



1
00:00:06,389 --> 00:00:03,750
the first word spoken by astronauts in

2
00:00:09,030 --> 00:00:06,399
space before history is made big or

3
00:00:11,030 --> 00:00:09,040
small is houston

4
00:00:13,190 --> 00:00:11,040
nasa's johnson space center has served

5
00:00:16,390 --> 00:00:13,200
as the iconic setting to some of

6
00:00:18,870 --> 00:00:16,400
humankind's greatest achievements

7
00:00:22,070 --> 00:00:18,880
for 60 years our center has been the

8
00:00:25,750 --> 00:00:22,080
world leader in human space exploration

9
00:00:28,230 --> 00:00:25,760
on may 25th 1961 president john f

10
00:00:30,790 --> 00:00:28,240
kennedy committed the nation to achieve

11
00:00:33,830 --> 00:00:30,800
the goal of landing a man on the moon

12
00:00:36,150 --> 00:00:33,840
and returning him safely to earth before

13
00:00:38,709 --> 00:00:36,160

the end of the decade

14

00:00:41,190 --> 00:00:38,719

nasa's space task group in charge of

15

00:00:43,510 --> 00:00:41,200

america's human space flight program was

16

00:00:46,470 --> 00:00:43,520

already working on project mercury to

17

00:00:48,950 --> 00:00:46,480

put astronauts into earth's orbit

18

00:00:51,510 --> 00:00:48,960

but with the additional task of a human

19

00:00:53,830 --> 00:00:51,520

lunar landing it soon outgrew its

20

00:00:56,150 --> 00:00:53,840

facilities at nasa's langley research

21

00:00:58,950 --> 00:00:56,160

center in hampton virginia

22

00:01:01,990 --> 00:00:58,960

the agency decided it needed a dedicated

23

00:01:04,030 --> 00:01:02,000

field center for human space flight

24

00:01:07,270 --> 00:01:04,040

and on september 19

25

00:01:09,670 --> 00:01:07,280

1961 after evaluating multiple sites

26
00:01:12,310 --> 00:01:09,680
around the country nasa announced that

27
00:01:15,429 --> 00:01:12,320
the new manned spacecraft center would

28
00:01:17,350 --> 00:01:15,439
be built in houston

29
00:01:19,990 --> 00:01:17,360
you may have noticed we have already

30
00:01:23,270 --> 00:01:20,000
begun celebrating our 60th anniversary

31
00:01:25,910 --> 00:01:23,280
with a new logo and through a series of

32
00:01:27,670 --> 00:01:25,920
articles featuring aspects of the space

33
00:01:29,590 --> 00:01:27,680
center's history

34
00:01:31,830 --> 00:01:29,600
we have even more planned throughout

35
00:01:33,910 --> 00:01:31,840
this celebratory year

36
00:01:36,710 --> 00:01:33,920
activities will include panel

37
00:01:39,190 --> 00:01:36,720
presentations the installation of 60th

38
00:01:41,350 --> 00:01:39,200

anniversary light pole banners social

39

00:01:43,510 --> 00:01:41,360

media posts about our history

40

00:01:46,789 --> 00:01:43,520

merchandise emblazoned with the

41

00:01:49,510 --> 00:01:46,799

anniversary logo a slideshow of jsc

42

00:01:51,590 --> 00:01:49,520

through the decades a podcast reflecting

43

00:01:53,910 --> 00:01:51,600

on jsc's history

44

00:01:56,310 --> 00:01:53,920

bill denied catwalk tours and mission

45

00:01:58,630 --> 00:01:56,320

operations control room tours

46

00:02:00,709 --> 00:01:58,640

videos and more

47

00:02:04,389 --> 00:02:00,719

this will all be capped off by an

48

00:02:07,109 --> 00:02:04,399

in-person event in spring 2022

49

00:02:09,990 --> 00:02:07,119

covet 19 permitting

50

00:02:12,150 --> 00:02:10,000

jsc has made many giant leaps throughout

51
00:02:14,550 --> 00:02:12,160
the past 60 years

52
00:02:17,270 --> 00:02:14,560
we fulfilled president kennedy's goal of

53
00:02:19,910 --> 00:02:17,280
landing a man on the moon and today we

54
00:02:22,550 --> 00:02:19,920
reach further into the stars as we push

55
00:02:24,229 --> 00:02:22,560
forward to the moon once again and then

56
00:02:26,550 --> 00:02:24,239
on to mars

57
00:02:29,190 --> 00:02:26,560
for more than 20 years we have

58
00:02:31,190 --> 00:02:29,200
successfully continuously crewed the

59
00:02:33,350 --> 00:02:31,200
international space station

60
00:02:36,470 --> 00:02:33,360
and we have so much more to accomplish

61
00:02:38,790 --> 00:02:36,480
with our ryan and gateway programs we

62
00:02:41,110 --> 00:02:38,800
continue to make history every day

63
00:02:42,869 --> 00:02:41,120

because of each of you

64

00:02:43,990 --> 00:02:42,879

let's take time to celebrate this

65

00:02:46,229 --> 00:02:44,000

milestone

66

00:02:48,869 --> 00:02:46,239

both by looking back at what we as a

67

00:02:51,350 --> 00:02:48,879

center have accomplished but also by

68

00:02:54,309 --> 00:02:51,360

looking forward to what's to come

69

00:02:56,790 --> 00:02:54,319

today we push forward to the moon

70

00:02:59,509 --> 00:02:56,800

tomorrow we leap to greater heights and

71

00:03:00,470 --> 00:02:59,519

new destinations there is history to be

72

00:03:03,589 --> 00:03:00,480

made

73

00:03:06,309 --> 00:03:03,599

in mission control we eagerly anticipate

74

00:03:10,390 --> 00:03:06,319

the first transmissions from unexplored

75

00:03:14,630 --> 00:03:12,070

hello welcome to our celebration of

76

00:03:16,550 --> 00:03:14,640

nasa's 60 years in houston from jsc's

77

00:03:17,509 --> 00:03:16,560

external relations office i'm milika

78

00:03:20,309 --> 00:03:17,519

ramji

79

00:03:22,470 --> 00:03:20,319

in 1961 the nasa administrator announced

80

00:03:24,630 --> 00:03:22,480

the completion of a location study which

81

00:03:26,710 --> 00:03:24,640

founded the new manned space flight

82

00:03:29,270 --> 00:03:26,720

laboratory would be located in houston

83

00:03:31,350 --> 00:03:29,280

texas on a thousand acres of land to be

84

00:03:32,789 --> 00:03:31,360

made available to the government by rice

85

00:03:34,550 --> 00:03:32,799

university

86

00:03:36,550 --> 00:03:34,560

well the name changed to the manned

87

00:03:38,229 --> 00:03:36,560

spacecraft center by the time it opened

88

00:03:40,710 --> 00:03:38,239

for business and years later to the

89

00:03:42,949 --> 00:03:40,720

lyndon b johnson space center and it has

90

00:03:45,350 --> 00:03:42,959

served as the home of human space flight

91

00:03:47,509 --> 00:03:45,360

in the united states ever since

92

00:03:51,670 --> 00:03:47,519

every single american space flight with

93

00:03:53,509 --> 00:03:51,680

people on board since gemini 4 in 1965.

94

00:03:55,830 --> 00:03:53,519

as we look forward to the next 60 years

95

00:03:58,149 --> 00:03:55,840

we really aim to focus on how johnson

96

00:03:59,910 --> 00:03:58,159

space center 60 year history is

97

00:04:01,110 --> 00:03:59,920

propelling us forward to the moon and on

98

00:04:02,949 --> 00:04:01,120

to mars

99

00:04:05,030 --> 00:04:02,959

there are many teams who work to ensure

100

00:04:06,789 --> 00:04:05,040

that this is a reality today we have

101

00:04:09,589 --> 00:04:06,799

representation from the international

102

00:04:13,190 --> 00:04:09,599

space station commercial low earth orbit

103

00:04:14,710 --> 00:04:13,200

gateway orion and jsc's history office

104

00:04:16,629 --> 00:04:14,720

i'm going to let each of them introduce

105

00:04:18,390 --> 00:04:16,639

themselves what they have to do what

106

00:04:20,710 --> 00:04:18,400

they do sorry and in honor of the

107

00:04:22,710 --> 00:04:20,720

anniversary we're celebrating today i'd

108

00:04:25,189 --> 00:04:22,720

love for each of you to tell us your

109

00:04:27,590 --> 00:04:25,199

earliest memory of jsc

110

00:04:29,670 --> 00:04:27,600

ryan why don't we start with you

111

00:04:31,110 --> 00:04:29,680

thank you and thanks for the opportunity

112

00:04:33,189 --> 00:04:31,120

to do this today

113

00:04:35,270 --> 00:04:33,199

i'm ryan prouty and i am the

114

00:04:37,670 --> 00:04:35,280

representative here on this esteemed

115

00:04:40,550 --> 00:04:37,680

panel from space station i am currently

116

00:04:41,350 --> 00:04:40,560

managing the research integration office

117

00:04:43,830 --> 00:04:41,360

and

118

00:04:46,070 --> 00:04:43,840

i've started in flight control have done

119

00:04:48,390 --> 00:04:46,080

a plethora of jobs through the space

120

00:04:49,909 --> 00:04:48,400

station program

121

00:04:52,950 --> 00:04:49,919

and even spent some time at the center

122

00:04:54,150 --> 00:04:52,960

level working on vision and strategy

123

00:04:55,830 --> 00:04:54,160

so

124

00:04:58,469 --> 00:04:55,840

i'm going to cheat a little bit it's not

125

00:05:00,390 --> 00:04:58,479

my earliest memory but i think probably

126

00:05:02,390 --> 00:05:00,400

the most poignant when you're looking at

127

00:05:03,670 --> 00:05:02,400

the history of jsc and where we're

128

00:05:05,510 --> 00:05:03,680

headed

129

00:05:07,830 --> 00:05:05,520

given a lot of the conversations we've

130

00:05:10,390 --> 00:05:07,840

had over the last couple years but it

131

00:05:12,870 --> 00:05:10,400

was about circa 2001

132

00:05:16,150 --> 00:05:12,880

and i was a flight controller on console

133

00:05:18,070 --> 00:05:16,160

i think during expedition 3

134

00:05:20,150 --> 00:05:18,080

and sally davis was the flight director

135

00:05:22,390 --> 00:05:20,160

on console and she got on the loops and

136

00:05:24,310 --> 00:05:22,400

she said i need all of you to stand up

137

00:05:26,950 --> 00:05:24,320

and meet me on the airwaves we were like

138

00:05:28,629 --> 00:05:26,960

ah what's happening so we all stand up

139

00:05:30,629 --> 00:05:28,639

and then just in the room she says i

140

00:05:32,230 --> 00:05:30,639

need all of you to look around you

141

00:05:34,150 --> 00:05:32,240

we did we're all look you know we're all

142

00:05:35,110 --> 00:05:34,160

college kids pretty much we're looking

143

00:05:37,189 --> 00:05:35,120

around

144

00:05:39,749 --> 00:05:37,199

and she said this is the first time in

145

00:05:42,710 --> 00:05:39,759

history all women have been flying a

146

00:05:45,590 --> 00:05:42,720

spacecraft i want you to remember this

147

00:05:47,350 --> 00:05:45,600

so anyway i do and that was one of my

148

00:05:49,830 --> 00:05:47,360

favorite memories

149

00:05:51,590 --> 00:05:49,840

that's very inspirational camille you're

150

00:05:53,749 --> 00:05:51,600

up next

151

00:05:56,150 --> 00:05:53,759

hi everyone thank you for having me

152

00:05:58,469 --> 00:05:56,160

first of all i'm camila lane i'm the

153

00:06:00,390 --> 00:05:58,479

deputy manager for the commercial leo

154

00:06:03,430 --> 00:06:00,400

development program

155

00:06:05,830 --> 00:06:03,440

and my earliest my memory of jsc i

156

00:06:08,710 --> 00:06:05,840

actually have only been at jsc for 14

157

00:06:11,510 --> 00:06:08,720

years i believe i think i'm going on 15.

158

00:06:14,070 --> 00:06:11,520

but i actually came to jsc before then

159

00:06:16,230 --> 00:06:14,080

because i was uh back

160

00:06:18,230 --> 00:06:16,240

years and years and years ago i was a

161

00:06:21,029 --> 00:06:18,240

finalist for the astronaut selection and

162

00:06:22,629 --> 00:06:21,039

so i got to be invited to come down and

163

00:06:24,950 --> 00:06:22,639

interview and

164

00:06:27,270 --> 00:06:24,960

just being able to

165

00:06:29,270 --> 00:06:27,280

um go to the sixth floor in building

166

00:06:31,830 --> 00:06:29,280

four south and meet the other astronauts

167

00:06:35,350 --> 00:06:31,840

was just like incredible and um that for

168

00:06:37,909 --> 00:06:35,360

me was my first memory of being

169

00:06:39,670 --> 00:06:37,919

even associated with uh johnson space

170

00:06:41,350 --> 00:06:39,680

center

171

00:06:43,350 --> 00:06:41,360

amazing thank you so much camille glad

172

00:06:46,309 --> 00:06:43,360

you're here with us today uh next up we

173

00:06:47,990 --> 00:06:46,319

have rod jones rod

174

00:06:51,029 --> 00:06:48,000

well thank you very much my name is rod

175

00:06:53,189 --> 00:06:51,039

jones and um i'm currently the gateway

176
00:06:55,189 --> 00:06:53,199
vehicle systems integration manager and

177
00:06:57,110 --> 00:06:55,199
we're responsible for pulling together

178
00:06:58,469 --> 00:06:57,120
all the systems within the gateway

179
00:07:00,469 --> 00:06:58,479
elements to make sure it works as a

180
00:07:03,430 --> 00:07:00,479
cohesive spacecraft

181
00:07:05,830 --> 00:07:03,440
i started at jsc in 1984

182
00:07:08,150 --> 00:07:05,840
and it's hard to remember back that

183
00:07:10,230 --> 00:07:08,160
impressed me back then but i think

184
00:07:12,550 --> 00:07:10,240
what is what is absent today is what i

185
00:07:15,110 --> 00:07:12,560
remember the most i was in an office it

186
00:07:18,070 --> 00:07:15,120
was called the man systems division and

187
00:07:20,469 --> 00:07:18,080
it was in the human or in the science

188
00:07:23,029 --> 00:07:20,479

life sciences directorate at the time

189

00:07:23,909 --> 00:07:23,039

and the folks in that division were

190

00:07:26,309 --> 00:07:23,919

really

191

00:07:28,070 --> 00:07:26,319

interesting to me i came to jsc to work

192

00:07:29,990 --> 00:07:28,080

on the architecture and design of the

193

00:07:31,830 --> 00:07:30,000

inside of a space station and all the

194

00:07:33,589 --> 00:07:31,840

folks in that division were associated

195

00:07:34,629 --> 00:07:33,599

with the equipment the crew

196

00:07:36,790 --> 00:07:34,639

lived with

197

00:07:38,790 --> 00:07:36,800

the food they ate the cameras they used

198

00:07:40,870 --> 00:07:38,800

the equipment the clothes they wore

199

00:07:43,110 --> 00:07:40,880

and i got to sit in the in the same

200

00:07:46,070 --> 00:07:43,120

floor with people like rita wrap now

201

00:07:48,309 --> 00:07:46,080

rita was the food lead and she had

202

00:07:51,029 --> 00:07:48,319

packed every meal for the crew since

203

00:07:53,110 --> 00:07:51,039

mercury i mean the original brown paper

204

00:07:54,790 --> 00:07:53,120

bag sack lunches she went to the store

205

00:07:57,430 --> 00:07:54,800

bought the food made the sandwiches and

206

00:07:59,510 --> 00:07:57,440

packed it and so listening to her

207

00:08:02,150 --> 00:07:59,520

anecdotes all the way up through shuttle

208

00:08:03,189 --> 00:08:02,160

and how that technology changed was was

209

00:08:05,110 --> 00:08:03,199

really

210

00:08:07,430 --> 00:08:05,120

impressed me a lot and

211

00:08:09,589 --> 00:08:07,440

that's my my fondest memory i think most

212

00:08:12,950 --> 00:08:09,599

impressed thank you

213

00:08:14,150 --> 00:08:12,960

thanks chuck and fi oh thanks rod i'm

214

00:08:15,670 --> 00:08:14,160

sorry

215

00:08:17,990 --> 00:08:15,680

i'm getting ahead of myself here and now

216

00:08:20,790 --> 00:08:18,000

let's hear from chuck dingle chuck

217

00:08:23,990 --> 00:08:20,800

yeah hi thanks for having me uh on

218

00:08:26,869 --> 00:08:24,000

uh today so yeah my i'm currently the

219

00:08:30,230 --> 00:08:26,879

orion program chief engineer

220

00:08:32,149 --> 00:08:30,240

my first memory of jsc goes back

221

00:08:33,750 --> 00:08:32,159

literally when i was i don't know just a

222

00:08:35,909 --> 00:08:33,760

few years old

223

00:08:38,310 --> 00:08:35,919

jsc has been it's been part of my life

224

00:08:40,310 --> 00:08:38,320

for literally all my life i

225

00:08:41,750 --> 00:08:40,320

grew up in the houston uh clear lake

226

00:08:44,870 --> 00:08:41,760

area

227

00:08:46,949 --> 00:08:44,880

my dad worked uh at jsc

228

00:08:48,230 --> 00:08:46,959

uh then my older sister also worked here

229

00:08:51,030 --> 00:08:48,240

at jsc

230

00:08:53,030 --> 00:08:51,040

as a kid i was uh totally captivated by

231

00:08:54,790 --> 00:08:53,040

the apollo missions

232

00:08:57,350 --> 00:08:54,800

uh just

233

00:08:58,470 --> 00:08:57,360

couldn't turn off the tv

234

00:09:00,710 --> 00:08:58,480

back then

235

00:09:01,910 --> 00:09:00,720

i went to college here locally went to

236

00:09:03,269 --> 00:09:01,920

the university of houston got a

237

00:09:05,269 --> 00:09:03,279

bachelor's

238

00:09:08,630 --> 00:09:05,279

in electrical engineering

239

00:09:11,430 --> 00:09:08,640

started at jsc in 1983 in

240

00:09:13,350 --> 00:09:11,440

first third of my career in fod

241

00:09:16,630 --> 00:09:13,360

uh first training cruising and

242

00:09:18,870 --> 00:09:16,640

simulators then as a flight controller

243

00:09:21,509 --> 00:09:18,880

then i went to engineering to work on

244

00:09:22,710 --> 00:09:21,519

the x38 project as the environmental

245

00:09:25,509 --> 00:09:22,720

systems

246

00:09:27,590 --> 00:09:25,519

development lead took on um

247

00:09:29,829 --> 00:09:27,600

kind of more and more uh

248

00:09:31,910 --> 00:09:29,839

responsibilities i kind of got into the

249

00:09:33,910 --> 00:09:31,920

chief engineer line and

250

00:09:35,829 --> 00:09:33,920

been working on orion since it started

251
00:09:37,750 --> 00:09:35,839
in 2004 and

252
00:09:41,590 --> 00:09:37,760
various technical leadership roles and

253
00:09:45,670 --> 00:09:43,750
wonderful rich history with nasa so

254
00:09:47,590 --> 00:09:45,680
speaking of history finally we have john

255
00:09:49,350 --> 00:09:47,600
urie john

256
00:09:52,150 --> 00:09:49,360
hi there thank you for having me this

257
00:09:53,990 --> 00:09:52,160
afternoon uh so i'm the manager of the

258
00:09:56,550 --> 00:09:54,000
jsc history office

259
00:09:58,790 --> 00:09:56,560
i've been at jsc for 34 years and my

260
00:09:59,990 --> 00:09:58,800
first memory actually i was here as a

261
00:10:01,990 --> 00:10:00,000
tourist

262
00:10:03,590 --> 00:10:02,000
and this was back in the day in 1984

263
00:10:05,750 --> 00:10:03,600

when tourists were allowed to just walk

264

00:10:07,990 --> 00:10:05,760

around campus between the buildings it

265

00:10:09,430 --> 00:10:08,000

wasn't such a secure facility and i just

266

00:10:11,190 --> 00:10:09,440

remember walking around and looking at

267

00:10:12,389 --> 00:10:11,200

the buildings that i'd seen on tv and

268

00:10:14,310 --> 00:10:12,399

read about

269

00:10:16,230 --> 00:10:14,320

and i think that day i decided that i

270

00:10:19,430 --> 00:10:16,240

needed to come and work here

271

00:10:20,870 --> 00:10:19,440

and so three years later 1987 is when i

272

00:10:23,030 --> 00:10:20,880

first started here at jsc as a

273

00:10:24,790 --> 00:10:23,040

contractor i've been here ever since

274

00:10:26,550 --> 00:10:24,800

most of my career was working in the

275

00:10:28,550 --> 00:10:26,560

science areas i worked the shuttle

276

00:10:30,230 --> 00:10:28,560

mirror program then i worked in the

277

00:10:31,910 --> 00:10:30,240

international space station program in

278

00:10:33,829 --> 00:10:31,920

the payloads office which is now the

279

00:10:35,350 --> 00:10:33,839

research integration office that ryan

280

00:10:37,030 --> 00:10:35,360

heads

281

00:10:38,710 --> 00:10:37,040

and then about five years ago i came

282

00:10:40,150 --> 00:10:38,720

over and started running the history

283

00:10:41,910 --> 00:10:40,160

office because there was a need to

284

00:10:42,710 --> 00:10:41,920

resurrect the history office at that

285

00:10:44,470 --> 00:10:42,720

time

286

00:10:46,310 --> 00:10:44,480

and so i've had a lifelong interest in

287

00:10:48,150 --> 00:10:46,320

space history and of course of jsc's

288

00:10:51,990 --> 00:10:48,160

history and i've been doing that for

289

00:10:55,509 --> 00:10:53,829

amazing this is already so much fun i

290

00:10:57,430 --> 00:10:55,519

think collectively

291

00:10:58,870 --> 00:10:57,440

there's well over 60 years of experience

292

00:11:00,870 --> 00:10:58,880

with this group so

293

00:11:02,389 --> 00:11:00,880

let's take a moment to look back and

294

00:11:03,990 --> 00:11:02,399

john i have a question for you as the

295

00:11:06,069 --> 00:11:04,000

manager of the history office can you

296

00:11:07,829 --> 00:11:06,079

tell us a little bit about what the

297

00:11:10,790 --> 00:11:07,839

history office does and how it's

298

00:11:12,949 --> 00:11:10,800

continued to preserve jsc's memories

299

00:11:15,030 --> 00:11:12,959

sure well preserving nasa's history is

300

00:11:17,509 --> 00:11:15,040

actually in the agency's charter so it's

301
00:11:19,910 --> 00:11:17,519
something we're obligated to do

302
00:11:21,910 --> 00:11:19,920
the jsc history office has been on again

303
00:11:23,509 --> 00:11:21,920
and off again for the last 60 years for

304
00:11:24,630 --> 00:11:23,519
the last five years has been very much

305
00:11:26,829 --> 00:11:24,640
on

306
00:11:29,190 --> 00:11:26,839
we do a lot of things to preserve our

307
00:11:31,350 --> 00:11:29,200
history the biggest project we've had

308
00:11:32,870 --> 00:11:31,360
going on since the late 90s is our oral

309
00:11:34,630 --> 00:11:32,880
history project

310
00:11:37,110 --> 00:11:34,640
where we actually talk to individuals

311
00:11:38,550 --> 00:11:37,120
who are what still here at jsc some have

312
00:11:40,389 --> 00:11:38,560
retired

313
00:11:42,710 --> 00:11:40,399

and we get the history of what they did

314

00:11:44,550 --> 00:11:42,720

in their own words their own experiences

315

00:11:46,630 --> 00:11:44,560

so it's a very personal way to to

316

00:11:48,230 --> 00:11:46,640

collect the history now we do a lot of

317

00:11:51,269 --> 00:11:48,240

other things too but right now we have

318

00:11:53,670 --> 00:11:51,279

about fourteen hundred oral histories

319

00:11:55,829 --> 00:11:53,680

and these are accessible to everyone

320

00:11:57,829 --> 00:11:55,839

uh we manage the jsc history portal

321

00:11:59,509 --> 00:11:57,839

which is a public website

322

00:12:01,030 --> 00:11:59,519

and the transcripts of all of these oral

323

00:12:02,949 --> 00:12:01,040

histories are on that website in

324

00:12:05,590 --> 00:12:02,959

addition to lots of other information

325

00:12:07,590 --> 00:12:05,600

about the history of jsc in particular

326

00:12:09,670 --> 00:12:07,600

and nasa as well we have

327

00:12:12,550 --> 00:12:09,680

mission transcripts we have editions of

328

00:12:14,470 --> 00:12:12,560

the jsc roundup from 1961 from the very

329

00:12:15,990 --> 00:12:14,480

first edition that appeared november 1st

330

00:12:17,430 --> 00:12:16,000

1961.

331

00:12:20,310 --> 00:12:17,440

all of those have been scanned in and we

332

00:12:22,150 --> 00:12:20,320

have them on our portal

333

00:12:24,389 --> 00:12:22,160

and we just have other information that

334

00:12:26,150 --> 00:12:24,399

is available to researchers both here

335

00:12:27,829 --> 00:12:26,160

within nasa for

336

00:12:29,190 --> 00:12:27,839

use you know if they want to find out

337

00:12:30,629 --> 00:12:29,200

how things were done in a previous

338

00:12:33,190 --> 00:12:30,639

program to help them with current and

339

00:12:35,590 --> 00:12:33,200

future programs they can go to this site

340

00:12:37,829 --> 00:12:35,600

and and find that information and we

341

00:12:39,750 --> 00:12:37,839

also support outside researchers whether

342

00:12:41,750 --> 00:12:39,760

it be universities

343

00:12:44,389 --> 00:12:41,760

who are looking to write histories

344

00:12:45,910 --> 00:12:44,399

around the apollo 11 anniversary back in

345

00:12:47,509 --> 00:12:45,920

2019

346

00:12:49,509 --> 00:12:47,519

we had a lot of interest and a lot of

347

00:12:51,509 --> 00:12:49,519

researchers came to us looking for very

348

00:12:52,710 --> 00:12:51,519

specific information

349

00:12:54,389 --> 00:12:52,720

these are the people that did the

350

00:12:55,670 --> 00:12:54,399

documentaries and the motion pictures

351

00:12:58,150 --> 00:12:55,680

that dealt with that with that

352

00:12:59,430 --> 00:12:58,160

anniversary so

353

00:13:00,710 --> 00:12:59,440

yeah they're go out there and look at

354

00:13:02,629 --> 00:13:00,720

that website there's lots of great

355

00:13:04,470 --> 00:13:02,639

information there to be had about jsc's

356

00:13:06,310 --> 00:13:04,480

history

357

00:13:09,110 --> 00:13:06,320

that's fantastic i bet you have some

358

00:13:11,750 --> 00:13:09,120

stories to tell based on those 1400 oral

359

00:13:13,190 --> 00:13:11,760

histories wow i can't i have a follow-up

360

00:13:15,350 --> 00:13:13,200

question for you now dude what's the

361

00:13:17,110 --> 00:13:15,360

most memorable uh

362

00:13:19,350 --> 00:13:17,120

interview you had or memorable story

363

00:13:21,430 --> 00:13:19,360

someone's told in that

364

00:13:23,350 --> 00:13:21,440

well i think some of the ones that are

365

00:13:25,509 --> 00:13:23,360

the most memorable is you know we got to

366

00:13:28,069 --> 00:13:25,519

interview people like neil armstrong so

367

00:13:30,389 --> 00:13:28,079

we have his oral history on our website

368

00:13:32,389 --> 00:13:30,399

a lot of the other apollo astronauts uh

369

00:13:34,389 --> 00:13:32,399

some of the people we even went back to

370

00:13:35,910 --> 00:13:34,399

you know nasa's predecessor organization

371

00:13:37,670 --> 00:13:35,920

the naca

372

00:13:39,910 --> 00:13:37,680

and we've interviewed people from back

373

00:13:42,629 --> 00:13:39,920

in the 50s of what things were like even

374

00:13:44,470 --> 00:13:42,639

before nasa existed or before jsc

375

00:13:46,310 --> 00:13:44,480

existed here so

376

00:13:48,230 --> 00:13:46,320

uh and it's and it's not just the famous

377

00:13:49,750 --> 00:13:48,240

people we also have some engineers that

378

00:13:51,269 --> 00:13:49,760

worked out there and you know in the

379

00:13:52,949 --> 00:13:51,279

battles of the buildings to get their

380

00:13:54,790 --> 00:13:52,959

stories so it's not just

381

00:13:57,430 --> 00:13:54,800

the managers and the astronauts and the

382

00:13:58,949 --> 00:13:57,440

directors it's we try to get a broad

383

00:14:00,550 --> 00:13:58,959

spectrum

384

00:14:02,150 --> 00:14:00,560

across the board of people who work here

385

00:14:03,990 --> 00:14:02,160

at jsc

386

00:14:05,030 --> 00:14:04,000

definitely and i believe that that will

387

00:14:09,189 --> 00:14:05,040

really

388

00:14:11,110 --> 00:14:09,199

help tell our story so you know jsc has

389

00:14:12,629 --> 00:14:11,120

had a hand in several areas of human

390

00:14:14,069 --> 00:14:12,639

spaceflight and one of those areas is

391

00:14:15,269 --> 00:14:14,079

with the international space station

392

00:14:17,350 --> 00:14:15,279

program

393

00:14:18,710 --> 00:14:17,360

excuse me ryan building the

394

00:14:20,949 --> 00:14:18,720

international space station made the

395

00:14:23,430 --> 00:14:20,959

last 21 years of continuous human

396

00:14:25,110 --> 00:14:23,440

presence in space possible can you speak

397

00:14:28,389 --> 00:14:25,120

to some of the key areas of achievement

398

00:14:30,550 --> 00:14:28,399

that have added to the legacy of jsc

399

00:14:32,230 --> 00:14:30,560

oh it's an inter interesting way you

400

00:14:36,310 --> 00:14:32,240

wrote that question right that the word

401
00:14:38,389 --> 00:14:36,320
that really jumps out to me is legacy

402
00:14:39,509 --> 00:14:38,399
right there's a difference between

403
00:14:41,590 --> 00:14:39,519
um

404
00:14:44,710 --> 00:14:41,600
achievements or or things that we did

405
00:14:47,590 --> 00:14:44,720
but there's this legacy that any legacy

406
00:14:50,069 --> 00:14:47,600
of iss is going to be a legacy of jsc as

407
00:14:51,110 --> 00:14:50,079
the home for human space flight

408
00:14:54,230 --> 00:14:51,120
um

409
00:14:56,829 --> 00:14:54,240
the first one that comes to mind is just

410
00:14:59,670 --> 00:14:56,839
how much we have learned about the

411
00:15:02,230 --> 00:14:59,680
advancement and achievement for how to

412
00:15:05,509 --> 00:15:02,240
do research in space

413
00:15:09,350 --> 00:15:05,519

lessons that will help us in our further

414

00:15:10,949 --> 00:15:09,360

exploration to the moon and to mars

415

00:15:12,870 --> 00:15:10,959

at the core

416

00:15:15,910 --> 00:15:12,880

however i think there are

417

00:15:16,949 --> 00:15:15,920

legacies in in the people and in the

418

00:15:17,829 --> 00:15:16,959

culture

419

00:15:19,670 --> 00:15:17,839

that

420

00:15:20,949 --> 00:15:19,680

his i'll say history will mark maybe

421

00:15:21,829 --> 00:15:20,959

john will mark

422

00:15:24,949 --> 00:15:21,839

um

423

00:15:26,550 --> 00:15:24,959

at jsc that really do work to propel us

424

00:15:28,550 --> 00:15:26,560

to the future

425

00:15:31,110 --> 00:15:28,560

clearly technical competence

426
00:15:36,150 --> 00:15:31,120
iss is the largest international

427
00:15:41,749 --> 00:15:40,629
the type of leaders that we've um grown

428
00:15:43,189 --> 00:15:41,759
and

429
00:15:45,990 --> 00:15:43,199
um

430
00:15:48,629 --> 00:15:46,000
taught in this long duration

431
00:15:50,790 --> 00:15:48,639
program in program integration and how

432
00:15:53,030 --> 00:15:50,800
to balance risk

433
00:15:54,870 --> 00:15:53,040
for the long haul right it's we didn't

434
00:15:57,590 --> 00:15:54,880
do short little sprints we have been

435
00:16:00,230 --> 00:15:57,600
doing a marathon with little sprints on

436
00:16:01,749 --> 00:16:00,240
top of it along the way and

437
00:16:03,189 --> 00:16:01,759
it's it's a different way to think about

438
00:16:05,670 --> 00:16:03,199

risk and i think that's a skill that

439

00:16:08,870 --> 00:16:05,680

we've built for the whole center

440

00:16:11,430 --> 00:16:08,880

um cross-center collaboration station

441

00:16:13,189 --> 00:16:11,440

would not be possible with help and work

442

00:16:14,550 --> 00:16:13,199

from every single center across the

443

00:16:15,430 --> 00:16:14,560

agency

444

00:16:17,030 --> 00:16:15,440

um

445

00:16:19,110 --> 00:16:17,040

one of my

446

00:16:21,430 --> 00:16:19,120

i believe at its core will be one of the

447

00:16:23,670 --> 00:16:21,440

largest standing legacies are

448

00:16:24,550 --> 00:16:23,680

international collaboration

449

00:16:27,350 --> 00:16:24,560

and

450

00:16:29,030 --> 00:16:27,360

space leadership on the world stage

451
00:16:30,550 --> 00:16:29,040
it's the the international piece is what

452
00:16:32,790 --> 00:16:30,560
brought me here

453
00:16:34,550 --> 00:16:32,800
was to get to work um

454
00:16:37,829 --> 00:16:34,560
doing something that was you know bigger

455
00:16:38,870 --> 00:16:37,839
than me but um at an at an international

456
00:16:42,629 --> 00:16:38,880
level

457
00:16:45,430 --> 00:16:42,639
and then lately i'll say a new legacy

458
00:16:47,269 --> 00:16:45,440
that that we're just leaning into

459
00:16:49,509 --> 00:16:47,279
is leading the way for building a

460
00:16:51,509 --> 00:16:49,519
commercial economy in low earth orbit

461
00:16:55,030 --> 00:16:51,519
this is not something i thought i would

462
00:16:57,509 --> 00:16:55,040
be doing when i started before we even

463
00:16:59,829 --> 00:16:57,519

flew the first element so i think

464

00:17:01,590 --> 00:16:59,839

there's a lot in there

465

00:17:03,509 --> 00:17:01,600

definitely there's a lot to unpack there

466

00:17:04,470 --> 00:17:03,519

too and i hope we can get more into that

467

00:17:06,069 --> 00:17:04,480

um

468

00:17:07,829 --> 00:17:06,079

you know everyone everyone definitely

469

00:17:10,069 --> 00:17:07,839

nodded when you said commercial earth

470

00:17:11,750 --> 00:17:10,079

orbit economy and the international

471

00:17:14,549 --> 00:17:11,760

space station has really helped us kick

472

00:17:16,549 --> 00:17:14,559

that off so camille since commercial leo

473

00:17:18,230 --> 00:17:16,559

is a recent undertaking at nasa can you

474

00:17:19,669 --> 00:17:18,240

talk a little bit about its goals and

475

00:17:21,750 --> 00:17:19,679

aspirations

476

00:17:24,870 --> 00:17:21,760

absolutely i'm delighted to it's one of

477

00:17:30,230 --> 00:17:27,350

so um so as you said commercial leo

478

00:17:32,230 --> 00:17:30,240

development program is one of the newest

479

00:17:35,510 --> 00:17:32,240

programs at the agency and of course we

480

00:17:38,950 --> 00:17:35,520

are housed here at johnson space center

481

00:17:42,470 --> 00:17:38,960

but we are responsible for creating and

482

00:17:45,270 --> 00:17:42,480

enabling a sustainable and robust

483

00:17:48,070 --> 00:17:45,280

marketplace and economy in earth orbit

484

00:17:50,870 --> 00:17:48,080

beyond the international space station

485

00:17:52,470 --> 00:17:50,880

um when it's it comes to

486

00:17:55,590 --> 00:17:52,480

the end of its life

487

00:17:59,510 --> 00:17:55,600

which we are now scheduled for 2030

488

00:18:02,230 --> 00:17:59,520

um but our office is enabling

489

00:18:05,830 --> 00:18:02,240

the next comm the next

490

00:18:09,110 --> 00:18:05,840

blurs orbit platforms right that will be

491

00:18:11,590 --> 00:18:09,120

owned and operated not by nasa which the

492

00:18:14,070 --> 00:18:11,600

international space station is but owned

493

00:18:15,909 --> 00:18:14,080

and operated by commercial companies and

494

00:18:18,630 --> 00:18:15,919

commercial providers

495

00:18:21,430 --> 00:18:18,640

and the reason for that is that we want

496

00:18:24,150 --> 00:18:21,440

to one have a sustainable presence in

497

00:18:28,230 --> 00:18:24,160

earth orbit as a nation

498

00:18:31,270 --> 00:18:28,240

but nasa also has goals to continue to

499

00:18:32,150 --> 00:18:31,280

do research in microgravity environment

500

00:18:33,110 --> 00:18:32,160

right

501
00:18:35,830 --> 00:18:33,120
using

502
00:18:37,909 --> 00:18:35,840
these platforms as a technology testbed

503
00:18:41,110 --> 00:18:37,919
for exploration

504
00:18:43,350 --> 00:18:41,120
continuing to do human research um

505
00:18:46,150 --> 00:18:43,360
you know on the research on the human

506
00:18:48,390 --> 00:18:46,160
body and how the adaptation of space

507
00:18:51,029 --> 00:18:48,400
impacts the human body and so we're

508
00:18:54,390 --> 00:18:51,039
still going to have these needs

509
00:18:56,870 --> 00:18:54,400
for earth orbit research and so we are

510
00:19:00,150 --> 00:18:56,880
going we hope to be one of many

511
00:19:03,430 --> 00:19:00,160
customers of these commercial platforms

512
00:19:05,669 --> 00:19:03,440
but in the process right we if we talk

513
00:19:07,669 --> 00:19:05,679

about an economy when we talk about

514

00:19:10,150 --> 00:19:07,679

economy there's a supply and there's

515

00:19:13,190 --> 00:19:10,160

demand and that commercial platform is

516

00:19:14,710 --> 00:19:13,200

the supply side but we are also doing

517

00:19:17,270 --> 00:19:14,720

things now

518

00:19:20,150 --> 00:19:17,280

using the international space space

519

00:19:23,270 --> 00:19:20,160

station to stimulate the demand and and

520

00:19:25,430 --> 00:19:23,280

ryan touched a little bit on that but

521

00:19:28,070 --> 00:19:25,440

things like private astronaut missions

522

00:19:31,029 --> 00:19:28,080

as part of that stimulating the demand

523

00:19:33,430 --> 00:19:31,039

the commercial use for advertising

524

00:19:35,990 --> 00:19:33,440

marketing and entertainment of the iss

525

00:19:37,990 --> 00:19:36,000

is part of that demand so we're not just

526

00:19:40,789 --> 00:19:38,000

enabling the supply with these

527

00:19:43,190 --> 00:19:40,799

commercial platforms but we are also

528

00:19:48,230 --> 00:19:43,200

stimulating demand so that there's a

529

00:19:50,230 --> 00:19:48,240

robust marketplace um at the end

530

00:19:52,390 --> 00:19:50,240

definitely and it allows us to explore

531

00:19:54,310 --> 00:19:52,400

our universe more than ever and you know

532

00:19:55,990 --> 00:19:54,320

speaking of universe we're going back to

533

00:19:58,630 --> 00:19:56,000

the moon or forward to the moon and on

534

00:19:59,909 --> 00:19:58,640

to mars so let's talk a little bit about

535

00:20:01,830 --> 00:19:59,919

orion

536

00:20:04,390 --> 00:20:01,840

uh chuck would love to hear from you on

537

00:20:07,510 --> 00:20:04,400

how past jsc work on apollo has

538

00:20:09,350 --> 00:20:07,520

contributed to orion and how and when

539

00:20:10,789 --> 00:20:09,360

orion got started there's a rich history

540

00:20:13,430 --> 00:20:10,799

there

541

00:20:15,029 --> 00:20:13,440

okay yeah uh let's see so you can you

542

00:20:17,029 --> 00:20:15,039

know just take a look at orion and you

543

00:20:18,630 --> 00:20:17,039

can tell that we certainly leveraged

544

00:20:21,990 --> 00:20:18,640

some specific

545

00:20:24,549 --> 00:20:22,000

uh aspects of the apollo

546

00:20:26,149 --> 00:20:24,559

program uh you know architecturally

547

00:20:28,870 --> 00:20:26,159

having a separate

548

00:20:30,870 --> 00:20:28,880

crew module service module a launch

549

00:20:32,070 --> 00:20:30,880

abort system

550

00:20:33,830 --> 00:20:32,080

the shape

551
00:20:35,909 --> 00:20:33,840
of the crew module you know physics

552
00:20:39,110 --> 00:20:35,919
stays the same between

553
00:20:41,750 --> 00:20:39,120
uh decades so physics kind of dictates

554
00:20:44,630 --> 00:20:41,760
uh the shape is an appropriate one

555
00:20:47,430 --> 00:20:44,640
for the mission that we're flying so um

556
00:20:49,110 --> 00:20:47,440
we obviously leveraged that

557
00:20:51,590 --> 00:20:49,120
we tweaked the shape just a little bit

558
00:20:53,430 --> 00:20:51,600
but uh not so much that we couldn't use

559
00:20:56,070 --> 00:20:53,440
the error sciences

560
00:20:57,430 --> 00:20:56,080
database that was developed uh back as

561
00:20:59,430 --> 00:20:57,440
part of the

562
00:21:01,669 --> 00:20:59,440
apollo program

563
00:21:02,950 --> 00:21:01,679

we leveraged certain things from apollo

564

00:21:05,590 --> 00:21:02,960

like

565

00:21:08,230 --> 00:21:05,600

the tps the thermal protection system

566

00:21:09,669 --> 00:21:08,240

material on the base heat shield of the

567

00:21:12,230 --> 00:21:09,679

crew module it's a little bit different

568

00:21:13,510 --> 00:21:12,240

than apollo we we currently put it on in

569

00:21:15,510 --> 00:21:13,520

in blocks

570

00:21:17,750 --> 00:21:15,520

instead of filling individual uh

571

00:21:20,390 --> 00:21:17,760

honeycomb cells but the

572

00:21:22,710 --> 00:21:20,400

yavcoat material is essentially on the

573

00:21:24,789 --> 00:21:22,720

same material it was flown

574

00:21:26,630 --> 00:21:24,799

on apollo um

575

00:21:29,110 --> 00:21:26,640

you know our analysis

576

00:21:32,149 --> 00:21:29,120

tools and the platforms they run on

577

00:21:34,710 --> 00:21:32,159

are certainly different and and upgraded

578

00:21:37,270 --> 00:21:34,720

but some of the core techniques that we

579

00:21:39,590 --> 00:21:37,280

used uh for our

580

00:21:41,909 --> 00:21:39,600

engineering analyses

581

00:21:44,230 --> 00:21:41,919

we leveraged from apollo

582

00:21:46,390 --> 00:21:44,240

some of the ops techniques obviously

583

00:21:49,270 --> 00:21:46,400

began back

584

00:21:51,990 --> 00:21:49,280

in apollo and i would just say um

585

00:21:53,990 --> 00:21:52,000

you know just uh generally you know

586

00:21:57,350 --> 00:21:54,000

across the entire team

587

00:21:59,909 --> 00:21:57,360

there's a enormous body of knowledge

588

00:22:02,310 --> 00:21:59,919

that was established

589

00:22:05,350 --> 00:22:02,320

you know back from back from apollo you

590

00:22:06,710 --> 00:22:05,360

know in terms of how orion got started

591

00:22:10,789 --> 00:22:06,720

um

592

00:22:13,430 --> 00:22:10,799

i think the country

593

00:22:16,470 --> 00:22:13,440

came their realization that uh the nasa

594

00:22:18,230 --> 00:22:16,480

man human space flight program

595

00:22:20,470 --> 00:22:18,240

we needed a different mission we needed

596

00:22:23,990 --> 00:22:20,480

a different uh vehicle

597

00:22:26,470 --> 00:22:24,000

i think it was january of uh 2004 that

598

00:22:27,510 --> 00:22:26,480

president bush announced i think they

599

00:22:29,350 --> 00:22:27,520

called it the

600

00:22:31,990 --> 00:22:29,360

the vision for space

601
00:22:34,870 --> 00:22:32,000
exploration and said uh we're going back

602
00:22:38,870 --> 00:22:34,880
uh to the moon so as part of that

603
00:22:43,110 --> 00:22:38,880
the cev the crew exploration vehicle was

604
00:22:46,630 --> 00:22:43,120
born later became uh known as orion

605
00:22:49,029 --> 00:22:46,640
and the focus started a lot on the

606
00:22:51,430 --> 00:22:49,039
cev spacecraft itself

607
00:22:53,350 --> 00:22:51,440
we organized a team

608
00:22:56,630 --> 00:22:53,360
stationed that team at headquarters to

609
00:22:59,669 --> 00:22:56,640
write an rfp a request for a proposal

610
00:23:00,870 --> 00:22:59,679
that led to a contract award for two um

611
00:23:02,149 --> 00:23:00,880
competing

612
00:23:05,590 --> 00:23:02,159
teams

613
00:23:07,909 --> 00:23:05,600

we were

614

00:23:10,070 --> 00:23:07,919

off and running with a prime

615

00:23:12,710 --> 00:23:10,080

contractor

616

00:23:14,950 --> 00:23:12,720

shortly after that mike griffin came in

617

00:23:17,029 --> 00:23:14,960

dr griffin came in as the new

618

00:23:18,870 --> 00:23:17,039

nasa administrator

619

00:23:20,549 --> 00:23:18,880

he realized there were some additional

620

00:23:22,390 --> 00:23:20,559

things that needed to be addressed in

621

00:23:24,230 --> 00:23:22,400

addition to the spacecraft

622

00:23:27,350 --> 00:23:24,240

itself like what launch vehicle is it

623

00:23:29,590 --> 00:23:27,360

going to fly on uh what's the lander

624

00:23:32,789 --> 00:23:29,600

going to look like and so he put

625

00:23:34,470 --> 00:23:32,799

together a study team to kind of put

626
00:23:36,310 --> 00:23:34,480
put together thoughts for the rest of

627
00:23:38,070 --> 00:23:36,320
the program

628
00:23:41,029 --> 00:23:38,080
so to speak

629
00:23:43,830 --> 00:23:41,039
we started the um cev

630
00:23:46,149 --> 00:23:43,840
we called it project office back then

631
00:23:47,350 --> 00:23:46,159
2006

632
00:23:49,190 --> 00:23:47,360
maybe

633
00:23:51,909 --> 00:23:49,200
half a year year or so later the

634
00:23:55,029 --> 00:23:51,919
constellation program was born and

635
00:23:56,230 --> 00:23:55,039
and cev was later named as orion became

636
00:23:58,470 --> 00:23:56,240
a project

637
00:24:00,470 --> 00:23:58,480
uh working as part of

638
00:24:02,950 --> 00:24:00,480

the constellation program

639

00:24:05,029 --> 00:24:02,960

and we down select it to a single prime

640

00:24:05,909 --> 00:24:05,039

contractor of those two and i think it

641

00:24:08,630 --> 00:24:05,919

was

642

00:24:10,470 --> 00:24:08,640

2007 or so um

643

00:24:12,870 --> 00:24:10,480

spacecraft configuration evolved over

644

00:24:14,390 --> 00:24:12,880

time we added the europeans as a partner

645

00:24:17,430 --> 00:24:14,400

and i think it was

646

00:24:18,630 --> 00:24:17,440

uh 2012 to supply a significant part of

647

00:24:24,630 --> 00:24:18,640

the

648

00:24:26,390 --> 00:24:24,640

service module or esm

649

00:24:27,990 --> 00:24:26,400

we've flown three times

650

00:24:31,110 --> 00:24:28,000

we flew

651

00:24:33,909 --> 00:24:31,120

a lot of the early work was

652

00:24:36,310 --> 00:24:33,919

kind of focus towards the abort systems

653

00:24:39,190 --> 00:24:36,320

that we would use so in 2010 we flew

654

00:24:41,430 --> 00:24:39,200

what we called pa one or pad abort one

655

00:24:44,470 --> 00:24:41,440

uh the white sands mitchell

656

00:24:46,789 --> 00:24:44,480

white sands missile range in 2010

657

00:24:48,870 --> 00:24:46,799

2014 we had an orbital space flight

658

00:24:50,390 --> 00:24:48,880

called the eft-1 that we launched on a

659

00:24:53,350 --> 00:24:50,400

delta heavy

660

00:24:56,630 --> 00:24:53,360

and in 2019 we did our um

661

00:24:58,710 --> 00:24:56,640

first ascent abort uh flight test

662

00:25:00,390 --> 00:24:58,720

uh out

663

00:25:02,070 --> 00:25:00,400

at cape canaveral

664

00:25:04,149 --> 00:25:02,080

and uh right now we're getting ready for

665

00:25:05,750 --> 00:25:04,159

our fourth flight which will be uh

666

00:25:08,390 --> 00:25:05,760

artemis one and it's right around the

667

00:25:12,549 --> 00:25:10,549

very very exciting i see everybody's

668

00:25:14,230 --> 00:25:12,559

eyes light up when you set artemis one

669

00:25:16,310 --> 00:25:14,240

and um for those of you that are

670

00:25:18,470 --> 00:25:16,320

watching us today you know i started off

671

00:25:20,230 --> 00:25:18,480

250 miles above the earth and we're

672

00:25:21,590 --> 00:25:20,240

going further and further away so let's

673

00:25:24,950 --> 00:25:21,600

talk a little bit about the lunar

674

00:25:26,710 --> 00:25:24,960

outpost nasa gateway program and um i

675

00:25:28,470 --> 00:25:26,720

wanted to go to rod for a second can you

676

00:25:31,830 --> 00:25:28,480

tell us what the aspirations are for

677

00:25:33,830 --> 00:25:31,840

gateway and how it fits in with artemis

678

00:25:36,549 --> 00:25:33,840

absolutely um

679

00:25:39,510 --> 00:25:36,559

one of the things we learned from apollo

680

00:25:42,070 --> 00:25:39,520

is is that you know that was a very

681

00:25:44,549 --> 00:25:42,080

sprint-like mission you you had a very

682

00:25:46,789 --> 00:25:44,559

limited capability in order to achieve

683

00:25:48,230 --> 00:25:46,799

that goal with the technologies we had

684

00:25:50,310 --> 00:25:48,240

you know the the first

685

00:25:51,590 --> 00:25:50,320

lunar landing was only several hours

686

00:25:53,430 --> 00:25:51,600

before the crew had to get back in and

687

00:25:56,390 --> 00:25:53,440

come home and so

688

00:25:58,390 --> 00:25:56,400

the purpose of our program is to make a

689

00:26:00,870 --> 00:25:58,400

more sustainable approach to exploration

690

00:26:02,789 --> 00:26:00,880

artemis is attempting to do that with

691

00:26:05,029 --> 00:26:02,799

the major components orion being of

692

00:26:07,750 --> 00:26:05,039

course the crude vehicle that gets the

693

00:26:09,830 --> 00:26:07,760

crew to the lunar vicinity a lander that

694

00:26:11,990 --> 00:26:09,840

gets them to the surface and gateway

695

00:26:14,630 --> 00:26:12,000

which orbits the moon and provides that

696

00:26:16,789 --> 00:26:14,640

transportation link between the crude

697

00:26:18,390 --> 00:26:16,799

vehicle from earth to the crude vehicle

698

00:26:20,789 --> 00:26:18,400

that gets you to the surface so by

699

00:26:23,190 --> 00:26:20,799

breaking up that transportation

700

00:26:25,190 --> 00:26:23,200

loop so to speak each of those vehicles

701

00:26:27,350 --> 00:26:25,200

can specialize in their area of

702

00:26:30,149 --> 00:26:27,360

expertise and what they need to do and

703

00:26:31,669 --> 00:26:30,159

allows us more robust exploration of the

704

00:26:32,470 --> 00:26:31,679

surface of the moon

705

00:26:35,350 --> 00:26:32,480

so

706

00:26:38,149 --> 00:26:35,360

with the gateway we can leave

707

00:26:40,070 --> 00:26:38,159

an hls or a lander docked for long

708

00:26:42,070 --> 00:26:40,080

periods of time and reuse it which makes

709

00:26:43,830 --> 00:26:42,080

it sustainable the gateway can

710

00:26:46,149 --> 00:26:43,840

transition its orbit to other

711

00:26:47,990 --> 00:26:46,159

inclinations which means we can explore

712

00:26:49,590 --> 00:26:48,000

almost nearly any point or on the

713

00:26:52,390 --> 00:26:49,600

surface of the moon whereas before we

714

00:26:55,590 --> 00:26:52,400

were very limited to equatorial type

715

00:26:57,830 --> 00:26:55,600

landing sites and and so therefore the

716

00:27:00,549 --> 00:26:57,840

the goal of gateway is to create that

717

00:27:04,630 --> 00:27:00,559

platform it's a base camp in lunar orbit

718

00:27:10,070 --> 00:27:07,669

that was a a wonderful concise way of

719

00:27:12,149 --> 00:27:10,080

putting it so uh just to elaborate that

720

00:27:14,310 --> 00:27:12,159

a little bit more so how will that help

721

00:27:16,149 --> 00:27:14,320

us with uh upcoming artemis missions as

722

00:27:19,590 --> 00:27:16,159

far as getting getting boots on the

723

00:27:20,870 --> 00:27:19,600

ground um on the lunar surface

724

00:27:23,110 --> 00:27:20,880

well it

725

00:27:25,590 --> 00:27:23,120

it allows you to bring the vehicles

726

00:27:28,149 --> 00:27:25,600

together so the orion can dock and the

727

00:27:30,630 --> 00:27:28,159

and so the gateway itself is composed of

728

00:27:33,110 --> 00:27:30,640

seven major components it has a power

729

00:27:35,269 --> 00:27:33,120

propulsion element which is basically a

730

00:27:37,510 --> 00:27:35,279

satellite bus which generates the power

731

00:27:38,710 --> 00:27:37,520

and does the attitude control of stack

732

00:27:40,789 --> 00:27:38,720

and distributes power to the other

733

00:27:42,870 --> 00:27:40,799

elements we have two habitable elements

734

00:27:45,590 --> 00:27:42,880

one is made by northrop grumman called

735

00:27:47,909 --> 00:27:45,600

the halo and one is made by the esa

736

00:27:49,669 --> 00:27:47,919

our esa partners called the ihab and

737

00:27:52,070 --> 00:27:49,679

these provide the living spaces for the

738

00:27:53,990 --> 00:27:52,080

crew the key elements to these

739

00:27:56,070 --> 00:27:54,000

volumes in addition to living space are

740

00:27:57,990 --> 00:27:56,080

the ability for vehicles to dock to them

741

00:27:59,590 --> 00:27:58,000

and so now we can have an aggregation

742

00:28:01,830 --> 00:27:59,600

point where we can bring in

743

00:28:03,830 --> 00:28:01,840

all kinds of future vehicles we can

744

00:28:06,470 --> 00:28:03,840

bring in logistics commercial resupply

745

00:28:08,389 --> 00:28:06,480

vehicles future commercial crude

746

00:28:10,710 --> 00:28:08,399

vehicles and of course the commercial

747

00:28:12,950 --> 00:28:10,720

lunar landers so by creating this

748

00:28:15,269 --> 00:28:12,960

network of architecture and not single

749

00:28:17,269 --> 00:28:15,279

point designs driven by a very specific

750

00:28:18,389 --> 00:28:17,279

mission we have a more flexible and

751
00:28:21,510 --> 00:28:18,399
robust

752
00:28:24,310 --> 00:28:21,520
lunar exploration capability

753
00:28:26,710 --> 00:28:24,320
robust in it it truly it takes a village

754
00:28:28,389 --> 00:28:26,720
as we've heard from everybody um i just

755
00:28:29,110 --> 00:28:28,399
wanted to take a step back for a second

756
00:28:30,470 --> 00:28:29,120
so

757
00:28:33,190 --> 00:28:30,480
uh camille

758
00:28:36,389 --> 00:28:33,200
uh leo is commercial leo is is very new

759
00:28:38,230 --> 00:28:36,399
nasa as you mentioned and how how do you

760
00:28:39,830 --> 00:28:38,240
can you give us some some perspective on

761
00:28:41,029 --> 00:28:39,840
how it's preparing us for the moon and

762
00:28:43,110 --> 00:28:41,039
mars

763
00:28:44,870 --> 00:28:43,120

yeah so as i mentioned

764

00:28:47,909 --> 00:28:44,880

you know we so

765

00:28:53,750 --> 00:28:51,269

a step from the iss right i talked about

766

00:28:55,590 --> 00:28:53,760

iss being owned and operated by nasa

767

00:28:58,230 --> 00:28:55,600

commercial platform being owned and

768

00:29:00,630 --> 00:28:58,240

operated by commercial but we nasa are

769

00:29:03,590 --> 00:29:00,640

going to be one of many customers and so

770

00:29:06,149 --> 00:29:03,600

we want to one maintain a sustained

771

00:29:08,950 --> 00:29:06,159

presence in earth orbit right as a

772

00:29:11,269 --> 00:29:08,960

nation so that's one of our goals two we

773

00:29:15,590 --> 00:29:11,279

want to enable commercial marketplace

774

00:29:19,590 --> 00:29:15,600

this really opens up commercialization

775

00:29:21,750 --> 00:29:19,600

and access to space for everyone right

776

00:29:23,669 --> 00:29:21,760

we started with the transportation

777

00:29:25,750 --> 00:29:23,679

systems the ccp

778

00:29:27,990 --> 00:29:25,760

the um commercial crew program the

779

00:29:31,190 --> 00:29:28,000

commercial resupply program as

780

00:29:33,430 --> 00:29:31,200

transportation systems commercially but

781

00:29:35,750 --> 00:29:33,440

now we're working on the destination the

782

00:29:38,630 --> 00:29:35,760

platforms the commercial platforms and

783

00:29:41,669 --> 00:29:38,640

so being one of many customers we will

784

00:29:44,470 --> 00:29:41,679

still have needs in terms of

785

00:29:47,269 --> 00:29:44,480

wanting to do research in earth orbit

786

00:29:50,710 --> 00:29:47,279

wanting to test out our eclipse system

787

00:29:52,230 --> 00:29:50,720

for exploration right for as part of the

788

00:29:54,389 --> 00:29:52,240

atomos program

789

00:29:57,430 --> 00:29:54,399

wanting to still

790

00:29:59,669 --> 00:29:57,440

understand there are a lot of um risk

791

00:30:01,269 --> 00:29:59,679

human risk right um

792

00:30:04,070 --> 00:30:01,279

to

793

00:30:06,870 --> 00:30:04,080

flying out astronauts for long durations

794

00:30:09,350 --> 00:30:06,880

our human uh missions to mars for

795

00:30:11,350 --> 00:30:09,360

example there are a lot of risk we're

796

00:30:13,430 --> 00:30:11,360

still buying down from a human

797

00:30:17,110 --> 00:30:13,440

adaptation perspective

798

00:30:18,230 --> 00:30:17,120

and so using these platforms to continue

799

00:30:20,950 --> 00:30:18,240

to do

800

00:30:23,590 --> 00:30:20,960

research in the area of human research

801
00:30:25,430 --> 00:30:23,600
is one of the big things the big areas

802
00:30:28,389 --> 00:30:25,440
we'll be focusing on

803
00:30:30,310 --> 00:30:28,399
um in addition to using it for other

804
00:30:33,350 --> 00:30:30,320
needs that we may have

805
00:30:34,870 --> 00:30:33,360
um you know beyond technology doing

806
00:30:37,590 --> 00:30:34,880
microgravity

807
00:30:38,870 --> 00:30:37,600
life science experiments biological

808
00:30:42,149 --> 00:30:38,880
experiments

809
00:30:44,470 --> 00:30:42,159
doing earth and space science research

810
00:30:46,230 --> 00:30:44,480
like we do on the iss there will be

811
00:30:49,269 --> 00:30:46,240
capabilities on these commercial

812
00:30:52,149 --> 00:30:49,279
platforms for us to be able to do that

813
00:30:54,389 --> 00:30:52,159

continue that type of research um and so

814

00:30:56,470 --> 00:30:54,399

we're really excited to see what these

815

00:30:58,149 --> 00:30:56,480

commercial providers come up with you

816

00:30:59,029 --> 00:30:58,159

know that

817

00:31:05,110 --> 00:30:59,039

we

818

00:31:07,990 --> 00:31:05,120

more innovative and they're more agile

819

00:31:12,149 --> 00:31:08,000

and nimble but also with competition it

820

00:31:14,870 --> 00:31:12,159

drives some costs for for us as nasa and

821

00:31:17,110 --> 00:31:14,880

as a country and so we're really excited

822

00:31:20,149 --> 00:31:17,120

to see what designs they come up with

823

00:31:23,029 --> 00:31:20,159

and um you know and to to partner with

824

00:31:25,190 --> 00:31:23,039

them to enable this new capability

825

00:31:26,310 --> 00:31:25,200

coming online

826
00:31:29,269 --> 00:31:26,320
that was a

827
00:31:30,389 --> 00:31:29,279
fantastic response and um you know one

828
00:31:31,669 --> 00:31:30,399
one of the things that you truly

829
00:31:33,830 --> 00:31:31,679
mentioned was the

830
00:31:36,870 --> 00:31:33,840
the platforms that were using and the

831
00:31:38,789 --> 00:31:36,880
research in low earth orbit so

832
00:31:41,430 --> 00:31:38,799
ryan i wanted to toss it back to you to

833
00:31:42,310 --> 00:31:41,440
talk a little bit about some of the

834
00:31:43,909 --> 00:31:42,320
um

835
00:31:46,070 --> 00:31:43,919
what stands out to you as being one of

836
00:31:48,710 --> 00:31:46,080
the most exciting advancements being

837
00:31:50,870 --> 00:31:48,720
made to enable scientific scientific

838
00:31:52,549 --> 00:31:50,880

discovery um aboard the international

839

00:31:54,630 --> 00:31:52,559

space station what is there something

840

00:31:55,750 --> 00:31:54,640

that you would like to touch on

841

00:31:57,750 --> 00:31:55,760

oh

842

00:32:00,870 --> 00:31:57,760

yes there's i have lots of favorites

843

00:32:02,870 --> 00:32:00,880

there's a good question

844

00:32:05,029 --> 00:32:02,880

that's not fair um i always tell

845

00:32:07,110 --> 00:32:05,039

everybody on my team find that one find

846

00:32:08,549 --> 00:32:07,120

that one thing that really gets you

847

00:32:10,230 --> 00:32:08,559

jazzed and

848

00:32:12,549 --> 00:32:10,240

you know i could think through a whole

849

00:32:14,950 --> 00:32:12,559

list of even in the last

850

00:32:17,350 --> 00:32:14,960

five years what we have figured out to

851

00:32:19,269 --> 00:32:17,360

do in space between

852

00:32:20,870 --> 00:32:19,279

microbe identification where we used to

853

00:32:23,509 --> 00:32:20,880

have to return samples to the ground we

854

00:32:26,470 --> 00:32:23,519

can now do that on orbit um

855

00:32:29,590 --> 00:32:26,480

molecular biology processes where we

856

00:32:32,710 --> 00:32:29,600

learned how to break repair and

857

00:32:34,310 --> 00:32:32,720

resequence dna in space you know this

858

00:32:35,990 --> 00:32:34,320

this comes into play like camille's

859

00:32:37,830 --> 00:32:36,000

saying when we learn

860

00:32:40,389 --> 00:32:37,840

um or when we have

861

00:32:43,269 --> 00:32:40,399

our crews way out there and they've

862

00:32:45,750 --> 00:32:43,279

we we need to repair damaged dna caused

863

00:32:48,149 --> 00:32:45,760

by radiation or even when they come home

864

00:32:49,269 --> 00:32:48,159

i'm at a conference right now and just

865

00:32:51,830 --> 00:32:49,279

today

866

00:32:55,669 --> 00:32:51,840

i heard a number of scientists talk

867

00:32:58,789 --> 00:32:55,679

about tissue chip experiments and aiding

868

00:33:00,310 --> 00:32:58,799

in the science of cell regeneration

869

00:33:02,870 --> 00:33:00,320

and we're doing experiments on the space

870

00:33:04,870 --> 00:33:02,880

station right now where we're looking at

871

00:33:07,110 --> 00:33:04,880

growing

872

00:33:09,590 --> 00:33:07,120

flat tissues like skin or tubular

873

00:33:10,870 --> 00:33:09,600

tissues like our vascular system

874

00:33:14,549 --> 00:33:10,880

all the way

875

00:33:16,470 --> 00:33:14,559

to full up solid organs and how

876

00:33:19,269 --> 00:33:16,480

doing fundamental science in low earth

877

00:33:23,350 --> 00:33:19,279

orbit helps us do that

878

00:33:26,630 --> 00:33:25,190

better on earth and then help us explore

879

00:33:29,190 --> 00:33:26,640

the moon and mars so there's there's

880

00:33:31,750 --> 00:33:29,200

like a triple whammy here if not more

881

00:33:33,750 --> 00:33:31,760

just a deep space exactly it's just our

882

00:33:35,750 --> 00:33:33,760

universe is here to explore and i see

883

00:33:37,750 --> 00:33:35,760

everyone smiling and nodding and i

884

00:33:39,750 --> 00:33:37,760

wanted to take a minute uh john i have

885

00:33:42,389 --> 00:33:39,760

another question for you so

886

00:33:43,750 --> 00:33:42,399

um as as uh

887

00:33:46,149 --> 00:33:43,760

the manager

888

00:33:47,750 --> 00:33:46,159

of the history office

889

00:33:49,590 --> 00:33:47,760

um

890

00:33:52,070 --> 00:33:49,600

share your perspective on the center's

891

00:33:54,070 --> 00:33:52,080

evolution and how it's preparing us for

892

00:33:56,389 --> 00:33:54,080

the moon and mars

893

00:33:58,549 --> 00:33:56,399

okay it's a big question but i'll try to

894

00:34:01,190 --> 00:33:58,559

summarize it in just a few minutes

895

00:34:03,350 --> 00:34:01,200

uh so let's go back to maybe when nasa

896

00:34:04,870 --> 00:34:03,360

was founded in 1958

897

00:34:06,630 --> 00:34:04,880

about a month after that they

898

00:34:07,750 --> 00:34:06,640

established something called the space

899

00:34:09,430 --> 00:34:07,760

task group

900

00:34:11,510 --> 00:34:09,440

and they were tasked with developing the

901
00:34:12,950 --> 00:34:11,520
first human spacecraft for for the

902
00:34:14,470 --> 00:34:12,960
united states that was the mercury

903
00:34:16,629 --> 00:34:14,480
project

904
00:34:19,510 --> 00:34:16,639
and it was moving along and then in may

905
00:34:20,869 --> 00:34:19,520
of 1961 president kennedy says well this

906
00:34:22,790 --> 00:34:20,879
is good we've had we've now had a

907
00:34:24,230 --> 00:34:22,800
15-minute suborbital flight alan

908
00:34:25,909 --> 00:34:24,240
shepard's flight

909
00:34:28,310 --> 00:34:25,919
but now we want to go to the moon and do

910
00:34:29,829 --> 00:34:28,320
it before the end of the decade

911
00:34:31,990 --> 00:34:29,839
all of a sudden everybody realized a

912
00:34:34,470 --> 00:34:32,000
space task group you know working in

913
00:34:35,990 --> 00:34:34,480

their offices at langley research center

914

00:34:37,829 --> 00:34:36,000

they just didn't have the facilities to

915

00:34:40,230 --> 00:34:37,839

handle that kind of massive project in

916

00:34:42,069 --> 00:34:40,240

that short time period and so

917

00:34:43,589 --> 00:34:42,079

they had to establish as you said at the

918

00:34:45,030 --> 00:34:43,599

opening the manned spacecraft center

919

00:34:46,550 --> 00:34:45,040

here in houston

920

00:34:47,990 --> 00:34:46,560

and that took a few years to actually

921

00:34:49,109 --> 00:34:48,000

build the center here at clear lake in

922

00:34:50,790 --> 00:34:49,119

the meantime

923

00:34:52,629 --> 00:34:50,800

they were working out of 14 different

924

00:34:54,790 --> 00:34:52,639

buildings in southeast houston trying to

925

00:34:57,270 --> 00:34:54,800

make this whole project work starting

926
00:34:58,870 --> 00:34:57,280
the gemini program working on apollo

927
00:35:00,790 --> 00:34:58,880
it was an evolutionary thing they were

928
00:35:02,630 --> 00:35:00,800
literally they brought about 600 people

929
00:35:05,589 --> 00:35:02,640
from langley and they were hiring like

930
00:35:07,430 --> 00:35:05,599
crazy because they needed people to do

931
00:35:09,589 --> 00:35:07,440
this amazing job of getting us to the

932
00:35:11,270 --> 00:35:09,599
moon in less than 10 years

933
00:35:13,030 --> 00:35:11,280
and and really nobody knew how to do

934
00:35:14,550 --> 00:35:13,040
that so they were writing the textbooks

935
00:35:15,750 --> 00:35:14,560
as they were building the buildings and

936
00:35:17,829 --> 00:35:15,760
figuring out what kind of training

937
00:35:19,750 --> 00:35:17,839
facilities they needed and and how do

938
00:35:21,109 --> 00:35:19,760

you select more astronauts and and all

939

00:35:23,030 --> 00:35:21,119

those things were tasked to the manned

940

00:35:25,270 --> 00:35:23,040

spacecraft center

941

00:35:26,790 --> 00:35:25,280

and that evolved through the 1960s and

942

00:35:28,390 --> 00:35:26,800

we went through the gemini program to

943

00:35:29,990 --> 00:35:28,400

test out all the technologies that we

944

00:35:32,630 --> 00:35:30,000

would need to get us to the moon the

945

00:35:34,790 --> 00:35:32,640

rendezvous the docking the space walking

946

00:35:36,790 --> 00:35:34,800

and so forth and keeping people healthy

947

00:35:37,990 --> 00:35:36,800

for long enough that we can get to the

948

00:35:39,910 --> 00:35:38,000

moon and back

949

00:35:42,069 --> 00:35:39,920

and so that was an evolutionary process

950

00:35:43,670 --> 00:35:42,079

and and once we landed on the moon okay

951
00:35:44,390 --> 00:35:43,680
mission accomplished we finished that

952
00:35:46,310 --> 00:35:44,400
goal

953
00:35:47,990 --> 00:35:46,320
it was time to move on to other projects

954
00:35:48,950 --> 00:35:48,000
so the space shuttle came along and of

955
00:35:51,349 --> 00:35:48,960
course

956
00:35:53,430 --> 00:35:51,359
nasa jsc in particular had to adapt to

957
00:35:56,230 --> 00:35:53,440
that new program it was far more complex

958
00:35:58,390 --> 00:35:56,240
nobody had ever built a reusable space

959
00:36:00,710 --> 00:35:58,400
vehicle like the space shuttle so we

960
00:36:02,870 --> 00:36:00,720
needed to learn how to do that so we

961
00:36:05,510 --> 00:36:02,880
used the facilities we already had here

962
00:36:07,589 --> 00:36:05,520
we expanded upon them we had to build

963
00:36:09,750 --> 00:36:07,599

larger training facilities hire new

964

00:36:13,030 --> 00:36:09,760

astronauts so again it was a whole new

965

00:36:14,550 --> 00:36:13,040

level of doing human space flight

966

00:36:16,550 --> 00:36:14,560

and then of course international space

967

00:36:19,270 --> 00:36:16,560

station came along yet again

968

00:36:21,109 --> 00:36:19,280

we had to take on a new you know far

969

00:36:22,870 --> 00:36:21,119

more complex project

970

00:36:25,190 --> 00:36:22,880

learning how to keep people going

971

00:36:26,870 --> 00:36:25,200

essentially 24 7 operations we just

972

00:36:29,829 --> 00:36:26,880

really had not done that before so that

973

00:36:31,670 --> 00:36:29,839

was a whole new process so i think based

974

00:36:34,390 --> 00:36:31,680

on all that experience that we built up

975

00:36:36,710 --> 00:36:34,400

over the last 60 years we are supremely

976
00:36:38,550 --> 00:36:36,720
well positioned to take on all these new

977
00:36:40,950 --> 00:36:38,560
projects that will take us out of low

978
00:36:42,790 --> 00:36:40,960
earth orbit and back to the moon and

979
00:36:44,069 --> 00:36:42,800
hopefully beyond that in the next few

980
00:36:46,150 --> 00:36:44,079
years so

981
00:36:48,069 --> 00:36:46,160
we have the we have the facilities we

982
00:36:49,990 --> 00:36:48,079
have the people we have the expertise we

983
00:36:51,430 --> 00:36:50,000
have the knowledge it's it's all in

984
00:36:53,750 --> 00:36:51,440
place

985
00:36:55,670 --> 00:36:53,760
and from from speaking to all of you i

986
00:36:58,470 --> 00:36:55,680
also see the element of passion there

987
00:36:59,990 --> 00:36:58,480
you guys are all very very excited about

988
00:37:01,910 --> 00:37:00,000

this new era of exploration and

989

00:37:03,430 --> 00:37:01,920

discovery so i wanted to open it up to

990

00:37:05,910 --> 00:37:03,440

the group a little bit

991

00:37:07,750 --> 00:37:05,920

um i would love to hear from all of you

992

00:37:10,069 --> 00:37:07,760

some of you if you can share one thing

993

00:37:12,310 --> 00:37:10,079

with our viewers today about how jsc is

994

00:37:13,430 --> 00:37:12,320

preparing us for exploration and

995

00:37:15,109 --> 00:37:13,440

discovery

996

00:37:17,030 --> 00:37:15,119

from your perspective or the area that

997

00:37:22,870 --> 00:37:17,040

you work in um

998

00:37:22,880 --> 00:37:26,630

then i'll answer it once

999

00:37:30,150 --> 00:37:28,230

okay well i'll just jump in because it's

1000

00:37:32,150 --> 00:37:30,160

kind of a continuation to my previous

1001
00:37:34,470 --> 00:37:32,160
answer and i'm going to jump off what

1002
00:37:36,710 --> 00:37:34,480
ryan said about the uh the cell studies

1003
00:37:38,390 --> 00:37:36,720
that are now going on on space station

1004
00:37:40,710 --> 00:37:38,400
i remember when i worked on shuttle mir

1005
00:37:42,230 --> 00:37:40,720
we did one of the first cell biology

1006
00:37:44,550 --> 00:37:42,240
experiments trying to grow a cell

1007
00:37:46,069 --> 00:37:44,560
culture aboard the mere space station

1008
00:37:48,150 --> 00:37:46,079
and compared to what's happening today

1009
00:37:49,990 --> 00:37:48,160
it was relatively primitive

1010
00:37:51,510 --> 00:37:50,000
but even back then we knew that it was

1011
00:37:53,190 --> 00:37:51,520
just the start of something big that

1012
00:37:55,670 --> 00:37:53,200
eventually we could get to where we are

1013
00:37:57,109 --> 00:37:55,680

today and move beyond that

1014

00:37:59,829 --> 00:37:57,119

to actually build we could actually

1015

00:38:01,829 --> 00:37:59,839

build organs in in microgravity aboard a

1016

00:38:04,710 --> 00:38:01,839

facility and so that evolutionary

1017

00:38:06,470 --> 00:38:04,720

process is really what is going to get

1018

00:38:08,150 --> 00:38:06,480

us to moon and mars not just in the

1019

00:38:09,910 --> 00:38:08,160

science areas which i'm very familiar

1020

00:38:12,310 --> 00:38:09,920

with but also all the technology we

1021

00:38:13,829 --> 00:38:12,320

built on the apollo program to build

1022

00:38:15,510 --> 00:38:13,839

orion

1023

00:38:16,870 --> 00:38:15,520

we've now expanded to the commercial

1024

00:38:19,190 --> 00:38:16,880

area which is something we hadn't

1025

00:38:20,550 --> 00:38:19,200

thought about five or ten years ago and

1026

00:38:22,790 --> 00:38:20,560

that's probably going to open up even

1027

00:38:24,790 --> 00:38:22,800

more areas that we probably can't even

1028

00:38:27,030 --> 00:38:24,800

imagine today

1029

00:38:28,630 --> 00:38:27,040

and and that all of that will help us to

1030

00:38:31,589 --> 00:38:28,640

achieve the goals of getting to the moon

1031

00:38:35,030 --> 00:38:31,599

and then on to mars

1032

00:38:38,470 --> 00:38:35,040

i i would like to add to what ryan said

1033

00:38:40,470 --> 00:38:38,480

a little bit in the area of technology

1034

00:38:43,030 --> 00:38:40,480

you know we've talked about 20 plus

1035

00:38:44,390 --> 00:38:43,040

years of human habitation in space and

1036

00:38:45,750 --> 00:38:44,400

that's extremely important to understand

1037

00:38:48,870 --> 00:38:45,760

what happens to humans living in

1038

00:38:51,670 --> 00:38:48,880

microgravity away from where we evolved

1039

00:38:53,510 --> 00:38:51,680

but people i think also underestimate

1040

00:38:55,109 --> 00:38:53,520

the technology and the importance of the

1041

00:38:57,910 --> 00:38:55,119

technology what that really means is

1042

00:39:00,150 --> 00:38:57,920

we've had 20 years of operational life

1043

00:39:01,990 --> 00:39:00,160

support systems and waste management

1044

00:39:04,069 --> 00:39:02,000

compartments and power systems and

1045

00:39:06,390 --> 00:39:04,079

communication systems and those are

1046

00:39:09,670 --> 00:39:06,400

extremely difficult things to build and

1047

00:39:12,470 --> 00:39:09,680

operate reliably continuously while

1048

00:39:14,950 --> 00:39:12,480

people are dependent on them to survive

1049

00:39:16,550 --> 00:39:14,960

and so the space station has given us

1050

00:39:18,950 --> 00:39:16,560

that opportunity

1051
00:39:21,349 --> 00:39:18,960
and we are applying all that to the next

1052
00:39:23,589 --> 00:39:21,359
generation stations for gateway and then

1053
00:39:25,510 --> 00:39:23,599
for vehicles to go to mars so we have a

1054
00:39:27,589 --> 00:39:25,520
wonderful platform we are continuing to

1055
00:39:29,270 --> 00:39:27,599
exploit with those technologies the

1056
00:39:31,510 --> 00:39:29,280
commercial partners are coming on and

1057
00:39:34,069 --> 00:39:31,520
learn and absorbing that technology as

1058
00:39:35,910 --> 00:39:34,079
fast as we can we can transfer to

1059
00:39:37,430 --> 00:39:35,920
transfer it to them

1060
00:39:40,150 --> 00:39:37,440
and then we're going to take that and

1061
00:39:42,390 --> 00:39:40,160
use that for a gateway in order to

1062
00:39:44,790 --> 00:39:42,400
start and ex and extend that that

1063
00:39:47,109 --> 00:39:44,800

technology to the next logical place to

1064

00:39:49,670 --> 00:39:47,119

be and that's in lunar orbit where we

1065

00:39:51,349 --> 00:39:49,680

can safely still experiment with these

1066

00:39:53,510 --> 00:39:51,359

technologies and figure out how to

1067

00:39:55,030 --> 00:39:53,520

operate these vehicles

1068

00:39:57,270 --> 00:39:55,040

how to make them more autonomous because

1069

00:39:59,190 --> 00:39:57,280

when you go to mars there's many many

1070

00:40:01,109 --> 00:39:59,200

points of the orbit that you don't get

1071

00:40:03,190 --> 00:40:01,119

to talk you have to be autonomous and

1072

00:40:05,349 --> 00:40:03,200

operate independently

1073

00:40:07,750 --> 00:40:05,359

and so i think for me that's one of the

1074

00:40:09,430 --> 00:40:07,760

biggest interesting changes over time is

1075

00:40:11,430 --> 00:40:09,440

how we're moving these technologies

1076
00:40:13,990 --> 00:40:11,440
forward over these different platforms

1077
00:40:15,990 --> 00:40:14,000
and bringing in this commercial aspect

1078
00:40:17,750 --> 00:40:16,000
to help us advance the exploration

1079
00:40:20,230 --> 00:40:17,760
mission

1080
00:40:23,190 --> 00:40:20,240
and can i add to what rod says even in

1081
00:40:26,309 --> 00:40:23,200
earth orbit i mean we are transferring

1082
00:40:28,550 --> 00:40:26,319
the knowledge i mean up until now it's

1083
00:40:29,910 --> 00:40:28,560
nasa's been the only

1084
00:40:33,829 --> 00:40:29,920
agency to

1085
00:40:35,589 --> 00:40:33,839
build a u.s to build a space station

1086
00:40:39,109 --> 00:40:35,599
right and so

1087
00:40:41,990 --> 00:40:39,119
to enable the commercial sector to be

1088
00:40:44,790 --> 00:40:42,000

able to do the same thing we have to

1089

00:40:46,390 --> 00:40:44,800

transfer the knowledge and so that's

1090

00:40:48,710 --> 00:40:46,400

that's one of the things we're going to

1091

00:40:50,950 --> 00:40:48,720

be doing over the next years right it's

1092

00:40:53,829 --> 00:40:50,960

really that trans that transfer of

1093

00:40:54,630 --> 00:40:53,839

knowledge the technology transfer

1094

00:40:57,030 --> 00:40:54,640

um

1095

00:40:59,109 --> 00:40:57,040

so that they are able to

1096

00:41:01,430 --> 00:40:59,119

you know and they will bring their own

1097

00:41:03,349 --> 00:41:01,440

innovation as i said innovative

1098

00:41:07,910 --> 00:41:03,359

solutions to it

1099

00:41:11,349 --> 00:41:07,920

um too and so that that combination is

1100

00:41:13,510 --> 00:41:12,550

i'll add

1101

00:41:15,750 --> 00:41:13,520

um

1102

00:41:17,589 --> 00:41:15,760

to what all three of you said because

1103

00:41:20,550 --> 00:41:17,599

it's all what i love about this entire

1104

00:41:22,309 --> 00:41:20,560

panel is it's all connected so

1105

00:41:23,109 --> 00:41:22,319

right your question was

1106

00:41:27,270 --> 00:41:23,119

how

1107

00:41:30,390 --> 00:41:27,280

forward to the moon and mars and

1108

00:41:32,150 --> 00:41:30,400

jsc is this wonderful little microcosm

1109

00:41:34,710 --> 00:41:32,160

that i feel like i was

1110

00:41:37,829 --> 00:41:34,720

just really privileged to get to to peek

1111

00:41:39,349 --> 00:41:37,839

at in different ways when i was working

1112

00:41:41,589 --> 00:41:39,359

for the center director over the last

1113

00:41:44,950 --> 00:41:41,599

year and a half or so but

1114

00:41:46,870 --> 00:41:44,960

it's this little microcosm of people who

1115

00:41:48,790 --> 00:41:46,880

are at one point

1116

00:41:50,950 --> 00:41:48,800

so technically competent we can do all

1117

00:41:53,270 --> 00:41:50,960

of the things that

1118

00:41:56,630 --> 00:41:53,280

my colleagues have said here but also

1119

00:41:59,670 --> 00:41:56,640

dreamers to think up of what's coming

1120

00:42:01,670 --> 00:41:59,680

next and and it all comes in one place

1121

00:42:05,109 --> 00:42:01,680

where you have these people just

1122

00:42:07,030 --> 00:42:05,119

passionate to be a part of where we're

1123

00:42:09,670 --> 00:42:07,040

going and i think that's one of the

1124

00:42:10,950 --> 00:42:09,680

highlights at jsc that kept coming up as

1125

00:42:14,950 --> 00:42:10,960

i interviewed people over the last

1126
00:42:20,550 --> 00:42:18,470
yes so on orion um so we're you know

1127
00:42:23,829 --> 00:42:20,560
we're able to leverage those decades of

1128
00:42:26,230 --> 00:42:23,839
experience uh here at jsc to make uh

1129
00:42:27,829 --> 00:42:26,240
significant contributions uh you know we

1130
00:42:30,710 --> 00:42:27,839
lead

1131
00:42:32,630 --> 00:42:30,720
the program office here out of jsc

1132
00:42:35,910 --> 00:42:32,640
substantial part of the engineering is

1133
00:42:39,589 --> 00:42:35,920
done here at jsc we do safety and

1134
00:42:42,870 --> 00:42:39,599
mission insurance we have fod that leads

1135
00:42:44,630 --> 00:42:42,880
and executes the flight operations

1136
00:42:47,589 --> 00:42:44,640
health and medical of course we've got

1137
00:42:49,589 --> 00:42:47,599
the flight crew office here as well

1138
00:42:51,109 --> 00:42:49,599

so we've really got all the

1139

00:42:53,270 --> 00:42:51,119

uh we really got all the skills

1140

00:42:54,470 --> 00:42:53,280

necessary to run a complex program like

1141

00:42:56,150 --> 00:42:54,480

orion

1142

00:42:58,630 --> 00:42:56,160

and it's because of the rich history

1143

00:43:00,950 --> 00:42:58,640

that jsc has that we've got we've got

1144

00:43:03,349 --> 00:43:00,960

that talent

1145

00:43:06,630 --> 00:43:03,359

definitely and i i recall recently just

1146

00:43:08,550 --> 00:43:06,640

seeing some of the the imagery of orion

1147

00:43:10,630 --> 00:43:08,560

stacked at the kennedy space center

1148

00:43:11,990 --> 00:43:10,640

vehicle assembly building so chuck do

1149

00:43:13,589 --> 00:43:12,000

you want to tell us a little bit about

1150

00:43:15,270 --> 00:43:13,599

what we can look forward to i know you

1151

00:43:17,190 --> 00:43:15,280

mentioned artemis one but i know there's

1152

00:43:19,750 --> 00:43:17,200

a bigger story to tell there

1153

00:43:22,069 --> 00:43:19,760

sure we're coming down the home stretch

1154

00:43:24,069 --> 00:43:22,079

uh getting ready to fly artemis one of

1155

00:43:27,270 --> 00:43:24,079

course artemis one is a

1156

00:43:29,750 --> 00:43:27,280

uncrewed uh mission uh to the moon uh

1157

00:43:32,390 --> 00:43:29,760

it's the first flight on the new

1158

00:43:35,270 --> 00:43:32,400

uh sls heavy lift vehicle

1159

00:43:37,510 --> 00:43:35,280

uh orion spacecraft is fully fueled and

1160

00:43:38,390 --> 00:43:37,520

serviced with all its fluids and gases

1161

00:43:40,390 --> 00:43:38,400

and it's

1162

00:43:43,750 --> 00:43:40,400

it's pretty much ready to go we were

1163

00:43:45,430 --> 00:43:43,760

mated uh to the sls launch vehicle a

1164

00:43:48,390 --> 00:43:45,440

couple of um

1165

00:43:50,309 --> 00:43:48,400

weeks or so ago we've done initial

1166

00:43:52,390 --> 00:43:50,319

spacecraft power on and health checks

1167

00:43:53,589 --> 00:43:52,400

after that mating and everything

1168

00:43:56,309 --> 00:43:53,599

looks good

1169

00:43:58,230 --> 00:43:56,319

we'll be participating in more uh power

1170

00:44:01,190 --> 00:43:58,240

testing in the coming

1171

00:44:03,270 --> 00:44:01,200

uh couple of months and um

1172

00:44:04,550 --> 00:44:03,280

looking forward to her launch um

1173

00:44:07,030 --> 00:44:04,560

probably

1174

00:44:08,630 --> 00:44:07,040

uh second week of february i think it's

1175

00:44:11,109 --> 00:44:08,640

our launch

1176

00:44:12,309 --> 00:44:11,119

window opens it'll be a long mission uh

1177

00:44:16,230 --> 00:44:12,319

at least

1178

00:44:17,990 --> 00:44:16,240

uh 26 days uh possibly 42 days depending

1179

00:44:19,190 --> 00:44:18,000

on the exact

1180

00:44:21,430 --> 00:44:19,200

day that we

1181

00:44:22,790 --> 00:44:21,440

get to launch we'll be flying a very

1182

00:44:24,630 --> 00:44:22,800

unique orbit

1183

00:44:28,870 --> 00:44:24,640

as compared to um

1184

00:44:31,270 --> 00:44:28,880

guatemala flew apollo flew a very low

1185

00:44:32,950 --> 00:44:31,280

relatively low altitude orbit

1186

00:44:35,750 --> 00:44:32,960

close to the lunar surface and went

1187

00:44:36,950 --> 00:44:35,760

around an orbit in about an hour so for

1188

00:44:38,950 --> 00:44:36,960

us to

1189

00:44:40,150 --> 00:44:38,960

uh to complete an orbit it's more like a

1190

00:44:42,150 --> 00:44:40,160

two-week

1191

00:44:45,750 --> 00:44:42,160

orbit so it's a much higher orbit it's

1192

00:44:48,069 --> 00:44:45,760

called a distant retrograde orbit or dro

1193

00:44:51,030 --> 00:44:48,079

i'm sure you guys will um

1194

00:44:53,990 --> 00:44:51,040

hear about that so it's um

1195

00:44:55,910 --> 00:44:54,000

anyway it's gonna be a very uh unique

1196

00:44:57,829 --> 00:44:55,920

mission it's gonna be very exciting

1197

00:44:59,829 --> 00:44:57,839

flying the first production version of

1198

00:45:01,750 --> 00:44:59,839

the spacecraft it'll be our fourth

1199

00:45:03,510 --> 00:45:01,760

flight but the first full pretty much

1200

00:45:04,390 --> 00:45:03,520

full up spacecraft

1201
00:45:06,870 --> 00:45:04,400
and

1202
00:45:09,990 --> 00:45:06,880
on a real uh our real ride our real

1203
00:45:12,069 --> 00:45:10,000
heavy lift sls vehicle

1204
00:45:14,069 --> 00:45:12,079
i get butterflies as you're speaking so

1205
00:45:15,750 --> 00:45:14,079
and then it looks like again everybody

1206
00:45:19,270 --> 00:45:15,760
here is getting those same butterflies

1207
00:45:21,589 --> 00:45:19,280
so you know i i look back 50 years and

1208
00:45:23,990 --> 00:45:21,599
you mentioned uh flight controls ready

1209
00:45:25,589 --> 00:45:24,000
vehicles fueled we're basically ready to

1210
00:45:27,270 --> 00:45:25,599
launch you know and

1211
00:45:29,829 --> 00:45:27,280
and i think about

1212
00:45:31,829 --> 00:45:29,839
the apollo mission control and i just

1213
00:45:33,430 --> 00:45:31,839

wanted to take a minute john you were

1214

00:45:36,550 --> 00:45:33,440

part of the team

1215

00:45:38,790 --> 00:45:36,560

uh in 2019 that was responsible for the

1216

00:45:40,470 --> 00:45:38,800

restoration of apollo mission control

1217

00:45:42,630 --> 00:45:40,480

that that project was a large

1218

00:45:44,390 --> 00:45:42,640

undertaking and if any of you haven't

1219

00:45:46,550 --> 00:45:44,400

had a chance to see it i highly

1220

00:45:49,349 --> 00:45:46,560

recommend you take a look

1221

00:45:52,230 --> 00:45:49,359

every last detail has been thought about

1222

00:45:54,230 --> 00:45:52,240

but can you talk a little bit about that

1223

00:45:58,390 --> 00:45:54,240

restoration project and

1224

00:46:00,390 --> 00:45:58,400

the impact the apollo program had at jsc

1225

00:46:02,230 --> 00:46:00,400

well sure uh thanks for that question

1226

00:46:04,630 --> 00:46:02,240

it's it's uh it's a big one uh obviously

1227

00:46:06,790 --> 00:46:04,640

apollo was kind of the reason why jsc

1228

00:46:08,230 --> 00:46:06,800

was built it was to get us to the moon

1229

00:46:10,150 --> 00:46:08,240

that was the goal that was set by

1230

00:46:11,589 --> 00:46:10,160

president kennedy and of course the you

1231

00:46:13,349 --> 00:46:11,599

know the mission control function was

1232

00:46:15,589 --> 00:46:13,359

one of the ones established for for the

1233

00:46:17,109 --> 00:46:15,599

manned spacecraft center at the time

1234

00:46:18,790 --> 00:46:17,119

and so that was controlled out of the

1235

00:46:19,750 --> 00:46:18,800

mission operations control room or the

1236

00:46:21,829 --> 00:46:19,760

moker

1237

00:46:23,430 --> 00:46:21,839

for apollo 11 over in

1238

00:46:25,270 --> 00:46:23,440

mission control center

1239

00:46:26,870 --> 00:46:25,280

and that that room was also used in the

1240

00:46:29,670 --> 00:46:26,880

early days of the shuttle until about

1241

00:46:31,589 --> 00:46:29,680

1992 before he was retired

1242

00:46:33,510 --> 00:46:31,599

and so they made modifications from the

1243

00:46:35,589 --> 00:46:33,520

apollo configuration as we flew through

1244

00:46:37,510 --> 00:46:35,599

the shuttle they were upgrades made

1245

00:46:39,430 --> 00:46:37,520

and after he was retired it kind of fell

1246

00:46:41,589 --> 00:46:39,440

into some disrepair and of course with

1247

00:46:43,829 --> 00:46:41,599

the 50th anniversary of apollo 11 coming

1248

00:46:45,349 --> 00:46:43,839

up the idea was well we probably ought

1249

00:46:47,349 --> 00:46:45,359

to restore this so you know when

1250

00:46:48,950 --> 00:46:47,359

visitors come to see it it would look

1251
00:46:51,510 --> 00:46:48,960
more like what they it really would have

1252
00:46:53,109 --> 00:46:51,520
looked like during apollo 11.

1253
00:46:54,710 --> 00:46:53,119
and that's easier said than done because

1254
00:46:57,109 --> 00:46:54,720
number one it was declared a national

1255
00:46:58,550 --> 00:46:57,119
historic landmark in 1985 which means

1256
00:47:00,150 --> 00:46:58,560
you can't just go in there and move

1257
00:47:01,430 --> 00:47:00,160
things around and take things out it has

1258
00:47:03,589 --> 00:47:01,440
to be done per

1259
00:47:05,030 --> 00:47:03,599
a certain set of rules and so our office

1260
00:47:07,270 --> 00:47:05,040
and it was primarily

1261
00:47:09,990 --> 00:47:07,280
our chief historian dr uh jennifer ross

1262
00:47:11,910 --> 00:47:10,000
nazal who who helped with that process

1263
00:47:13,670 --> 00:47:11,920

to give the historical perspective on

1264

00:47:16,230 --> 00:47:13,680

the control center

1265

00:47:18,069 --> 00:47:16,240

helped develop kind of the historical

1266

00:47:19,270 --> 00:47:18,079

dialogue about this the story that can

1267

00:47:21,030 --> 00:47:19,280

be told

1268

00:47:22,790 --> 00:47:21,040

to people who come visit the center so

1269

00:47:25,270 --> 00:47:22,800

she worked closely with our historic

1270

00:47:26,790 --> 00:47:25,280

preservation officer sandra tetley to

1271

00:47:28,470 --> 00:47:26,800

make all that happen a lot of other

1272

00:47:30,790 --> 00:47:28,480

folks were involved too so it's not to

1273

00:47:32,630 --> 00:47:30,800

it was a huge team effort

1274

00:47:35,270 --> 00:47:32,640

and it took a you know a couple years to

1275

00:47:37,030 --> 00:47:35,280

get all the consoles restored and as you

1276

00:47:38,950 --> 00:47:37,040

said everything was literally restored

1277

00:47:41,349 --> 00:47:38,960

back to the original condition as it

1278

00:47:43,510 --> 00:47:41,359

would appear during apollo 11. i mean

1279

00:47:45,670 --> 00:47:43,520

down to the armchairs to the to the

1280

00:47:47,190 --> 00:47:45,680

ashtrays to just about everything in the

1281

00:47:48,870 --> 00:47:47,200

control center is

1282

00:47:50,790 --> 00:47:48,880

back to original equipment and so when

1283

00:47:52,950 --> 00:47:50,800

you go there you kind of feel the whole

1284

00:47:54,630 --> 00:47:52,960

experience of the moon landing there's

1285

00:47:57,109 --> 00:47:54,640

there's video playing there's audio

1286

00:47:58,630 --> 00:47:57,119

playing so you feel like it's july 20th

1287

00:48:00,950 --> 00:47:58,640

1969

1288

00:48:03,270 --> 00:48:00,960

and so it was our pleasure in our office

1289

00:48:05,510 --> 00:48:03,280

to participate in that in restoring that

1290

00:48:08,470 --> 00:48:05,520

truly unique historic place to its

1291

00:48:12,870 --> 00:48:09,910

and your response john gave me

1292

00:48:17,430 --> 00:48:14,950

um i can't wait for 50 years from now

1293

00:48:19,750 --> 00:48:17,440

when folks are looking back at artemis

1294

00:48:21,750 --> 00:48:19,760

and where we are on mars and where we're

1295

00:48:22,630 --> 00:48:21,760

exploring beyond mars as well so that

1296

00:48:24,630 --> 00:48:22,640

that's

1297

00:48:26,630 --> 00:48:24,640

just such an exciting project to be a

1298

00:48:29,270 --> 00:48:26,640

part of so i wanted to pivot for a

1299

00:48:31,190 --> 00:48:29,280

second over to gateway with rod

1300

00:48:33,829 --> 00:48:31,200

um can you tell me a little bit about

1301

00:48:35,910 --> 00:48:33,839

how gateway is different from other nasa

1302

00:48:37,349 --> 00:48:35,920

programs and what what excites you most

1303

00:48:39,750 --> 00:48:37,359

about this

1304

00:48:41,990 --> 00:48:39,760

that's interesting um it's extremely

1305

00:48:44,950 --> 00:48:42,000

different and i would tell you um in all

1306

00:48:46,829 --> 00:48:44,960

the years so all my early career we have

1307

00:48:50,230 --> 00:48:46,839

a very classical approach

1308

00:48:52,230 --> 00:48:50,240

at any engineering driven i guess agency

1309

00:48:54,230 --> 00:48:52,240

where you you define you have a goal and

1310

00:48:56,710 --> 00:48:54,240

a mission and you define your concept of

1311

00:48:58,870 --> 00:48:56,720

operations you derive your requirements

1312

00:49:01,750 --> 00:48:58,880

you flow those requirements into

1313

00:49:03,589 --> 00:49:01,760

logical engineering engineered elements

1314

00:49:04,950 --> 00:49:03,599

you you divide those elements up and you

1315

00:49:07,270 --> 00:49:04,960

get them built and then you plug it all

1316

00:49:09,270 --> 00:49:07,280

back together and you get a spacecraft

1317

00:49:11,190 --> 00:49:09,280

and so it's a very top-down driven

1318

00:49:13,190 --> 00:49:11,200

approach where the design and the

1319

00:49:16,150 --> 00:49:13,200

concept flows all the way through to the

1320

00:49:18,390 --> 00:49:16,160

the end item and you you end up with a

1321

00:49:20,390 --> 00:49:18,400

very unique and custom purpose-built

1322

00:49:22,710 --> 00:49:20,400

vehicle much like the shuttle was or the

1323

00:49:25,670 --> 00:49:22,720

apollo was mercury all the all the

1324

00:49:27,750 --> 00:49:25,680

vehicles gateway is opposite day

1325

00:49:30,309 --> 00:49:27,760

gateway is an attempt to take and

1326
00:49:34,150 --> 00:49:30,319
aggregate commercial systems into a

1327
00:49:35,109 --> 00:49:34,160
cohesive useful spacecraft so we started

1328
00:49:36,309 --> 00:49:35,119
with

1329
00:49:38,549 --> 00:49:36,319
the commercial

1330
00:49:40,710 --> 00:49:38,559
bus which is a actually it's a satellite

1331
00:49:44,549 --> 00:49:40,720
bus it's built by maxar they have 90 of

1332
00:49:46,950 --> 00:49:44,559
these buses operating in space today and

1333
00:49:49,190 --> 00:49:46,960
that it's the basis of their of their

1334
00:49:51,430 --> 00:49:49,200
satellite and it it provides like i said

1335
00:49:53,829 --> 00:49:51,440
before the ability to create you know

1336
00:49:55,750 --> 00:49:53,839
generates power it does attitude control

1337
00:49:58,710 --> 00:49:55,760
and it communicates to the earth

1338
00:50:00,390 --> 00:49:58,720

and controls the overall stack and so we

1339

00:50:03,750 --> 00:50:00,400

started with that commercial bus there

1340

00:50:05,829 --> 00:50:03,760

are 1300 series and tweaked it to become

1341

00:50:07,670 --> 00:50:05,839

the core element for our gateway our

1342

00:50:09,750 --> 00:50:07,680

foundational element

1343

00:50:11,829 --> 00:50:09,760

then we go to northrop grumman

1344

00:50:13,670 --> 00:50:11,839

and we take their orbital

1345

00:50:16,230 --> 00:50:13,680

resupply vehicle for space station and

1346

00:50:18,710 --> 00:50:16,240

we take that module and we modify it to

1347

00:50:20,630 --> 00:50:18,720

whatever extents necessary to let it

1348

00:50:22,950 --> 00:50:20,640

become a habitable element and

1349

00:50:24,630 --> 00:50:22,960

permanently attached to the gateway as

1350

00:50:26,710 --> 00:50:24,640

part of our space station the first

1351

00:50:28,069 --> 00:50:26,720

element and then we have ihab and they

1352

00:50:30,470 --> 00:50:28,079

come along and do the same thing so what

1353

00:50:32,470 --> 00:50:30,480

we are doing is instead of

1354

00:50:35,589 --> 00:50:32,480

writing requirements that go all the way

1355

00:50:37,750 --> 00:50:35,599

down to the to the thread size of a

1356

00:50:39,510 --> 00:50:37,760

particular pieces of hardware we are

1357

00:50:42,150 --> 00:50:39,520

writing the requirements as as

1358

00:50:45,750 --> 00:50:42,160

capabilities and working with commercial

1359

00:50:47,829 --> 00:50:45,760

vendors and using their heritage systems

1360

00:50:49,510 --> 00:50:47,839

as much as possible and then trying to

1361

00:50:52,470 --> 00:50:49,520

figure out how to plug those systems

1362

00:50:54,710 --> 00:50:52,480

together and so that is an extremely

1363

00:50:56,069 --> 00:50:54,720

exciting opportunity it's a challenge

1364

00:50:58,069 --> 00:50:56,079

it's a puzzle

1365

00:51:00,069 --> 00:50:58,079

you have to be flexible you have to work

1366

00:51:02,390 --> 00:51:00,079

with these different vendors

1367

00:51:03,829 --> 00:51:02,400

to understand their system architecture

1368

00:51:06,230 --> 00:51:03,839

and how you can make it work and you

1369

00:51:08,470 --> 00:51:06,240

have to adapt you so you've become very

1370

00:51:10,630 --> 00:51:08,480

adaptable at how you are going to meet

1371

00:51:12,069 --> 00:51:10,640

your mission goals and the objective of

1372

00:51:13,750 --> 00:51:12,079

your program

1373

00:51:15,750 --> 00:51:13,760

i often

1374

00:51:17,670 --> 00:51:15,760

use anecdotes like it's like buying an

1375

00:51:19,670 --> 00:51:17,680

engine for a forward and the body from

1376

00:51:21,510 --> 00:51:19,680

subaru and a computer from someone else

1377

00:51:23,190 --> 00:51:21,520

trying to make it all work together and

1378

00:51:24,470 --> 00:51:23,200

yet it's a really exciting challenge and

1379

00:51:26,870 --> 00:51:24,480

i think that's the way the agency's

1380

00:51:29,510 --> 00:51:26,880

moving and as we transition from top

1381

00:51:31,510 --> 00:51:29,520

down driven engineering to aggregation

1382

00:51:34,470 --> 00:51:31,520

of commercial systems that are being

1383

00:51:36,630 --> 00:51:34,480

promoted by in leo and and across the

1384

00:51:38,390 --> 00:51:36,640

logistics and transportation systems you

1385

00:51:40,470 --> 00:51:38,400

know that's how we're shifting our

1386

00:51:42,549 --> 00:51:40,480

overall um

1387

00:51:46,470 --> 00:51:42,559

expertise and our management

1388

00:51:50,710 --> 00:51:48,710

that's a really great way of putting it

1389

00:51:52,710 --> 00:51:50,720

i liked your little anecdote as well but

1390

00:51:55,910 --> 00:51:52,720

um we're getting close to the end of our

1391

00:51:57,190 --> 00:51:55,920

time for for our panel today and

1392

00:51:58,870 --> 00:51:57,200

i wanted to

1393

00:52:01,990 --> 00:51:58,880

give each of our panelists to take a

1394

00:52:05,750 --> 00:52:02,000

moment and summarize their thoughts um

1395

00:52:07,829 --> 00:52:05,760

our topic today is how is 60 years of

1396

00:52:09,510 --> 00:52:07,839

jsc propelling us forward to the moon

1397

00:52:12,470 --> 00:52:09,520

and mars if you could summarize your

1398

00:52:15,589 --> 00:52:12,480

thought in one or two key sentences

1399

00:52:17,349 --> 00:52:15,599

why don't we start with you john

1400

00:52:19,109 --> 00:52:17,359

okay i guess i'm going to jump off of

1401
00:52:20,150 --> 00:52:19,119
something that ryan said about vision

1402
00:52:21,910 --> 00:52:20,160
because

1403
00:52:24,309 --> 00:52:21,920
in 1961

1404
00:52:26,230 --> 00:52:24,319
the area where jsc is now located was

1405
00:52:28,069 --> 00:52:26,240
coastal prairie basically

1406
00:52:30,150 --> 00:52:28,079
and somebody had the vision to turn that

1407
00:52:32,710 --> 00:52:30,160
into the leading human space flight

1408
00:52:34,870 --> 00:52:32,720
center and made that vision a reality

1409
00:52:36,870 --> 00:52:34,880
and you know eight years later we landed

1410
00:52:39,430 --> 00:52:36,880
on the moon so vision is key in making

1411
00:52:41,910 --> 00:52:39,440
sure you can implement your vision

1412
00:52:43,349 --> 00:52:41,920
and as exciting as the past 60 years

1413
00:52:45,750 --> 00:52:43,359

have been in everything that we have

1414

00:52:50,470 --> 00:52:45,760

accomplished here i cannot wait to see

1415

00:52:50,480 --> 00:52:55,589

thanks so much what an inspiration chuck

1416

00:52:58,710 --> 00:52:57,670

well for me it's uh it's really just a

1417

00:53:01,990 --> 00:52:58,720

humbling

1418

00:53:05,910 --> 00:53:02,000

experience to be able to um

1419

00:53:09,190 --> 00:53:05,920

be part of it i mean jsc is a fabulous

1420

00:53:11,829 --> 00:53:09,200

institution has a fabulous

1421

00:53:12,950 --> 00:53:11,839

history monumental

1422

00:53:16,309 --> 00:53:12,960

missions

1423

00:53:18,950 --> 00:53:16,319

and uh the people that work here are

1424

00:53:21,430 --> 00:53:18,960

not only uh exceptionally talented but

1425

00:53:22,230 --> 00:53:21,440

of the highest integrity of anybody you

1426
00:53:24,390 --> 00:53:22,240
can

1427
00:53:26,470 --> 00:53:24,400
meet so um

1428
00:53:29,910 --> 00:53:26,480
it's been it's really a privilege to

1429
00:53:31,510 --> 00:53:29,920
work here the institution and the people

1430
00:53:33,670 --> 00:53:31,520
has made me a better engineer and made

1431
00:53:33,930 --> 00:53:33,680
me a better person being part of it so

1432
00:53:35,349 --> 00:53:33,940
um

1433
00:53:36,790 --> 00:53:35,359
[Music]

1434
00:53:38,630 --> 00:53:36,800
it's

1435
00:53:39,589 --> 00:53:38,640
really humbling to be part of it thank

1436
00:53:44,710 --> 00:53:39,599
you

1437
00:53:48,710 --> 00:53:45,990
i would um

1438
00:53:50,870 --> 00:53:48,720

say that over 50 years we put

1439

00:53:53,349 --> 00:53:50,880

humans on the moon in the last 20 years

1440

00:53:54,790 --> 00:53:53,359

we've had them in space i can remember

1441

00:53:56,790 --> 00:53:54,800

saying

1442

00:53:58,390 --> 00:53:56,800

to folks that when we were talking about

1443

00:53:59,990 --> 00:53:58,400

space station one day there will be a

1444

00:54:01,670 --> 00:54:00,000

generation that's never not seen folks

1445

00:54:02,630 --> 00:54:01,680

in space and that generation is here

1446

00:54:04,710 --> 00:54:02,640

today

1447

00:54:07,510 --> 00:54:04,720

and in five years we will start

1448

00:54:09,510 --> 00:54:07,520

sustainable exploration of the lunar

1449

00:54:11,829 --> 00:54:09,520

vicinity so i think that's an incredibly

1450

00:54:13,670 --> 00:54:11,839

exciting time jsc has been

1451
00:54:15,589 --> 00:54:13,680
in the in a leadership role in all of

1452
00:54:21,030 --> 00:54:15,599
those programs and it

1453
00:54:26,390 --> 00:54:23,750
well jsc is at the forefront of

1454
00:54:28,710 --> 00:54:26,400
commercialization right we

1455
00:54:31,990 --> 00:54:28,720
and when i talk commercialization

1456
00:54:33,910 --> 00:54:32,000
building economies not just in

1457
00:54:35,349 --> 00:54:33,920
the earth orbit we're building economies

1458
00:54:36,950 --> 00:54:35,359
on the moon too we didn't talk about

1459
00:54:40,870 --> 00:54:36,960
that the commercial lunar payload

1460
00:54:42,950 --> 00:54:40,880
services right project and so gsc is at

1461
00:54:46,230 --> 00:54:42,960
the forefront of that we are leading the

1462
00:54:48,870 --> 00:54:46,240
way for what it means to open up

1463
00:54:51,670 --> 00:54:48,880

access to space for everyone through

1464

00:54:53,670 --> 00:54:51,680

commercialization and i'm just excited

1465

00:54:55,990 --> 00:54:53,680

i'm honored and privileged to be a part

1466

00:54:58,549 --> 00:54:56,000

of it and it's just

1467

00:55:00,950 --> 00:54:58,559

i just it's incredible it's an

1468

00:55:04,710 --> 00:55:00,960

incredible incredible opportunity and

1469

00:55:08,950 --> 00:55:04,720

privilege so thank you for having me

1470

00:55:13,030 --> 00:55:08,960

thank you last but not least ryan

1471

00:55:15,589 --> 00:55:13,040

there is probably not much i can add um

1472

00:55:18,470 --> 00:55:15,599

i resonate with everything everybody

1473

00:55:19,829 --> 00:55:18,480

said it is such an exciting time to be

1474

00:55:22,630 --> 00:55:19,839

not only a part of the aerospace

1475

00:55:23,829 --> 00:55:22,640

community but but jsc

1476

00:55:26,950 --> 00:55:23,839

chuck you're right the people are

1477

00:55:29,750 --> 00:55:26,960

phenomenal um their passion

1478

00:55:31,270 --> 00:55:29,760

their minds how they show up every day

1479

00:55:32,630 --> 00:55:31,280

at work it's just

1480

00:55:36,630 --> 00:55:32,640

truly

1481

00:55:40,549 --> 00:55:38,390

i don't think i've worked anywhere else

1482

00:55:42,870 --> 00:55:40,559

where every single person

1483

00:55:45,430 --> 00:55:42,880

uh i've crossed paths with including all

1484

00:55:47,109 --> 00:55:45,440

of all of you today has been so excited

1485

00:55:49,270 --> 00:55:47,119

to work where they work so

1486

00:55:51,190 --> 00:55:49,280

i really really appreciate everyone's

1487

00:55:53,190 --> 00:55:51,200

time thank you thank you so much to our

1488

00:55:55,750 --> 00:55:53,200

panelists who help us look forward to

1489

00:55:57,589 --> 00:55:55,760

the moon and on to mars celebrating 60

1490

00:55:59,109 --> 00:55:57,599

years is definitely a milestone and

1491

00:56:02,069 --> 00:55:59,119

thanks so much for joining us today

1492

00:56:04,150 --> 00:56:02,079

here's to 60 more years