

HUBBLE
25



HUBBLE

hangouts

Hubble's 25th Anniversary Celebration!!

Friday April 24, 2015 11am PT, 2pm EDT, 6pm UTC

1
00:00:08,720 --> 00:00:05,690
hello everybody and welcome to a special

2
00:00:10,970 --> 00:00:08,730
Hubble 25th anniversary edition of our

3
00:00:12,230 --> 00:00:10,980
Hubble hangouts my name is Tony Darnell

4
00:00:14,419 --> 00:00:12,240
I work at the Space Telescope Science

5
00:00:16,730 --> 00:00:14,429
Institute and this week we've got

6
00:00:18,380 --> 00:00:16,740
something slightly different plans as

7
00:00:20,359 --> 00:00:18,390
you've already noticed this is a friday

8
00:00:25,040 --> 00:00:20,369
and not a Thursday but it's also a very

9
00:00:27,679 --> 00:00:25,050
important day today marks 25 years of

10
00:00:30,439 --> 00:00:27,689
the hubble space telescope orbiting over

11
00:00:33,200 --> 00:00:30,449
the earth and we've been celebrating it

12
00:00:34,880 --> 00:00:33,210
all week yesterday was a the institute

13
00:00:36,979 --> 00:00:34,890

was full of activities all kinds of

14

00:00:38,900 --> 00:00:36,989

really fun things and we throughout the

15

00:00:40,670 --> 00:00:38,910

year we've been doing social media

16

00:00:42,530 --> 00:00:40,680

activities and things like that and so

17

00:00:45,619 --> 00:00:42,540

it's been a real whirlwind of activity

18

00:00:47,540 --> 00:00:45,629

the show of support to for the for the

19

00:00:49,069 --> 00:00:47,550

telescope from the public has really

20

00:00:50,810 --> 00:00:49,079

literally been overwhelming I've been

21

00:00:52,400 --> 00:00:50,820

monitoring Twitter on my tweet deck and

22

00:00:54,680 --> 00:00:52,410

it's more like it's been like an

23

00:00:58,430 --> 00:00:54,690

odometer with all the tweets go oh it's

24

00:01:01,369 --> 00:00:58,440

been it's been absolutely I can't keep

25

00:01:02,810 --> 00:01:01,379

up with it I tried it got to a point

26

00:01:04,100 --> 00:01:02,820

where I just couldn't do it so next week

27

00:01:05,390 --> 00:01:04,110

I'm going to be getting some statistics

28

00:01:07,039 --> 00:01:05,400

on some of those to see what happened

29

00:01:09,679 --> 00:01:07,049

but it I want to thank you all so much

30

00:01:12,080 --> 00:01:09,689

for the warm messages of congratulations

31

00:01:14,539 --> 00:01:12,090

and and support for this wonderful

32

00:01:15,950 --> 00:01:14,549

telescope so today what we're going to

33

00:01:19,130 --> 00:01:15,960

do is we're going to take a minute and

34

00:01:20,719 --> 00:01:19,140

just kind of appreciate a Hubble in a

35

00:01:23,030 --> 00:01:20,729

variety of ways what we're hoping is

36

00:01:24,679 --> 00:01:23,040

that while we're on the Hangout will get

37

00:01:27,679 --> 00:01:24,689

a lot of interaction from you guys we

38

00:01:29,719 --> 00:01:27,689

hope that you will chat with us and talk

39

00:01:32,120 --> 00:01:29,729

with us and tell us what what Hubble

40

00:01:34,490 --> 00:01:32,130

means to you because we'd love to hear

41

00:01:37,460 --> 00:01:34,500

and we like to talk about it today and

42

00:01:38,749 --> 00:01:37,470

I'll I guess I'll it's God you want to

43

00:01:41,780 --> 00:01:38,759

tell people how they can interact with

44

00:01:43,190 --> 00:01:41,790

us yeah so the best way for you to

45

00:01:45,980 --> 00:01:43,200

interact with us since you're watching

46

00:01:47,630 --> 00:01:45,990

us on YouTube and as on the very bottom

47

00:01:49,190 --> 00:01:47,640

left you'll see some gold lettering

48

00:01:52,069 --> 00:01:49,200

there it says that we're answering

49

00:01:53,300 --> 00:01:52,079

questions and it opens up the Q&A app

50

00:01:56,480 --> 00:01:53,310

and it gives you a brand-new experience

51
00:01:57,980 --> 00:01:56,490
you can ask us questions but also make

52
00:02:00,920 --> 00:01:57,990
comments and what we're really asking

53
00:02:03,649 --> 00:02:00,930
for today is how has the Hubble Space

54
00:02:06,740 --> 00:02:03,659
Telescope impacted you has it inspired

55
00:02:08,660 --> 00:02:06,750
you in any ways and we have two amazing

56
00:02:10,490 --> 00:02:08,670
get or three amazing guests with us that

57
00:02:11,960 --> 00:02:10,500
created something through the

58
00:02:13,760 --> 00:02:11,970
inspiration from Hubble Space Telescope

59
00:02:15,560 --> 00:02:13,770
but we want to hear from you

60
00:02:17,360 --> 00:02:15,570
and how that's inspired you so you can

61
00:02:19,580 --> 00:02:17,370
do that there with the Q&A app on

62
00:02:22,460 --> 00:02:19,590
YouTube and Google Plus you can leave

63
00:02:27,140 --> 00:02:22,470

regular comments on YouTube and also in

64

00:02:31,430 --> 00:02:27,150

our event page and I'll try very hard to

65

00:02:34,190 --> 00:02:31,440

monitor Twitter with our hashtag I help

66

00:02:35,750 --> 00:02:34,200

out hang out yeah help the hashtag hub

67

00:02:37,910 --> 00:02:35,760

will hang out I'm monitoring that too so

68

00:02:42,590 --> 00:02:37,920

I'll be able to do that so I have Hubble

69

00:02:44,570 --> 00:02:42,600

25 up to but that is a whirlwind of

70

00:02:47,600 --> 00:02:44,580

everything that everyone is celebrating

71

00:02:50,150 --> 00:02:47,610

it if you want to I recommend going

72

00:02:52,130 --> 00:02:50,160

through the hashtag just to see all the

73

00:02:53,600 --> 00:02:52,140

amazing announcements going on but for

74

00:02:56,390 --> 00:02:53,610

this show we're going to be going over

75

00:02:58,940 --> 00:02:56,400

the Hubble hang out hashtag which is in

76
00:03:00,590 --> 00:02:58,950
below out Antonius lower third wonderful

77
00:03:02,870 --> 00:03:00,600
thank you Scott and we're joining us as

78
00:03:04,670 --> 00:03:02,880
she does every week is dr. carol

79
00:03:06,800 --> 00:03:04,680
christian she is the HS the Hubble Space

80
00:03:10,940 --> 00:03:06,810
Telescope outreach project scientist

81
00:03:17,540 --> 00:03:10,950
welcome Carol hello Ben week huh oh yeah

82
00:03:18,949 --> 00:03:17,550
and it's not over ok with us so let me

83
00:03:21,440 --> 00:03:18,959
go ahead and get started joining me here

84
00:03:24,650 --> 00:03:21,450
at the Institute is Georgia blade and

85
00:03:26,780 --> 00:03:24,660
she is the Hubble of press information

86
00:03:29,180 --> 00:03:26,790
officer for the Hubble Space Telescope

87
00:03:31,760 --> 00:03:29,190
for ISA the European Space Agency and

88
00:03:33,980 --> 00:03:31,770

she ran the she was in charge of the ode

89

00:03:36,500 --> 00:03:33,990

to Hubble video contest so welcome

90

00:03:37,760 --> 00:03:36,510

Georgia is great to have you so tell us

91

00:03:39,740 --> 00:03:37,770

about the god tell us about your

92

00:03:42,320 --> 00:03:39,750

experience how did it go it was

93

00:03:44,060 --> 00:03:42,330

fantastic to sum up I wanted to just

94

00:03:46,220 --> 00:03:44,070

thank everyone who sent in the video

95

00:03:48,640 --> 00:03:46,230

everyone who did took place in the crowd

96

00:03:50,990 --> 00:03:48,650

voting I was absolutely blown away

97

00:03:54,170 --> 00:03:51,000

having the opportunity to watch all of

98

00:03:56,449 --> 00:03:54,180

the submitted videos which I did and was

99

00:03:58,100 --> 00:03:56,459

incredible time took a lot of time but

100

00:04:00,470 --> 00:03:58,110

it was so rewarding because the amount

101
00:04:03,050 --> 00:04:00,480
of love and energy that people are put

102
00:04:06,290 --> 00:04:03,060
into creating these videos was well it

103
00:04:09,230 --> 00:04:06,300
just blew me away and so we started this

104
00:04:12,710 --> 00:04:09,240
competition back in February I opened up

105
00:04:14,780 --> 00:04:12,720
the entries then and since then we had a

106
00:04:17,659 --> 00:04:14,790
whole bunch of entries these were then

107
00:04:20,390 --> 00:04:17,669
shortlisted buy you guys the public the

108
00:04:21,979 --> 00:04:20,400
community on social media on our website

109
00:04:23,270 --> 00:04:21,989
now how did that work you had people

110
00:04:24,560 --> 00:04:23,280
just you had them all listed and they

111
00:04:26,600 --> 00:04:24,570
just liked it on Facebook because that

112
00:04:26,940 --> 00:04:26,610
what they did or none of the number of

113
00:04:30,030 --> 00:04:26,950

light

114

00:04:31,650 --> 00:04:30,040

yeah we used a program for it where it

115

00:04:34,410 --> 00:04:31,660

displays all of the entries in the two

116

00:04:36,720 --> 00:04:34,420

categories because we had the under-25s

117

00:04:38,460 --> 00:04:36,730

the board and Hubble's lifetime as you

118

00:04:40,650 --> 00:04:38,470

are at the public generation the Hubble

119

00:04:42,510 --> 00:04:40,660

generation and then you had the over 25

120

00:04:43,980 --> 00:04:42,520

so for each of those it displays all of

121

00:04:45,720 --> 00:04:43,990

the videos and yeah you have to be

122

00:04:47,940 --> 00:04:45,730

logged into Facebook and then you liked

123

00:04:49,920 --> 00:04:47,950

them and the six with the highest likes

124

00:04:52,530 --> 00:04:49,930

in both of the categories well in short

125

00:04:55,940 --> 00:04:52,540

listed and and those were judged by our

126
00:04:57,960 --> 00:04:55,950
panel of judges which was a mixture of

127
00:05:01,830 --> 00:04:57,970
scientists science outreach

128
00:05:05,250 --> 00:05:01,840
professionals artists and four of them

129
00:05:07,890 --> 00:05:05,260
more so a really mixed judging group and

130
00:05:09,840 --> 00:05:07,900
in the end as of today we have two

131
00:05:13,320 --> 00:05:09,850
winning videos one from each category

132
00:05:14,700 --> 00:05:13,330
one from each category and so let's why

133
00:05:16,530 --> 00:05:14,710
do we go ahead and get started with it

134
00:05:18,150 --> 00:05:16,540
let's start with we have the winners

135
00:05:19,680 --> 00:05:18,160
here they both agreed to join us in

136
00:05:21,780 --> 00:05:19,690
there hang out i'm so excited they did

137
00:05:24,180 --> 00:05:21,790
i'm gonna let georgia introduce them and

138
00:05:25,680 --> 00:05:24,190

well what we're going to do is going to

139

00:05:28,500 --> 00:05:25,690

start after the introductions and we're

140

00:05:31,230 --> 00:05:28,510

going to take a look at each video so

141

00:05:33,360 --> 00:05:31,240

first we have the winner of our over 25s

142

00:05:35,370 --> 00:05:33,370

to category and with a beautiful

143

00:05:38,190 --> 00:05:35,380

beautiful video which are about to see

144

00:05:40,650 --> 00:05:38,200

and using well actually you talk about

145

00:05:43,290 --> 00:05:40,660

it yourself so here's hope I get this

146

00:05:44,940 --> 00:05:43,300

right at 20 so if you could introduce

147

00:05:50,370 --> 00:05:44,950

yourself and just tell us a bit about

148

00:05:53,610 --> 00:05:50,380

your you and your video okay hello

149

00:05:57,170 --> 00:05:53,620

everyone I am delighted to be here it's

150

00:05:59,670 --> 00:05:57,180

an honor to me you have invited me

151
00:06:03,000 --> 00:05:59,680
anyway I would like to thank you for the

152
00:06:06,060 --> 00:06:03,010
opportunity to to participate to to

153
00:06:08,820 --> 00:06:06,070
these Howell hang out and I would like

154
00:06:12,060 --> 00:06:08,830
to congratulate the other contest winner

155
00:06:20,520 --> 00:06:12,070
and because i really enjoyed their their

156
00:06:24,000 --> 00:06:20,530
video too well my video is divided into

157
00:06:27,480 --> 00:06:24,010
into bar in the first part i make a

158
00:06:31,770 --> 00:06:27,490
little reflection on the fact that hovel

159
00:06:36,840 --> 00:06:31,780
discoveries hard on me and in the second

160
00:06:39,780 --> 00:06:36,850
part i show of my own a sequence of my

161
00:06:41,010 --> 00:06:39,790
own creation photograph that we are

162
00:06:45,119 --> 00:06:41,020
inspired

163
00:06:46,439 --> 00:06:45,129

and by having my cheese wonderful I i'm

164

00:06:47,790 --> 00:06:46,449

going to have some comments and i'm

165

00:06:49,920 --> 00:06:47,800

going to make after we watch it but

166

00:06:51,629 --> 00:06:49,930

Scott's getting it cued up for us now

167

00:06:54,149 --> 00:06:51,639

and we're going to we're going to take a

168

00:06:55,350 --> 00:06:54,159

look at it and then we'll we'll ask you

169

00:06:58,050 --> 00:06:55,360

some more about it okay are you ready

170

00:08:04,030 --> 00:06:58,060

Scott or do you need some more time okay

171

00:08:04,040 --> 00:10:05,880

Oh

172

00:10:13,240 --> 00:10:11,490

wow that was absolutely stunning yeah

173

00:10:15,670 --> 00:10:13,250

congratulation that is an outstanding

174

00:10:22,720 --> 00:10:15,680

vide so you also composed the music for

175

00:10:27,310 --> 00:10:22,730

that correct yes I I have a man in the

176
00:10:30,040 --> 00:10:27,320
past and but and I'm sorry I give some

177
00:10:32,110 --> 00:10:30,050
song from that time well I was

178
00:10:34,000 --> 00:10:32,120
absolutely beautiful I tell you I did

179
00:10:36,010 --> 00:10:34,010
when we got to the end of the first part

180
00:10:37,780 --> 00:10:36,020
I actually got a little lump in my

181
00:10:40,000 --> 00:10:37,790
throat I had a real emotional reaction

182
00:10:42,400 --> 00:10:40,010
that part about you know our place our

183
00:10:43,870 --> 00:10:42,410
home in the universe that was an amazing

184
00:10:45,460 --> 00:10:43,880
part for me it was really it really

185
00:10:47,650 --> 00:10:45,470
affected me and that's how you know

186
00:10:49,600 --> 00:10:47,660
you've got it because I've made one or

187
00:10:51,160 --> 00:10:49,610
two videos in my time and and when

188
00:10:52,630 --> 00:10:51,170

you're doing you can get an emotional

189

00:10:54,580 --> 00:10:52,640

reaction from something you've watched

190

00:10:57,280 --> 00:10:54,590

that's hard to do that's when you know

191

00:10:59,500 --> 00:10:57,290

you you hit it you really done you've

192

00:11:01,090 --> 00:10:59,510

gotten it right and I felt that way

193

00:11:05,320 --> 00:11:01,100

right in at the end of that first part

194

00:11:07,060 --> 00:11:05,330

now in the the you're also a

195

00:11:15,310 --> 00:11:07,070

photographer correct those were your

196

00:11:18,990 --> 00:11:15,320

feet photographs yes I and I was doing

197

00:11:23,890 --> 00:11:19,000

the photograph when the contest appears

198

00:11:27,550 --> 00:11:23,900

then I thought that it's a good and

199

00:11:31,120 --> 00:11:27,560

change due to to participate with my

200

00:11:33,670 --> 00:11:31,130

photograph that M did you look at the

201
00:11:36,190 --> 00:11:33,680
with with respect to the Hubble images

202
00:11:37,870 --> 00:11:36,200
did you see the Hubble image and then

203
00:11:39,790 --> 00:11:37,880
try to recreate that somehow with

204
00:11:41,200 --> 00:11:39,800
photography or did you already have some

205
00:11:43,750 --> 00:11:41,210
images and tried to match them up with

206
00:11:45,430 --> 00:11:43,760
things that that you thought would be a

207
00:11:51,820 --> 00:11:45,440
good match with with Hubble photographs

208
00:11:56,050 --> 00:11:51,830
or Hubble images and when I discovered

209
00:12:00,130 --> 00:11:56,060
the house mattress and what's very

210
00:12:03,640 --> 00:12:00,140
prevalent to me and because and I

211
00:12:08,380 --> 00:12:03,650
discovered that the universe changes

212
00:12:11,200 --> 00:12:08,390
constantly so I decided to make song

213
00:12:15,070 --> 00:12:11,210

Hubble images with more women shot to do

214

00:12:17,030 --> 00:12:15,080

and the collation baryonic that's

215

00:12:19,519 --> 00:12:17,040

outstanding wow that's the

216

00:12:22,189 --> 00:12:19,529

the the ones with via that where you

217

00:12:23,930 --> 00:12:22,199

matched up the Hubble of the the

218

00:12:26,300 --> 00:12:23,940

Horsehead Nebula I thought was right on

219

00:12:28,249 --> 00:12:26,310

as those were really great photos and it

220

00:12:30,139 --> 00:12:28,259

is someone that I i love doing

221

00:12:32,780 --> 00:12:30,149

photography myself I was blown away by

222

00:12:34,910 --> 00:12:32,790

photography skills as well as i make

223

00:12:37,069 --> 00:12:34,920

videos and like you're blending in the

224

00:12:38,600 --> 00:12:37,079

two things that really are passionate to

225

00:12:40,280 --> 00:12:38,610

me and i really really love the way that

226

00:12:43,280 --> 00:12:40,290

it came out so i thought was absolutely

227

00:12:46,519 --> 00:12:43,290

fantastic yeah it was really good I'm

228

00:12:50,809 --> 00:12:46,529

happy that you have enjoyed as much as I

229

00:12:55,730 --> 00:12:50,819

did create didn't do any questions you

230

00:12:57,680 --> 00:12:55,740

like to ask I understand that this is

231

00:13:05,120 --> 00:12:57,690

like a selection that you actually have

232

00:13:11,800 --> 00:13:05,130

more photographs very only a collection

233

00:13:17,509 --> 00:13:11,810

is actually larger yes the hotel has a

234

00:13:20,360 --> 00:13:17,519

20 photograph but in the video to do the

235

00:13:28,579 --> 00:13:20,370

day assembling I need to concentrate all

236

00:13:31,699 --> 00:13:28,589

day I choose the the rest I think do you

237

00:13:33,650 --> 00:13:31,709

have any are you a an artist by trade

238

00:13:35,210 --> 00:13:33,660

you do you do this for a living or do

239

00:13:37,280 --> 00:13:35,220

you do something you do you have a day

240

00:13:38,809 --> 00:13:37,290

job that's what we could call it in

241

00:13:44,389 --> 00:13:38,819

America do you have a job that isn't it

242

00:13:47,990 --> 00:13:44,399

being an artist yeah it's like I hope I

243

00:13:53,420 --> 00:13:48,000

not work like reception is in my free

244

00:13:58,579 --> 00:13:53,430

time I I take photograph and and I make

245

00:14:01,429 --> 00:13:58,589

music in the other and poet you've got a

246

00:14:05,600 --> 00:14:01,439

real future as an artist if you choose

247

00:14:08,829 --> 00:14:05,610

to pursue that even stronger la s

248

00:14:10,790 --> 00:14:08,839

beautiful yeah arnis you can

249

00:14:12,170 --> 00:14:10,800

congratulations disarray we appreciate

250

00:14:15,710 --> 00:14:12,180

you at you you're showing up for our

251
00:14:16,970 --> 00:14:15,720
hangout and you're gonna get an amazing

252
00:14:18,379 --> 00:14:16,980
prize what it would have a min by the

253
00:14:21,230 --> 00:14:18,389
way we didn't talk about that oh yeah

254
00:14:24,150 --> 00:14:21,240
yes I'm so jealous oh yeah we're all

255
00:14:30,460 --> 00:14:26,880
so I hope you saw the anniversary image

256
00:14:33,310 --> 00:14:30,470
yesterday that was released we've got

257
00:14:36,250 --> 00:14:33,320
you guys both a mounted image on like

258
00:14:37,930 --> 00:14:36,260
metal of that of that image it's a

259
00:14:40,150 --> 00:14:37,940
pretty really high quality on on the

260
00:14:42,250 --> 00:14:40,160
back yesterday we we skipped around and

261
00:14:45,070 --> 00:14:42,260
we got some astronauts and some

262
00:14:46,630 --> 00:14:45,080
astronomers who work here on hubble to

263
00:14:48,670 --> 00:14:46,640

sign the back so that's signed by

264

00:14:50,290 --> 00:14:48,680

astronauts and astronomers and then

265

00:14:52,990 --> 00:14:50,300

we've also got which is really special

266

00:14:55,840 --> 00:14:53,000

and these pieces of the first solar

267

00:14:57,790 --> 00:14:55,850

array from Hubble so that was there from

268

00:15:00,010 --> 00:14:57,800

1990 till nineteen ninety-three on

269

00:15:01,930 --> 00:15:00,020

hubble and then it was brought down to

270

00:15:04,000 --> 00:15:01,940

earth and we've got these little bits of

271

00:15:07,090 --> 00:15:04,010

that solar aware array mounted in

272

00:15:08,620 --> 00:15:07,100

perspex and so it's literally a piece of

273

00:15:12,550 --> 00:15:08,630

Hubble that spent three years in space

274

00:15:16,000 --> 00:15:12,560

in a little bit of planning they look

275

00:15:18,220 --> 00:15:16,010

really tho those are becoming your ways

276

00:15:21,820 --> 00:15:18,230

I think that's where they're really

277

00:15:25,510 --> 00:15:21,830

great yeah really are all very jealous

278

00:15:29,280 --> 00:15:25,520

yeah yeah that's definitely can i change

279

00:15:31,750 --> 00:15:29,290

my contract and negotiate my belly yeah

280

00:15:34,840 --> 00:15:31,760

I'll tell you that it was quite a

281

00:15:38,280 --> 00:15:34,850

madhouse yesterday but we we got we got

282

00:15:42,040 --> 00:15:38,290

um the astronauts to sign something

283

00:15:45,460 --> 00:15:42,050

great I was on howell actually she be

284

00:15:48,190 --> 00:15:45,470

manhandled astronaut oh I did ya come

285

00:15:50,800 --> 00:15:48,200

around four where's everything and

286

00:15:53,580 --> 00:15:50,810

hurtling cats right that's actually

287

00:15:57,790 --> 00:15:53,590

Carol's day job that's her danger my dad

288

00:16:02,530 --> 00:15:57,800

oh she has that's around go here go here

289

00:16:04,530 --> 00:16:02,540

sit down sign is those are right

290

00:16:07,140 --> 00:16:04,540

congratulations and thank you for for

291

00:16:09,670 --> 00:16:07,150

taking part in the contest yes

292

00:16:11,680 --> 00:16:09,680

congratulations okay so that's so now

293

00:16:14,470 --> 00:16:11,690

the Hubble generation what do we mean by

294

00:16:17,500 --> 00:16:14,480

that Georgia people who were born in

295

00:16:19,120 --> 00:16:17,510

Hubble's lifetime never known a world

296

00:16:21,490 --> 00:16:19,130

without Hubble so the winners in that

297

00:16:25,200 --> 00:16:21,500

category are oh hey leion Martin

298

00:16:28,140 --> 00:16:25,210

congratulation hi guys congratulations

299

00:16:31,120 --> 00:16:28,150

you don't know a world without Hubble

300

00:16:36,030 --> 00:16:31,130

does that mean anything to you and

301
00:16:39,660 --> 00:16:37,889
what's great about Hubble is that it was

302
00:16:41,310 --> 00:16:39,670
designed to be serviced by the space

303
00:16:42,810 --> 00:16:41,320
shuttle and but and it's probably unique

304
00:16:44,999 --> 00:16:42,820
in almost anything we've ever put in

305
00:16:46,590 --> 00:16:45,009
space because I don't know if there's

306
00:16:49,069 --> 00:16:46,600
very been very many other things like

307
00:16:52,050 --> 00:16:49,079
that that's been designed to be got

308
00:16:53,430 --> 00:16:52,060
grabbed and put and fixed and upgraded

309
00:16:55,019 --> 00:16:53,440
throughout the years which is why it's

310
00:16:56,759 --> 00:16:55,029
about that but up there so long we don't

311
00:16:58,170 --> 00:16:56,769
do that with as far as I know any other

312
00:17:00,660 --> 00:16:58,180
thing maybe Carol can correct me if I'm

313
00:17:02,790 --> 00:17:00,670

wrong but um and so that's why it's

314

00:17:05,909 --> 00:17:02,800

lasted for 25 years and we actually have

315

00:17:08,880 --> 00:17:05,919

a Hubble generation so why don't you

316

00:17:10,319 --> 00:17:08,890

introduce are you do you want to which

317

00:17:12,059 --> 00:17:10,329

we just get to the video well I think

318

00:17:13,289 --> 00:17:12,069

you should introduce your video yeah

319

00:17:15,390 --> 00:17:13,299

what did you all good idea that's a

320

00:17:19,199 --> 00:17:15,400

better idea miss italia morning tell us

321

00:17:23,069 --> 00:17:19,209

about your video um okay our video is um

322

00:17:25,500 --> 00:17:23,079

I guess it has like some stuff motion to

323

00:17:30,419 --> 00:17:25,510

it we have photos so that hubble took

324

00:17:33,030 --> 00:17:30,429

and it basically goes through how we

325

00:17:34,950 --> 00:17:33,040

started seeing the stars for sort of

326

00:17:36,900 --> 00:17:34,960

like from the ground you couldn't get

327

00:17:39,930 --> 00:17:36,910

out there we were able able to paint and

328

00:17:41,789 --> 00:17:39,940

how through signs and through Hubble

329

00:17:45,600 --> 00:17:41,799

eventually step by step we were able to

330

00:17:50,399 --> 00:17:45,610

actually have a sort of eyes in space to

331

00:17:52,530 --> 00:17:50,409

see the end of this true man I guess

332

00:17:55,200 --> 00:17:52,540

that's part of it that since we've never

333

00:17:58,110 --> 00:17:55,210

experienced a world without uncle in our

334

00:18:00,030 --> 00:17:58,120

lifetimes then seeing like that's where

335

00:18:01,649 --> 00:18:00,040

to kind of thinking is like what were

336

00:18:04,620 --> 00:18:01,659

people thinking about the universe

337

00:18:07,799 --> 00:18:04,630

before Hubble on successive discoveries

338

00:18:09,750 --> 00:18:07,809

before that yeah so now while while

339

00:18:11,340 --> 00:18:09,760

Scott gets it ready for us to watch I

340

00:18:13,919 --> 00:18:11,350

want to remind everybody that I put the

341

00:18:15,270 --> 00:18:13,929

links to both of these videos on the

342

00:18:16,710 --> 00:18:15,280

description box so it's in the

343

00:18:18,899 --> 00:18:16,720

description box of this hangout so you

344

00:18:21,149 --> 00:18:18,909

can watch them both on youtube also

345

00:18:22,710 --> 00:18:21,159

because it'll be slightly better quality

346

00:18:24,380 --> 00:18:22,720

because we're rebroadcasting it's going

347

00:18:27,690 --> 00:18:24,390

to make maybe maybe a little bit more

348

00:18:29,100 --> 00:18:27,700

jerky in the video then would be if you

349

00:18:30,419 --> 00:18:29,110

watch it on youtube so i encourage you

350

00:18:33,060 --> 00:18:30,429

to go straight to the videos themselves

351

00:18:34,440 --> 00:18:33,070

and check them out as well and scott

352

00:18:36,750 --> 00:18:34,450

whenever you're ready we can maybe take

353

00:21:40,389 --> 00:18:36,760

a look at the at the second with is the

354

00:21:46,249 --> 00:21:43,669

incredible whoa very well done well done

355

00:21:51,409 --> 00:21:46,259

guys but my very first question is I got

356

00:21:54,109 --> 00:21:51,419

to know how long did that take to do I

357

00:21:56,149 --> 00:21:54,119

guess you saw the days two solid days

358

00:21:57,769 --> 00:21:56,159

via two solid days at least I don't

359

00:21:59,450 --> 00:21:57,779

believe it not for a second i had to

360

00:22:01,789 --> 00:21:59,460

have taken longer than that that would

361

00:22:04,460 --> 00:22:01,799

issued it is just the shooting alone now

362

00:22:10,690 --> 00:22:04,470

hailey did a weaker rap with all the

363

00:22:13,820 --> 00:22:10,700

artwork she drew like the telescope yeah

364

00:22:15,739 --> 00:22:13,830

so how about is rad get a piece of the

365

00:22:19,090 --> 00:22:15,749

solar array I want pieces of your

366

00:22:23,440 --> 00:22:19,100

artwork all right you did those

367

00:22:25,930 --> 00:22:23,450

artifacts to now those are amazing yeah

368

00:22:28,369 --> 00:22:25,940

yeah you good you could sell it on eBay

369

00:22:31,279 --> 00:22:28,379

beautiful work beautifully not my

370

00:22:34,700 --> 00:22:31,289

favorite part is the Hubble has to come

371

00:22:36,080 --> 00:22:34,710

to the telescope is great yeah you do

372

00:22:39,409 --> 00:22:36,090

that you just you have like a black

373

00:22:41,419 --> 00:22:39,419

background or what um for which scene

374

00:22:44,419 --> 00:22:41,429

again how do pray any about how do you

375

00:22:46,580 --> 00:22:44,429

do it without me uh well essentially for

376

00:22:49,700 --> 00:22:46,590

everything that was like hand animation

377

00:22:51,470 --> 00:22:49,710

we built a black box of foam core two am

378

00:22:51,980 --> 00:22:51,480

I gonna move feeling like you know the

379

00:22:55,160 --> 00:22:51,990

sides

380

00:22:57,049 --> 00:22:55,170

back and then we create they become a

381

00:22:59,570 --> 00:22:57,059

hole in the ceiling of that little black

382

00:23:00,980 --> 00:22:59,580

box and then we had like a light going

383

00:23:03,740 --> 00:23:00,990

through so it's almost like a stage

384

00:23:07,160 --> 00:23:03,750

atmosphere where as soon as I've one

385

00:23:09,380 --> 00:23:07,170

looks like this so say it's not motion

386

00:23:11,780 --> 00:23:09,390

of Hubble here he is as this platform as

387

00:23:14,810 --> 00:23:11,790

a stick and then he says mounted on this

388

00:23:16,880 --> 00:23:14,820

as soon as he comes from the black box

389

00:23:18,470 --> 00:23:16,890

like from behind to like that point

390

00:23:20,870 --> 00:23:18,480

where the light is coming through in the

391

00:23:23,600 --> 00:23:20,880

hole it's almost like a stage so then it

392

00:23:25,910 --> 00:23:23,610

can create a dynamic to the area were

393

00:23:32,780 --> 00:23:25,920

like their character is so sweet I'm

394

00:23:36,140 --> 00:23:32,790

Anna knows way that would like some

395

00:23:38,960 --> 00:23:36,150

videos from like then NASA hums like the

396

00:23:41,120 --> 00:23:38,970

site and such so I loved all of that but

397

00:23:43,460 --> 00:23:41,130

I have to say map it it's like it's an

398

00:23:46,400 --> 00:23:43,470

old classic technique though that is

399

00:23:48,950 --> 00:23:46,410

what's so amazing about it that's I mean

400

00:23:52,430 --> 00:23:48,960

people used to do puppetry and things

401
00:23:55,250 --> 00:23:52,440
like that it's fantastic i love the way

402
00:23:58,490 --> 00:23:55,260
that you guys did the fly through of the

403
00:24:01,490 --> 00:23:58,500
ultra deep field yes an analog that was

404
00:24:03,919 --> 00:24:01,500
fantastic I that's why I think I was my

405
00:24:06,590 --> 00:24:03,929
favorite part of it is like I I've used

406
00:24:08,419 --> 00:24:06,600
that footage all the time in many videos

407
00:24:10,040 --> 00:24:08,429
I make and I'm seeing it now in a

408
00:24:12,530 --> 00:24:10,050
completely different way and made me

409
00:24:15,080 --> 00:24:12,540
rethink it well Tony must be happy that

410
00:24:18,790 --> 00:24:15,090
both of you I mean you know both videos

411
00:24:22,310 --> 00:24:18,800
had healthy because Tony feels not me

412
00:24:25,130 --> 00:24:22,320
videos oh that's right Carol you're

413
00:24:28,910 --> 00:24:25,140

gonna get the message here later or you

414

00:24:30,470 --> 00:24:28,920

never take though well my favorite part

415

00:24:32,180 --> 00:24:30,480

even with all of that was still was the

416

00:24:34,070 --> 00:24:32,190

was the whiteboard parts where you

417

00:24:37,250 --> 00:24:34,080

actually injected a bit of perspective

418

00:24:38,930 --> 00:24:37,260

into it that's very nice I think was my

419

00:24:40,520 --> 00:24:38,940

absolute favorite part because to

420

00:24:42,950 --> 00:24:40,530

provide perspective the way you did

421

00:24:44,600 --> 00:24:42,960

having that hand up there and then

422

00:24:47,990 --> 00:24:44,610

drawing how many galaxies might be in

423

00:24:50,480 --> 00:24:48,000

there was really well done and I was my

424

00:24:52,520 --> 00:24:50,490

favorite part so um I think that's the

425

00:24:54,830 --> 00:24:52,530

part that gives you that lump that's

426

00:24:56,990 --> 00:24:54,840

right again yeah I said nobody i did

427

00:24:58,990 --> 00:24:57,000

that as well yeah I think yeah the way

428

00:25:01,460 --> 00:24:59,000

you gave it perspective and scale and

429

00:25:03,260 --> 00:25:01,470

you really come away feeling like you

430

00:25:05,450 --> 00:25:03,270

experience something quite special like

431

00:25:05,779 --> 00:25:05,460

that like Desiree you you've got you've

432

00:25:07,279 --> 00:25:05,789

got a

433

00:25:10,820 --> 00:25:07,289

future in our so what do you guys do in

434

00:25:15,379 --> 00:25:10,830

your real and your in your actual non

435

00:25:19,369 --> 00:25:15,389

making video time your students are you

436

00:25:26,269 --> 00:25:19,379

I don't know I need though their or

437

00:25:27,799 --> 00:25:26,279

their hobby or their contest will start

438

00:25:29,149 --> 00:25:27,809

at what Carol Carol it's our turn the

439

00:25:30,769 --> 00:25:29,159

East I did one now we've got to do

440

00:25:32,930 --> 00:25:30,779

something we have to do another yeah

441

00:25:34,489 --> 00:25:32,940

i'll let you guys know what about you

442

00:25:38,589 --> 00:25:34,499

guys Hallie hey Liam Martin what you

443

00:25:42,349 --> 00:25:38,599

guys do um I'm a camera system videos

444

00:25:50,239 --> 00:25:42,359

huh I'm the camera system in the film

445

00:25:55,700 --> 00:25:50,249

industry already working long so and

446

00:26:00,349 --> 00:25:55,710

like slate good for you good for you

447

00:26:02,210 --> 00:26:00,359

what you Martin I work hard time on the

448

00:26:07,310 --> 00:26:02,220

phone on the street but I'm in school

449

00:26:10,839 --> 00:26:07,320

now for astronomy Oh dandy okay there

450

00:26:14,029 --> 00:26:10,849

you go I Saint Mary's University no no

451

00:26:16,580 --> 00:26:14,039

well good luck with that yes that's a

452

00:26:18,909 --> 00:26:16,590

great nation we actually have a plan for

453

00:26:21,200 --> 00:26:18,919

the piece of the solar panel there's a

454

00:26:23,570 --> 00:26:21,210

Observatory here that does public tours

455

00:26:25,700 --> 00:26:23,580

and we're gonna display there so

456

00:26:28,070 --> 00:26:25,710

families can come and everybody can just

457

00:26:32,299 --> 00:26:28,080

see Saul that's nice I'm so great you

458

00:26:36,619 --> 00:26:32,309

guys that's really wonderful is going to

459

00:26:39,139 --> 00:26:36,629

ask you what you're good well I want to

460

00:26:41,479 --> 00:26:39,149

thank all of the winners you guys are

461

00:26:43,909 --> 00:26:41,489

truly inspirational thank you for

462

00:26:45,589 --> 00:26:43,919

sharing your video with us Desiree Haley

463

00:26:48,379 --> 00:26:45,599

Martin thank you for joining us in this

464

00:26:52,159 --> 00:26:48,389

hangout I congratulations to all of you

465

00:26:56,749 --> 00:26:52,169

yeah well done very nice thank you very

466

00:26:58,639 --> 00:26:56,759

much for over right you guys guys are

467

00:26:59,989 --> 00:26:58,649

welcome to stay or you you could hang

468

00:27:02,330 --> 00:26:59,999

out with us for a little bit longer but

469

00:27:04,909 --> 00:27:02,340

i just want to give my congratulations

470

00:27:06,649 --> 00:27:04,919

broom reminding everybody go see i've

471

00:27:07,909 --> 00:27:06,659

posted all these videos all over the

472

00:27:09,919 --> 00:27:07,919

place they're on our twitter page by the

473

00:27:11,930 --> 00:27:09,929

way if you're not following us on

474

00:27:13,820 --> 00:27:11,940

twitter at Hubble telescope you need to

475

00:27:16,099 --> 00:27:13,830

go to Twitter right now type that in and

476

00:27:17,989 --> 00:27:16,109

click follow you also need to subscribe

477

00:27:18,500 --> 00:27:17,999

to us I'm Hubble slight channel on you

478

00:27:22,230 --> 00:27:18,510

too

479

00:27:25,560 --> 00:27:22,240

it's because we are we are all over the

480

00:27:27,270 --> 00:27:25,570

place on in the unit in the internet

481

00:27:28,590 --> 00:27:27,280

sphere so we hope you'll follow us and

482

00:27:29,820 --> 00:27:28,600

we'll let you know everything

483

00:27:32,640 --> 00:27:29,830

interesting that's going on about hover

484

00:27:35,820 --> 00:27:32,650

so the I posted the links to their all

485

00:27:36,990 --> 00:27:35,830

of their videos here and we want and you

486

00:27:39,899 --> 00:27:37,000

can check them out watching as many

487

00:27:42,149 --> 00:27:39,909

times as you want and was it a success

488

00:27:45,870 --> 00:27:42,159

Georgia I think you only have to watch

489

00:27:48,510 --> 00:27:45,880

those videos judge for yourselves yes

490

00:27:51,510 --> 00:27:48,520

yeah there were so many irie honestly I

491

00:27:52,890 --> 00:27:51,520

was looking at you know just just a

492

00:27:54,690 --> 00:27:52,900

short list because I don't have a lot of

493

00:27:57,360 --> 00:27:54,700

time but I was looking and there were so

494

00:28:00,720 --> 00:27:57,370

many great submissions I don't know how

495

00:28:02,760 --> 00:28:00,730

you guys were able to choose the best I

496

00:28:05,039 --> 00:28:02,770

me I mean it do you guys did an amazing

497

00:28:06,990 --> 00:28:05,049

job there were just so many amazing

498

00:28:08,970 --> 00:28:07,000

things that came through so I want to

499

00:28:11,940 --> 00:28:08,980

applaud all the people that made their

500

00:28:14,690 --> 00:28:11,950

submissions because it really inspired

501
00:28:17,610 --> 00:28:14,700
me just seeing all these different

502
00:28:19,830 --> 00:28:17,620
contexts of the way that Hubble hasn't

503
00:28:21,810 --> 00:28:19,840
has inspired them and really kind of

504
00:28:24,029 --> 00:28:21,820
just rejuvenated some of my creative

505
00:28:27,419 --> 00:28:24,039
mind as well with the things that I

506
00:28:29,010 --> 00:28:27,429
create yeah and that's worth mentioning

507
00:28:30,450 --> 00:28:29,020
actually first of all yes definitely

508
00:28:32,730 --> 00:28:30,460
worth thanking everyone on the short

509
00:28:34,830 --> 00:28:32,740
list as well and but will also be

510
00:28:37,500 --> 00:28:34,840
putting all the rest of the videos on

511
00:28:39,539 --> 00:28:37,510
the Space Telescope website and source

512
00:28:40,980 --> 00:28:39,549
code blood org Space Telescope dog will

513
00:28:42,210 --> 00:28:40,990

be putting those all up in the next

514

00:28:44,250 --> 00:28:42,220

couple of weeks so that you can browse

515

00:28:45,899 --> 00:28:44,260

through all of them because we just want

516

00:28:47,039 --> 00:28:45,909

to acknowledge everyone who entered a

517

00:28:49,740 --> 00:28:47,049

video because they were all fantastic

518

00:28:51,480 --> 00:28:49,750

they all have very little flair their

519

00:28:53,669 --> 00:28:51,490

own little take on what Hubble had done

520

00:28:55,020 --> 00:28:53,679

and what Hubble meant to them so we will

521

00:28:57,690 --> 00:28:55,030

be putting them all up to acknowledge

522

00:28:59,850 --> 00:28:57,700

all of those as well yes and you know I

523

00:29:02,100 --> 00:28:59,860

think it just well actually before I get

524

00:29:04,680 --> 00:29:02,110

there on a couple of comments Michael

525

00:29:06,480 --> 00:29:04,690

Michael jobin on the Q&A app comments

526

00:29:09,330 --> 00:29:06,490

real quick that the the Deep Field

527

00:29:12,000 --> 00:29:09,340

images are what the HST is I think all

528

00:29:13,980 --> 00:29:12,010

about our unison cara cara and the the

529

00:29:15,539 --> 00:29:13,990

others of nebulae and galaxies could be

530

00:29:17,690 --> 00:29:15,549

done by smaller space telescopes well

531

00:29:20,010 --> 00:29:17,700

that's not fair Michael I mean come on

532

00:29:21,960 --> 00:29:20,020

they could be done by space telescopes

533

00:29:24,029 --> 00:29:21,970

yes but not at the resolution and

534

00:29:26,070 --> 00:29:24,039

clarity with which humble guess so

535

00:29:27,960 --> 00:29:26,080

there's always the atmosphere in the way

536

00:29:30,060 --> 00:29:27,970

with ground-based telescope Hubble is

537

00:29:31,980 --> 00:29:30,070

uniquely purchased above us to not have

538

00:29:35,610 --> 00:29:31,990

to do that but yes I couldn't agree

539

00:29:42,330 --> 00:29:35,620

hopefully feels good there's no by all

540

00:29:44,610 --> 00:29:42,340

of you gotta care net Carol what else we

541

00:29:47,160 --> 00:29:44,620

have here I hope you want season I'm

542

00:29:48,660 --> 00:29:47,170

just gonna say I reckon a good I haven't

543

00:29:50,850 --> 00:29:48,670

actually counted by racking a good

544

00:29:53,190 --> 00:29:50,860

eighty percent plus of the 02 helpful

545

00:29:56,910 --> 00:29:53,200

videos that came in had the Deep Field

546

00:29:59,640 --> 00:29:56,920

video Oh a little bit of a buzz me

547

00:30:01,440 --> 00:29:59,650

inspires people yeah well I mean we've

548

00:30:04,620 --> 00:30:01,450

talked about it so many times it's it's

549

00:30:06,030 --> 00:30:04,630

truly I next to the video that these

550

00:30:07,410 --> 00:30:06,040

guys have made nothing really gives us

551
00:30:08,880 --> 00:30:07,420
that much perspective other than looking

552
00:30:12,560 --> 00:30:08,890
at that image mute really shows you how

553
00:30:14,700 --> 00:30:12,570
what our place is in the universe so in

554
00:30:16,260 --> 00:30:14,710
one of the things Carol I don't know if

555
00:30:17,490 --> 00:30:16,270
you want to talk about this or not but

556
00:30:20,640 --> 00:30:17,500
I'd kind of like to bring up the subject

557
00:30:22,530 --> 00:30:20,650
of the sort of partner multinational

558
00:30:24,720 --> 00:30:22,540
partnership that is part of Hubble's

559
00:30:26,580 --> 00:30:24,730
mission one of the things I've

560
00:30:29,400 --> 00:30:26,590
discovered this week is that it working

561
00:30:31,830 --> 00:30:29,410
with Georgia and and with the guys over

562
00:30:33,330 --> 00:30:31,840
at NASA Goddard is that you know you see

563
00:30:37,040 --> 00:30:33,340

all these things like Space Telescope

564

00:30:39,650 --> 00:30:37,050

torg Hubble site Hubble site org and

565

00:30:44,700 --> 00:30:39,660

there's also a Goddard a Hubble page

566

00:30:46,350 --> 00:30:44,710

these are all parallel social streams

567

00:30:49,500 --> 00:30:46,360

that kind of highlight the partnership

568

00:30:52,169 --> 00:30:49,510

that we have in this mission for example

569

00:30:54,000 --> 00:30:52,179

George is in charge of the European

570

00:30:57,299 --> 00:30:54,010

Space Agency component of Hubble

571

00:30:58,620 --> 00:30:57,309

outreach and so what I think if you look

572

00:31:00,570 --> 00:30:58,630

at our twitter page you'll see things

573

00:31:03,090 --> 00:31:00,580

like our twitter handles you'll see

574

00:31:04,560 --> 00:31:03,100

three different twitter feeds for

575

00:31:07,880 --> 00:31:04,570

example you'll see ours Hubble Space

576
00:31:10,590 --> 00:31:07,890
Telescope yours is hubble space I don't

577
00:31:11,700 --> 00:31:10,600
sub Hubble underscore space and then

578
00:31:14,190 --> 00:31:11,710
there's another one that NASA Goddard

579
00:31:15,870 --> 00:31:14,200
runs NASA Goddard and so there are three

580
00:31:17,790 --> 00:31:15,880
streams all of them are verified we're

581
00:31:19,620 --> 00:31:17,800
all real we're all part of the Hubble

582
00:31:21,390 --> 00:31:19,630
mission but we all tell a slightly

583
00:31:22,680 --> 00:31:21,400
different story and Caroline wonder if

584
00:31:26,549 --> 00:31:22,690
you want to talk a little bit about the

585
00:31:29,130 --> 00:31:26,559
multinational nature of mission well I I

586
00:31:32,190 --> 00:31:29,140
think starting with the social media

587
00:31:34,110 --> 00:31:32,200
side we always get frustrated because

588
00:31:36,870 --> 00:31:34,120

sometimes people say why do you have so

589

00:31:39,419 --> 00:31:36,880

many streams but you you point out

590

00:31:42,630 --> 00:31:39,429

something interesting is that each one

591

00:31:44,940 --> 00:31:42,640

of these sources of information has a

592

00:31:45,970 --> 00:31:44,950

different perspective and so it gives

593

00:31:47,890 --> 00:31:45,980

you a different way

594

00:31:50,650 --> 00:31:47,900

of looking at the mission and how it

595

00:31:52,840 --> 00:31:50,660

affects society so I think that's that's

596

00:31:56,169 --> 00:31:52,850

pretty important that we don't just have

597

00:31:58,240 --> 00:31:56,179

I mean it's wonderful to live in an

598

00:31:59,950 --> 00:31:58,250

environment in which you we're not only

599

00:32:02,200 --> 00:31:59,960

getting the NASA point of view we're

600

00:32:05,530 --> 00:32:02,210

getting you know public's point of view

601
00:32:07,510 --> 00:32:05,540
in ESS point of view and a lots of

602
00:32:10,270 --> 00:32:07,520
different perspectives on the telescope

603
00:32:12,820 --> 00:32:10,280
what people are using it to do and how

604
00:32:15,299 --> 00:32:12,830
it affects them the other thing is i

605
00:32:17,890 --> 00:32:15,309
think that the international corporate

606
00:32:21,150 --> 00:32:17,900
cooperation and this both the science

607
00:32:24,760 --> 00:32:21,160
well the science is really multinational

608
00:32:26,650 --> 00:32:24,770
any more big programs have many many

609
00:32:28,120 --> 00:32:26,660
people on them I'm part I'm actually

610
00:32:30,190 --> 00:32:28,130
part of the team that did the

611
00:32:33,940 --> 00:32:30,200
anniversary image and we're a

612
00:32:37,900 --> 00:32:33,950
multinational and some of the other

613
00:32:40,740 --> 00:32:37,910

programs that are being pursued to you

614

00:32:44,110 --> 00:32:40,750

use to Hubble and other telescope data

615

00:32:46,210 --> 00:32:44,120

are certainly multinational in the early

616

00:32:49,360 --> 00:32:46,220

days of Hubble it used to be kind of

617

00:32:52,120 --> 00:32:49,370

small teams in one or two collaborators

618

00:32:54,580 --> 00:32:52,130

but now we need so much expertise that

619

00:32:56,950 --> 00:32:54,590

that people who do different things and

620

00:33:00,370 --> 00:32:56,960

have the perspective on the data and how

621

00:33:02,380 --> 00:33:00,380

to process it and how to model it and

622

00:33:04,450 --> 00:33:02,390

all that it's it's very important from

623

00:33:06,430 --> 00:33:04,460

the science side and the technical side

624

00:33:08,799 --> 00:33:06,440

is also important as well because we

625

00:33:13,270 --> 00:33:08,809

have instruments in the canadian armed

626

00:33:15,789 --> 00:33:13,280

and and we really need those

627

00:33:18,070 --> 00:33:15,799

cooperations between the US Europe

628

00:33:20,200 --> 00:33:18,080

Canada and any of the other partners we

629

00:33:22,510 --> 00:33:20,210

can partner with because again it's a

630

00:33:24,280 --> 00:33:22,520

different technological perspective but

631

00:33:27,690 --> 00:33:24,290

then integrating it together gives

632

00:33:32,470 --> 00:33:27,700

everybody a piece of the action and so

633

00:33:34,900 --> 00:33:32,480

you know and nations have an affinity

634

00:33:37,960 --> 00:33:34,910

with the telescope because they have a

635

00:33:40,659 --> 00:33:37,970

part of it so I think it's it's a really

636

00:33:43,720 --> 00:33:40,669

great like this the solar panels I i can

637

00:33:45,490 --> 00:33:43,730

tell you my hat is off to ISA for for

638

00:33:46,870 --> 00:33:45,500

chopping it up in peace I couldn't

639

00:33:48,400 --> 00:33:46,880

believe it when i was told that was

640

00:33:50,919 --> 00:33:48,410

happening that would never happen in

641

00:33:52,750 --> 00:33:50,929

nasa they would rather warehouse it then

642

00:33:54,669 --> 00:33:52,760

chop chop it into little pieces and i

643

00:33:58,770 --> 00:33:54,679

think it's great to return to the public

644

00:34:01,980 --> 00:33:58,780

you know in displays and other means

645

00:34:04,320 --> 00:34:01,990

um pieces of this talisker so it's very

646

00:34:06,240 --> 00:34:04,330

cool but I think you hit a really good

647

00:34:07,200 --> 00:34:06,250

point that I really agree with the tues

648

00:34:08,940 --> 00:34:07,210

when you're talking about these

649

00:34:11,310 --> 00:34:08,950

different perspectives and really that

650

00:34:13,970 --> 00:34:11,320

that is what science is we're trying to

651
00:34:17,159 --> 00:34:13,980
understand what's going on there but it

652
00:34:18,750 --> 00:34:17,169
is storytelling we're telling the story

653
00:34:20,159 --> 00:34:18,760
of what's going on in the universe and

654
00:34:23,760 --> 00:34:20,169
we're all going to have different ways

655
00:34:25,830 --> 00:34:23,770
of finding out those answers and and

656
00:34:27,300 --> 00:34:25,840
being able to bounce those ideas off and

657
00:34:28,950 --> 00:34:27,310
I think it's extremely important that

658
00:34:31,520 --> 00:34:28,960
it's not just coming from one place but

659
00:34:33,480 --> 00:34:31,530
it's coming from a global community of

660
00:34:36,120 --> 00:34:33,490
astronomers and engineers and

661
00:34:38,120 --> 00:34:36,130
astrophysicists that are able to look at

662
00:34:41,820 --> 00:34:38,130
the universe in it in a different way

663
00:34:45,690 --> 00:34:41,830

with the same amazing instrument and I

664

00:34:47,190 --> 00:34:45,700

just I've been going over for the past

665

00:34:49,500 --> 00:34:47,200

few week just some of the different

666

00:34:53,250 --> 00:34:49,510

papers and stuff like that and we have

667

00:34:55,290 --> 00:34:53,260

what 12,700 academic papers as come from

668

00:34:57,240 --> 00:34:55,300

the Hubble Space Telescope and it's from

669

00:34:59,700 --> 00:34:57,250

people from all over the world and

670

00:35:02,940 --> 00:34:59,710

that's extremely important that it's

671

00:35:07,410 --> 00:35:02,950

made such a huge impact on our knowledge

672

00:35:10,110 --> 00:35:07,420

of the universe as a species over this

673

00:35:11,700 --> 00:35:10,120

past quarter century I yes I have a

674

00:35:13,560 --> 00:35:11,710

great appreciation for the scientific

675

00:35:15,660 --> 00:35:13,570

output since I'm supposed to at least

676

00:35:18,000 --> 00:35:15,670

read the abstracts of every paper and

677

00:35:22,800 --> 00:35:18,010

it's more than two a day and it's more

678

00:35:25,500 --> 00:35:22,810

than I I mean it's really a fire of

679

00:35:27,660 --> 00:35:25,510

things that are being discovered and we

680

00:35:30,840 --> 00:35:27,670

just we've just completed a week of a

681

00:35:34,680 --> 00:35:30,850

conference looking at not only what

682

00:35:36,690 --> 00:35:34,690

Hubble has produced in the past but

683

00:35:38,490 --> 00:35:36,700

looking forward what is it going to do

684

00:35:40,380 --> 00:35:38,500

in the future and then how is it going

685

00:35:42,180 --> 00:35:40,390

to be in synergy with the James Webb and

686

00:35:44,400 --> 00:35:42,190

then from there James Webb will take

687

00:35:46,980 --> 00:35:44,410

over when Hubble is no longer operating

688

00:35:50,640 --> 00:35:46,990

and there's just some amazing science

689

00:35:52,980 --> 00:35:50,650

that has been done and the great to mess

690

00:35:55,560 --> 00:35:52,990

two big messages is that the longevity

691

00:35:58,620 --> 00:35:55,570

of the telescope is very important

692

00:36:00,240 --> 00:35:58,630

because you know when I was in fourth

693

00:36:02,640 --> 00:36:00,250

grade it was all about taking snapshots

694

00:36:05,040 --> 00:36:02,650

and trying to model that but since the

695

00:36:08,040 --> 00:36:05,050

telescope has been consistently in orbit

696

00:36:10,230 --> 00:36:08,050

and it's so well calibrated that it's

697

00:36:12,539 --> 00:36:10,240

possible to compare the very first

698

00:36:16,559 --> 00:36:12,549

observations of an object with those

699

00:36:19,589 --> 00:36:16,569

were taken last week you can see changes

700

00:36:21,749 --> 00:36:19,599

in astronomical objects and that can be

701
00:36:24,089 --> 00:36:21,759
modeled and we're really understanding a

702
00:36:27,739 --> 00:36:24,099
lot more about the universe because of

703
00:36:30,390 --> 00:36:27,749
that very consistent data set and

704
00:36:32,969 --> 00:36:30,400
whereas when you have other telescopes

705
00:36:35,400 --> 00:36:32,979
in the mix that's great and it augments

706
00:36:37,739 --> 00:36:35,410
the entire picture but having one

707
00:36:42,209 --> 00:36:37,749
telescope that's been doing all these

708
00:36:45,089 --> 00:36:42,219
observations is really invaluable so the

709
00:36:46,199 --> 00:36:45,099
one of the things I wanted to let

710
00:36:48,779 --> 00:36:46,209
everybody know is I want to remind

711
00:36:50,130 --> 00:36:48,789
everybody that you can we're hoping

712
00:36:51,299 --> 00:36:50,140
you'll you'll leave us some comments and

713
00:36:52,380 --> 00:36:51,309

questions throughout this hangout so

714

00:36:54,509 --> 00:36:52,390

that we can talk a little bit more

715

00:36:56,729 --> 00:36:54,519

please please tell us what you think

716

00:36:59,579 --> 00:36:56,739

about Hubble and the impact it's had on

717

00:37:01,829 --> 00:36:59,589

your life careless I want to ask you a

718

00:37:03,539 --> 00:37:01,839

little bit about the anniversary image

719

00:37:05,819 --> 00:37:03,549

with yesterday that was I was at the

720

00:37:07,859 --> 00:37:05,829

museum yesterday and I think Scott has a

721

00:37:09,239 --> 00:37:07,869

has a very nice presentation of it as

722

00:37:11,849 --> 00:37:09,249

well and so while he's queuing data

723

00:37:14,449 --> 00:37:11,859

yesterday at the museum at a museum at

724

00:37:16,519 --> 00:37:14,459

in washington DC at about 9am

725

00:37:20,429 --> 00:37:16,529

administrator Bolden and John Grunsfeld

726

00:37:22,709 --> 00:37:20,439

unveiled an image that celebrates 25

727

00:37:26,370 --> 00:37:22,719

years of Hubble you want to talk about a

728

00:37:29,219 --> 00:37:26,380

little bit Carol sure um I do want to

729

00:37:33,120 --> 00:37:29,229

mention that also in January we revealed

730

00:37:36,299 --> 00:37:33,130

a precursor anniversary image of the

731

00:37:38,789 --> 00:37:36,309

favorite m16 the pillars which also were

732

00:37:42,179 --> 00:37:38,799

in the videos that we saw in many other

733

00:37:45,809 --> 00:37:42,189

videos with an infrared view and the

734

00:37:47,489 --> 00:37:45,819

point was we had taken mm 16 the Eagle

735

00:37:50,219 --> 00:37:47,499

Nebula the pillars of creation a long

736

00:37:52,799 --> 00:37:50,229

time ago with the original camera and

737

00:37:55,319 --> 00:37:52,809

now we've recently observed it just to

738

00:37:57,870 --> 00:37:55,329

show that the telescope really has

739

00:38:01,349 --> 00:37:57,880

improved it has much greater capability

740

00:38:04,919 --> 00:38:01,359

and to show the comparison of the visual

741

00:38:06,929 --> 00:38:04,929

with the infrared so for the anniversary

742

00:38:09,900 --> 00:38:06,939

itself we wanted to kick off the year

743

00:38:12,630 --> 00:38:09,910

with the m16 because it's such a legacy

744

00:38:14,400 --> 00:38:12,640

pillars of creation is a legacy iconic

745

00:38:16,679 --> 00:38:14,410

image that's right we did back in

746

00:38:19,199 --> 00:38:16,689

January if you want remember right and

747

00:38:21,390 --> 00:38:19,209

the anniversary image which Scott is

748

00:38:24,059 --> 00:38:21,400

showing this isn't I'm actually on the

749

00:38:26,760 --> 00:38:24,069

science team for this and it's just

750

00:38:28,620 --> 00:38:26,770

amazing region so

751

00:38:30,360 --> 00:38:28,630

what what you're seeing is a star

752

00:38:34,170 --> 00:38:30,370

cluster that's all the bright

753

00:38:38,070 --> 00:38:34,180

concentrated stars more or less in the

754

00:38:40,650 --> 00:38:38,080

center of the image uh and what happens

755

00:38:42,600 --> 00:38:40,660

here is this star cluster is not very

756

00:38:44,760 --> 00:38:42,610

old a couple of million years old and

757

00:38:46,920 --> 00:38:44,770

what happens is the gas in the dust that

758

00:38:50,910 --> 00:38:46,930

you kind of see off to the side that

759

00:38:53,550 --> 00:38:50,920

material condenses collapses due to its

760

00:38:55,740 --> 00:38:53,560

gravity and sometimes you can have

761

00:38:58,230 --> 00:38:55,750

shocks where clouds run into each other

762

00:39:00,150 --> 00:38:58,240

and they compress and what happens is in

763

00:39:03,300 --> 00:39:00,160

the center of that depending on how much

764

00:39:05,370 --> 00:39:03,310

material is there how violent the

765

00:39:08,850 --> 00:39:05,380

collapse how strong the gravity do the

766

00:39:10,770 --> 00:39:08,860

amount of material you can get a large

767

00:39:12,480 --> 00:39:10,780

or small star clusters so this is a

768

00:39:14,940 --> 00:39:12,490

healthy star cluster it's not the

769

00:39:16,590 --> 00:39:14,950

biggest star cluster we've ever seen but

770

00:39:18,990 --> 00:39:16,600

it's very healthy and the reason that

771

00:39:21,960 --> 00:39:19,000

the stars are different brightnesses is

772

00:39:23,640 --> 00:39:21,970

because they are different masses and so

773

00:39:26,130 --> 00:39:23,650

the different mass the brightest ones

774

00:39:29,840 --> 00:39:26,140

are the biggest mass and but you can

775

00:39:32,640 --> 00:39:29,850

also see this plethora of very tiny

776

00:39:35,460 --> 00:39:32,650

fainter stars that are less than the

777

00:39:38,010 --> 00:39:35,470

mass of the Sun the interesting thing is

778

00:39:39,810 --> 00:39:38,020

that that cluster those bright stars in

779

00:39:43,170 --> 00:39:39,820

the cluster have blown away and

780

00:39:46,190 --> 00:39:43,180

basically carved out away from the

781

00:39:49,800 --> 00:39:46,200

material out of which they were born the

782

00:39:51,720 --> 00:39:49,810

the the cloud and what you see is a

783

00:39:53,520 --> 00:39:51,730

residual so some of that stuff is being

784

00:39:57,000 --> 00:39:53,530

blown back and that's why you see those

785

00:39:59,160 --> 00:39:57,010

finger proteins which we've seen in many

786

00:40:03,090 --> 00:39:59,170

nebula and that means that the light is

787

00:40:05,190 --> 00:40:03,100

carving out and blowing back the

788

00:40:07,530 --> 00:40:05,200

material and so the fingers are more

789

00:40:11,520 --> 00:40:07,540

dense than the surrounding area and so

790

00:40:13,860 --> 00:40:11,530

it kind of pushes away some of the light

791

00:40:17,460 --> 00:40:13,870

or more diffuse material and the

792

00:40:20,310 --> 00:40:17,470

different colors represent the reason

793

00:40:22,380 --> 00:40:20,320

that we use these colors is first of all

794

00:40:25,380 --> 00:40:22,390

we want to show the colors of the stars

795

00:40:26,730 --> 00:40:25,390

as a balance of how to do the image

796

00:40:29,310 --> 00:40:26,740

processing the first thing you want to

797

00:40:30,990 --> 00:40:29,320

notice that the little red the little

798

00:40:33,420 --> 00:40:31,000

stars are red that's because they are

799

00:40:35,760 --> 00:40:33,430

cooler than the bright bluish stars and

800

00:40:39,210 --> 00:40:35,770

the second thing is that there are also

801
00:40:40,170 --> 00:40:39,220
some observations using very narrow

802
00:40:42,780 --> 00:40:40,180
bands that

803
00:40:48,030 --> 00:40:42,790
sample carbon nitrogen and oxygen and

804
00:40:50,069 --> 00:40:48,040
those caused the nebula to be it emits

805
00:40:51,950 --> 00:40:50,079
in those different wavelengths and that

806
00:40:54,030 --> 00:40:51,960
tells me something about its comforts

807
00:40:56,099 --> 00:40:54,040
composition so there's a lot of

808
00:40:59,579 --> 00:40:56,109
astrophysics going on in this picture

809
00:41:02,460 --> 00:40:59,589
and in addition on the website there is

810
00:41:05,520 --> 00:41:02,470
a movie of this region that our folks

811
00:41:08,540 --> 00:41:05,530
have done and which is just spectacular

812
00:41:10,890 --> 00:41:08,550
and I just wanted to mention whatever

813
00:41:12,960 --> 00:41:10,900

surprising result westerlund too has

814

00:41:14,490 --> 00:41:12,970

been known for a long time it was named

815

00:41:16,650 --> 00:41:14,500

after a guy named westerlund who

816

00:41:19,020 --> 00:41:16,660

discovered it looking at photographic

817

00:41:20,970 --> 00:41:19,030

plates this cluster is actually two

818

00:41:25,380 --> 00:41:20,980

clusters there's one behind the other

819

00:41:27,450 --> 00:41:25,390

and there is a paper a scientific paper

820

00:41:29,760 --> 00:41:27,460

coming out about the fact that there are

821

00:41:32,010 --> 00:41:29,770

two clusters and in fact overnight after

822

00:41:35,609 --> 00:41:32,020

the party last night one of our

823

00:41:37,770 --> 00:41:35,619

astronomers sent to our deputy director

824

00:41:40,770 --> 00:41:37,780

a whole theory about the two clusters

825

00:41:43,170 --> 00:41:40,780

and how the bow shock from the one went

826
00:41:45,359 --> 00:41:43,180
to the other and all that so you know he

827
00:41:48,030 --> 00:41:45,369
was thinking about this as soon as you

828
00:41:49,319 --> 00:41:48,040
saw the image right cuz he isnt he does

829
00:41:51,990 --> 00:41:49,329
that kind of work but he's actually not

830
00:41:56,880 --> 00:41:52,000
on the team so he immediately created a

831
00:41:58,559 --> 00:41:56,890
model yesterday afternoon about how this

832
00:42:01,349 --> 00:41:58,569
whole thing worked so it's actually two

833
00:42:04,620 --> 00:42:01,359
clusters one from the other they appear

834
00:42:07,530 --> 00:42:04,630
to be very closely the same age but it

835
00:42:09,359 --> 00:42:07,540
is suggestive that one cluster perhaps

836
00:42:12,180 --> 00:42:09,369
the smaller cluster triggered the

837
00:42:14,250 --> 00:42:12,190
formation of the larger one which is

838
00:42:16,500 --> 00:42:14,260

which is nearer to us so it's a very

839

00:42:18,000 --> 00:42:16,510

very interesting cluster and a lot of

840

00:42:19,859 --> 00:42:18,010

this was a complete surprise to us

841

00:42:21,870 --> 00:42:19,869

because it had never been studied very

842

00:42:24,510 --> 00:42:21,880

well before but it was a great choice

843

00:42:26,339 --> 00:42:24,520

for the program we got the observations

844

00:42:29,130 --> 00:42:26,349

and once we got the observations last

845

00:42:31,220 --> 00:42:29,140

fall we all kind of one who this is

846

00:42:34,470 --> 00:42:31,230

gonna be spectacular so we actually

847

00:42:35,910 --> 00:42:34,480

augmented the core observations with

848

00:42:38,970 --> 00:42:35,920

some others so that we can really

849

00:42:41,609 --> 00:42:38,980

enhance the clouds as well very nice so

850

00:42:43,260 --> 00:42:41,619

i wanted so i would remind everybody you

851

00:42:45,390 --> 00:42:43,270

can download this on hubble side org

852

00:42:48,539 --> 00:42:45,400

also go to Hubble 25th or to get both

853

00:42:50,670 --> 00:42:48,549

the image and the video the video is

854

00:42:53,640 --> 00:42:50,680

also posted on YouTube on our publicit 

855

00:42:55,260 --> 00:42:53,650

channel the channel so

856

00:42:56,400 --> 00:42:55,270

you check them out and watch them all

857

00:42:58,640 --> 00:42:56,410

you want I'm going to get to a couple

858

00:43:01,349 --> 00:42:58,650

comments here Craig Landon is saying

859

00:43:03,269 --> 00:43:01,359

can't let this anniversary go by without

860

00:43:05,460 --> 00:43:03,279

mentioning the shoemaker-levy comic

861

00:43:07,380 --> 00:43:05,470

collision the rise of the World Wide Web

862

00:43:13,019 --> 00:43:07,390

allowing us to download the Deep Field

863

00:43:14,940 --> 00:43:13,029

remember Netscape yeah sadly I do and

864

00:43:17,579 --> 00:43:14,950

the Astronomy Picture of the Day

865

00:43:19,500 --> 00:43:17,589

combining Kamal combined allowing us to

866

00:43:21,210 --> 00:43:19,510

watch what the scientific world is

867

00:43:23,010 --> 00:43:21,220

seeing that's an excellent point Craig

868

00:43:24,930 --> 00:43:23,020

it's uh is true without without the

869

00:43:27,299 --> 00:43:24,940

internet we wouldn't have access to this

870

00:43:30,390 --> 00:43:27,309

data so quickly and the images wouldn't

871

00:43:32,160 --> 00:43:30,400

be we'd have to get mailed a picture I

872

00:43:35,039 --> 00:43:32,170

guess or a printed picture or something

873

00:43:38,099 --> 00:43:35,049

like that so and ok and the

874

00:43:39,720 --> 00:43:38,109

shoemaker-levy comment event was one of

875

00:43:42,480 --> 00:43:39,730

the most spectacular it wasn't it Carol

876

00:43:44,760 --> 00:43:42,490

it was it was quite remarkable and

877

00:43:47,010 --> 00:43:44,770

actually it was brought up this week and

878

00:43:48,900 --> 00:43:47,020

I wanted to pitch a little bit about the

879

00:43:51,510 --> 00:43:48,910

solar system observations that have been

880

00:43:53,160 --> 00:43:51,520

done there have been a lot that you know

881

00:43:56,359 --> 00:43:53,170

for a while Hubble was kind of the Mars

882

00:43:59,099 --> 00:43:56,369

Weather Channel but also with the

883

00:44:00,799 --> 00:43:59,109

ultraviolet capability no kidding I mean

884

00:44:03,690 --> 00:44:00,809

they actually before there were

885

00:44:05,339 --> 00:44:03,700

satellites orbiting Mars Hubble

886

00:44:06,900 --> 00:44:05,349

observations were often used to see

887

00:44:08,940 --> 00:44:06,910

where the death storms were and we're

888

00:44:11,609 --> 00:44:08,950

good locations were for land there

889

00:44:14,819 --> 00:44:11,619

landers so Hubble actually contributed

890

00:44:16,620 --> 00:44:14,829

quite a lot to Mars exploration but on

891

00:44:19,339 --> 00:44:16,630

top of that observations in the

892

00:44:22,650 --> 00:44:19,349

ultraviolet have been done of Aurora on

893

00:44:26,010 --> 00:44:22,660

a several of the planets and in

894

00:44:28,859 --> 00:44:26,020

particular Jupiter and Saturn and the

895

00:44:31,680 --> 00:44:28,869

amazing thing to me which I guess some

896

00:44:34,049 --> 00:44:31,690

of us in the audience remembered and

897

00:44:37,920 --> 00:44:34,059

some of us did not is that one

898

00:44:40,829 --> 00:44:37,930

shoemaker-levy hit Jupiter it actually

899

00:44:43,710 --> 00:44:40,839

triggered a disruption in Jupiter's

900

00:44:46,069 --> 00:44:43,720

magnetic field with which manifests

901
00:44:49,170 --> 00:44:46,079
itself as bright spots in the Aurora

902
00:44:51,180 --> 00:44:49,180
which I hadn't appreciated that happen

903
00:44:53,640 --> 00:44:51,190
usually the auroral field and Jupiter's

904
00:44:55,589 --> 00:44:53,650
kind of a circular cap a bright cursor

905
00:44:57,630 --> 00:44:55,599
and so that these bright spots show up

906
00:45:00,000 --> 00:44:57,640
now we've known that bright spots show

907
00:45:03,120 --> 00:45:00,010
up also from the interaction between I

908
00:45:05,069 --> 00:45:03,130
oh and the other satellites of Jupiter

909
00:45:07,290 --> 00:45:05,079
but I didn't realize that you babe or

910
00:45:09,060 --> 00:45:07,300
leave me by hitting the planet

911
00:45:12,090 --> 00:45:09,070
actually disrupted the magnetic field

912
00:45:15,240 --> 00:45:12,100
and created a signature way up in the

913
00:45:22,290 --> 00:45:15,250

pole juber I mean that stuff you can't

914

00:45:24,780 --> 00:45:22,300

make that stuff up you could make it up

915

00:45:26,820 --> 00:45:24,790

but it wouldn't be as good well John

916

00:45:28,740 --> 00:45:26,830

Murphy is commenting the Hubble birthday

917

00:45:36,600 --> 00:45:28,750

is the same as mine well happy birthday

918

00:45:38,610 --> 00:45:36,610

hey Ben gays Lee désolée is commenting

919

00:45:40,440 --> 00:45:38,620

the Magnificent hubble deep sky images

920

00:45:42,390 --> 00:45:40,450

encouraged me to look further into the

921

00:45:44,460 --> 00:45:42,400

science behind them since then I've

922

00:45:45,720 --> 00:45:44,470

participated in many online astronomy

923

00:45:47,610 --> 00:45:45,730

courses you know it's a good point

924

00:45:49,260 --> 00:45:47,620

that's true it gets people kind of

925

00:45:50,970 --> 00:45:49,270

motivated to learn more about this stuff

926

00:45:52,980 --> 00:45:50,980

people so even I've heard of people

927

00:45:54,480 --> 00:45:52,990

becoming or trying to become astronomers

928

00:45:56,100 --> 00:45:54,490

or engineered or something as a result

929

00:46:02,670 --> 00:45:56,110

of it so that's that's really that's

930

00:46:04,140 --> 00:46:02,680

really important to let's see Michael

931

00:46:06,240 --> 00:46:04,150

jobin he's asked he's saying again that

932

00:46:08,490 --> 00:46:06,250

i bought a 12-foot c-band satellite

933

00:46:14,190 --> 00:46:08,500

earth station just to see the launch of

934

00:46:17,610 --> 00:46:14,200

HST in 1990 wow wow you are hardcore

935

00:46:18,870 --> 00:46:17,620

your bike was so Carol I have a question

936

00:46:20,790 --> 00:46:18,880

for you because I've been getting it on

937

00:46:23,070 --> 00:46:20,800

social media and I really don't know the

938

00:46:24,570 --> 00:46:23,080

answer to it one as we were you know

939

00:46:26,490 --> 00:46:24,580

that obviously this week there's been a

940

00:46:29,970 --> 00:46:26,500

lot of top ten images top 10 this is

941

00:46:34,020 --> 00:46:29,980

Matt's for Hubble is there a top 10 list

942

00:46:36,480 --> 00:46:34,030

of the the most site top ten papers of

943

00:46:38,880 --> 00:46:36,490

the most that involve Hubble data like

944

00:46:41,310 --> 00:46:38,890

the most cited the top 10 most cited

945

00:46:44,430 --> 00:46:41,320

Hubble data papers am I asking that in a

946

00:46:46,800 --> 00:46:44,440

way that makes yes yes unfortunately I

947

00:46:51,360 --> 00:46:46,810

don't have that list on the top of my

948

00:46:55,080 --> 00:46:51,370

head but certainly the whole series of

949

00:46:56,880 --> 00:46:55,090

the expansion of the universe which

950

00:46:59,400 --> 00:46:56,890

which I mean there's a whole series of

951
00:47:02,310 --> 00:46:59,410
those papers and so women ethical isn't

952
00:47:04,920 --> 00:47:02,320
that was a real I a big watershed from

953
00:47:08,100 --> 00:47:04,930
the Hubble Deep Field of course I'm

954
00:47:09,900 --> 00:47:08,110
saying I'm just yeah I know you are but

955
00:47:12,350 --> 00:47:09,910
then the follow up I'm just pandering to

956
00:47:17,760 --> 00:47:12,360
you don't worry it's about the XL

957
00:47:21,180 --> 00:47:17,770
acceleration of the universal which the

958
00:47:23,730 --> 00:47:21,190
trio Adam Brian and Saul

959
00:47:25,470 --> 00:47:23,740
won the Nobel Prize so that acceleration

960
00:47:29,280 --> 00:47:25,480
in the universe has then spawned a whole

961
00:47:31,859 --> 00:47:29,290
industry in dark energy so they all

962
00:47:36,859 --> 00:47:31,869
quote that paper of course so that

963
00:47:39,750 --> 00:47:36,869

that's another highly quoted paper I

964

00:47:42,990 --> 00:47:39,760

think there are several in the study of

965

00:47:45,710 --> 00:47:43,000

exoplanets we're like the first transit

966

00:47:49,020 --> 00:47:45,720

that was observed by Hubble and also the

967

00:47:51,569 --> 00:47:49,030

the other one were beta / Taurus where

968

00:47:55,680 --> 00:47:51,579

the the actual and in fact that was in

969

00:47:57,930 --> 00:47:55,690

one of the videos of it were a planet

970

00:48:00,329 --> 00:47:57,940

the trace of upon it was actually

971

00:48:03,180 --> 00:48:00,339

detected by Hubble those are kind of

972

00:48:05,970 --> 00:48:03,190

iconic papers I mean they were hard to

973

00:48:07,530 --> 00:48:05,980

do and very speculative at the time but

974

00:48:09,809 --> 00:48:07,540

they are always referenced in the

975

00:48:12,780 --> 00:48:09,819

subsequent observations done by Hubble

976

00:48:16,829 --> 00:48:12,790

so those and so it pretty much covers

977

00:48:18,540 --> 00:48:16,839

the gamut from from you know they dis

978

00:48:21,089 --> 00:48:18,550

older system all the way out but i would

979

00:48:23,880 --> 00:48:21,099

say probably the cosmology stuff this is

980

00:48:25,200 --> 00:48:23,890

them yeah okay well what we should do is

981

00:48:26,700 --> 00:48:25,210

maybe put that together somewhere and i

982

00:48:29,010 --> 00:48:26,710

should post on social media i have a

983

00:48:31,170 --> 00:48:29,020

great question for the contest winners

984

00:48:33,450 --> 00:48:31,180

this is from Cecil Morgan actually

985

00:48:42,540 --> 00:48:33,460

actually can I just tell you the most

986

00:48:52,620 --> 00:48:42,550

cited paper is a calibration paper to

987

00:48:55,230 --> 00:48:52,630

meet isn't always exciting operation of

988

00:48:57,480 --> 00:48:55,240

what text you or something I ain't go

989

00:49:00,470 --> 00:48:57,490

ahead think about sighs just because

990

00:49:03,809 --> 00:49:00,480

it's highly cited doesn't necessarily

991

00:49:06,690 --> 00:49:03,819

but important but it's so not a science

992

00:49:08,490 --> 00:49:06,700

worth all Cecil Morgan has asked a great

993

00:49:10,109 --> 00:49:08,500

question to our guests I want i'd like

994

00:49:13,050 --> 00:49:10,119

to get your thoughts this is a great one

995

00:49:15,599 --> 00:49:13,060

what are the contest winners favorite HS

996

00:49:18,270 --> 00:49:15,609

de image let me start with you Desiree

997

00:49:22,309 --> 00:49:18,280

now you're muted so I'm you yourself if

998

00:49:28,770 --> 00:49:25,770

you have that ok I'll go to it you're

999

00:49:30,540 --> 00:49:28,780

muted ok I'll go down you go to hey Liam

1000

00:49:34,530 --> 00:49:30,550

Martin real quick what are you guys as

1001

00:49:37,830 --> 00:49:34,540

favorite edge HST image um

1002

00:49:39,990 --> 00:49:37,840

I guess I like the one that was just

1003

00:49:43,920 --> 00:49:40,000

released but Hubble to be the been

1004

00:49:50,610 --> 00:49:43,930

averse damage I was like yeah I cried

1005

00:49:53,850 --> 00:49:50,620

when I saw it was so touched by this

1006

00:49:55,140 --> 00:49:53,860

incredible image yeah they they are they

1007

00:49:58,400 --> 00:49:55,150

are moving aren't they I mean you see

1008

00:50:03,810 --> 00:49:58,410

him minutes like take your breath away

1009

00:50:05,670 --> 00:50:03,820

so much so many things going on yeah and

1010

00:50:09,030 --> 00:50:05,680

he really likes that like globular

1011

00:50:12,600 --> 00:50:09,040

clusters mom look at them oh okay a

1012

00:50:15,800 --> 00:50:12,610

woman after my own heart that's I love

1013

00:50:18,540 --> 00:50:15,810

clusters yeah yeah I'm with you on that

1014

00:50:20,220 --> 00:50:18,550

tony is a hard time about it in fact

1015

00:50:22,920 --> 00:50:20,230

everybody does I'm like oh why are we

1016

00:50:25,770 --> 00:50:22,930

doing this holster it's like it but

1017

00:50:28,910 --> 00:50:25,780

they're great I got ready buster I love

1018

00:50:32,790 --> 00:50:28,920

Buster remember I you subscribed

1019

00:50:35,220 --> 00:50:32,800

Hercules oh my gah fireworks nay foran

1020

00:50:36,420 --> 00:50:35,230

time frozen in time for over 20 min time

1021

00:50:43,950 --> 00:50:36,430

that's how you described Hercules my

1022

00:50:45,750 --> 00:50:43,960

first saw it that's beautiful Desiree do

1023

00:50:50,720 --> 00:50:45,760

you have a favorite HST image Hubble

1024

00:50:56,700 --> 00:50:50,730

image hmm I remember that the first

1025

00:51:01,830 --> 00:50:56,710

imagined that I also was and the pillars

1026
00:51:04,230 --> 00:51:01,840
of creating and it seemed very wonderful

1027
00:51:08,220 --> 00:51:04,240
not only because it's beautiful but also

1028
00:51:11,280 --> 00:51:08,230
the explanation I found on the Hubble

1029
00:51:15,720 --> 00:51:11,290
webpage I mean about the whole new star

1030
00:51:16,890 --> 00:51:15,730
are born there yeah that is one of that

1031
00:51:19,410 --> 00:51:16,900
has been that's been that's sort of like

1032
00:51:22,710 --> 00:51:19,420
that image is also kind of an icon of

1033
00:51:24,870 --> 00:51:22,720
home yeah that's a beautiful image yeah

1034
00:51:27,270 --> 00:51:24,880
that in there is a little you know

1035
00:51:28,470 --> 00:51:27,280
there's a whole like a hey Liam Martin

1036
00:51:30,660 --> 00:51:28,480
were saying it was a whole lot going on

1037
00:51:32,700 --> 00:51:30,670
in that image to its I guess is that a

1038
00:51:36,030 --> 00:51:32,710

Zetas theme we try to pick images that

1039

00:51:39,540 --> 00:51:36,040

where it's just so much fun Gerald's oh

1040

00:51:42,210 --> 00:51:39,550

I think um well of course we we look at

1041

00:51:44,130 --> 00:51:42,220

four images that actually well we have

1042

00:51:46,350 --> 00:51:44,140

two programs one is the science program

1043

00:51:48,329 --> 00:51:46,360

we do newsworthy things in the other is

1044

00:51:51,120 --> 00:51:48,339

heritage where we just picked images

1045

00:51:53,670 --> 00:51:51,130

that are really stunning that we want to

1046

00:51:55,880 --> 00:51:53,680

show and share with the public and I

1047

00:51:58,559 --> 00:51:55,890

think the Heritage Program which has

1048

00:52:00,599 --> 00:51:58,569

most of the images that people that

1049

00:52:05,549 --> 00:52:00,609

people think about except for the Hubble

1050

00:52:07,229 --> 00:52:05,559

Deep Field are chosen because the nebula

1051
00:52:09,450 --> 00:52:07,239
are so striking and each one is

1052
00:52:10,979 --> 00:52:09,460
different even in a class like planetary

1053
00:52:15,269 --> 00:52:10,989
nebula they're all different they're not

1054
00:52:19,620 --> 00:52:15,279
the same so it's like amazing someone's

1055
00:52:21,599 --> 00:52:19,630
feeling scared all right ah County yeah

1056
00:52:24,180 --> 00:52:21,609
so we talked about everyone else I know

1057
00:52:26,009 --> 00:52:24,190
we've talked about you and your Hubble

1058
00:52:28,469 --> 00:52:26,019
Deep Field so let me put that up and

1059
00:52:31,200 --> 00:52:28,479
then I want to hear from you about why

1060
00:52:33,029 --> 00:52:31,210
it's the most important image to you so

1061
00:52:35,489 --> 00:52:33,039
let me screen sure this real quick and

1062
00:52:37,410 --> 00:52:35,499
so this is and again all these images

1063
00:52:40,739 --> 00:52:37,420

that I'm sharing here this is on Hubble

1064

00:52:43,469 --> 00:52:40,749

25th or so you can see all these images

1065

00:52:45,209 --> 00:52:43,479

plus any of the associated videos and

1066

00:52:47,640 --> 00:52:45,219

press releases I go along with them and

1067

00:52:50,849 --> 00:52:47,650

high resolution copies and I believe

1068

00:52:52,499 --> 00:52:50,859

also Carolyn there are printable pdfs

1069

00:52:55,559 --> 00:52:52,509

for these images so people can make

1070

00:52:57,900 --> 00:52:55,569

posters is that right yes yes the Hubble

1071

00:53:04,589 --> 00:52:57,910

site has a place where you can go and

1072

00:53:07,019 --> 00:53:04,599

print out oh ma resolution yeah so Tony

1073

00:53:08,910 --> 00:53:07,029

tell me about your love of the Ltd field

1074

00:53:11,400 --> 00:53:08,920

cuz you want me to sign you bet is all

1075

00:53:13,890 --> 00:53:11,410

about I'm sorry there are the images you

1076

00:53:17,729 --> 00:53:13,900

can get in various formats but on the

1077

00:53:22,499 --> 00:53:17,739

hub hubble hubble 25th so there are

1078

00:53:24,719 --> 00:53:22,509

those 25 images um there are poster

1079

00:53:27,630 --> 00:53:24,729

ready yeah post already not just images

1080

00:53:29,519 --> 00:53:27,640

for framing but poster ready yeah you

1081

00:53:31,709 --> 00:53:29,529

can put a large format printer like some

1082

00:53:33,930 --> 00:53:31,719

place and I can't say names but you mark

1083

00:53:36,569 --> 00:53:33,940

boutique at Kinkos you can go and kick

1084

00:53:40,950 --> 00:53:36,579

ok we can ok I didn't know if he gets on

1085

00:53:43,170 --> 00:53:40,960

the website hey favorite your favorite

1086

00:53:45,239 --> 00:53:43,180

pro i was in college when this when the

1087

00:53:48,859 --> 00:53:45,249

first deep field came out the very first

1088

00:53:50,849 --> 00:53:48,869

one and then i thought it was great i

1089

00:53:56,099 --> 00:53:50,859

didn't really understand it and then

1090

00:53:59,370 --> 00:53:56,109

this came out in in two in go to 2004

1091

00:54:00,959 --> 00:53:59,380

and I learned how it was taken and once

1092

00:54:01,599 --> 00:54:00,969

I learned how was taken and that it was

1093

00:54:02,739 --> 00:54:01,609

kind of a risk

1094

00:54:05,200 --> 00:54:02,749

the image to make and we didn't even

1095

00:54:06,849 --> 00:54:05,210

know what we'd see and then they looked

1096

00:54:09,269 --> 00:54:06,859

at this area this guy for 11 days and

1097

00:54:12,819 --> 00:54:09,279

then saw all these galaxies it literally

1098

00:54:14,200 --> 00:54:12,829

changed my life I I was so inspired by

1099

00:54:15,789 --> 00:54:14,210

that that I made I started making videos

1100

00:54:17,349 --> 00:54:15,799

about it and things like that it was

1101
00:54:19,420 --> 00:54:17,359
that it was a very humbling image it was

1102
00:54:21,489 --> 00:54:19,430
one of the few images that really got me

1103
00:54:23,229 --> 00:54:21,499
gave me true perspective about what my

1104
00:54:26,499 --> 00:54:23,239
place was in the universe so that's why

1105
00:54:28,839 --> 00:54:26,509
it's my favorite and always will be and

1106
00:54:34,359 --> 00:54:28,849
I you know I will put up what mine is

1107
00:54:37,089 --> 00:54:34,369
and I I sit what I think is my favorite

1108
00:54:41,289 --> 00:54:37,099
image from all this is the Crab Nebula

1109
00:54:43,559 --> 00:54:41,299
so and then the reason behind this is as

1110
00:54:48,569 --> 00:54:43,569
make sure it gets screen share roughly

1111
00:54:51,640 --> 00:54:48,579
is this is something that humans saw

1112
00:54:53,710 --> 00:54:51,650
happen a thousand years ago so we saw

1113
00:54:56,049 --> 00:54:53,720

the supernova so this is something that

1114

00:55:00,370 --> 00:54:56,059

with Ryan saying Scott we're just seeing

1115

00:55:03,999 --> 00:55:00,380

your icon I'm seeing it are you I mean I

1116

00:55:05,620 --> 00:55:04,009

apologize I'm singing out I'm so so this

1117

00:55:08,440 --> 00:55:05,630

is a supernova remnant and so the

1118

00:55:10,359 --> 00:55:08,450

supernova that happened with this was

1119

00:55:13,720 --> 00:55:10,369

observed by humans and we've actually

1120

00:55:15,940 --> 00:55:13,730

you know have seen writings about this

1121

00:55:17,620 --> 00:55:15,950

and we've been able to study it over

1122

00:55:19,779 --> 00:55:17,630

time and first all it's a beautiful

1123

00:55:22,900 --> 00:55:19,789

image anyway but the fact that this is a

1124

00:55:24,789 --> 00:55:22,910

beautiful wonderful scientific we can

1125

00:55:27,339 --> 00:55:24,799

learn a lot of science about what's

1126
00:55:31,809 --> 00:55:27,349
going on here but it's happened within

1127
00:55:33,910 --> 00:55:31,819
the human timeline and we're a lot of

1128
00:55:35,650 --> 00:55:33,920
the other things like you know the ultra

1129
00:55:37,239 --> 00:55:35,660
deep field which i'm not going to bash

1130
00:55:39,190 --> 00:55:37,249
or anything like that but these things

1131
00:55:40,660 --> 00:55:39,200
are happening billions of years ago but

1132
00:55:42,989 --> 00:55:40,670
this is something that happens within

1133
00:55:45,819 --> 00:55:42,999
the human context and helps us

1134
00:55:48,339 --> 00:55:45,829
understand and get a different timeline

1135
00:55:51,009 --> 00:55:48,349
of what's going on in the universe so

1136
00:55:55,749 --> 00:55:51,019
for me I've always really loved to Crab

1137
00:55:57,940 --> 00:55:55,759
Nebula because of we as a species can

1138
00:56:02,289 --> 00:55:57,950

connect to it because we we've been able

1139

00:56:03,370 --> 00:56:02,299

to see it grow over time and that we

1140

00:56:05,739 --> 00:56:03,380

don't necessarily get that opportunity

1141

00:56:06,940 --> 00:56:05,749

with many astronomical images I know it

1142

00:56:08,620 --> 00:56:06,950

that's the things kind of blow me away

1143

00:56:10,150 --> 00:56:08,630

about the way the astronomy has exploded

1144

00:56:11,559 --> 00:56:10,160

this in the past couple of decades and

1145

00:56:15,190 --> 00:56:11,569

now we can make movies of things like

1146

00:56:16,300 --> 00:56:15,200

super novae and and galaxies rotating

1147

00:56:17,770 --> 00:56:16,310

things like that it's just really

1148

00:56:22,569 --> 00:56:17,780

amazing so Carol what's your favorite

1149

00:56:24,819 --> 00:56:22,579

you see people ask me that our news

1150

00:56:26,500 --> 00:56:24,829

chief just asked me to write that up for

1151
00:56:28,270 --> 00:56:26,510
somebody and I said I won't do it and I

1152
00:56:30,790 --> 00:56:28,280
won't because I don't have a favorite I

1153
00:56:35,980 --> 00:56:30,800
like so many of them that i can't choose

1154
00:56:38,920 --> 00:56:35,990
one over the other I rather babies yeah

1155
00:56:42,460 --> 00:56:38,930
I really like westerlund to which was

1156
00:56:45,099 --> 00:56:42,470
released yesterday but you know I I'm a

1157
00:56:49,390 --> 00:56:45,109
coaster person so I tend to like the

1158
00:56:51,160 --> 00:56:49,400
clusters like NGC 3603 NGC 602 I'm gonna

1159
00:56:56,380 --> 00:56:51,170
throw these numbers out but I love

1160
00:56:58,810 --> 00:56:56,390
globular clusters as well um uh they're

1161
00:57:00,310 --> 00:56:58,820
great i love you know and then also

1162
00:57:04,569 --> 00:57:00,320
observing the clusters and other

1163
00:57:08,200 --> 00:57:04,579

galaxies like m31 m93 so that's kind of

1164

00:57:10,510 --> 00:57:08,210

my theme is is clusters I think the

1165

00:57:13,510 --> 00:57:10,520

planetary nebulae are really fantastic

1166

00:57:15,609 --> 00:57:13,520

but if I can be pushed into a category

1167

00:57:17,560 --> 00:57:15,619

which would be the clusters but i can't

1168

00:57:19,990 --> 00:57:17,570

i can't pick one image because they're

1169

00:57:22,870 --> 00:57:20,000

also great for different reasons fair

1170

00:57:29,040 --> 00:57:22,880

enough georgia yeah georgia it's like

1171

00:57:32,230 --> 00:57:29,050

coming to build us i i really loved the

1172

00:57:34,690 --> 00:57:32,240

the infrared version as the m16 that we

1173

00:57:37,359 --> 00:57:34,700

put out in January so like the pillars

1174

00:57:40,120 --> 00:57:37,369

night yep infrared I thought when I saw

1175

00:57:41,770 --> 00:57:40,130

that I was just it's an image that you

1176

00:57:43,720 --> 00:57:41,780

really recognize and it is very iconic

1177

00:57:45,460 --> 00:57:43,730

and to see it in that different

1178

00:57:46,809 --> 00:57:45,470

wavelengths gave it just a completely

1179

00:57:49,420 --> 00:57:46,819

different look a completely different

1180

00:57:52,210 --> 00:57:49,430

feel I thought aesthetically that was

1181

00:57:53,620 --> 00:57:52,220

brilliant mm-hmm but in terms of the

1182

00:57:55,420 --> 00:57:53,630

actual feeling that you get when you

1183

00:58:02,290 --> 00:57:55,430

look at something I think the ultra deep

1184

00:58:04,720 --> 00:58:02,300

field asst yeah hahaha i was gonna say

1185

00:58:07,359 --> 00:58:04,730

so some of it is since I've been with in

1186

00:58:09,069 --> 00:58:07,369

het with heritage for long so long you

1187

00:58:10,780 --> 00:58:09,079

know some of it is actually the whole

1188

00:58:13,390 --> 00:58:10,790

process of our giving over getting the

1189

00:58:15,099 --> 00:58:13,400

images and exactly what filters to take

1190

00:58:16,990 --> 00:58:15,109

and all that the other one was the

1191

00:58:18,849 --> 00:58:17,000

Horsehead the Horsehead was a stunner

1192

00:58:21,010 --> 00:58:18,859

when we did it we had many arguments

1193

00:58:24,220 --> 00:58:21,020

about how we were going to do that image

1194

00:58:26,109 --> 00:58:24,230

and in the end we threw all our eggs in

1195

00:58:28,390 --> 00:58:26,119

the infrared basket and when we took it

1196

00:58:28,760 --> 00:58:28,400

we had all these arguments but we're not

1197

00:58:32,930 --> 00:58:28,770

going to

1198

00:58:34,310 --> 00:58:32,940

anything how much of it in house mosaic

1199

00:58:39,800 --> 00:58:34,320

gonna be done and all this stuff and

1200

00:58:42,530 --> 00:58:39,810

then we can kiss really and then then

1201

00:58:44,690 --> 00:58:42,540

the day you know we had processed it and

1202

00:58:47,210 --> 00:58:44,700

we all had our meeting we sent and it

1203

00:58:51,680 --> 00:58:47,220

came up on the screen and collectively

1204

00:58:56,870 --> 00:58:51,690

we all want looks way better than we

1205

00:58:58,850 --> 00:58:56,880

thought I really i did a beautiful job

1206

00:59:00,410 --> 00:58:58,860

of the 3d I agree that's that was an

1207

00:59:01,820 --> 00:59:00,420

outstanding image so we're going you got

1208

00:59:03,050 --> 00:59:01,830

a few couple of minutes left I just want

1209

00:59:05,270 --> 00:59:03,060

to get a couple of real quick comments

1210

00:59:07,880 --> 00:59:05,280

in from YouTube here is one well-known

1211

00:59:10,090 --> 00:59:07,890

from moon draw three from YouTube well

1212

00:59:12,980 --> 00:59:10,100

no one else has said it so i am going

1213

00:59:14,960 --> 00:59:12,990

happy birthday Hubble thank you for the

1214

00:59:17,120 --> 00:59:14,970

many wonderful images over the years and

1215

00:59:20,200 --> 00:59:17,130

hopefully many more to come you have

1216

00:59:23,450 --> 00:59:20,210

made this space geek happy same here

1217

00:59:25,730 --> 00:59:23,460

birthday Hubble okay couple of a couple

1218

00:59:27,430 --> 00:59:25,740

of things on on Twitter that I just want

1219

00:59:30,740 --> 00:59:27,440

to mention real quick-- lots of people

1220

00:59:32,450 --> 00:59:30,750

congratulating a Hubble on its oh

1221

00:59:35,210 --> 00:59:32,460

there's an e-book we should talk about

1222

00:59:37,220 --> 00:59:35,220

that there's no just coming up that's

1223

00:59:39,320 --> 00:59:37,230

that's on where can I get that Carol

1224

00:59:42,770 --> 00:59:39,330

shoot I wish I'd had that URL handy I

1225

00:59:44,860 --> 00:59:42,780

have that URL up that's why you drive

1226
00:59:49,340 --> 00:59:44,870
the internet Scott you're awesome thank

1227
00:59:53,270 --> 00:59:49,350
for that up here so you're that so this

1228
00:59:55,310 --> 00:59:53,280
is our ebook and it is fantastic and I

1229
00:59:57,560 --> 00:59:55,320
am NOT saying it because I'm biased but

1230
01:00:00,380 --> 00:59:57,570
it is it really isn't anything I've had

1231
01:00:03,430 --> 01:00:00,390
so much great feedback from many people

1232
01:00:08,480 --> 01:00:03,440
out here but you can go to Hubble 25th

1233
01:00:10,310 --> 01:00:08,490
org / images / 26 or you can actually

1234
01:00:12,410 --> 01:00:10,320
just see from the main page you can you

1235
01:00:14,210 --> 01:00:12,420
can go there and explore and find it and

1236
01:00:15,560 --> 01:00:14,220
it's it's going to be in our resources

1237
01:00:17,840 --> 01:00:15,570
you can get it from the apple itunes

1238
01:00:20,720 --> 01:00:17,850

store you can download it as a PDF and

1239

01:00:23,950 --> 01:00:20,730

an ePub so for many different types of

1240

01:00:27,620 --> 01:00:23,960

tablets you can get this and it is

1241

01:00:29,750 --> 01:00:27,630

wonderful yeah so definitely check it

1242

01:00:32,650 --> 01:00:29,760

out folks got a lot of tweets from

1243

01:00:36,260 --> 01:00:32,660

people you got the Canadian Space Agency

1244

01:00:39,350 --> 01:00:36,270

lots of people wishing a happy birthday

1245

01:00:41,930 --> 01:00:39,360

the everybody's got posting pictures and

1246

01:00:42,320 --> 01:00:41,940

and and just being wonderful all around

1247

01:00:44,060 --> 01:00:42,330

the two

1248

01:00:45,260 --> 01:00:44,070

sphere so thank you all very much I

1249

01:00:47,600 --> 01:00:45,270

didn't want to hear one thing from

1250

01:00:49,610 --> 01:00:47,610

Twitter because it blew it really made

1251

01:00:52,700 --> 01:00:49,620

me laugh thank you for letting me forget

1252

01:00:55,010 --> 01:00:52,710

that yes yes yeah so I put out a call to

1253

01:00:58,370 --> 01:00:55,020

action site you know let let us know how

1254

01:01:00,920 --> 01:00:58,380

Hubble has inspired you and we've got a

1255

01:01:04,700 --> 01:01:00,930

lot of responses but my favorite by far

1256

01:01:08,510 --> 01:01:04,710

is from Paul and I'm gonna just get one

1257

01:01:15,670 --> 01:01:08,520

real quick I Paul the force at all the

1258

01:01:27,050 --> 01:01:24,230

that is hardcore look at that hello my

1259

01:01:28,880 --> 01:01:27,060

hat is off to you sir that is fantastic

1260

01:01:31,160 --> 01:01:28,890

and no talk about actually being

1261

01:01:32,870 --> 01:01:31,170

inspired and going the full length and

1262

01:01:36,590 --> 01:01:32,880

you went through some pain for that and

1263

01:01:38,450 --> 01:01:36,600

that she did that were fought easy but

1264

01:01:40,550 --> 01:01:38,460

it's good work to whoever did I was

1265

01:01:42,980 --> 01:01:40,560

really a good artist that's all I looks

1266

01:01:45,110 --> 01:01:42,990

like it's at tattoo Connor so there you

1267

01:01:46,550 --> 01:01:45,120

go there you go you want your very own

1268

01:01:48,380 --> 01:01:46,560

space testing well we're gonna plug

1269

01:01:51,920 --> 01:01:48,390

those guys because that is awesome you

1270

01:01:54,680 --> 01:01:51,930

thank you Paul that's outstanding okay

1271

01:01:57,260 --> 01:01:54,690

folks we are out of time sadly I hope

1272

01:01:58,820 --> 01:01:57,270

that you enjoyed the special Hubble hang

1273

01:02:01,070 --> 01:01:58,830

out that we've had for the 25th

1274

01:02:05,540 --> 01:02:01,080

anniversary here's hoping Hubble will

1275

01:02:07,310 --> 01:02:05,550

stand another 25 years and we Hubble

1276

01:02:10,220 --> 01:02:07,320

certainly has a lot of life left in it

1277

01:02:11,720 --> 01:02:10,230

next week we are hoping we'll be back at

1278

01:02:13,910 --> 01:02:11,730

a regular time Thursday three o'clock

1279

01:02:16,160 --> 01:02:13,920

we're hoping to do and schedule a

1280

01:02:18,140 --> 01:02:16,170

hangout on on frontier fields get an

1281

01:02:20,600 --> 01:02:18,150

update with the latest they are halfway

1282

01:02:22,520 --> 01:02:20,610

through the six clusters that they're

1283

01:02:24,530 --> 01:02:22,530

looking at we hope to have some people

1284

01:02:26,240 --> 01:02:24,540

on board we have not confirmed it yet so

1285

01:02:28,370 --> 01:02:26,250

that may change but we will be back next

1286

01:02:30,470 --> 01:02:28,380

Thursday three o'clock eastern daylight

1287

01:02:32,120 --> 01:02:30,480

time thank you all for watching happy

1288

01:02:34,640 --> 01:02:32,130

birthday Hubble thank you Scott and

1289

01:02:37,220 --> 01:02:34,650

Carol and congratulations Desiree and

1290

01:02:41,390 --> 01:02:37,230

Martin and Haley can grade you guys are

1291

01:02:42,710 --> 01:02:41,400

awesome great work yes thank you all

1292

01:02:44,810 --> 01:02:42,720

right that's it for this week folks