



1
00:00:11,830 --> 00:00:09,750
all right good evening ladies and

2
00:00:13,350 --> 00:00:11,840
gentlemen i'm jack daly the john and

3
00:00:15,110 --> 00:00:13,360
adrian mars director of the

4
00:00:17,750 --> 00:00:15,120
smithsonian's national air and space

5
00:00:20,150 --> 00:00:17,760
museum it's my pleasure to welcome you

6
00:00:24,070 --> 00:00:20,160
to the hubble space telescope 25th

7
00:00:26,630 --> 00:00:24,080
anniversary reception and award ceremony

8
00:00:28,710 --> 00:00:26,640
25 years ago today the single most

9
00:00:30,870 --> 00:00:28,720
influential scientific instrument in

10
00:00:32,870 --> 00:00:30,880
history launched aboard the space

11
00:00:34,950 --> 00:00:32,880
shuttle discovery

12
00:00:36,470 --> 00:00:34,960
it has forever opened our eyes to the

13
00:00:38,790 --> 00:00:36,480

universe

14

00:00:40,869 --> 00:00:38,800

a quarter century later it remains one

15

00:00:42,549 --> 00:00:40,879

of the high water marks of human

16

00:00:44,389 --> 00:00:42,559

achievement

17

00:00:46,470 --> 00:00:44,399

the hubble space telescope have

18

00:00:48,069 --> 00:00:46,480

revolutionized our understanding of the

19

00:00:51,430 --> 00:00:48,079

cosmos

20

00:00:53,750 --> 00:00:51,440

from its perch 350 miles above us it has

21

00:00:56,389 --> 00:00:53,760

seen the birth and death of stars

22

00:00:57,510 --> 00:00:56,399

the transit of alien worlds past distant

23

00:01:00,630 --> 00:00:57,520

suns

24

00:01:02,549 --> 00:01:00,640

and the very pillars of creation

25

00:01:05,910 --> 00:01:02,559

howell appeared back in time and helped

26
00:01:08,230 --> 00:01:05,920
us understand our accelerating universe

27
00:01:10,230 --> 00:01:08,240
the telescope's achievements belong to

28
00:01:13,030 --> 00:01:10,240
the outstanding men and women who made

29
00:01:14,550 --> 00:01:13,040
the program a reality many of you are

30
00:01:17,270 --> 00:01:14,560
here tonight

31
00:01:19,429 --> 00:01:17,280
the picture belongs to the world

32
00:01:21,670 --> 00:01:19,439
our master of ceremonies for tonight has

33
00:01:25,109 --> 00:01:21,680
been the public's eyes and ears of the

34
00:01:27,749 --> 00:01:25,119
space program for more than 20 years

35
00:01:29,990 --> 00:01:27,759
he's a third generation pilot a veteran

36
00:01:31,749 --> 00:01:30,000
journalist and long time friend and

37
00:01:34,630 --> 00:01:31,759
advocate of this museum

38
00:01:41,429 --> 00:01:34,640

please join me in welcoming mr miles

39

00:01:44,870 --> 00:01:43,350

thank you general good to see you

40

00:01:46,630 --> 00:01:44,880

it's a pleasure

41

00:01:48,550 --> 00:01:46,640

it's nice to be uh introduced by a

42

00:01:50,550 --> 00:01:48,560

decorated marine general

43

00:01:53,510 --> 00:01:50,560

i get to introduce one in a moment which

44

00:01:55,990 --> 00:01:53,520

i believe makes me a civilian sandwich

45

00:01:58,630 --> 00:01:56,000

on leather right

46

00:01:59,590 --> 00:01:58,640

this is my favorite place in washington

47

00:02:01,429 --> 00:01:59,600

and

48

00:02:03,670 --> 00:02:01,439

it's nice to have a night at the museum

49

00:02:05,830 --> 00:02:03,680

if only the hubble could talk during the

50

00:02:09,510 --> 00:02:05,840

night of the museum

51

00:02:11,830 --> 00:02:09,520

happy birthday hubble

52

00:02:13,350 --> 00:02:11,840

25 years you know

53

00:02:15,910 --> 00:02:13,360

by my uh

54

00:02:17,430 --> 00:02:15,920

history major math

55

00:02:18,949 --> 00:02:17,440

which includes getting my using my

56

00:02:21,110 --> 00:02:18,959

fingers and i'm a little diminished on

57

00:02:24,710 --> 00:02:21,120

that front these days by my history

58

00:02:26,150 --> 00:02:24,720

major math hubble was conceived 69 years

59

00:02:28,550 --> 00:02:26,160

ago

60

00:02:31,589 --> 00:02:28,560

44 years of gestation and it was a

61

00:02:34,550 --> 00:02:31,599

roller coaster ride to orbit and then

62

00:02:36,630 --> 00:02:34,560

even after it arrived in orbit but let's

63

00:02:39,589 --> 00:02:36,640

take a moment to remember

64

00:02:41,589 --> 00:02:39,599

the widely acclaimed father of hubble

65

00:02:44,150 --> 00:02:41,599

lyman spitzer let's give him a round of

66

00:02:46,550 --> 00:02:44,160

applause in possibility

67

00:02:48,390 --> 00:02:46,560

the late lyman spitzer i had the good

68

00:02:50,070 --> 00:02:48,400

fortune to meet him on a story back in

69

00:02:52,390 --> 00:02:50,080

1993

70

00:02:55,430 --> 00:02:52,400

he was such a a dear man and he

71

00:02:57,350 --> 00:02:55,440

literally advocated for 30 plus years to

72

00:02:59,350 --> 00:02:57,360

make hubble happen it's an extraordinary

73

00:03:01,270 --> 00:02:59,360

feat and a great testament to his

74

00:03:03,589 --> 00:03:01,280

perseverance

75

00:03:06,470 --> 00:03:03,599

in that same year in 1993 i was at the

76

00:03:08,470 --> 00:03:06,480

space telescope science institute

77

00:03:10,149 --> 00:03:08,480

and i was shooting a story for cnn in

78

00:03:12,070 --> 00:03:10,159

preparation for the first hubble repair

79

00:03:14,390 --> 00:03:12,080

mission

80

00:03:16,550 --> 00:03:14,400

and this uh odd fellow kind of called me

81

00:03:18,869 --> 00:03:16,560

over to a computer

82

00:03:21,190 --> 00:03:18,879

and he said you know take a look at this

83

00:03:23,350 --> 00:03:21,200

and what i looked at

84

00:03:25,430 --> 00:03:23,360

was something called the world wide web

85

00:03:26,949 --> 00:03:25,440

and mosaic which was brand new and the

86

00:03:29,830 --> 00:03:26,959

first thing i saw

87

00:03:31,750 --> 00:03:29,840

on mosaic on the world wide web

88

00:03:34,470 --> 00:03:31,760

was a hubble image

89

00:03:36,869 --> 00:03:34,480

the second thing i saw was a cat video

90

00:03:38,710 --> 00:03:36,879

and that blew my mind

91

00:03:41,270 --> 00:03:38,720

after that i thanked al gore for showing

92

00:03:44,630 --> 00:03:41,280

me his invention

93

00:03:46,309 --> 00:03:44,640

and i went on my business and had i only

94

00:03:47,990 --> 00:03:46,319

invested at that point i wouldn't be

95

00:03:50,070 --> 00:03:48,000

standing here tonight

96

00:03:51,509 --> 00:03:50,080

but hey it's a living

97

00:03:53,190 --> 00:03:51,519

i want to show you three of my favorite

98

00:03:55,589 --> 00:03:53,200

images from hubble real quickly if i

99

00:03:57,190 --> 00:03:55,599

could let's put them up here if we can

100

00:03:59,429 --> 00:03:57,200

uh i'm kind of old school when it comes

101

00:04:00,869 --> 00:03:59,439

to hubble images that i like

102

00:04:03,350 --> 00:04:00,879

number one i

103

00:04:05,030 --> 00:04:03,360

i who could forget shoemaker levy nine

104

00:04:08,630 --> 00:04:05,040

the newly

105

00:04:10,869 --> 00:04:08,640

clear seeing hubble 1994

106

00:04:12,869 --> 00:04:10,879

talk about scientific serendipity and

107

00:04:14,949 --> 00:04:12,879

that i believe is

108

00:04:16,469 --> 00:04:14,959

another kind of g-spot right there that

109

00:04:19,430 --> 00:04:16,479

was the um

110

00:04:20,710 --> 00:04:19,440

the g impact which many hundreds of

111

00:04:23,030 --> 00:04:20,720

times

112

00:04:25,510 --> 00:04:23,040

the the nuclear arsenal of the world

113

00:04:27,670 --> 00:04:25,520

where it exploded at once spectacular

114

00:04:29,510 --> 00:04:27,680

image spectacular story really captured

115

00:04:31,350 --> 00:04:29,520

the world's imagination next image

116

00:04:34,790 --> 00:04:31,360

speaking of capturing the world's

117

00:04:37,350 --> 00:04:34,800

imagination is of course it's iconic and

118

00:04:38,790 --> 00:04:37,360

it's kind of predictable but you can't

119

00:04:40,950 --> 00:04:38,800

help but do

120

00:04:42,790 --> 00:04:40,960

that the pillars of creation this is

121

00:04:44,469 --> 00:04:42,800

scientifically fascinating of course

122

00:04:46,629 --> 00:04:44,479

we're looking at you know basically a

123

00:04:48,230 --> 00:04:46,639

nursery for stars

124

00:04:50,550 --> 00:04:48,240

where they're born

125

00:04:52,150 --> 00:04:50,560

but think of how this image galvanized

126

00:04:53,909 --> 00:04:52,160

public interest in the in the hubble

127

00:04:56,070 --> 00:04:53,919

space telescope you do not have you can

128

00:04:58,870 --> 00:04:56,080

be a history major and appreciate that

129

00:05:01,029 --> 00:04:58,880

that image and then finally the one that

130

00:05:02,710 --> 00:05:01,039

has always blown my mind is

131

00:05:05,110 --> 00:05:02,720

and there were subsequent ones which got

132

00:05:07,990 --> 00:05:05,120

better but the the first deep field

133

00:05:11,830 --> 00:05:08,000

image when you think that that image

134

00:05:13,830 --> 00:05:11,840

is one 24mm millionth of the sky

135

00:05:17,270 --> 00:05:13,840

presumably dark

136

00:05:19,430 --> 00:05:17,280

on a long time exposure and voila 3 000

137

00:05:22,070 --> 00:05:19,440

galaxies give or take

138

00:05:24,070 --> 00:05:22,080

and so again i can't do the math but if

139

00:05:25,510 --> 00:05:24,080

there are 3 000 galaxies in one twenty

140

00:05:27,350 --> 00:05:25,520

four millionth of the sky we couldn't

141

00:05:29,749 --> 00:05:27,360

see otherwise

142

00:05:32,550 --> 00:05:29,759

how can we possibly be alone

143

00:05:34,469 --> 00:05:32,560

in this universe

144

00:05:36,150 --> 00:05:34,479

what does i mean really the fact that

145

00:05:37,990 --> 00:05:36,160

that textbooks have been rewritten is

146

00:05:39,590 --> 00:05:38,000

extraordinary you know it's easy to take

147

00:05:41,590 --> 00:05:39,600

this all for granted but there were many

148

00:05:43,189 --> 00:05:41,600

things we didn't even know

149

00:05:44,390 --> 00:05:43,199

we guessed about astronomy but which

150

00:05:46,550 --> 00:05:44,400

have been

151

00:05:49,189 --> 00:05:46,560

confirmed by hubble over the years

152

00:05:52,790 --> 00:05:49,199

quasars black holes

153

00:05:55,110 --> 00:05:52,800

constants expansions you name it

154

00:05:57,189 --> 00:05:55,120

methane on moons it goes on and on and

155

00:05:59,990 --> 00:05:57,199

on it's extraordinary

156

00:06:02,870 --> 00:06:00,000

our first speaker

157

00:06:04,870 --> 00:06:02,880

was a science advisor

158

00:06:07,110 --> 00:06:04,880

to the clinton administration

159

00:06:09,990 --> 00:06:07,120

went on to triple a s has had a great

160

00:06:12,390 --> 00:06:10,000

career in science and in public policy

161

00:06:16,390 --> 00:06:12,400

uh you know i often say to people

162

00:06:17,909 --> 00:06:16,400

i'm not a scientist but i play one on tv

163

00:06:19,909 --> 00:06:17,919

president obama said he's not a

164

00:06:23,590 --> 00:06:19,919

scientist either but he said he's got

165

00:06:25,350 --> 00:06:23,600

this guy john holdren he's a scientist

166

00:06:26,469 --> 00:06:25,360

ladies and gentlemen we got this guy

167

00:06:28,950 --> 00:06:26,479

right here

168

00:06:37,749 --> 00:06:28,960

please welcome the president's science r

169

00:06:42,230 --> 00:06:40,150

well good evening everybody it is a huge

170

00:06:44,629 --> 00:06:42,240

pleasure for me to be here to help

171

00:06:47,749 --> 00:06:44,639

celebrate this extraordinary

172

00:06:49,510 --> 00:06:47,759

milestone this extraordinary anniversary

173

00:06:52,469 --> 00:06:49,520

i think everybody in this room knows

174

00:06:56,150 --> 00:06:52,479

that hubble images are powerful not just

175

00:06:59,830 --> 00:06:56,160

for the scientific insights they reveal

176

00:07:01,029 --> 00:06:59,840

but in their capacity to inspire

177

00:07:03,430 --> 00:07:01,039

everybody

178

00:07:06,550 --> 00:07:03,440

about the universe and our place in the

179

00:07:09,510 --> 00:07:06,560

universe anybody who gazes on the

180

00:07:11,670 --> 00:07:09,520

spectacular hubble deep field or the

181

00:07:14,629 --> 00:07:11,680

magnificent pillars of creation which

182

00:07:16,870 --> 00:07:14,639

miles just shared with us again

183

00:07:18,070 --> 00:07:16,880

whether it's a scientist or a student or

184

00:07:20,309 --> 00:07:18,080

a citizen

185

00:07:22,230 --> 00:07:20,319

anybody who looks at these images is

186

00:07:23,350 --> 00:07:22,240

left with a sense of wonder and a sense

187

00:07:25,350 --> 00:07:23,360

of awe

188

00:07:26,469 --> 00:07:25,360

at the universe in which we find

189

00:07:28,710 --> 00:07:26,479

ourselves

190

00:07:30,790 --> 00:07:28,720

and the president of the united states

191

00:07:33,350 --> 00:07:30,800

whom i have the privilege to serve as a

192

00:07:34,550 --> 00:07:33,360

science advisor is certainly no

193

00:07:37,510 --> 00:07:34,560

exception

194

00:07:41,189 --> 00:07:37,520

today i shared with him the stunning

195

00:07:43,749 --> 00:07:41,199

25th anniversary photograph that nasa

196

00:07:45,510 --> 00:07:43,759

has distributed in honor of this

197

00:07:48,950 --> 00:07:45,520

extraordinary event

198

00:07:50,790 --> 00:07:48,960

and the president was inspired in fact

199

00:07:52,710 --> 00:07:50,800

he was so inspired

200

00:07:54,390 --> 00:07:52,720

that he said how could you possibly go

201
00:07:58,070 --> 00:07:54,400
to this event representing the white

202
00:07:59,589 --> 00:07:58,080
house and not read a letter from me on

203
00:08:01,430 --> 00:07:59,599
the occasion

204
00:08:03,430 --> 00:08:01,440
and so i would like to read you a letter

205
00:08:04,710 --> 00:08:03,440
from president obama it says the

206
00:08:07,670 --> 00:08:04,720
following

207
00:08:09,990 --> 00:08:07,680
to the men and women of nasa

208
00:08:13,670 --> 00:08:10,000
i just wanted to congratulate you on

209
00:08:15,909 --> 00:08:13,680
this extraordinary feat 25 years ago

210
00:08:18,950 --> 00:08:15,919
today the hubble space telescope was

211
00:08:22,230 --> 00:08:18,960
launched into orbit to explore our solar

212
00:08:23,749 --> 00:08:22,240
system and plumb the deepest recesses of

213
00:08:26,790 --> 00:08:23,759

our universe

214

00:08:28,950 --> 00:08:26,800

in our wildest dreams we couldn't have

215

00:08:31,110 --> 00:08:28,960

predicted that it would produce more

216

00:08:32,949 --> 00:08:31,120

than a million observations that would

217

00:08:35,990 --> 00:08:32,959

expand and deed

218

00:08:37,670 --> 00:08:36,000

transform our knowledge of the universe

219

00:08:39,909 --> 00:08:37,680

we couldn't have known

220

00:08:43,190 --> 00:08:39,919

that it would open our eyes to the

221

00:08:45,670 --> 00:08:43,200

unimaginable beauty of the cosmos

222

00:08:47,190 --> 00:08:45,680

it's thanks to your own administrator

223

00:08:49,430 --> 00:08:47,200

charlie bolden

224

00:08:51,750 --> 00:08:49,440

who was the pilot of the shuttle mission

225

00:08:53,829 --> 00:08:51,760

that made all of this possible

226

00:08:57,269 --> 00:08:53,839

charlie flew four shuttle missions in

227

00:08:59,990 --> 00:08:57,279

total two as pilot and two as commander

228

00:09:03,430 --> 00:09:00,000

including the historic first joint space

229

00:09:05,670 --> 00:09:03,440

shuttle mission with russian cosmonauts

230

00:09:08,389 --> 00:09:05,680

and as your fearless leader

231

00:09:10,630 --> 00:09:08,399

he has taken nasa into the next frontier

232

00:09:12,550 --> 00:09:10,640

of exploration from launching a

233

00:09:15,110 --> 00:09:12,560

spacecraft to jupiter

234

00:09:16,630 --> 00:09:15,120

to landing a rover called curiosity on

235

00:09:19,670 --> 00:09:16,640

mars

236

00:09:22,150 --> 00:09:19,680

it's thanks to dr john grunsfeld

237

00:09:24,710 --> 00:09:22,160

john is your associate administrator for

238

00:09:26,630 --> 00:09:24,720

science but he's also known as the

239

00:09:29,110 --> 00:09:26,640

hubble repairman

240

00:09:32,389 --> 00:09:29,120

he's done eight spacewalks

241

00:09:34,070 --> 00:09:32,399

totaling 58 hours and 30 minutes

242

00:09:36,470 --> 00:09:34,080

over the course of three shuttle

243

00:09:37,670 --> 00:09:36,480

missions to upgrade and repair

244

00:09:41,030 --> 00:09:37,680

the hubble

245

00:09:43,269 --> 00:09:41,040

i think he's earned some overtime

246

00:09:45,350 --> 00:09:43,279

and it's thanks to all of you

247

00:09:48,630 --> 00:09:45,360

men and women who have poured your heart

248

00:09:50,949 --> 00:09:48,640

and souls into america's space program

249

00:09:53,350 --> 00:09:50,959

propelled by sheer nerve

250

00:09:54,790 --> 00:09:53,360

talent and a limitless sense of

251
00:09:56,870 --> 00:09:54,800
possibility

252
00:09:59,590 --> 00:09:56,880
that america will continue to push the

253
00:10:02,389 --> 00:09:59,600
boundaries of humanity's reach

254
00:10:03,670 --> 00:10:02,399
today as we celebrate 25 years of

255
00:10:06,150 --> 00:10:03,680
discovery

256
00:10:08,389 --> 00:10:06,160
let's set our sights even higher

257
00:10:12,069 --> 00:10:08,399
and inspire the next generation of

258
00:10:14,310 --> 00:10:12,079
astronauts scientists and engineers

259
00:10:16,630 --> 00:10:14,320
young dreamers everywhere who are

260
00:10:19,910 --> 00:10:16,640
looking up to the heavens tonight

261
00:10:21,910 --> 00:10:19,920
to boldly seek the next frontier

262
00:10:31,030 --> 00:10:21,920
thank you for all you do

263
00:10:36,310 --> 00:10:34,550

let me let me echo the thanks of

264

00:10:39,350 --> 00:10:36,320

president obama

265

00:10:41,430 --> 00:10:39,360

to all of you in nasa present and past

266

00:10:44,389 --> 00:10:41,440

who have contributed so much

267

00:10:46,550 --> 00:10:44,399

to the nation's space program

268

00:10:48,470 --> 00:10:46,560

in the 25 years that the hubble space

269

00:10:50,710 --> 00:10:48,480

telescope has been in orbit

270

00:10:53,350 --> 00:10:50,720

it has transformed our understanding of

271

00:10:55,990 --> 00:10:53,360

the universe and our place in it

272

00:10:58,870 --> 00:10:56,000

because of hubble we have seen deeper

273

00:11:00,710 --> 00:10:58,880

into the universe than ever before

274

00:11:03,190 --> 00:11:00,720

we've seen the birth of stars and

275

00:11:05,750 --> 00:11:03,200

galaxies including those that are now

276

00:11:07,910 --> 00:11:05,760

billions of years old themselves and

277

00:11:10,630 --> 00:11:07,920

we've seen the spectacular deaths of

278

00:11:13,829 --> 00:11:10,640

stars that seed the universe with the

279

00:11:15,750 --> 00:11:13,839

elements that enable life as we know it

280

00:11:18,470 --> 00:11:15,760

we've gained new insight into our

281

00:11:20,710 --> 00:11:18,480

nearest neighbors the planets and bodies

282

00:11:23,430 --> 00:11:20,720

of our own solar system

283

00:11:24,470 --> 00:11:23,440

as we celebrate this monumental

284

00:11:27,030 --> 00:11:24,480

testament

285

00:11:28,389 --> 00:11:27,040

to the curiosity and ambition of the

286

00:11:30,470 --> 00:11:28,399

american people

287

00:11:32,790 --> 00:11:30,480

and all of humanity

288

00:11:36,710 --> 00:11:32,800

we are reminded of how much more we can

289

00:11:38,949 --> 00:11:36,720

learn and how much farther we can go

290

00:11:41,750 --> 00:11:38,959

america is a country that has always

291

00:11:43,910 --> 00:11:41,760

embraced the promise and the potential

292

00:11:46,790 --> 00:11:43,920

of science and technology

293

00:11:49,509 --> 00:11:46,800

and we have always pushed the envelope

294

00:11:52,949 --> 00:11:49,519

across the science technology

295

00:11:55,269 --> 00:11:52,959

engineering and math domains

296

00:11:56,949 --> 00:11:55,279

hubble has played a unique role in our

297

00:11:59,350 --> 00:11:56,959

american culture

298

00:12:02,069 --> 00:11:59,360

giving us a window into our universe

299

00:12:03,990 --> 00:12:02,079

that is accessible to everyone from the

300

00:12:06,870 --> 00:12:04,000

front pages of our newspapers and

301
00:12:08,150 --> 00:12:06,880
magazines to classrooms across the

302
00:12:10,550 --> 00:12:08,160
country

303
00:12:13,110 --> 00:12:10,560
the stunning images and discoveries from

304
00:12:16,710 --> 00:12:13,120
this observatory have touched

305
00:12:18,550 --> 00:12:16,720
generations of students girls and boys

306
00:12:20,550 --> 00:12:18,560
young and old

307
00:12:22,790 --> 00:12:20,560
there are countless scientists and

308
00:12:25,030 --> 00:12:22,800
engineers across the country

309
00:12:27,269 --> 00:12:25,040
who in learning about the universe

310
00:12:29,430 --> 00:12:27,279
through the eyes of the hubble

311
00:12:32,470 --> 00:12:29,440
were inspired to pursue their own

312
00:12:34,470 --> 00:12:32,480
careers in the stem fields

313
00:12:35,590 --> 00:12:34,480

that inspiration will undoubtedly

314

00:12:38,470 --> 00:12:35,600

continue

315

00:12:40,790 --> 00:12:38,480

with each new orbit of the telescope one

316

00:12:43,030 --> 00:12:40,800

of america's greatest scientific and

317

00:12:45,430 --> 00:12:43,040

technological achievements

318

00:12:48,150 --> 00:12:45,440

but the story does not end here

319

00:12:50,470 --> 00:12:48,160

as the hubble itself continues

320

00:12:52,710 --> 00:12:50,480

only a few years from now it will be

321

00:12:55,829 --> 00:12:52,720

joined by nasa's most ambitious

322

00:12:57,430 --> 00:12:55,839

telescope yet the james webb space

323

00:13:00,389 --> 00:12:57,440

telescope

324

00:13:03,190 --> 00:13:00,399

once operational the james webb will

325

00:13:05,829 --> 00:13:03,200

build on hubble's foundation to observe

326

00:13:07,670 --> 00:13:05,839

the most distant reaches of the cosmos

327

00:13:10,629 --> 00:13:07,680

answering questions about the first

328

00:13:13,110 --> 00:13:10,639

stars and galaxies in our universe as

329

00:13:15,590 --> 00:13:13,120

well as questions we have not yet even

330

00:13:18,790 --> 00:13:15,600

learned to ask

331

00:13:21,269 --> 00:13:18,800

we hope that a few decades from now

332

00:13:24,389 --> 00:13:21,279

our successors will celebrate the james

333

00:13:26,710 --> 00:13:24,399

webb telescope's tremendous discoveries

334

00:13:28,710 --> 00:13:26,720

the way we celebrate hubble's

335

00:13:31,350 --> 00:13:28,720

achievements tonight

336

00:13:39,350 --> 00:13:31,360

congratulations once again

337

00:13:44,150 --> 00:13:41,829

thank you very much john holdren

338

00:13:46,629 --> 00:13:44,160

25 years ago as john mentioned the man

339

00:13:49,750 --> 00:13:46,639

sitting in the right seat of the shuttle

340

00:13:51,189 --> 00:13:49,760

was well into an epic career on and off

341

00:13:53,670 --> 00:13:51,199

the planet

342

00:13:55,829 --> 00:13:53,680

a naval academy graduate in 1968

343

00:13:57,590 --> 00:13:55,839

president of his class

344

00:13:58,790 --> 00:13:57,600

i got to say the naval academy graduates

345

00:14:00,310 --> 00:13:58,800

are the best what would we do without

346

00:14:02,629 --> 00:14:00,320

them in the astronaut corps right i've

347

00:14:05,269 --> 00:14:02,639

got a son who's about to toss his hat

348

00:14:09,750 --> 00:14:05,279

high on may 22nd so i'm going to put in

349

00:14:11,430 --> 00:14:09,760

a plug for those who serve there but

350

00:14:13,189 --> 00:14:11,440

he's he's ready to move on that's for

351

00:14:15,030 --> 00:14:13,199

sure that's that's a hard four years it

352

00:14:18,389 --> 00:14:15,040

really is um

353

00:14:22,069 --> 00:14:18,399

our astronaut core is is lucky to have

354

00:14:23,990 --> 00:14:22,079

had someone of charlie's caliber uh even

355

00:14:26,389 --> 00:14:24,000

before he got there 100 sorties over

356

00:14:28,870 --> 00:14:26,399

vietnam and cambodia

357

00:14:30,710 --> 00:14:28,880

uh by the time he got to the hubble

358

00:14:32,310 --> 00:14:30,720

deployment mission he was his very

359

00:14:34,870 --> 00:14:32,320

accomplished

360

00:14:36,949 --> 00:14:34,880

young man and since 2009 he's been

361

00:14:38,949 --> 00:14:36,959

flying a desk in the corner office ninth

362

00:14:40,550 --> 00:14:38,959

floor at nasa headquarters

363

00:14:42,389 --> 00:14:40,560

uh probably not as much fun as deploying

364

00:14:45,269 --> 00:14:42,399

the hubble i gotta say right please

365

00:14:54,790 --> 00:14:45,279

welcome a true hero a great american

366

00:14:58,470 --> 00:14:56,790

thank you so much miles um you know for

367

00:15:01,030 --> 00:14:58,480

me it's an honor to be here tonight

368

00:15:02,949 --> 00:15:01,040

among all of you many of you um

369

00:15:04,790 --> 00:15:02,959

many of you here represent the thousands

370

00:15:06,150 --> 00:15:04,800

of people who played a critical role in

371

00:15:09,430 --> 00:15:06,160

the success of the hubble space

372

00:15:11,509 --> 00:15:09,440

telescope over the past 25 years

373

00:15:13,110 --> 00:15:11,519

through your efforts and and i mean that

374

00:15:14,790 --> 00:15:13,120

through the efforts of many of you

375

00:15:15,990 --> 00:15:14,800

sitting in this room

376

00:15:18,069 --> 00:15:16,000

um

377

00:15:19,990 --> 00:15:18,079

we have just astronomers have used

378

00:15:22,389 --> 00:15:20,000

hubble to revolutionize our

379

00:15:24,470 --> 00:15:22,399

understanding of the universe

380

00:15:26,870 --> 00:15:24,480

my job is to present awards tonight but

381

00:15:30,150 --> 00:15:26,880

before i get to that i do want to thank

382

00:15:32,629 --> 00:15:30,160

you again dr john holdren for for coming

383

00:15:34,790 --> 00:15:32,639

and out to be with us tonight

384

00:15:37,509 --> 00:15:34,800

for those of you who don't know john he

385

00:15:39,430 --> 00:15:37,519

has been a great friend of nasa science

386

00:15:43,030 --> 00:15:39,440

and it's always wonderful to have him

387

00:15:44,710 --> 00:15:43,040

and his lovely wife dr holdren

388

00:15:47,189 --> 00:15:44,720

who is also with us

389

00:15:49,269 --> 00:15:47,199

for this important event this evening

390

00:15:52,150 --> 00:15:49,279

it's always great to be at the national

391

00:15:54,069 --> 00:15:52,160

air and space museum so i echo what

392

00:15:56,150 --> 00:15:54,079

what what myles said earlier about it's

393

00:15:57,910 --> 00:15:56,160

just a phenomenal place to be

394

00:16:00,550 --> 00:15:57,920

when we come here we're where you can

395

00:16:02,949 --> 00:16:00,560

see firsthand what humans can achieve

396

00:16:04,949 --> 00:16:02,959

through aviation and in space

397

00:16:07,430 --> 00:16:04,959

hubble is one of those great missions

398

00:16:09,910 --> 00:16:07,440

that straddles the line between human

399

00:16:12,389 --> 00:16:09,920

exploration of space and scientific

400

00:16:13,509 --> 00:16:12,399

discovery and pushes the envelope on

401
00:16:15,670 --> 00:16:13,519
both

402
00:16:18,470 --> 00:16:15,680
hubble belongs to the entire world it

403
00:16:20,389 --> 00:16:18,480
truly is the people's telescope

404
00:16:22,550 --> 00:16:20,399
and all of you have truly been a part of

405
00:16:25,030 --> 00:16:22,560
a milestone for humanity

406
00:16:27,269 --> 00:16:25,040
you've expanded our reach

407
00:16:29,910 --> 00:16:27,279
and by the amazing transformative

408
00:16:32,230 --> 00:16:29,920
discoveries of this great observatory

409
00:16:34,949 --> 00:16:32,240
you've opened our eyes to our place in

410
00:16:38,230 --> 00:16:34,959
the universe and helped unify the globe

411
00:16:40,870 --> 00:16:38,240
in a higher spirit of pursuit

412
00:16:44,389 --> 00:16:40,880
it's hard to believe that 25 years ago

413
00:16:46,150 --> 00:16:44,399

today i was in the pilot seat for sts-31

414

00:16:48,389 --> 00:16:46,160

now all of you who um

415

00:16:50,470 --> 00:16:48,399

who know shuttle and all that stuff i

416

00:16:52,389 --> 00:16:50,480

have to i have to you know i got a lot

417

00:16:54,150 --> 00:16:52,399

of credit tonight i don't deserve

418

00:16:56,150 --> 00:16:54,160

uh the pilot

419

00:16:57,990 --> 00:16:56,160

ray j where are you

420

00:17:00,069 --> 00:16:58,000

okay

421

00:17:02,870 --> 00:17:00,079

ray j and i were pilots on our hubble

422

00:17:05,270 --> 00:17:02,880

missions and that meant we were helpers

423

00:17:07,270 --> 00:17:05,280

uh we were the co-pilot

424

00:17:09,429 --> 00:17:07,280

it was the commander lauren shriver and

425

00:17:11,270 --> 00:17:09,439

lauren schreiber is somewhere

426

00:17:12,390 --> 00:17:11,280

in this house tonight lauren where are

427

00:17:14,789 --> 00:17:12,400

you

428

00:17:18,470 --> 00:17:14,799

uh lauren is right back there

429

00:17:20,549 --> 00:17:18,480

so lauren was the guy at the controls um

430

00:17:22,390 --> 00:17:20,559

on that particular day in fact that

431

00:17:24,309 --> 00:17:22,400

particular mission in discovery when we

432

00:17:27,110 --> 00:17:24,319

deployed hubble

433

00:17:29,590 --> 00:17:27,120

you can see discovery herself at our

434

00:17:32,549 --> 00:17:29,600

sister museum to this one the hudvar

435

00:17:34,710 --> 00:17:32,559

hazy center out at dulles airport

436

00:17:36,789 --> 00:17:34,720

you know i know

437

00:17:39,350 --> 00:17:36,799

i'll never forget watching the telescope

438

00:17:41,430 --> 00:17:39,360

float out into space after a a very

439

00:17:43,830 --> 00:17:41,440

difficult deploy day that involved

440

00:17:46,870 --> 00:17:43,840

challenges to getting the observatory

441

00:17:49,510 --> 00:17:46,880

out of the cargo bay and also a bulky

442

00:17:51,669 --> 00:17:49,520

solar rate on that deploy day

443

00:17:52,870 --> 00:17:51,679

but after following for a while once it

444

00:17:55,830 --> 00:17:52,880

was free

445

00:17:57,909 --> 00:17:55,840

eventually our crew and i left hubble

446

00:18:00,470 --> 00:17:57,919

to space for future astronauts to

447

00:18:02,310 --> 00:18:00,480

complete its full amplification as a

448

00:18:04,789 --> 00:18:02,320

scientific legend and for those of you

449

00:18:07,830 --> 00:18:04,799

who had the privilege of of watching the

450

00:18:10,870 --> 00:18:07,840

the hubble imax 3d tonight it gave you a

451
00:18:13,590 --> 00:18:10,880
slight idea of all that hubble has been

452
00:18:15,990 --> 00:18:13,600
through over the last 25 years in fact

453
00:18:18,230 --> 00:18:16,000
more than 25 years but over the last 25

454
00:18:20,070 --> 00:18:18,240
years on orbit to be perhaps the

455
00:18:21,990 --> 00:18:20,080
greatest observatory that humans have

456
00:18:23,909 --> 00:18:22,000
ever have ever known

457
00:18:25,669 --> 00:18:23,919
i salute all my fellow astronauts who

458
00:18:27,669 --> 00:18:25,679
are here tonight and other places for

459
00:18:29,990 --> 00:18:27,679
their bravery and their commitment to

460
00:18:31,990 --> 00:18:30,000
deploying and servicing hubble

461
00:18:34,310 --> 00:18:32,000
they developed new tools and ways of

462
00:18:37,270 --> 00:18:34,320
doing work on orbit they pioneered the

463
00:18:39,990 --> 00:18:37,280

repair of a satellite in space

464

00:18:42,230 --> 00:18:40,000

something that i think will be a lasting

465

00:18:44,710 --> 00:18:42,240

legacy in the in addition to hubble's

466

00:18:46,870 --> 00:18:44,720

science as we move forward to an ever

467

00:18:48,070 --> 00:18:46,880

greater human presence in low earth

468

00:18:50,630 --> 00:18:48,080

orbit

469

00:18:53,029 --> 00:18:50,640

john grunsfeld who is uh was

470

00:18:55,110 --> 00:18:53,039

a key figure in bringing us all together

471

00:18:57,510 --> 00:18:55,120

for this occasion for this incredible

472

00:19:00,549 --> 00:18:57,520

week of activity to be quite honest

473

00:19:02,630 --> 00:19:00,559

uh john you certainly have the record

474

00:19:05,029 --> 00:19:02,640

for house calls with hubble

475

00:19:06,950 --> 00:19:05,039

and i thank you for all and all the

476
00:19:09,190 --> 00:19:06,960
servicing mission crews for the

477
00:19:11,430 --> 00:19:09,200
sacrifices you made and the hard work

478
00:19:13,590 --> 00:19:11,440
you poured into this asset for the

479
00:19:15,830 --> 00:19:13,600
entire world

480
00:19:17,750 --> 00:19:15,840
thanks to all of you

481
00:19:20,390 --> 00:19:17,760
we have a strong chance that there will

482
00:19:23,270 --> 00:19:20,400
be a continuous continuous data coming

483
00:19:25,909 --> 00:19:23,280
back from a great observatory as dr

484
00:19:28,549 --> 00:19:25,919
holdren said as we prepare to launch the

485
00:19:30,070 --> 00:19:28,559
james webb space telescope in just a few

486
00:19:32,630 --> 00:19:30,080
short years

487
00:19:35,110 --> 00:19:32,640
thank you also to the space telescope

488
00:19:37,830 --> 00:19:35,120

science institute for its unflagging

489

00:19:39,750 --> 00:19:37,840

enthusiasm and cheerleading of hubble in

490

00:19:43,750 --> 00:19:39,760

addition to its astute management of

491

00:19:45,430 --> 00:19:43,760

this complex project for so many years

492

00:19:47,830 --> 00:19:45,440

i also want to give a very special

493

00:19:49,750 --> 00:19:47,840

recognition to our colleague and my

494

00:19:52,310 --> 00:19:49,760

personal friend the dean

495

00:19:53,590 --> 00:19:52,320

of heads of space agencies as i like to

496

00:19:55,590 --> 00:19:53,600

call him

497

00:19:57,350 --> 00:19:55,600

jean-jacques dordian

498

00:19:59,190 --> 00:19:57,360

jean-jacques service to the space

499

00:20:01,029 --> 00:19:59,200

community is legendary

500

00:20:02,070 --> 00:20:01,039

and i look forward to seeing what he

501
00:20:05,029 --> 00:20:02,080
will do

502
00:20:07,909 --> 00:20:05,039
next after he leaves isa this summer

503
00:20:09,110 --> 00:20:07,919
esa's contributions to hubble have been

504
00:20:11,270 --> 00:20:09,120
critical

505
00:20:13,830 --> 00:20:11,280
and i thank jean-jacques for his

506
00:20:16,710 --> 00:20:13,840
leadership and continued dedication

507
00:20:18,870 --> 00:20:16,720
not only to our legacy missions but also

508
00:20:21,190 --> 00:20:18,880
to pushing the frontier toward the

509
00:20:23,029 --> 00:20:21,200
future of exploration let you in on a

510
00:20:24,390 --> 00:20:23,039
little secret jean-jacques and i are

511
00:20:27,029 --> 00:20:24,400
conspiring

512
00:20:30,789 --> 00:20:27,039
uh we're both trying to get to 77 years

513
00:20:32,630 --> 00:20:30,799

of age because what's magic about 77

514

00:20:34,630 --> 00:20:32,640

that's the age that john glenn said we

515

00:20:37,110 --> 00:20:34,640

can't think about going back into space

516

00:20:38,070 --> 00:20:37,120

again so we're working to get there so

517

00:20:41,590 --> 00:20:38,080

we can

518

00:20:44,789 --> 00:20:41,600

partners

519

00:20:44,799 --> 00:20:47,750

jackie

520

00:20:51,750 --> 00:20:49,909

the accomplishments and performance of

521

00:20:53,590 --> 00:20:51,760

the incredible international hubble

522

00:20:56,149 --> 00:20:53,600

space telescope team

523

00:20:58,950 --> 00:20:56,159

is deserving of a special recognition

524

00:21:01,190 --> 00:20:58,960

because of its long-term iconic impact

525

00:21:04,070 --> 00:21:01,200

on science and humanity

526

00:21:07,430 --> 00:21:04,080

since we at nasa currently have no

527

00:21:09,590 --> 00:21:07,440

established a reward to recognize a

528

00:21:11,190 --> 00:21:09,600

lifetime of achievement on part of a

529

00:21:13,590 --> 00:21:11,200

group or a team

530

00:21:15,990 --> 00:21:13,600

we have created a unique certificate of

531

00:21:18,390 --> 00:21:16,000

recognition just for this occasion of

532

00:21:19,669 --> 00:21:18,400

the 25th anniversary of the hubble space

533

00:21:21,590 --> 00:21:19,679

telescope

534

00:21:23,830 --> 00:21:21,600

each certificate that we hand out

535

00:21:26,390 --> 00:21:23,840

tonight reads from the national

536

00:21:28,630 --> 00:21:26,400

aeronautics and space administration

537

00:21:31,270 --> 00:21:28,640

presents this hubble 25th anniversary

538

00:21:33,510 --> 00:21:31,280

commendation to the specific team

539

00:21:36,390 --> 00:21:33,520

for contributions that rival the best

540

00:21:38,230 --> 00:21:36,400

that nasa has achieved in innovation and

541

00:21:40,470 --> 00:21:38,240

overcoming challenges

542

00:21:42,830 --> 00:21:40,480

signed and sealed in washington dc this

543

00:21:47,350 --> 00:21:42,840

24th day of april in

544

00:21:52,710 --> 00:21:50,230

it doesn't say me

545

00:21:54,710 --> 00:21:52,720

now miles if you would uh come back and

546

00:21:56,950 --> 00:21:54,720

take your podium and resume your duties

547

00:21:58,870 --> 00:21:56,960

as the emcee i'll step down for a few

548

00:22:01,830 --> 00:21:58,880

minutes and then later i'm going to ask

549

00:22:04,789 --> 00:22:01,840

mike garcia to uh to assist me by

550

00:22:07,669 --> 00:22:04,799

introducing each team as i stand down on

551
00:22:08,390 --> 00:22:07,679
the floor and present them with uh with

552
00:22:10,149 --> 00:22:08,400
the

553
00:22:11,990 --> 00:22:10,159
awards of recognition that we have

554
00:22:14,070 --> 00:22:12,000
tonight and mike's going to read you a

555
00:22:16,470 --> 00:22:14,080
brief description of each team and the

556
00:22:18,549 --> 00:22:16,480
unique roles they played in the life of

557
00:22:19,909 --> 00:22:18,559
hubble today so miles thank you very

558
00:22:21,669 --> 00:22:19,919
much all right

559
00:22:26,310 --> 00:22:21,679
thank you charlie

560
00:22:29,750 --> 00:22:26,320
as um

561
00:22:32,549 --> 00:22:29,760
nasa didn't build uh hubble alone like

562
00:22:34,310 --> 00:22:32,559
so many great space missions

563
00:22:36,390 --> 00:22:34,320

perhaps most notably the international

564

00:22:38,070 --> 00:22:36,400

space station it is the result of a

565

00:22:40,470 --> 00:22:38,080

partnership with the european space

566

00:22:42,789 --> 00:22:40,480

agency now our next guest has been with

567

00:22:45,270 --> 00:22:42,799

issa for 30 years

568

00:22:47,270 --> 00:22:45,280

since hubble was still on terra firma

569

00:22:49,270 --> 00:22:47,280

uh when he started there were 11 members

570

00:22:51,430 --> 00:22:49,280

now they're 22. he obviously has a very

571

00:22:52,950 --> 00:22:51,440

magnetic personality clearly

572

00:22:54,789 --> 00:22:52,960

he's forged partnerships with other

573

00:22:56,710 --> 00:22:54,799

countries including china that's a good

574

00:22:58,630 --> 00:22:56,720

idea and

575

00:22:59,830 --> 00:22:58,640

he wanted to be an astronaut as i

576
00:23:02,470 --> 00:22:59,840
understand it

577
00:23:04,310 --> 00:23:02,480
but instead has served his agency and

578
00:23:05,750 --> 00:23:04,320
frankly all of us who care deeply about

579
00:23:08,549 --> 00:23:05,760
space

580
00:23:10,710 --> 00:23:08,559
with great vigor and great success and

581
00:23:12,789 --> 00:23:10,720
particularly for the past 12 years

582
00:23:15,190 --> 00:23:12,799
as the general director of visa he is

583
00:23:18,070 --> 00:23:15,200
leaving his post in june so give him a

584
00:23:20,070 --> 00:23:18,080
special warm welcome tonight

585
00:23:32,390 --> 00:23:20,080
acknowledging him for his great service

586
00:23:37,750 --> 00:23:34,870
thank you very much

587
00:23:39,830 --> 00:23:37,760
it's certainly a pleasure for isaac and

588
00:23:42,470 --> 00:23:39,840

and for me to

589

00:23:45,029 --> 00:23:42,480

to celebrate the 25th anniversary of the

590

00:23:47,990 --> 00:23:45,039

hubble space telescope together with the

591

00:23:50,390 --> 00:23:48,000

family it's a large

592

00:23:52,870 --> 00:23:50,400

and old family

593

00:23:55,750 --> 00:23:52,880

which has made the success of

594

00:23:57,990 --> 00:23:55,760

of the herbal space telescope so hst

595

00:23:58,870 --> 00:23:58,000

it's a three letters

596

00:24:03,110 --> 00:23:58,880

that

597

00:24:04,630 --> 00:24:03,120

i shall translate into uh five words

598

00:24:05,669 --> 00:24:04,640

cooperation

599

00:24:07,190 --> 00:24:05,679

risk

600

00:24:09,990 --> 00:24:07,200

success

601
00:24:12,310 --> 00:24:10,000
people and future

602
00:24:14,390 --> 00:24:12,320
cooperation first

603
00:24:16,789 --> 00:24:14,400
so the above space telescope is a

604
00:24:18,789 --> 00:24:16,799
long-standing cooperation between nasa

605
00:24:21,430 --> 00:24:18,799
and isa

606
00:24:25,830 --> 00:24:21,440
which has started 45 years ago

607
00:24:27,990 --> 00:24:25,840
in 1970 when nasa invited esro isa was

608
00:24:30,870 --> 00:24:28,000
not even existing at that time it was

609
00:24:32,950 --> 00:24:30,880
esro the predecessor of isa

610
00:24:35,669 --> 00:24:32,960
to join a mission

611
00:24:38,070 --> 00:24:35,679
to look at the universe

612
00:24:41,510 --> 00:24:38,080
and as i am repeating at each

613
00:24:43,110 --> 00:24:41,520

opportunity and charlie knows that

614

00:24:45,510 --> 00:24:43,120

cooperation is

615

00:24:46,710 --> 00:24:45,520

a slow process

616

00:24:49,350 --> 00:24:46,720

but

617

00:24:51,909 --> 00:24:49,360

is robust and sustainable and the proof

618

00:24:56,149 --> 00:24:51,919

is that we have signed the memorandum of

619

00:24:59,430 --> 00:24:56,159

understanding in 1977

620

00:25:02,630 --> 00:24:59,440

and the paper still exists

621

00:25:03,590 --> 00:25:02,640

has been renewed several times

622

00:25:05,909 --> 00:25:03,600

to

623

00:25:08,549 --> 00:25:05,919

drive this cooperation and isa has

624

00:25:11,269 --> 00:25:08,559

provided to the hubble

625

00:25:15,029 --> 00:25:11,279

some hardware

626
00:25:17,750 --> 00:25:15,039
and one instrument and solar panels

627
00:25:19,430 --> 00:25:17,760
but also scientists and there is there

628
00:25:21,990 --> 00:25:19,440
are 15

629
00:25:25,029 --> 00:25:22,000
is a scientist working at the space

630
00:25:28,470 --> 00:25:25,039
telescope science institute

631
00:25:29,430 --> 00:25:28,480
and also astronauts and i have seen them

632
00:25:33,669 --> 00:25:29,440
since

633
00:25:35,590 --> 00:25:33,679
claude and jean-francois have flown

634
00:25:38,230 --> 00:25:35,600
on servicing missions

635
00:25:40,149 --> 00:25:38,240
to the hubble

636
00:25:43,029 --> 00:25:40,159
second world is risks

637
00:25:46,230 --> 00:25:43,039
yes it was risky for nasa

638
00:25:47,190 --> 00:25:46,240

to decide to make such a huge

639

00:25:51,029 --> 00:25:47,200

piece

640

00:25:54,950 --> 00:25:51,039

to look at the universe it was a risk

641

00:25:58,310 --> 00:25:54,960

it was also a risk for nasa to ask isa

642

00:25:59,350 --> 00:25:58,320

45 years ago to join this

643

00:26:01,190 --> 00:25:59,360

program

644

00:26:04,549 --> 00:26:01,200

because he's at that time there was

645

00:26:07,669 --> 00:26:04,559

almost no achievement at that time so

646

00:26:11,110 --> 00:26:07,679

isa was a baby agency

647

00:26:13,590 --> 00:26:11,120

you took the risk to put isa on board

648

00:26:15,350 --> 00:26:13,600

and it was risky also to

649

00:26:16,470 --> 00:26:15,360

send astronauts

650

00:26:18,630 --> 00:26:16,480

to

651
00:26:21,029 --> 00:26:18,640
service the

652
00:26:25,190 --> 00:26:21,039
telescope

653
00:26:29,190 --> 00:26:25,200
life

654
00:26:32,950 --> 00:26:29,200
and even improving the telescope

655
00:26:35,350 --> 00:26:32,960
but risks belong to progress

656
00:26:38,710 --> 00:26:35,360
you cannot push the frontiers

657
00:26:40,310 --> 00:26:38,720
of knowledge without taking risks i know

658
00:26:43,029 --> 00:26:40,320
that it's difficult

659
00:26:46,070 --> 00:26:43,039
but it's necessary

660
00:26:48,870 --> 00:26:46,080
the third word is success

661
00:26:50,149 --> 00:26:48,880
i would not say that the hubble is a

662
00:26:59,990 --> 00:26:50,159
success

663
00:27:01,830 --> 00:27:00,000

at each discovery

664

00:27:07,029 --> 00:27:01,840

you have new questions

665

00:27:09,190 --> 00:27:07,039

you have new discoveries and this is a

666

00:27:11,510 --> 00:27:09,200

cooperation between the different

667

00:27:14,470 --> 00:27:11,520

scientific communities and also the

668

00:27:17,750 --> 00:27:14,480

cooperation among generations

669

00:27:20,230 --> 00:27:17,760

because the 45 years ago the scientists

670

00:27:23,190 --> 00:27:20,240

of today were not even born so it was a

671

00:27:26,870 --> 00:27:23,200

cooperation among generations which have

672

00:27:28,789 --> 00:27:26,880

put the leverage for new success

673

00:27:32,149 --> 00:27:28,799

the first word is people

674

00:27:35,830 --> 00:27:32,159

because cooperation risk management

675

00:27:37,590 --> 00:27:35,840

and discoveries is a matter of people

676
00:27:39,190 --> 00:27:37,600
people who are taking political

677
00:27:41,110 --> 00:27:39,200
decisions

678
00:27:42,710 --> 00:27:41,120
people who are taking technical

679
00:27:43,669 --> 00:27:42,720
decisions

680
00:27:45,909 --> 00:27:43,679
nasa

681
00:27:48,950 --> 00:27:45,919
industry

682
00:27:51,830 --> 00:27:48,960
people from the scientific communities

683
00:27:54,149 --> 00:27:51,840
and also astronauts working together

684
00:27:56,230 --> 00:27:54,159
with one single objective

685
00:27:58,789 --> 00:27:56,240
progress

686
00:27:59,990 --> 00:27:58,799
and i would say and this was been said

687
00:28:02,070 --> 00:28:00,000
that

688
00:28:04,549 --> 00:28:02,080

among the people there is also all the

689

00:28:06,630 --> 00:28:04,559

public and the young generations who are

690

00:28:11,269 --> 00:28:06,640

all fascinated by

691

00:28:15,909 --> 00:28:13,990

it's important to involve the people

692

00:28:17,350 --> 00:28:15,919

because only the people can change the

693

00:28:20,149 --> 00:28:17,360

world

694

00:28:22,070 --> 00:28:20,159

and invent a better future

695

00:28:24,310 --> 00:28:22,080

and i shall finish by that this is the

696

00:28:26,710 --> 00:28:24,320

future the future is always more

697

00:28:27,990 --> 00:28:26,720

interesting than the past

698

00:28:30,710 --> 00:28:28,000

but the past

699

00:28:32,630 --> 00:28:30,720

just serves to make the future

700

00:28:34,230 --> 00:28:32,640

better

701
00:28:36,470 --> 00:28:34,240
so

702
00:28:39,669 --> 00:28:36,480
that more data will come from the herbal

703
00:28:42,310 --> 00:28:39,679
space telescope but even when the data

704
00:28:44,149 --> 00:28:42,320
will be over

705
00:28:47,269 --> 00:28:44,159
the work will continue because the

706
00:28:49,750 --> 00:28:47,279
scientists will use this data for

707
00:28:52,070 --> 00:28:49,760
decades so the mission will not be over

708
00:28:54,310 --> 00:28:52,080
with the hardware

709
00:28:56,789 --> 00:28:54,320
and after that there was the gems there

710
00:28:57,669 --> 00:28:56,799
will be the james webb telescope

711
00:29:03,510 --> 00:28:57,679
and

712
00:29:04,549 --> 00:29:03,520
will continue on the jobs web we are

713
00:29:07,350 --> 00:29:04,559

ready

714

00:29:09,190 --> 00:29:07,360

and we shall be there again as we have

715

00:29:12,870 --> 00:29:09,200

been together on the oval space

716

00:29:14,789 --> 00:29:12,880

telescope so congratulations nasa and

717

00:29:22,310 --> 00:29:14,799

happy birthday

718

00:29:28,710 --> 00:29:24,870

i understand

719

00:29:30,070 --> 00:29:28,720

is a very popular corner and i i'm

720

00:29:32,549 --> 00:29:30,080

hoping

721

00:29:34,389 --> 00:29:32,559

it's because of the hubble and not the

722

00:29:35,830 --> 00:29:34,399

fact that right over here is the how do

723

00:29:37,350 --> 00:29:35,840

they go to the bathroom and space

724

00:29:39,269 --> 00:29:37,360

exhibit

725

00:29:42,310 --> 00:29:39,279

which as any astronaut knows is the

726

00:29:44,310 --> 00:29:42,320

first question of any sixth grader when

727

00:29:45,750 --> 00:29:44,320

they go into the classroom by the way i

728

00:29:48,789 --> 00:29:45,760

i know there's you know we've talked

729

00:29:50,950 --> 00:29:48,799

about charlie and john would anybody who

730

00:29:52,549 --> 00:29:50,960

has uh as an astronaut flown to hubble

731

00:29:53,990 --> 00:29:52,559

please stand

732

00:29:56,070 --> 00:29:54,000

there are more than one of them more

733

00:29:57,430 --> 00:29:56,080

than two of them here

734

00:30:01,750 --> 00:29:57,440

and please just give them a round of

735

00:30:06,830 --> 00:30:04,310

i mean let's face it

736

00:30:08,389 --> 00:30:06,840

had it not been

737

00:30:11,269 --> 00:30:08,399

congratulated

738

00:30:13,590 --> 00:30:11,279

had it not been for their efforts

739

00:30:16,789 --> 00:30:13,600

it would have been the techno turkey

740

00:30:18,470 --> 00:30:16,799

that they talked about back in 1990

741

00:30:20,549 --> 00:30:18,480

um

742

00:30:23,510 --> 00:30:20,559

and we do applaud them but as a former

743

00:30:24,789 --> 00:30:23,520

tv anchorman you you will understand

744

00:30:26,549 --> 00:30:24,799

that i know

745

00:30:29,430 --> 00:30:26,559

they really are taking all the credit

746

00:30:31,909 --> 00:30:29,440

and that there are many others who

747

00:30:34,070 --> 00:30:31,919

make it all happen it takes a village to

748

00:30:36,389 --> 00:30:34,080

make these things happen so let's spend

749

00:30:39,430 --> 00:30:36,399

a few moments listening to some of the

750

00:30:41,269 --> 00:30:39,440

people who through the ups and downs the

751
00:30:43,510 --> 00:30:41,279
wild roller coaster ride that is the

752
00:30:44,710 --> 00:30:43,520
hubble space telescope let's hear from

753
00:30:47,510 --> 00:30:44,720
some of the people that made it all

754
00:30:49,590 --> 00:30:47,520
happen on video

755
00:30:51,909 --> 00:30:49,600
it means that we now understand much

756
00:30:53,669 --> 00:30:51,919
more about our universe than we ever

757
00:30:55,909 --> 00:30:53,679
would have known had it not been for

758
00:30:57,830 --> 00:30:55,919
hubble it just gives me that sense that

759
00:31:00,070 --> 00:30:57,840
we live in this vast and remarkable

760
00:31:02,470 --> 00:31:00,080
universe hubble today would be a piece

761
00:31:04,310 --> 00:31:02,480
of floating space debris if it weren't

762
00:31:06,870 --> 00:31:04,320
for the human spaceflight program to

763
00:31:09,350 --> 00:31:06,880

build a telescope in many ways is a

764

00:31:12,070 --> 00:31:09,360

decision to build a time machine the

765

00:31:15,110 --> 00:31:12,080

united states congress approved a large

766

00:31:17,990 --> 00:31:15,120

space telescope in 1977

767

00:31:20,630 --> 00:31:18,000

sparkling work to begin on creating this

768

00:31:21,909 --> 00:31:20,640

large complex and capable orbiting

769

00:31:25,029 --> 00:31:21,919

telescope

770

00:31:27,029 --> 00:31:25,039

well it wasn't easy uh it was a long

771

00:31:29,350 --> 00:31:27,039

slog difficult

772

00:31:31,669 --> 00:31:29,360

politically at first to have it accepted

773

00:31:33,990 --> 00:31:31,679

and funded in the us congress

774

00:31:37,350 --> 00:31:34,000

and then technically it was difficult

775

00:31:40,070 --> 00:31:37,360

it's an amazing machine it can

776

00:31:41,430 --> 00:31:40,080

orbit around the earth at 17 500 miles

777

00:31:43,110 --> 00:31:41,440

an hour

778

00:31:44,950 --> 00:31:43,120

and the reason it can take all these

779

00:31:46,389 --> 00:31:44,960

these great images is not only because

780

00:31:49,029 --> 00:31:46,399

it's above the atmosphere

781

00:31:51,509 --> 00:31:49,039

but because it can very steadily hold

782

00:31:54,310 --> 00:31:51,519

its gaze on

783

00:31:56,389 --> 00:31:54,320

an object in space a globally connected

784

00:31:58,389 --> 00:31:56,399

telescope built through a partnership

785

00:32:00,710 --> 00:31:58,399

with the european space agency which

786

00:32:02,710 --> 00:32:00,720

would look into the stars well beyond

787

00:32:05,350 --> 00:32:02,720

international borders it takes a lot of

788

00:32:07,110 --> 00:32:05,360

people you know it takes people that

789

00:32:10,230 --> 00:32:07,120

obviously the scientists

790

00:32:13,029 --> 00:32:10,240

to conceive of it it takes engineers to

791

00:32:15,110 --> 00:32:13,039

design it and build it and test it takes

792

00:32:16,950 --> 00:32:15,120

technicians to actually build it it

793

00:32:18,230 --> 00:32:16,960

takes the people to keep the rooms clean

794

00:32:19,830 --> 00:32:18,240

the facilities

795

00:32:22,389 --> 00:32:19,840

up and operating

796

00:32:25,430 --> 00:32:22,399

so it takes people from every walk of

797

00:32:27,750 --> 00:32:25,440

life in order to do it every skill set

798

00:32:30,630 --> 00:32:27,760

that you can think of to then place this

799

00:32:32,870 --> 00:32:30,640

telescope into orbit to send back to us

800

00:32:35,750 --> 00:32:32,880

the data that scientists needed

801
00:32:38,310 --> 00:32:35,760
unobstructed and unencumbered and when

802
00:32:40,789 --> 00:32:38,320
it was launched in 1990 it really opened

803
00:32:43,190 --> 00:32:40,799
a new vista on the whole universe simply

804
00:32:45,190 --> 00:32:43,200
by enabling us to get sharper images

805
00:32:48,070 --> 00:32:45,200
above the atmosphere at the time i was

806
00:32:50,149 --> 00:32:48,080
the what we call the plt or the pilot

807
00:32:53,110 --> 00:32:50,159
for the hubble deploy mission which was

808
00:32:54,950 --> 00:32:53,120
sts-31 aboard the shuttle discovery all

809
00:32:57,269 --> 00:32:54,960
of us in the crew had a certain feeling

810
00:32:59,590 --> 00:32:57,279
of exhilaration and excitement

811
00:33:01,830 --> 00:32:59,600
we knew that this was going to be an

812
00:33:02,630 --> 00:33:01,840
important mission two

813
00:33:04,630 --> 00:33:02,640

one

814

00:33:06,470 --> 00:33:04,640
and liftoff of the space shuttle

815

00:33:09,350 --> 00:33:06,480
discovery with the hubble space

816

00:33:12,950 --> 00:33:09,360
telescope our window on the universe on

817

00:33:15,029 --> 00:33:12,960
the 25th of april 1990 the space shuttle

818

00:33:17,909 --> 00:33:15,039
discovery deployed the hubble space

819

00:33:20,070 --> 00:33:17,919
telescope into an orbit around earth

820

00:33:22,830 --> 00:33:20,080
discover houston you have a go to open

821

00:33:28,710 --> 00:33:25,830
doors the mission itself was pretty

822

00:33:30,789 --> 00:33:28,720
intense because we we had to train for

823

00:33:32,950 --> 00:33:30,799
any number of contingencies that we all

824

00:33:34,950 --> 00:33:32,960
prayed would not happen ironically one

825

00:33:37,269 --> 00:33:34,960
of those contingencies was failure of

826

00:33:39,190 --> 00:33:37,279

the solar array to deploy it took us

827

00:33:41,430 --> 00:33:39,200

much of the day for the flight control

828

00:33:43,190 --> 00:33:41,440

team to say look we this is not working

829

00:33:45,269 --> 00:33:43,200

out we don't think we're going to get

830

00:33:46,470 --> 00:33:45,279

the solar rays deployed side of the path

831

00:33:48,310 --> 00:33:46,480

the other half

832

00:33:51,909 --> 00:33:48,320

all of a sudden this great experience

833

00:33:53,830 --> 00:33:51,919

turned out to just go this is not good

834

00:33:56,470 --> 00:33:53,840

supervisor when the ground control team

835

00:33:59,269 --> 00:33:56,480

calls it stop stop we think we found a

836

00:34:01,750 --> 00:33:59,279

solution um you know just stop where you

837

00:34:03,750 --> 00:34:01,760

are we're going to try this and and they

838

00:34:05,750 --> 00:34:03,760

did and it worked and so we went ahead

839

00:34:10,069 --> 00:34:05,760

and deployed boy activity so far is

840

00:34:14,869 --> 00:34:12,069

it all worked out because of the

841

00:34:16,710 --> 00:34:14,879

incredible work of the combination of

842

00:34:19,669 --> 00:34:16,720

the crew on board the flight control

843

00:34:21,270 --> 00:34:19,679

team in houston but most especially

844

00:34:23,190 --> 00:34:21,280

very smart

845

00:34:24,310 --> 00:34:23,200

people at the goddard space flight

846

00:34:26,470 --> 00:34:24,320

center

847

00:34:28,950 --> 00:34:26,480

who actually knew the hubble space

848

00:34:30,389 --> 00:34:28,960

telescope about as well as any people

849

00:34:32,829 --> 00:34:30,399

around

850

00:34:35,510 --> 00:34:32,839

discovery go for hubble

851
00:34:38,470 --> 00:34:35,520
release the discovery go ahead charlie

852
00:34:41,030 --> 00:34:38,480
okay story uh we've been taking marks

853
00:34:42,550 --> 00:34:41,040
residuals and ratios look good and we'd

854
00:34:44,710 --> 00:34:42,560
like to go ahead and

855
00:34:46,950 --> 00:34:44,720
go to filter state

856
00:34:49,349 --> 00:34:46,960
we concur charlie the science that is

857
00:34:51,190 --> 00:34:49,359
astronomy would never be the same when

858
00:34:52,869 --> 00:34:51,200
people think about a telescope here on

859
00:34:55,270 --> 00:34:52,879
earth they think about a mirror with a

860
00:34:57,750 --> 00:34:55,280
tube around it and that's exactly what

861
00:35:00,310 --> 00:34:57,760
hubble is it's a it's a huge mirror with

862
00:35:01,829 --> 00:35:00,320
a huge tube around it in space of course

863
00:35:03,670 --> 00:35:01,839

the purpose of hubble is to take these

864

00:35:05,270 --> 00:35:03,680

beautiful images that we learn about and

865

00:35:07,349 --> 00:35:05,280

then the data sent back to earth for us

866

00:35:09,829 --> 00:35:07,359

to study the hubble space telescope

867

00:35:11,829 --> 00:35:09,839

powered up all systems nominal and the

868

00:35:14,470 --> 00:35:11,839

data began to stream in

869

00:35:16,950 --> 00:35:14,480

images of far off distances galaxies and

870

00:35:19,109 --> 00:35:16,960

stars but there was something wrong

871

00:35:22,150 --> 00:35:19,119

the magnificent space observatory's

872

00:35:23,750 --> 00:35:22,160

imagery was not clear not crisp we saw

873

00:35:26,790 --> 00:35:23,760

the first light images and to the

874

00:35:28,390 --> 00:35:26,800

amateur like me it looked great because

875

00:35:30,069 --> 00:35:28,400

we had made this great discovery right

876
00:35:32,470 --> 00:35:30,079
off the bat what we thought was a single

877
00:35:34,550 --> 00:35:32,480
star turned out to be a binary star when

878
00:35:36,230 --> 00:35:34,560
we learned that no it's not really that

879
00:35:38,790 --> 00:35:36,240
good an image it's kind of blurred

880
00:35:40,870 --> 00:35:38,800
because we have this theme from an

881
00:35:42,230 --> 00:35:40,880
agency perspective and from a public

882
00:35:46,470 --> 00:35:42,240
perspective

883
00:35:50,150 --> 00:35:46,480
doom and gloom but working on a

884
00:35:53,750 --> 00:35:50,160
bipartisan basis we used the best tools

885
00:35:55,990 --> 00:35:53,760
to identify was this a techno turkey

886
00:35:58,710 --> 00:35:56,000
that we would just bag

887
00:36:00,950 --> 00:35:58,720
as a terrible mistake and say bye bye

888
00:36:03,190 --> 00:36:00,960

boondoggle or where are we really going

889

00:36:05,109 --> 00:36:03,200

to try to fix it what we had was sincere

890

00:36:07,990 --> 00:36:05,119

collaboration the mirror was polished

891

00:36:10,390 --> 00:36:08,000

incorrectly we were off by

892

00:36:13,030 --> 00:36:10,400

half the thickness of a human hair from

893

00:36:15,030 --> 00:36:13,040

center to edge and that that's pretty

894

00:36:16,069 --> 00:36:15,040

astounding uh that that you know we

895

00:36:17,990 --> 00:36:16,079

could

896

00:36:20,470 --> 00:36:18,000

come so close and yet not make it the

897

00:36:23,190 --> 00:36:20,480

truly remarkable feature of the hubble

898

00:36:27,030 --> 00:36:23,200

space telescope is that it was designed

899

00:36:29,190 --> 00:36:27,040

to be upgraded and fixed and nasa is

900

00:36:31,349 --> 00:36:29,200

absolutely expertise on this when you've

901
00:36:33,589 --> 00:36:31,359
got to get the job done

902
00:36:36,150 --> 00:36:33,599
the team comes from many different

903
00:36:38,550 --> 00:36:36,160
places one

904
00:36:40,230 --> 00:36:38,560
and we have liftoff liftoff of the space

905
00:36:41,910 --> 00:36:40,240
shuttle endeavour on an ambitious

906
00:36:44,230 --> 00:36:41,920
mission to service the hubble space

907
00:36:46,150 --> 00:36:44,240
telescope the real magic on the hubble

908
00:36:48,630 --> 00:36:46,160
mission is almost 40 hours of space

909
00:36:50,550 --> 00:36:48,640
walking and we had almost no surprises

910
00:36:52,310 --> 00:36:50,560
because astronauts from nasa have been

911
00:36:53,829 --> 00:36:52,320
able to go back and

912
00:36:56,550 --> 00:36:53,839
refurbish it put in new instruments

913
00:36:58,710 --> 00:36:56,560

repair it so that 25 years has made it

914

00:37:00,150 --> 00:36:58,720

an increasingly more powerful telescope

915

00:37:02,470 --> 00:37:00,160

and it's the fact that hubble is so

916

00:37:05,349 --> 00:37:02,480

powerful today which is so remarkable

917

00:37:06,710 --> 00:37:05,359

after 25 years it's basically 10 to 100

918

00:37:09,589 --> 00:37:06,720

times more powerful than when it was

919

00:37:11,750 --> 00:37:09,599

first launched i did a mission to the

920

00:37:13,829 --> 00:37:11,760

hubble space telescope and it was a it

921

00:37:16,390 --> 00:37:13,839

wasn't it wasn't really a refurbishment

922

00:37:19,670 --> 00:37:16,400

it was a rescue mission because the

923

00:37:21,430 --> 00:37:19,680

hubble telescope uses um gyroscopes to

924

00:37:23,349 --> 00:37:21,440

determine how it's moving and how to

925

00:37:24,470 --> 00:37:23,359

point with absolutely no motion at a

926
00:37:26,069 --> 00:37:24,480
star

927
00:37:27,750 --> 00:37:26,079
and those gyroscopes

928
00:37:30,230 --> 00:37:27,760
were failing and by the time we got

929
00:37:32,069 --> 00:37:30,240
there only one i think was working and

930
00:37:33,829 --> 00:37:32,079
so it was a dead telescope at that point

931
00:37:35,030 --> 00:37:33,839
our role on that mission was to

932
00:37:36,950 --> 00:37:35,040
basically

933
00:37:38,790 --> 00:37:36,960
repaired the hubble telescope it was a

934
00:37:40,630 --> 00:37:38,800
repair a real repair mission just like

935
00:37:42,390 --> 00:37:40,640
the first repair mission to change the

936
00:37:44,069 --> 00:37:42,400
optics if i had messed that up i would

937
00:37:45,270 --> 00:37:44,079
be the one that had broken the telescope

938
00:37:46,870 --> 00:37:45,280

forever

939

00:37:48,550 --> 00:37:46,880

i guess that's part of the excitement of

940

00:37:50,790 --> 00:37:48,560

having worked a hubble mission because

941

00:37:53,190 --> 00:37:50,800

you know you've got the best best team

942

00:37:54,790 --> 00:37:53,200

on the ground best crew upstairs it's

943

00:37:56,150 --> 00:37:54,800

exciting but there's there's a level of

944

00:37:58,069 --> 00:37:56,160

confidence you're gonna pull through

945

00:38:00,150 --> 00:37:58,079

this we were able to leave the hubble in

946

00:38:02,550 --> 00:38:00,160

even better shape such that now we're

947

00:38:04,790 --> 00:38:02,560

able to celebrate the 25th anniversary

948

00:38:07,270 --> 00:38:04,800

with the repairs completed hubble blew

949

00:38:09,910 --> 00:38:07,280

the world away with what it saw circling

950

00:38:12,230 --> 00:38:09,920

the globe at five miles per second

951
00:38:14,390 --> 00:38:12,240
this school bus sized observatory was

952
00:38:15,670 --> 00:38:14,400
the most technologically advanced device

953
00:38:17,589 --> 00:38:15,680
ever launched

954
00:38:20,470 --> 00:38:17,599
and has stayed amazingly advanced

955
00:38:22,390 --> 00:38:20,480
through five repair and upgrade missions

956
00:38:25,990 --> 00:38:22,400
from the first mission critical optics

957
00:38:28,270 --> 00:38:26,000
repair on space shuttle mission sts-61

958
00:38:30,870 --> 00:38:28,280
to the last servicing mission

959
00:38:33,270 --> 00:38:30,880
sts-125 which added the wide field

960
00:38:35,349 --> 00:38:33,280
camera 3 and replaced or improved

961
00:38:38,150 --> 00:38:35,359
sensors batteries and numerous other

962
00:38:40,390 --> 00:38:38,160
components the magnitude of the things

963
00:38:42,790 --> 00:38:40,400

that they wanted to accomplish almost

964

00:38:44,390 --> 00:38:42,800

meant certain failure somewhere but the

965

00:38:45,589 --> 00:38:44,400

crew said look

966

00:38:47,270 --> 00:38:45,599

we can do this

967

00:38:49,190 --> 00:38:47,280

you know we will have accomplished so

968

00:38:51,670 --> 00:38:49,200

much more in making hubble better than

969

00:38:54,630 --> 00:38:51,680

it is ever ever believed to be everybody

970

00:38:56,710 --> 00:38:54,640

knows hubble it's it's really true

971

00:38:59,670 --> 00:38:56,720

worldwide all throughout the u.s

972

00:39:01,510 --> 00:38:59,680

everybody all ages all walks of life you

973

00:39:03,030 --> 00:39:01,520

say hubble space telescope people know

974

00:39:05,430 --> 00:39:03,040

what you're talking about more than a

975

00:39:07,829 --> 00:39:05,440

simple telescope hubble is humanity's

976

00:39:10,150 --> 00:39:07,839

grand observatory of the vastness of

977

00:39:12,470 --> 00:39:10,160

space and we've kept exploring by

978

00:39:14,550 --> 00:39:12,480

staring into the universe and moving

979

00:39:16,310 --> 00:39:14,560

forward the great thing about hubble now

980

00:39:18,790 --> 00:39:16,320

this year is that it's still going

981

00:39:21,910 --> 00:39:18,800

strong and we expect it to last out till

982

00:39:23,910 --> 00:39:21,920

2020 maybe even longer hubble has

983

00:39:26,630 --> 00:39:23,920

consistently

984

00:39:29,349 --> 00:39:26,640

taken us to places we've never been

985

00:39:31,030 --> 00:39:29,359

visually of course and

986

00:39:34,390 --> 00:39:31,040

uh given

987

00:39:35,990 --> 00:39:34,400

and empowered us to answer questions

988

00:39:38,790 --> 00:39:36,000

that in a previous generation of

989

00:39:41,109 --> 00:39:38,800

telescopes we couldn't even pose and

990

00:39:42,710 --> 00:39:41,119

that allowed us to probe much deeper in

991

00:39:44,870 --> 00:39:42,720

the universe and to see phenomena that

992

00:39:47,589 --> 00:39:44,880

were otherwise hidden from us

993

00:39:50,550 --> 00:39:47,599

and it revealed a scientific wonderland

994

00:39:52,310 --> 00:39:50,560

of discoveries but even more so

995

00:39:54,550 --> 00:39:52,320

it showed us for the first time how

996

00:39:56,630 --> 00:39:54,560

beautiful the universe is because the

997

00:39:59,349 --> 00:39:56,640

hubble space telescope was able to

998

00:40:01,109 --> 00:39:59,359

observe the cosmos with the kind of

999

00:40:02,950 --> 00:40:01,119

intricate detail

1000

00:40:05,109 --> 00:40:02,960

that we observed with our human eyeballs

1001
00:40:07,349 --> 00:40:05,119
it means that we now understand much

1002
00:40:09,190 --> 00:40:07,359
more about our universe than we ever

1003
00:40:11,829 --> 00:40:09,200
would have known had it not been for

1004
00:40:14,710 --> 00:40:11,839
hubble that we have

1005
00:40:17,670 --> 00:40:14,720
not only young people students

1006
00:40:18,790 --> 00:40:17,680
but now professionals who have grown up

1007
00:40:20,710 --> 00:40:18,800
with hubble

1008
00:40:23,109 --> 00:40:20,720
and who have had hubble change their

1009
00:40:25,430 --> 00:40:23,119
lives and change their minds about about

1010
00:40:27,349 --> 00:40:25,440
careers because they saw a hubble image

1011
00:40:29,270 --> 00:40:27,359
and decided that you know i don't really

1012
00:40:31,750 --> 00:40:29,280
think i like science but i think i want

1013
00:40:34,069 --> 00:40:31,760

to try it because i want to go take part

1014

00:40:35,829 --> 00:40:34,079

in in doing something with this

1015

00:40:37,030 --> 00:40:35,839

particular instrument that makes these

1016

00:40:39,030 --> 00:40:37,040

incredible

1017

00:40:41,190 --> 00:40:39,040

visual images for people so i think it

1018

00:40:43,430 --> 00:40:41,200

has changed not just textbooks but

1019

00:40:45,349 --> 00:40:43,440

people's lives we're on a never-ending

1020

00:40:47,190 --> 00:40:45,359

journey and the hubble space telescope

1021

00:41:02,710 --> 00:40:47,200

celebrates its quarter century of

1022

00:41:06,069 --> 00:41:03,829

so

1023

00:41:09,349 --> 00:41:06,079

what's really uh of course as you know

1024

00:41:10,309 --> 00:41:09,359

the hubble was built to be serviced on

1025

00:41:11,670 --> 00:41:10,319

orbit

1026
00:41:14,150 --> 00:41:11,680
and there were many pieces that were

1027
00:41:16,630 --> 00:41:14,160
designed just for that but

1028
00:41:18,230 --> 00:41:16,640
as it turns out over the years a lot of

1029
00:41:21,430 --> 00:41:18,240
the work that was done

1030
00:41:24,710 --> 00:41:21,440
was not intended to be done by a

1031
00:41:27,190 --> 00:41:24,720
spacewalking astronaut uh as someone

1032
00:41:29,190 --> 00:41:27,200
once told me it's like working on your

1033
00:41:32,230 --> 00:41:29,200
car in the cold

1034
00:41:34,309 --> 00:41:32,240
in ski gloves and i believe that person

1035
00:41:36,470 --> 00:41:34,319
is our next speaker but before i bring

1036
00:41:39,349 --> 00:41:36,480
him up here i have to do a little humble

1037
00:41:41,270 --> 00:41:39,359
brag i was the first reporter who had an

1038
00:41:43,030 --> 00:41:41,280

opportunity to interview the hubble

1039

00:41:45,109 --> 00:41:43,040

repairman

1040

00:41:46,630 --> 00:41:45,119

on the job site well at least the

1041

00:42:00,710 --> 00:41:46,640

practice job site take a look at this

1042

00:42:05,750 --> 00:42:03,349

and the hole is big leverage

1043

00:42:08,150 --> 00:42:05,760

to uh take the cards out

1044

00:42:09,270 --> 00:42:08,160

i'm not hurting anything i hope

1045

00:42:12,069 --> 00:42:09,280

okay

1046

00:42:15,109 --> 00:42:12,079

couple of times

1047

00:42:17,990 --> 00:42:15,119

just to get a feel for the trigger

1048

00:42:18,710 --> 00:42:18,000

this training is

1049

00:42:20,069 --> 00:42:18,720

so

1050

00:42:22,150 --> 00:42:20,079

you know you got a good job when your

1051
00:42:24,630 --> 00:42:22,160
rich friends call you up and say can you

1052
00:42:26,390 --> 00:42:24,640
get me in that pool in houston i say no

1053
00:42:30,630 --> 00:42:26,400
sorry

1054
00:42:32,470 --> 00:42:30,640
grunsfeld who's got an even better job

1055
00:42:34,230 --> 00:42:32,480
in any case uh that was one of my

1056
00:42:35,270 --> 00:42:34,240
all-time favorite opportunities as a

1057
00:42:38,309 --> 00:42:35,280
reporter

1058
00:42:39,270 --> 00:42:38,319
and uh a truly extraordinary interview

1059
00:42:40,710 --> 00:42:39,280
and it wouldn't have happened if it

1060
00:42:42,550 --> 00:42:40,720
hadn't been for john grunsfeld in the

1061
00:42:44,390 --> 00:42:42,560
rem the rest of that crew the last

1062
00:42:45,670 --> 00:42:44,400
hubble repair mission advocating for me

1063
00:42:48,470 --> 00:42:45,680

to be there

1064

00:42:49,670 --> 00:42:48,480

john is now um the science boss at

1065

00:42:51,430 --> 00:42:49,680

headquarters

1066

00:42:53,589 --> 00:42:51,440

uh which in some ways means the fun is

1067

00:42:55,349 --> 00:42:53,599

over for him too but that's all right

1068

00:42:57,349 --> 00:42:55,359

somebody's got to do that job too please

1069

00:43:07,030 --> 00:42:57,359

welcome the hubble repair

1070

00:43:10,630 --> 00:43:08,870

thank you very much miles for that kind

1071

00:43:12,470 --> 00:43:10,640

introduction and for joining me in the

1072

00:43:14,710 --> 00:43:12,480

neutral buoyancy laboratory while we

1073

00:43:16,950 --> 00:43:14,720

were practicing and training to repair

1074

00:43:18,710 --> 00:43:16,960

the advanced camera for surveys

1075

00:43:20,470 --> 00:43:18,720

as an nbl diver

1076
00:43:22,390 --> 00:43:20,480
we now count you as a member of our

1077
00:43:24,790 --> 00:43:22,400
hubble team

1078
00:43:26,470 --> 00:43:24,800
tonight we celebrate

1079
00:43:28,870 --> 00:43:26,480
we celebrate one of the grandest

1080
00:43:31,109 --> 00:43:28,880
adventures in human history certainly in

1081
00:43:33,349 --> 00:43:31,119
the history of our space program and as

1082
00:43:35,030 --> 00:43:33,359
you look around that's quite a feat

1083
00:43:36,710 --> 00:43:35,040
for me working with the hubble team has

1084
00:43:37,829 --> 00:43:36,720
been the highlight of my life without

1085
00:43:40,390 --> 00:43:37,839
doubt

1086
00:43:43,750 --> 00:43:40,400
there's nowhere i'd rather be

1087
00:43:45,990 --> 00:43:43,760
than in a spacesuit hugging hubble

1088
00:43:49,270 --> 00:43:46,000

the story of hubble with all its twists

1089

00:43:50,390 --> 00:43:49,280

and turns is almost too fantastic to be

1090

00:43:52,870 --> 00:43:50,400

true

1091

00:43:55,190 --> 00:43:52,880

but it is and we all lived it

1092

00:43:57,030 --> 00:43:55,200

from the launch to the trouble with the

1093

00:43:58,470 --> 00:43:57,040

solar array on deployment to the first

1094

00:44:00,390 --> 00:43:58,480

servicing mission

1095

00:44:02,470 --> 00:44:00,400

where women and men

1096

00:44:04,710 --> 00:44:02,480

in white suits rode to the rescue like

1097

00:44:06,390 --> 00:44:04,720

an old western

1098

00:44:09,430 --> 00:44:06,400

to the missions and the politics that

1099

00:44:12,950 --> 00:44:09,440

followed the hubble story is a narrative

1100

00:44:15,030 --> 00:44:12,960

about the most amazing team in the world

1101
00:44:18,790 --> 00:44:15,040
more than a team

1102
00:44:23,589 --> 00:44:22,150
our mission at nasa is to innovate

1103
00:44:24,790 --> 00:44:23,599
explore

1104
00:44:26,390 --> 00:44:24,800
discover

1105
00:44:27,829 --> 00:44:26,400
and inspire

1106
00:44:30,230 --> 00:44:27,839
we are searching for answers to

1107
00:44:31,030 --> 00:44:30,240
fundamental questions where do we come

1108
00:44:32,710 --> 00:44:31,040
from

1109
00:44:34,870 --> 00:44:32,720
where are we going

1110
00:44:36,390 --> 00:44:34,880
are we alone

1111
00:44:39,910 --> 00:44:36,400
hubble is helping us to answer these

1112
00:44:41,030 --> 00:44:39,920
questions and much much more

1113
00:44:42,630 --> 00:44:41,040

hubble

1114

00:44:46,069 --> 00:44:42,640
and all of our nasa activities are

1115

00:44:48,230 --> 00:44:46,079
funded by taxpayer investments in nasa

1116

00:44:50,390 --> 00:44:48,240
many of those taxpayers are not as not

1117

00:44:52,950 --> 00:44:50,400
as fortunate as we are

1118

00:44:55,589 --> 00:44:52,960
we all have a special responsibility to

1119

00:44:58,230 --> 00:44:55,599
the nation to deliver

1120

00:45:04,710 --> 00:44:58,240
hubble delivers

1121

00:45:06,550 --> 00:45:04,720
motivation to learn science technology

1122

00:45:08,309 --> 00:45:06,560
engineering and math for millions of

1123

00:45:11,990 --> 00:45:08,319
students

1124

00:45:14,470 --> 00:45:12,000
not only in our nation but worldwide

1125

00:45:17,829 --> 00:45:14,480
many scientists reached the peak of

1126

00:45:19,990 --> 00:45:17,839

their productivity in their twenties

1127

00:45:23,910 --> 00:45:20,000

think you would all agree

1128

00:45:26,150 --> 00:45:23,920

that hubble is at its peak right now

1129

00:45:28,710 --> 00:45:26,160

i want to personally thank all of you

1130

00:45:30,630 --> 00:45:28,720

who contributed to the hubble program

1131

00:45:34,630 --> 00:45:30,640

for doing your job

1132

00:45:39,270 --> 00:45:36,790

those of you who know me

1133

00:45:42,710 --> 00:45:39,280

know i give homework

1134

00:45:44,550 --> 00:45:42,720

my charge for you tonight is twofold

1135

00:45:46,150 --> 00:45:44,560

first of all

1136

00:45:48,550 --> 00:45:46,160

make sure and thank your loved ones if

1137

00:45:50,790 --> 00:45:48,560

they're not here for allowing you to do

1138

00:45:52,710 --> 00:45:50,800

these great things

1139

00:45:53,670 --> 00:45:52,720

and second i ask you to redouble your

1140

00:45:56,550 --> 00:45:53,680

efforts

1141

00:46:00,470 --> 00:45:56,560

to share the wonder and awe of hubble as

1142

00:46:02,309 --> 00:46:00,480

it continues its voyage of discovery

1143

00:46:04,309 --> 00:46:02,319

now it is my pleasure

1144

00:46:06,069 --> 00:46:04,319

to bring administrator charlie bolden

1145

00:46:08,950 --> 00:46:06,079

back to the stage

1146

00:46:11,510 --> 00:46:08,960

to begin our award ceremony

1147

00:46:12,390 --> 00:46:11,520

and to do that

1148

00:46:17,109 --> 00:46:12,400

i'd

1149

00:46:21,510 --> 00:46:18,550

charlie

1150

00:46:23,030 --> 00:46:21,520

it's a pleasure working with you

1151
00:46:24,710 --> 00:46:23,040
and for your role in launching the

1152
00:46:26,790 --> 00:46:24,720
scientific legacy of the hubble space

1153
00:46:28,390 --> 00:46:26,800
telescope and your team

1154
00:46:29,670 --> 00:46:28,400
we'd like to help you celebrate this

1155
00:46:31,589 --> 00:46:29,680
special day

1156
00:46:46,150 --> 00:46:31,599
with one of the new hubble images thank

1157
00:46:54,829 --> 00:46:48,470
not very often that i'm surprised but

1158
00:47:00,470 --> 00:46:58,150
much okay on to the awards

1159
00:47:05,750 --> 00:47:03,190
the award for for the science team

1160
00:47:07,990 --> 00:47:05,760
this award recognizes the spectacular

1161
00:47:10,870 --> 00:47:08,000
science that the hubble science team has

1162
00:47:13,589 --> 00:47:10,880
enabled and carried out this science

1163
00:47:14,630 --> 00:47:13,599

rewrote our textbooks it won a nobel

1164

00:47:16,470 --> 00:47:14,640

prize

1165

00:47:17,910 --> 00:47:16,480

and it showed us our place in the

1166

00:47:19,750 --> 00:47:17,920

universe

1167

00:47:22,309 --> 00:47:19,760

accepting on behalf of the science team

1168

00:47:23,670 --> 00:47:22,319

is my very good friend kathy flanagan

1169

00:47:41,750 --> 00:47:23,680

the interim director of the space

1170

00:47:46,630 --> 00:47:44,309

reward for the servicing mission teams

1171

00:47:48,870 --> 00:47:46,640

without the quick thinking and the hard

1172

00:47:50,390 --> 00:47:48,880

work of the servicing mission teams

1173

00:47:53,510 --> 00:47:50,400

hubble would not be the scientific

1174

00:47:56,549 --> 00:47:53,520

legacy it is today these teams are the

1175

00:47:57,990 --> 00:47:56,559

embodiment of resilience

1176
00:48:00,710 --> 00:47:58,000
their work ensures that hubble will

1177
00:48:03,349 --> 00:48:00,720
continue to produce great science into

1178
00:48:05,990 --> 00:48:03,359
the 2020s and hopefully beyond

1179
00:48:08,950 --> 00:48:06,000
accepting on behalf of those teams is

1180
00:48:10,150 --> 00:48:08,960
frank sepi seppolino from goddard space

1181
00:48:12,230 --> 00:48:10,160
flight center

1182
00:48:39,670 --> 00:48:12,240
who pioneered

1183
00:48:44,870 --> 00:48:42,549
the award for the european space agency

1184
00:48:47,670 --> 00:48:44,880
esa has been an essential partner with

1185
00:48:49,670 --> 00:48:47,680
us on hubble providing the solar panels

1186
00:48:50,790 --> 00:48:49,680
that power hubble and the faint optic

1187
00:48:54,549 --> 00:48:50,800
camera

1188
00:48:56,470 --> 00:48:54,559

esa astronauts helped service the hubble

1189

00:48:58,470 --> 00:48:56,480

that critical partnership continues with

1190

00:48:59,829 --> 00:48:58,480

hubble's successor the james webb space

1191

00:49:02,150 --> 00:48:59,839

telescope

1192

00:49:03,750 --> 00:49:02,160

accepting on behalf of the issa team

1193

00:49:28,549 --> 00:49:03,760

jean-jacques dordan

1194

00:49:28,559 --> 00:49:33,109

just to

1195

00:49:37,030 --> 00:49:35,190

since you have complained a lot about

1196

00:49:39,349 --> 00:49:37,040

solar panels

1197

00:49:41,829 --> 00:49:39,359

charlie

1198

00:49:44,390 --> 00:49:41,839

i wish to give you back

1199

00:49:57,030 --> 00:49:44,400

the original solar panel

1200

00:49:57,040 --> 00:50:05,430

sts-31

1201
00:50:09,589 --> 00:50:07,829
the award to astronaut team

1202
00:50:11,670 --> 00:50:09,599
it's a particular pleasure to see how

1203
00:50:13,670 --> 00:50:11,680
many of the hubble astronauts have been

1204
00:50:15,030 --> 00:50:13,680
able to make it to this 25th anniversary

1205
00:50:16,549 --> 00:50:15,040
ceremony

1206
00:50:18,950 --> 00:50:16,559
including the ones standing up here with

1207
00:50:24,069 --> 00:50:21,750
the astronaut retire team

1208
00:50:26,630 --> 00:50:24,079
embodies the collaboration between

1209
00:50:28,549 --> 00:50:26,640
manned space flight and science that

1210
00:50:30,470 --> 00:50:28,559
servicing missions are

1211
00:50:32,870 --> 00:50:30,480
accepting on behalf of the astronaut

1212
00:50:34,710 --> 00:50:32,880
team is john grunfeld

1213
00:50:36,390 --> 00:50:34,720

associate manager administrator for

1214

00:50:38,470 --> 00:50:36,400

science at nasa

1215

00:50:40,470 --> 00:50:38,480

veteran of three hubble servicing

1216

00:50:42,390 --> 00:50:40,480

admissions and affectionately known to

1217

00:50:55,109 --> 00:50:42,400

all of us hubble huggers here gathered

1218

00:50:58,630 --> 00:50:56,790

the award for the payload the mission

1219

00:51:00,470 --> 00:50:58,640

and the launch ops team

1220

00:51:02,630 --> 00:51:00,480

this award recognizes the work of the

1221

00:51:05,510 --> 00:51:02,640

teams who prepared the crews for the

1222

00:51:07,430 --> 00:51:05,520

evas prepared the payloads for the

1223

00:51:09,829 --> 00:51:07,440

servicing missions and prepared and

1224

00:51:12,309 --> 00:51:09,839

operated the shuttle for each launch

1225

00:51:13,349 --> 00:51:12,319

accepting on behalf of that team of ten

1226
00:51:15,510 --> 00:51:13,359
thousand

1227
00:51:17,109 --> 00:51:15,520
is jeffrey bantal who was a flight

1228
00:51:18,950 --> 00:51:17,119
director at johnson space center for

1229
00:51:35,190 --> 00:51:18,960
three of the six

1230
00:51:39,430 --> 00:51:37,030
the award for development

1231
00:51:42,069 --> 00:51:39,440
this award recognizes the start nearly

1232
00:51:44,470 --> 00:51:42,079
45 years ago of the effort to develop

1233
00:51:45,670 --> 00:51:44,480
the telescope and its overall science

1234
00:51:47,990 --> 00:51:45,680
program

1235
00:51:49,349 --> 00:51:48,000
accepting on behalf of those teams is

1236
00:51:51,589 --> 00:51:49,359
robert o'dell

1237
00:51:53,510 --> 00:51:51,599
who was the hubble project scientist at

1238
00:52:13,270 --> 00:51:53,520

marshall space flight center where much

1239

00:52:17,670 --> 00:52:15,349

of course hubble is a collaboration

1240

00:52:19,750 --> 00:52:17,680

between the government and

1241

00:52:21,670 --> 00:52:19,760

and it is industry that actually cuts

1242

00:52:23,589 --> 00:52:21,680

most of the metal and solders most of

1243

00:52:26,309 --> 00:52:23,599

the parts together that make the

1244

00:52:27,990 --> 00:52:26,319

beautiful hubble space telescope

1245

00:52:30,390 --> 00:52:28,000

the main industrial partner for the

1246

00:52:32,390 --> 00:52:30,400

hubble was lockheed martin and accepting

1247

00:52:33,990 --> 00:52:32,400

on behalf of our industrial team

1248

00:52:35,670 --> 00:52:34,000

is jim crocker

1249

00:52:55,750 --> 00:52:35,680

head of the civil space division at

1250

00:52:59,670 --> 00:52:58,150

and last and in no way least the award

1251
00:53:01,030 --> 00:52:59,680
for the goddard space flight project

1252
00:53:03,349 --> 00:53:01,040
team

1253
00:53:05,670 --> 00:53:03,359
hubble may be unique in the history of

1254
00:53:07,750 --> 00:53:05,680
nasa in terms of the size and the

1255
00:53:09,109 --> 00:53:07,760
breadth of the teams that have worked on

1256
00:53:11,190 --> 00:53:09,119
it

1257
00:53:12,549 --> 00:53:11,200
including teams at virtually every nasa

1258
00:53:16,230 --> 00:53:12,559
center

1259
00:53:18,069 --> 00:53:16,240
provided the overall leadership and the

1260
00:53:19,829 --> 00:53:18,079
direction that made hubble the great

1261
00:53:21,910 --> 00:53:19,839
success that it is

1262
00:53:24,309 --> 00:53:21,920
accepting behalf of the goddard space

1263
00:53:26,630 --> 00:53:24,319

flight center center hubble team

1264

00:53:28,710 --> 00:53:26,640

is jennifer wiseman the hubble senior

1265

00:53:49,190 --> 00:53:28,720

project scientist at goddard's wayside

1266

00:53:53,030 --> 00:53:51,109

without the work of all thousands of you

1267

00:53:56,309 --> 00:53:53,040

in the audience and at least a thousand

1268

00:53:58,549 --> 00:53:56,319

more who couldn't make it here tonight

1269

00:53:59,910 --> 00:53:58,559

we would not have the hubble we have

1270

00:54:02,790 --> 00:53:59,920

today

1271

00:54:05,430 --> 00:54:02,800

this truly was a team effort

1272

00:54:07,349 --> 00:54:05,440

you will all be receiving personalized

1273

00:54:09,270 --> 00:54:07,359

certificates of commendation for your

1274

00:54:10,470 --> 00:54:09,280

exemplary work

1275

00:54:24,549 --> 00:54:10,480

thank you and enjoy the rest of the

1276

00:54:24,559 --> 00:54:52,150

glad you did

1277

00:54:55,910 --> 00:54:53,750

give them all one more round of applause

1278

00:54:58,710 --> 00:54:55,920

that's um

1279

00:55:00,390 --> 00:54:58,720

tremendous accomplishment very inspiring

1280

00:55:03,750 --> 00:55:00,400

you know the hubble

1281

00:55:05,430 --> 00:55:03,760

hubble space telescope is a story of uh

1282

00:55:07,670 --> 00:55:05,440

exploration and understanding our

1283

00:55:09,990 --> 00:55:07,680

universe but it is also one which

1284

00:55:12,630 --> 00:55:10,000

teaches us a lot about perseverance and

1285

00:55:14,549 --> 00:55:12,640

what humanity can do i i always think of

1286

00:55:15,990 --> 00:55:14,559

that scene in the movie naked gun do you

1287

00:55:17,510 --> 00:55:16,000

remember the scene where leslie

1288

00:55:18,789 --> 00:55:17,520

nielsen's in the bar drowning his

1289

00:55:20,549 --> 00:55:18,799

sorrows and

1290

00:55:22,789 --> 00:55:20,559

there's a series of portraits of great

1291

00:55:24,710 --> 00:55:22,799

disasters there's the hindenburg and the

1292

00:55:27,829 --> 00:55:24,720

edsel and right beside it is the hubble

1293

00:55:30,069 --> 00:55:27,839

space telescope it was a punch line

1294

00:55:31,829 --> 00:55:30,079

and uh within a few years what a

1295

00:55:33,670 --> 00:55:31,839

turnaround what a turnaround and that

1296

00:55:34,390 --> 00:55:33,680

didn't happen by magic that happened

1297

00:55:36,789 --> 00:55:34,400

because

1298

00:55:38,710 --> 00:55:36,799

uh of all of you in this room and

1299

00:55:40,470 --> 00:55:38,720

and others who are not here with us

1300

00:55:42,870 --> 00:55:40,480

tonight and who are not with us period

1301
00:55:44,470 --> 00:55:42,880
and we want to salute you all for

1302
00:55:48,870 --> 00:55:44,480
your perseverance as well as your

1303
00:55:54,230 --> 00:55:50,870
it's a tough fact to follow

1304
00:55:55,750 --> 00:55:54,240
and we have uh that act being built as

1305
00:55:57,109 --> 00:55:55,760
we speak

1306
00:55:59,349 --> 00:55:57,119
with any luck

1307
00:56:01,030 --> 00:55:59,359
hubble will still be

1308
00:56:02,630 --> 00:56:01,040
in its prime in its

1309
00:56:04,950 --> 00:56:02,640
later twenties

1310
00:56:07,750 --> 00:56:04,960
as the james webb space telescope takes

1311
00:56:09,589 --> 00:56:07,760
its perch into lagrange point what out

1312
00:56:11,910 --> 00:56:09,599
of reach of the hubble repair man and

1313
00:56:14,230 --> 00:56:11,920

and human beings for now

1314

00:56:17,829 --> 00:56:14,240

but uh it does have the opportunity to

1315

00:56:18,789 --> 00:56:17,839

take us farther out and and thus further

1316

00:56:20,710 --> 00:56:18,799

back

1317

00:56:21,990 --> 00:56:20,720

and we look forward to seeing those

1318

00:56:24,230 --> 00:56:22,000

images and wouldn't it be good if they

1319

00:56:25,270 --> 00:56:24,240

were working together

1320

00:56:26,549 --> 00:56:25,280

um

1321

00:56:28,150 --> 00:56:26,559

somehow

1322

00:56:30,069 --> 00:56:28,160

so uh yeah

1323

00:56:32,710 --> 00:56:30,079

so yeah and a round of applause to him

1324

00:56:37,109 --> 00:56:34,390

a little cameo appearance from some of

1325

00:56:39,750 --> 00:56:38,470

it's good to have a nobel laureate in

1326

00:56:41,990 --> 00:56:39,760

the house you know you never know when

1327

00:56:45,109 --> 00:56:42,000

you need one right

1328

00:56:47,510 --> 00:56:45,119

anyway um so i wish all of you godspeed

1329

00:56:49,670 --> 00:56:47,520

i wish hubble godspeed and we leave you

1330

00:57:01,430 --> 00:56:49,680

as i say goodnight with a look at what

1331

00:57:07,349 --> 00:57:03,750

we tried some things as many people said

1332

00:57:10,309 --> 00:57:07,359

was impossible but we've achieved that

1333

00:57:12,549 --> 00:57:10,319

and we wish hubble the very best

1334

00:57:14,870 --> 00:57:12,559

the hubble space telescope offered its

1335

00:57:19,109 --> 00:57:14,880

greatest performance yet seeking clues

1336

00:57:21,349 --> 00:57:19,119

to how and when the universe was created

1337

00:57:25,030 --> 00:57:21,359

with the hubble we made incredible

1338

00:57:25,040 --> 00:57:29,109

but also told us where our limits were

1339

00:57:34,710 --> 00:57:31,030

as hubble stayed deeper and deeper into

1340

00:57:36,230 --> 00:57:34,720

space we began to run out of galaxies

1341

00:57:38,829 --> 00:57:36,240

does that mean the galaxies come to the

1342

00:57:44,710 --> 00:57:42,630

no we realized what we should really do

1343

00:57:48,549 --> 00:57:44,720

is build the largest space telescope

1344

00:57:50,710 --> 00:57:48,559

humanity has ever conceived of

1345

00:57:52,870 --> 00:57:50,720

this is the next generation telescope

1346

00:58:01,030 --> 00:57:52,880

and will show us a universe we have

1347

00:58:04,549 --> 00:58:02,789

the hubble telescope can only see what

1348

00:58:06,309 --> 00:58:04,559

you can see with your eye the james webb

1349

00:58:09,589 --> 00:58:06,319

telescope looks at areas that the hubble

1350

00:58:12,230 --> 00:58:09,599

could never see just the physical size

1351
00:58:14,470 --> 00:58:12,240
of the mirror is much much larger the

1352
00:58:16,230 --> 00:58:14,480
mirror is so big we need to slice it

1353
00:58:20,630 --> 00:58:16,240
into smaller segments so we can fold it

1354
00:58:25,030 --> 00:58:22,390
there's nothing i can say that can come

1355
00:58:27,270 --> 00:58:25,040
close to describing how technically

1356
00:58:29,349 --> 00:58:27,280
difficult building this telescope is

1357
00:58:31,349 --> 00:58:29,359
every team is so anxiously looking at

1358
00:58:32,630 --> 00:58:31,359
their part is the membrane shaped right

1359
00:58:34,870 --> 00:58:32,640
is that the right material is it going

1360
00:58:37,109 --> 00:58:34,880
to hold it in place will it deploy

1361
00:58:41,190 --> 00:58:37,119
hubble you could go up and fix this one

1362
00:58:46,150 --> 00:58:43,750
we can't afford a mistake we have to get

1363
00:58:47,910 --> 00:58:46,160

this right the first time the only time

1364

00:58:50,470 --> 00:58:47,920

we have to hit the pitch out of the park

1365

00:58:52,789 --> 00:58:50,480

a million miles out of the park

1366

00:58:55,349 --> 00:58:52,799

it's within our grasp for the first time

1367

00:58:59,829 --> 00:58:55,359

in human history to make a discovery

1368

00:59:05,030 --> 00:59:02,390

this telescope is going to capture the

1369

00:59:07,109 --> 00:59:05,040

very first light of the universe what we

1370

00:59:09,589 --> 00:59:07,119

can do is fill in when did the first

1371

00:59:12,069 --> 00:59:09,599

stars and galaxies turn on we'll be able

1372

00:59:14,230 --> 00:59:12,079

to peer inside of the very cold clouds

1373

00:59:16,309 --> 00:59:14,240

of gas and dust where baby stars and

1374

00:59:17,990 --> 00:59:16,319

planets are being formed

1375

00:59:20,150 --> 00:59:18,000

in our own milky way galaxy we have

1376

00:59:22,150 --> 00:59:20,160

hundreds of billions of stars another

1377

00:59:24,309 --> 00:59:22,160

earth is undoubtedly out there the

1378

00:59:29,829 --> 00:59:24,319

harder question we face right now is

1379

00:59:32,950 --> 00:59:31,349

one of the cool things about flying is

1380

00:59:34,549 --> 00:59:32,960

it makes me think about what other

1381

00:59:36,230 --> 00:59:34,559

worlds are out there that are like this

1382

00:59:37,510 --> 00:59:36,240

that have water and land and maybe

1383

00:59:38,950 --> 00:59:37,520

civilization

1384

00:59:40,870 --> 00:59:38,960

everyone's sort of trapped in their own

1385

00:59:43,829 --> 00:59:40,880

head and i think that we're trying to

1386

00:59:45,670 --> 00:59:43,839

find life elsewhere because we're lonely

1387

00:59:47,430 --> 00:59:45,680

i think that's why we do these things

1388

00:59:49,270 --> 00:59:47,440

this is a chance to measure myself

1389

00:59:51,510 --> 00:59:49,280

against one of the hardest problems man

1390

00:59:53,910 --> 00:59:51,520

has set himself the goal to do it's the

1391

00:59:56,470 --> 00:59:53,920

engineering job of a lifetime we want to

1392

00:59:58,150 --> 00:59:56,480

see what's at the outer edges of what's

1393

01:00:00,390 --> 00:59:58,160

possible and then we

1394

01:00:01,750 --> 01:00:00,400

push a little farther it's not just a

1395

01:00:03,270 --> 01:00:01,760

machine built by engineers and

1396

01:00:07,750 --> 01:00:03,280

scientists to look out for the universe

1397

01:00:12,710 --> 01:00:10,870

i have to believe with all that galaxy

1398

01:00:15,510 --> 01:00:12,720

up there that someone else is looking up

1399

01:00:17,589 --> 01:00:15,520

and sees me looking back even if we're

1400

01:00:19,589 --> 01:00:17,599

one in a million there's billions and

1401

01:00:21,190 --> 01:00:19,599

billions and billions within our

1402

01:00:22,630 --> 01:00:21,200

generation we might be able to answer

1403

01:00:23,670 --> 01:00:22,640

the question are we alone in the