:21:06,551 --> 02:21:02,790
yeah so it looks like they've already

3028
02:21:10,730 --> 02:21:06,561
started their filters a powerful beans

3029
02:21:12,290 --> 02:21:10,740
Greenpeace aquarium travel and it looks

3030
02:21:14,091 --> 02:21:12,300
like they're gonna add their final step

3031
02:21:14,870 --> 02:21:14,101
which is cotton balls looks like Oh

3032
02:21:17,120 --> 02:21:14,880
excellent

3033
02:21:18,950 --> 02:21:17,130
yeah it's really easy and for our dirty

3034
02:21:20,961 --> 02:21:18,960
water that we made we actually used

3035
02:21:22,520 --> 02:21:20,971
Italian dressing so I think is really

3036
02:21:24,410 --> 02:21:22,530
fun that's really awesome so you know

3037
02:21:26,270 --> 02:21:24,420
what you did was you mixed water with

3038
02:21:28,850 --> 02:21:26,280

the Italian dressing it's that easy

3039
02:21:31,131 --> 02:21:28,860
Wow okay all three times I like to just

3040
02:21:32,900 --> 02:21:31,141
go outside and grab some dirt that's

3041
02:21:36,171 --> 02:21:32,910
even more fun I love it I love playing

3042
02:21:38,330 --> 02:21:36,181
with dirt and it gives a real feel it's

3043
02:21:39,680 --> 02:21:38,340
real dirty water and then I get to test

3044
02:21:41,240 --> 02:21:39,690
it out and see if it's gonna be clean

3045
02:21:42,801 --> 02:21:41,250
and when astronauts are on the lunar

3046
02:21:44,720 --> 02:21:42,811
gateway they're going to neat systems

3047
02:21:47,211 --> 02:21:44,730
like this to be even more efficient

3048
02:21:50,330 --> 02:21:47,221
heavy-duty systems it looks like we have

3049
02:21:52,881 --> 02:21:50,340
a completed activity here yeah so looks

3050
02:21:56,180 --> 02:21:52,891
like everything is ready to go great and

3051
02:21:57,801 --> 02:21:56,190
the goggles are on so safety first I'm

3052
02:21:59,600 --> 02:21:57,811
glad what they're ready for that so now

3053
02:22:01,490 --> 02:21:59,610
all they need to do is just add the

3054
02:22:04,131 --> 02:22:01,500
dirty water excellent and that water

3055
02:22:09,200 --> 02:22:04,141
doesn't look too dirty to me I think we

3056
02:22:11,270 --> 02:22:09,210
need to give it a stir yeah oh there we

3057
02:22:13,700 --> 02:22:11,280
go look at that dirty water he's mixing

3058
02:22:16,420 --> 02:22:13,710
the Italian dressing and water

3059
02:22:19,490 --> 02:22:16,430
[Laughter]

3060
02:22:21,260 --> 02:22:19,500
so now I would probably say it's good to

3061
02:22:25,510 --> 02:22:21,270
try out so we're gonna try this out now

3062
02:22:29,780 --> 02:22:28,580
I'm hoping it works I hope so - fingers

3063
02:22:34,610 --> 02:22:29,790

crossed

3064
02:22:36,500 --> 02:22:34,620
oh wow starting to go through it's going

3065
02:22:37,490 --> 02:22:36,510
through all the layers that's faster

3066
02:22:40,010 --> 02:22:37,500
than I would expect

3067
02:22:42,710 --> 02:22:40,020
totally and I'm actually really

3068
02:22:44,330 --> 02:22:42,720
surprised it looks very clean it looks

3069
02:22:46,520 --> 02:22:44,340
very clean for those of you interested

3070
02:22:48,590 --> 02:22:46,530
in participating in this activity and

3071
02:22:50,420 --> 02:22:48,600
many others feel free to visit the

3072
02:22:57,250 --> 02:22:50,430
website at the bottom of our screen and

3073
02:23:01,100 --> 02:22:59,810
Nayla for the water looks a little

3074
02:23:02,870 --> 02:23:01,110
cleaner when it comes out of the

3075
02:23:03,590 --> 02:23:02,880
filtration system on the International

3076
02:23:06,050 --> 02:23:03,600
Space Station

3077
02:23:08,090 --> 02:23:06,060
that is true Stephanie our system

3078
02:23:10,010 --> 02:23:08,100
includes a couple of technologies that

3079
02:23:12,170 --> 02:23:10,020
you don't normally have at home which is

3080
02:23:15,560 --> 02:23:12,180
why we suggest students don't drink the

3081
02:23:17,570 --> 02:23:15,570
water you filter absolutely not now we

3082
02:23:20,719 --> 02:23:17,580
want stem discoveries and experiments to

3083
02:23:22,429 --> 02:23:20,729
be exciting for everyone we do and even

3084
02:23:25,219 --> 02:23:22,439
celebrities are getting excited about

3085
02:23:27,410 --> 02:23:25,229
NASA stem activities actress and singer

3086
02:23:29,000 --> 02:23:27,420
keke palmer recently had the opportunity

3087
02:23:31,100 --> 02:23:29,010
to learn more about our initiatives and

3088
02:23:33,130 --> 02:23:31,110

she shared this message about stem and

3089
02:23:36,080 --> 02:23:33,140
NASA's Artemis missions

3090
02:23:37,940 --> 02:23:36,090
hey Kiki Palmer here and when I'm not on

3091
02:23:39,830 --> 02:23:37,950
set or in the recording studio one of my

3092
02:23:41,840 --> 02:23:39,840
favorite things to do is to learn more

3093
02:23:43,460 --> 02:23:41,850
about organizations like NASA and what

3094
02:23:45,230 --> 02:23:43,470
they're doing to push the boundaries of

3095
02:23:47,330 --> 02:23:45,240
how we understand the world around us in

3096
02:23:48,080 --> 02:23:47,340
addition tons of new inventors are on

3097
02:23:50,179 --> 02:23:48,090
the horizon

3098
02:23:52,340 --> 02:23:50,189
including Artemis NASA's mission tool

3099
02:23:54,320 --> 02:23:52,350
and the first woman and next man on the

3100
02:23:56,450 --> 02:23:54,330
moon there's never been a better time to

3101
02:23:59,179 --> 02:23:56,460
get involved in science technology

3102
02:24:00,950 --> 02:23:59,189
engineering or math visit nasa.gov slash

3103
02:24:09,331 --> 02:24:00,960
stem to learn more about how to help

3104
02:24:14,640 --> 02:24:11,911
the landing of Apollo 11 is what we are

3105
02:24:18,511 --> 02:24:14,650
commemorating today and for the first

3106
02:24:19,980 --> 02:24:18,521
time when we land our first sorry when

3107
02:24:22,291 --> 02:24:19,990
we land the first Artemus mission

3108
02:24:23,581 --> 02:24:22,301
everyone around the world is going to be

3109
02:24:25,711 --> 02:24:23,591
celebrating and it's really gonna be

3110
02:24:27,301 --> 02:24:25,721
something we can all look forward to now

3111
02:24:28,890 --> 02:24:27,311
nila fir you've recently had a trip to

3112
02:24:30,631 --> 02:24:28,900
the st. Louis Science Center I did we

3113
02:24:32,430 --> 02:24:30,641

went to the st. Louis Science Center and

3114
02:24:34,020 --> 02:24:32,440
talked to several students there we

3115
02:24:36,301 --> 02:24:34,030
asked them what they thought it would be

3116
02:24:38,461 --> 02:24:36,311
like to land on the moon and showed us

3117
02:24:39,810 --> 02:24:38,471
what they imagined the big event would

3118
02:24:42,180 --> 02:24:39,820
be it would be like they were really

3119
02:24:44,220 --> 02:24:42,190
excited they got really into it and I

3120
02:24:49,110 --> 02:24:44,230
could see our future astronaut class in

3121
02:24:51,631 --> 02:24:49,120
treating Artemis this is Houston Mission

3122
02:24:54,241 --> 02:24:51,641
Control here you have 30 seconds to feel

3123
02:24:58,770 --> 02:24:54,251
remaining we are close drifting forward

3124
02:25:01,711 --> 02:24:58,780
a little shutdown okay stop we copy you

3125
02:25:04,470 --> 02:25:01,721
down Artemis engine is off South pull

3126
02:25:06,270 --> 02:25:04,480
here Artemis has landed Roger we copy

3127
02:25:08,551 --> 02:25:06,280
you on the ground welcome to the moon

3128
02:25:11,341 --> 02:25:08,561
Artemis you're looking good I would get

3129
02:25:13,110 --> 02:25:11,351
my classmates excited about Artemis by

3130
02:25:15,451 --> 02:25:13,120
telling them how we're gonna go to the

3131
02:25:17,430 --> 02:25:15,461
moon and I just think that's really cool

3132
02:25:19,831 --> 02:25:17,440
it's very important for NASA to send

3133
02:25:23,581 --> 02:25:19,841
people to the Moon and Mars so that we

3134
02:25:27,211 --> 02:25:23,591
can learn more about our planets in our

3135
02:25:29,911 --> 02:25:27,221
solar system and we can have new people

3136
02:25:31,890 --> 02:25:29,921
go and experience that we see you

3137
02:25:34,090 --> 02:25:31,900
opening up the hatch getting ready to

3138
02:25:36,460 --> 02:25:34,100

take your first steps

3139
02:25:39,100 --> 02:25:36,470
the most important experiment to do on

3140
02:25:43,030 --> 02:25:39,110
the moon in my opinion would definitely

3141
02:25:44,680 --> 02:25:43,040
be look at ice on the moon and see if

3142
02:25:47,261 --> 02:25:44,690
there are any signs of anything ever

3143
02:25:49,900 --> 02:25:47,271
living there Artemus welcome to the moon

3144
02:25:51,340 --> 02:25:49,910
as we establish a permanent presence we

3145
02:25:53,920 --> 02:25:51,350
are closer to sending the next

3146
02:26:01,060 --> 02:25:53,930
generation of explorers to Mars this is

3147
02:26:03,040 --> 02:26:01,070
Houston out the Museum of Flight in

3148
02:26:04,930 --> 02:26:03,050
Seattle is celebrating the landing of

3149
02:26:06,970 --> 02:26:04,940
Apollo 11 mission with a lunar block

3150
02:26:09,340 --> 02:26:06,980
party for all museum guests this weekend

3151
02:26:11,590 --> 02:26:09,350
the Museum of Flight also hosts the

3152
02:26:13,390 --> 02:26:11,600
Apollo 11 command module known as

3153
02:26:15,670 --> 02:26:13,400
Columbia which is on display for the

3154
02:26:17,940 --> 02:26:15,680
guests you see gathered when living in

3155
02:26:20,290 --> 02:26:17,950
space shelter is vital for survival

3156
02:26:22,360 --> 02:26:20,300
conducting experiments and to have a

3157
02:26:24,310 --> 02:26:22,370
place to rest when surrounded by harsh

3158
02:26:26,140 --> 02:26:24,320
conditions of space and death the seat

3159
02:26:28,030 --> 02:26:26,150
Lewis Science Center students explores

3160
02:26:30,190 --> 02:26:28,040
what it would take to build a habitat

3161
02:26:32,590 --> 02:26:30,200
that could be sustainable for astronauts

3162
02:26:36,190 --> 02:26:32,600
to stay in but also practical enough to

3163
02:26:40,120 --> 02:26:38,620

we're here today at the state Lewis sine

3164
02:26:41,230 --> 02:26:40,130
Center and I'm here with Aaron who's

3165
02:26:43,300 --> 02:26:41,240
going to be showing us a little bit

3166
02:26:45,100 --> 02:26:43,310
about a habitat activity Aaron that's

3167
02:26:46,840 --> 02:26:45,110
right our astronauts have just gotten

3168
02:26:48,850 --> 02:26:46,850
back from the moon and they are already

3169
02:26:49,929 --> 02:26:48,860
designing their next lunar habitats they

3170
02:26:53,260 --> 02:26:49,939
are busy at work

3171
02:26:56,380 --> 02:26:53,270
drawing a what they think would be

3172
02:26:58,600 --> 02:26:56,390
helpful and a habitat to live if they

3173
02:27:00,340 --> 02:26:58,610
were on the moon I can't wait to see

3174
02:27:02,350 --> 02:27:00,350
what a habitat looks like so we've got

3175
02:27:05,380 --> 02:27:02,360
Evan and Nikki here and they are working

3176
02:27:07,420 --> 02:27:05,390
on actually building a 3d version of

3177
02:27:08,770 --> 02:27:07,430
their habitat it looks like deep

3178
02:27:10,840 --> 02:27:08,780
scrounger on the house and found

3179
02:27:12,700 --> 02:27:10,850
everything and the recycling good they

3180
02:27:15,100 --> 02:27:12,710
have everything here has been recycled

3181
02:27:18,280 --> 02:27:15,110
or reused anybody could do this at home

3182
02:27:19,780 --> 02:27:18,290
or school anywhere habitats are so

3183
02:27:21,790 --> 02:27:19,790
important because we need astronauts to

3184
02:27:23,380 --> 02:27:21,800
have clean drinking water and clean air

3185
02:27:25,630 --> 02:27:23,390
to breathe yes there's all kinds of

3186
02:27:28,120 --> 02:27:25,640
different issues in space what you said

3187
02:27:29,950 --> 02:27:28,130
gravity is an issue and Nikki over here

3188
02:27:32,560 --> 02:27:29,960

in the laboratory how amazing is this

3189
02:27:34,300 --> 02:27:32,570
mad scientist Space Lab so he came up

3190
02:27:36,790 --> 02:27:34,310
with a lot of ways to bring those

3191
02:27:38,410 --> 02:27:36,800
experiments safely back all right I want

3192
02:27:38,980 --> 02:27:38,420
to see you completed habitat Aaron let's

3193
02:27:40,810 --> 02:27:38,990
do it

3194
02:27:42,370 --> 02:27:40,820
ice Amaya can you tell us a little bit

3195
02:27:46,300 --> 02:27:42,380
about what you felt for us today

3196
02:27:48,640 --> 02:27:46,310
yes I built the bedroom and so in the

3197
02:27:52,179 --> 02:27:48,650
bedroom when you come in there's a

3198
02:27:57,820 --> 02:27:52,189
button on and off button so if you want

3199
02:27:59,500 --> 02:27:57,830
the gravity on you press the green

3200
02:28:02,320 --> 02:27:59,510
button and if you want to off you press

3201
02:28:06,270 --> 02:28:02,330
the red button and then there's a bed

3202
02:28:10,960 --> 02:28:06,280
like a rollout bed with a dresser Wow

3203
02:28:15,400 --> 02:28:10,970
gonna be my car non-italian well I built

3204
02:28:17,830 --> 02:28:15,410
the kitchen of the habitat and there is

3205
02:28:20,380 --> 02:28:17,840
a table right here with chairs that you

3206
02:28:23,980 --> 02:28:20,390
can push under the tables so that way it

3207
02:28:25,570 --> 02:28:23,990
saves more space and then it's just the

3208
02:28:28,000 --> 02:28:25,580
basic stuff like the sink but then

3209
02:28:31,960 --> 02:28:28,010
there's a hot water tank inside of the

3210
02:28:34,390 --> 02:28:31,970
refrigerator to keep more water inside

3211
02:28:36,440 --> 02:28:34,400
the habitat and there's a pantry on the

3212
02:28:39,261 --> 02:28:36,450
side of everything

3213
02:28:42,620 --> 02:28:39,271

Katie what are you about going on hi I

3214
02:28:45,230 --> 02:28:42,630
built the living room and the gym I

3215
02:28:48,440 --> 02:28:45,240
thought when you come home from outer

3216
02:28:52,730 --> 02:28:48,450
space you would want to relax so we have

3217
02:28:56,330 --> 02:28:52,740
a TV and couch and a little bookcase

3218
02:28:58,011 --> 02:28:56,340
with some chairs you can sit in and you

3219
02:29:00,860 --> 02:28:58,021
have a treadmill you also have some

3220
02:29:02,900 --> 02:29:00,870
oxygen and nitrogen and a computer and

3221
02:29:05,150 --> 02:29:02,910
what's in the middle of your living room

3222
02:29:07,850 --> 02:29:05,160
because I really like this it's a

3223
02:29:09,921 --> 02:29:07,860
gravity button that you can push on and

3224
02:29:12,290 --> 02:29:09,931
off if you want gravity you can push it

3225
02:29:13,671 --> 02:29:12,300
if you don't you can push it again this

3226
02:29:18,350 --> 02:29:13,681
I think we've given people at home a

3227
02:29:20,210 --> 02:29:18,360
really great idea yeah it's your

3228
02:29:21,950 --> 02:29:20,220
imagination and what you find in your

3229
02:29:22,910 --> 02:29:21,960
own house is the limit I can't wait to

3230
02:29:24,650 --> 02:29:22,920
do this at home myself

3231
02:29:26,870 --> 02:29:24,660
yeah so for those of you interested in

3232
02:29:29,000 --> 02:29:26,880
participating in this activity and many

3233
02:29:33,591 --> 02:29:29,010
others feel free to visit the website at

3234
02:29:35,720 --> 02:29:33,601
the bottom of the screen so we've

3235
02:29:37,070 --> 02:29:35,730
covered launch gateway and landing the

3236
02:29:39,140 --> 02:29:37,080
next mission on the moon but there's

3237
02:29:40,700 --> 02:29:39,150
another important step to what you've

3238
02:29:42,320 --> 02:29:40,710

asked students to imagine that's right

3239
02:29:44,660 --> 02:29:42,330
as important as all of those other

3240
02:29:47,480 --> 02:29:44,670
aspects of the mission are we are going

3241
02:29:49,310 --> 02:29:47,490
to explore so we asked students at the

3242
02:29:51,350 --> 02:29:49,320
Arizona Science Center to envision a

3243
02:29:53,330 --> 02:29:51,360
lunar sample mission at the moon South

3244
02:30:02,779 --> 02:29:53,340
Pole this is what their imagination

3245
02:30:07,620 --> 02:30:05,189
Houston Mission Control here you're at

3246
02:30:09,330 --> 02:30:07,630
the optimal lunar South Pole location to

3247
02:30:11,309 --> 02:30:09,340
begin drilling free core sample of water

3248
02:30:14,729 --> 02:30:11,319
ice irate straights time of collection

3249
02:30:16,830 --> 02:30:14,739
and analysis Houston this is Artemis 3

3250
02:30:19,080 --> 02:30:16,840
we're go for water ice sample collection

3251
02:30:20,599 --> 02:30:19,090
the core drill is in position and rover

3252
02:30:23,300 --> 02:30:20,609
analytic lab is ready

3253
02:30:25,620 --> 02:30:23,310
proceed with collection and analysis

3254
02:30:27,510 --> 02:30:25,630
drilling has started and is proceeding

3255
02:30:29,189 --> 02:30:27,520
smoothly I'm really excited for the

3256
02:30:32,250 --> 02:30:29,199
first woman to be on the moon because

3257
02:30:34,710 --> 02:30:32,260
it's a really good achievement for

3258
02:30:36,719 --> 02:30:34,720
America and the whole world I like to

3259
02:30:38,880 --> 02:30:36,729
think of it as basically a gas station

3260
02:30:41,609 --> 02:30:38,890
on the way to Mars because from the

3261
02:30:44,279 --> 02:30:41,619
earth to Mars it's pretty far away so if

3262
02:30:46,739 --> 02:30:44,289
we're able to go to the moon and split

3263
02:30:50,609 --> 02:30:46,749

the like hydrogen atoms inside the ice

3264
02:30:51,840 --> 02:30:50,619
that's hopefully there and create rocket

3265
02:30:53,849 --> 02:30:51,850
fuel out of that I feel like that would

3266
02:30:55,439 --> 02:30:53,859
be pretty cool I think it's important to

3267
02:30:57,359 --> 02:30:55,449
have activities that really help

3268
02:31:00,449 --> 02:30:57,369
students understand just how important

3269
02:31:03,449 --> 02:31:00,459
this step is impossible' solar system

3270
02:31:05,340 --> 02:31:03,459
colonization stop drilling we are at the

3271
02:31:08,309 --> 02:31:05,350
twenty inch mark block drill to begin

3272
02:31:12,300 --> 02:31:08,319
collecting sample collection complete

3273
02:31:14,960 --> 02:31:12,310
anchor the drill for core extraction the

3274
02:31:16,889 --> 02:31:14,970
drill is anchored begin extraction

3275
02:31:20,849 --> 02:31:16,899
simple ready for analysis

3276
02:31:22,590 --> 02:31:20,859
open rover sample container the

3277
02:31:23,841 --> 02:31:22,600
container is open and ready begin

3278
02:31:27,020 --> 02:31:23,851
analysis

3279
02:31:30,950 --> 02:31:27,030
I think it's important because it really

3280
02:31:33,650 --> 02:31:30,960
is the first step in understanding space

3281
02:31:35,930 --> 02:31:33,660
travel in general and along with that

3282
02:31:37,011 --> 02:31:35,940
especially for Mars just be able to see

3283
02:31:41,060 --> 02:31:37,021
whether or not there's possible

3284
02:31:43,160 --> 02:31:41,070
biological life in the ice of Mars is

3285
02:31:44,570 --> 02:31:43,170
just amazing they could really signal

3286
02:31:47,470 --> 02:31:44,580
that perhaps there is a greater chance

3287
02:31:50,091 --> 02:31:47,480
of life in our universe I feel like

3288
02:31:52,251 --> 02:31:50,101

there's not any experiment that's more

3289
02:31:54,051 --> 02:31:52,261
important than any other because any

3290
02:31:56,751 --> 02:31:54,061
experiments any experiment they're all

3291
02:31:59,360 --> 02:31:56,761
equally important analysis complete

3292
02:32:02,841 --> 02:31:59,370
Houston great news we have 72 percent

3293
02:32:05,270 --> 02:32:02,851
water ice and 28 percent regolith re was

3294
02:32:06,591 --> 02:32:05,280
three that is great news those numbers

3295
02:32:08,360 --> 02:32:06,601
suggest that this is an excellent

3296
02:32:10,700 --> 02:32:08,370
location for a long-duration lunar

3297
02:32:12,501 --> 02:32:10,710
habitat this is an important step in

3298
02:32:14,091 --> 02:32:12,511
helping to ensure this generation will

3299
02:32:15,770 --> 02:32:14,101
be taking the free steps on the surface

3300
02:32:17,841 --> 02:32:15,780
of Mars great work

3301
02:32:20,001 --> 02:32:17,851
Houston out I feel like we can learn a

3302
02:32:21,680 --> 02:32:20,011
lot about how the moon was formed and

3303
02:32:22,850 --> 02:32:21,690
when we learned more about that we can

3304
02:32:25,610 --> 02:32:22,860
learn more about how the earth was

3305
02:32:27,830 --> 02:32:25,620
formed and learn more on from there I

3306
02:32:30,440 --> 02:32:27,840
think just feels to say you're their

3307
02:32:34,360 --> 02:32:30,450
first really making the mark for the

3308
02:32:37,160 --> 02:32:34,370
21st century is just absolutely amazing

3309
02:32:39,950 --> 02:32:37,170
man I tell you these kids are great I

3310
02:32:42,080 --> 02:32:39,960
love hearing how how excited they are

3311
02:32:43,490 --> 02:32:42,090
for our lunar missions and to see them

3312
02:32:45,140 --> 02:32:43,500
as they walk through these simulations

3313
02:32:47,030 --> 02:32:45,150

and put this themselves in the role of

3314
02:32:49,280 --> 02:32:47,040
flight controller and astronaut

3315
02:32:51,770 --> 02:32:49,290
it's just inspirational and I can see

3316
02:32:54,020 --> 02:32:51,780
how interactive these simulations are it

3317
02:32:56,030 --> 02:32:54,030
starts really great conversations in the

3318
02:32:58,160 --> 02:32:56,040
classroom and at home that's exactly

3319
02:33:00,080 --> 02:32:58,170
what we aim to do with the activity

3320
02:33:02,330 --> 02:33:00,090
guide encourage families to do these

3321
02:33:04,430 --> 02:33:02,340
activities at home and talk about them

3322
02:33:07,131 --> 02:33:04,440
that's really what science is all about

3323
02:33:09,801 --> 02:33:07,141
asking the questions getting an answer

3324
02:33:12,261 --> 02:33:09,811
and then asking the next question from

3325
02:33:13,850 --> 02:33:12,271
what you learned and it was so much fun

3326
02:33:16,131 --> 02:33:13,860
working with the kids at the different

3327
02:33:18,530 --> 02:33:16,141
locations I want to send a big thank you

3328
02:33:20,961 --> 02:33:18,540
to the Cosmosphere the Columbia Memorial

3329
02:33:23,091 --> 02:33:20,971
Space Center the st. Louis Science

3330
02:33:24,890 --> 02:33:23,101
Center and the Arizona Science Center

3331
02:33:27,080 --> 02:33:24,900
for all their help in making this show

3332
02:33:28,520 --> 02:33:27,090
possible it's great to work with such

3333
02:33:30,921 --> 02:33:28,530
great organizations who have the same

3334
02:33:33,261 --> 02:33:30,931
goals as NASA exactly there are great

3335
02:33:35,150 --> 02:33:33,271
museums schools and other informal

3336
02:33:36,309 --> 02:33:35,160
education organizations around the

3337
02:33:38,109 --> 02:33:36,319
country doing

3338
02:33:41,229 --> 02:33:38,119

amazing work to teach teach and

3339
02:33:43,059 --> 02:33:41,239
encourage kids about stem we are going

3340
02:33:45,760 --> 02:33:43,069
forward to the moon and to get us there

3341
02:33:48,029 --> 02:33:45,770
and on to Mars we need you the Artemis

3342
02:33:49,960 --> 02:33:48,039
generation to be the next scientists

3343
02:33:52,689 --> 02:33:49,970
technologists engineers and

3344
02:33:55,149 --> 02:33:52,699
mathematicians to take us further than

3345
02:34:01,090 --> 02:33:55,159
we have ever gone before to learn more

3346
02:34:03,040 --> 02:34:01,100
you can go to our website at WWF and you

3347
02:34:05,619 --> 02:34:03,050
can join our online conversation using

3348
02:34:07,630 --> 02:34:05,629
the hashtag NASA stem on Facebook and

3349
02:34:09,369 --> 02:34:07,640
Twitter we will leave you now with a

3350
02:34:11,710 --> 02:34:09,379
song from NASA's collection of moon