

1
00:00:03,470 --> 00:00:08,730
hello everybody and welcome to a special

2
00:00:05,700 --> 00:00:10,980
Hubble 25th anniversary edition of our

3
00:00:08,730 --> 00:00:12,240
Hubble hangouts my name is Tony Darnell

4
00:00:10,980 --> 00:00:14,429
I work at the Space Telescope Science

5
00:00:12,240 --> 00:00:16,740
Institute and this week we've got

6
00:00:14,429 --> 00:00:18,390
something slightly different plans as

7
00:00:16,739 --> 00:00:20,368
you've already noticed this is a friday

8
00:00:18,390 --> 00:00:25,050
and not a Thursday but it's also a very

9
00:00:20,368 --> 00:00:27,689
important day today marks 25 years of

10
00:00:25,050 --> 00:00:30,449
the hubble space telescope orbiting over

11
00:00:27,689 --> 00:00:33,210
the earth and we've been celebrating it

12
00:00:30,449 --> 00:00:34,890
all week yesterday was a the institute

13
00:00:33,210 --> 00:00:36,989
was full of activities all kinds of

14
00:00:34,890 --> 00:00:38,909
really fun things and we throughout the

15
00:00:36,988 --> 00:00:40,679
year we've been doing social media

16
00:00:38,909 --> 00:00:42,539
activities and things like that and so

17
00:00:40,679 --> 00:00:45,628
it's been a real whirlwind of activity

18
00:00:42,539 --> 00:00:47,549
the show of support to for the for the

19
00:00:45,628 --> 00:00:49,079
telescope from the public has really

20
00:00:47,549 --> 00:00:50,820
literally been overwhelming I've been

21
00:00:49,079 --> 00:00:52,410
monitoring Twitter on my tweet deck and

22
00:00:50,820 --> 00:00:54,689
it's more like it's been like an

23
00:00:52,409 --> 00:00:58,439
odometer with all the tweets go oh it's

24
00:00:54,689 --> 00:01:01,378
been it's been absolutely I can't keep

25
00:00:58,439 --> 00:01:02,820
up with it I tried it got to a point

26
00:01:01,378 --> 00:01:04,109
where I just couldn't do it so next week

27
00:01:02,820 --> 00:01:05,400
I'm going to be getting some statistics

28
00:01:04,109 --> 00:01:07,049
on some of those to see what happened

29

00:01:05,400 --> 00:01:09,689
but it I want to thank you all so much

30
00:01:07,049 --> 00:01:12,090
for the warm messages of congratulations

31
00:01:09,688 --> 00:01:14,548
and and support for this wonderful

32
00:01:12,090 --> 00:01:15,960
telescope so today what we're going to

33
00:01:14,549 --> 00:01:19,140
do is we're going to take a minute and

34
00:01:15,959 --> 00:01:20,728
just kind of appreciate a Hubble in a

35
00:01:19,140 --> 00:01:23,040
variety of ways what we're hoping is

36
00:01:20,728 --> 00:01:24,688
that while we're on the Hangout will get

37
00:01:23,040 --> 00:01:27,689
a lot of interaction from you guys we

38
00:01:24,688 --> 00:01:29,728
hope that you will chat with us and talk

39
00:01:27,688 --> 00:01:32,129
with us and tell us what what Hubble

40
00:01:29,728 --> 00:01:34,500
means to you because we'd love to hear

41
00:01:32,129 --> 00:01:37,469
and we like to talk about it today and

42
00:01:34,500 --> 00:01:38,759
I'll I guess I'll it's God you want to

43
00:01:37,469 --> 00:01:41,789

tell people how they can interact with

44

00:01:38,759 --> 00:01:43,200

us yeah so the best way for you to

45

00:01:41,790 --> 00:01:45,990

interact with us since you're watching

46

00:01:43,200 --> 00:01:47,640

us on YouTube and as on the very bottom

47

00:01:45,989 --> 00:01:49,199

left you'll see some gold lettering

48

00:01:47,640 --> 00:01:52,079

there it says that we're answering

49

00:01:49,200 --> 00:01:53,310

questions and it opens up the Q&A app

50

00:01:52,078 --> 00:01:56,489

and it gives you a brand-new experience

51

00:01:53,310 --> 00:01:57,990

you can ask us questions but also make

52

00:01:56,489 --> 00:02:00,929

comments and what we're really asking

53

00:01:57,989 --> 00:02:03,658

for today is how has the Hubble Space

54

00:02:00,930 --> 00:02:06,750

Telescope impacted you has it inspired

55

00:02:03,659 --> 00:02:08,670

you in any ways and we have two amazing

56

00:02:06,750 --> 00:02:10,500

get or three amazing guests with us that

57

00:02:08,669 --> 00:02:11,969

created something through the

58
00:02:10,500 --> 00:02:13,770
inspiration from Hubble Space Telescope

59
00:02:11,969 --> 00:02:15,569
but we want to hear from you

60
00:02:13,770 --> 00:02:17,370
and how that's inspired you so you can

61
00:02:15,569 --> 00:02:19,590
do that there with the Q&A app on

62
00:02:17,370 --> 00:02:22,469
YouTube and Google Plus you can leave

63
00:02:19,590 --> 00:02:27,150
regular comments on YouTube and also in

64
00:02:22,469 --> 00:02:31,439
our event page and I'll try very hard to

65
00:02:27,150 --> 00:02:34,200
monitor Twitter with our hashtag I help

66
00:02:31,439 --> 00:02:35,759
out hang out yeah help the hashtag hub

67
00:02:34,199 --> 00:02:37,919
will hang out I'm monitoring that too so

68
00:02:35,759 --> 00:02:42,599
I'll be able to do that so I have Hubble

69
00:02:37,919 --> 00:02:44,579
25 up to but that is a whirlwind of

70
00:02:42,599 --> 00:02:47,609
everything that everyone is celebrating

71
00:02:44,580 --> 00:02:50,160
it if you want to I recommend going

72
00:02:47,610 --> 00:02:52,140
through the hashtag just to see all the

73
00:02:50,159 --> 00:02:53,609
amazing announcements going on but for

74
00:02:52,139 --> 00:02:56,399
this show we're going to be going over

75
00:02:53,610 --> 00:02:58,950
the Hubble hang out hashtag which is in

76
00:02:56,400 --> 00:03:00,599
below out Antonius lower third wonderful

77
00:02:58,949 --> 00:03:02,879
thank you Scott and we're joining us as

78
00:03:00,599 --> 00:03:04,680
she does every week is dr. carol

79
00:03:02,879 --> 00:03:06,810
christian she is the HS the Hubble Space

80
00:03:04,680 --> 00:03:10,950
Telescope outreach project scientist

81
00:03:06,810 --> 00:03:17,550
welcome Carol hello Ben week huh oh yeah

82
00:03:10,949 --> 00:03:18,959
and it's not over ok with us so let me

83
00:03:17,550 --> 00:03:21,450
go ahead and get started joining me here

84
00:03:18,959 --> 00:03:24,659
at the Institute is Georgia blade and

85
00:03:21,449 --> 00:03:26,789
she is the Hubble of press information

86

00:03:24,659 --> 00:03:29,189
officer for the Hubble Space Telescope

87
00:03:26,789 --> 00:03:31,769
for ISA the European Space Agency and

88
00:03:29,189 --> 00:03:33,990
she ran the she was in charge of the ode

89
00:03:31,770 --> 00:03:36,510
to Hubble video contest so welcome

90
00:03:33,990 --> 00:03:37,770
Georgia is great to have you so tell us

91
00:03:36,509 --> 00:03:39,750
about the god tell us about your

92
00:03:37,770 --> 00:03:42,330
experience how did it go it was

93
00:03:39,750 --> 00:03:44,069
fantastic to sum up I wanted to just

94
00:03:42,330 --> 00:03:46,230
thank everyone who sent in the video

95
00:03:44,069 --> 00:03:48,650
everyone who did took place in the crowd

96
00:03:46,229 --> 00:03:51,000
voting I was absolutely blown away

97
00:03:48,650 --> 00:03:54,180
having the opportunity to watch all of

98
00:03:51,000 --> 00:03:56,459
the submitted videos which I did and was

99
00:03:54,180 --> 00:03:58,110
incredible time took a lot of time but

100
00:03:56,459 --> 00:04:00,479

it was so rewarding because the amount

101

00:03:58,110 --> 00:04:03,060

of love and energy that people are put

102

00:04:00,479 --> 00:04:06,299

into creating these videos was well it

103

00:04:03,060 --> 00:04:09,240

just blew me away and so we started this

104

00:04:06,300 --> 00:04:12,719

competition back in February I opened up

105

00:04:09,240 --> 00:04:14,790

the entries then and since then we had a

106

00:04:12,719 --> 00:04:17,668

whole bunch of entries these were then

107

00:04:14,789 --> 00:04:20,399

shortlisted buy you guys the public the

108

00:04:17,668 --> 00:04:21,988

community on social media on our website

109

00:04:20,399 --> 00:04:23,279

now how did that work you had people

110

00:04:21,988 --> 00:04:24,569

just you had them all listed and they

111

00:04:23,279 --> 00:04:26,609

just liked it on Facebook because that

112

00:04:24,569 --> 00:04:26,949

what they did or none of the number of

113

00:04:26,610 --> 00:04:30,040

light

114

00:04:26,949 --> 00:04:31,659

yeah we used a program for it where it

115
00:04:30,040 --> 00:04:34,420
displays all of the entries in the two

116
00:04:31,660 --> 00:04:36,730
categories because we had the under-25s

117
00:04:34,420 --> 00:04:38,470
the board and Hubble's lifetime as you

118
00:04:36,730 --> 00:04:40,660
are at the public generation the Hubble

119
00:04:38,470 --> 00:04:42,520
generation and then you had the over 25

120
00:04:40,660 --> 00:04:43,990
so for each of those it displays all of

121
00:04:42,519 --> 00:04:45,729
the videos and yeah you have to be

122
00:04:43,990 --> 00:04:47,949
logged into Facebook and then you liked

123
00:04:45,730 --> 00:04:49,930
them and the six with the highest likes

124
00:04:47,949 --> 00:04:52,539
in both of the categories well in short

125
00:04:49,930 --> 00:04:55,949
listed and and those were judged by our

126
00:04:52,540 --> 00:04:57,970
panel of judges which was a mixture of

127
00:04:55,949 --> 00:05:01,839
scientists science outreach

128
00:04:57,970 --> 00:05:05,260
professionals artists and four of them

129
00:05:01,839 --> 00:05:07,899
more so a really mixed judging group and

130
00:05:05,259 --> 00:05:09,849
in the end as of today we have two

131
00:05:07,899 --> 00:05:13,329
winning videos one from each category

132
00:05:09,850 --> 00:05:14,710
one from each category and so let's why

133
00:05:13,329 --> 00:05:16,539
do we go ahead and get started with it

134
00:05:14,709 --> 00:05:18,159
let's start with we have the winners

135
00:05:16,540 --> 00:05:19,689
here they both agreed to join us in

136
00:05:18,160 --> 00:05:21,790
there hang out i'm so excited they did

137
00:05:19,689 --> 00:05:24,189
i'm gonna let georgia introduce them and

138
00:05:21,790 --> 00:05:25,689
well what we're going to do is going to

139
00:05:24,189 --> 00:05:28,509
start after the introductions and we're

140
00:05:25,689 --> 00:05:31,240
going to take a look at each video so

141
00:05:28,509 --> 00:05:33,370
first we have the winner of our over 25s

142
00:05:31,240 --> 00:05:35,379
to category and with a beautiful

143

00:05:33,370 --> 00:05:38,199
beautiful video which are about to see

144
00:05:35,379 --> 00:05:40,659
and using well actually you talk about

145
00:05:38,199 --> 00:05:43,300
it yourself so here's hope I get this

146
00:05:40,660 --> 00:05:44,950
right at 20 so if you could introduce

147
00:05:43,300 --> 00:05:50,379
yourself and just tell us a bit about

148
00:05:44,949 --> 00:05:53,620
your you and your video okay hello

149
00:05:50,379 --> 00:05:57,180
everyone I am delighted to be here it's

150
00:05:53,620 --> 00:05:59,680
an honor to me you have invited me

151
00:05:57,180 --> 00:06:03,009
anyway I would like to thank you for the

152
00:05:59,680 --> 00:06:06,069
opportunity to to participate to to

153
00:06:03,009 --> 00:06:08,829
these Howell hang out and I would like

154
00:06:06,069 --> 00:06:12,069
to congratulate the other contest winner

155
00:06:08,829 --> 00:06:20,529
and because i really enjoyed their their

156
00:06:12,069 --> 00:06:24,009
video too well my video is divided into

157
00:06:20,529 --> 00:06:27,489

into bar in the first part i make a

158

00:06:24,009 --> 00:06:31,779

little reflection on the fact that hovel

159

00:06:27,490 --> 00:06:36,850

discoveries hard on me and in the second

160

00:06:31,779 --> 00:06:39,789

part i show of my own a sequence of my

161

00:06:36,850 --> 00:06:41,020

own creation photograph that we are

162

00:06:39,790 --> 00:06:45,129

inspired

163

00:06:41,019 --> 00:06:46,448

and by having my cheese wonderful I i'm

164

00:06:45,129 --> 00:06:47,800

going to have some comments and i'm

165

00:06:46,449 --> 00:06:49,930

going to make after we watch it but

166

00:06:47,800 --> 00:06:51,639

Scott's getting it cued up for us now

167

00:06:49,930 --> 00:06:54,158

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

168

00:06:51,639 --> 00:06:55,360

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

169

00:06:54,158 --> 00:06:58,060

some more about it okay are you ready

170

00:06:55,360 --> 00:07:01,050

Scott or do you need some more time okay

171

00:06:58,060 --> 00:07:01,050

all right

172
00:08:04,040 --> 00:08:06,069
Oh

173
00:10:05,889 --> 00:10:13,250
wow that was absolutely stunning yeah

174
00:10:11,500 --> 00:10:15,679
congratulation that is an outstanding

175
00:10:13,250 --> 00:10:22,730
vide so you also composed the music for

176
00:10:15,679 --> 00:10:27,319
that correct yes I I have a man in the

177
00:10:22,730 --> 00:10:30,050
past and but and I'm sorry I give some

178
00:10:27,320 --> 00:10:32,120
song from that time well I was

179
00:10:30,049 --> 00:10:34,009
absolutely beautiful I tell you I did

180
00:10:32,120 --> 00:10:36,019
when we got to the end of the first part

181
00:10:34,009 --> 00:10:37,789
I actually got a little lump in my

182
00:10:36,019 --> 00:10:40,009
throat I had a real emotional reaction

183
00:10:37,789 --> 00:10:42,409
that part about you know our place our

184
00:10:40,009 --> 00:10:43,879
home in the universe that was an amazing

185
00:10:42,409 --> 00:10:45,469
part for me it was really it really

186
00:10:43,879 --> 00:10:47,659
affected me and that's how you know

187
00:10:45,470 --> 00:10:49,610
you've got it because I've made one or

188
00:10:47,659 --> 00:10:51,169
two videos in my time and and when

189
00:10:49,610 --> 00:10:52,639
you're doing you can get an emotional

190
00:10:51,169 --> 00:10:54,589
reaction from something you've watched

191
00:10:52,639 --> 00:10:57,289
that's hard to do that's when you know

192
00:10:54,590 --> 00:10:59,509
you you hit it you really done you've

193
00:10:57,289 --> 00:11:01,099
gotten it right and I felt that way

194
00:10:59,509 --> 00:11:05,330
right in at the end of that first part

195
00:11:01,100 --> 00:11:07,070
now in the the you're also a

196
00:11:05,330 --> 00:11:15,320
photographer correct those were your

197
00:11:07,070 --> 00:11:19,000
feet photographs yes I and I was doing

198
00:11:15,320 --> 00:11:23,900
the photograph when the contest appears

199
00:11:19,000 --> 00:11:27,559
then I thought that it's a good and

200

00:11:23,899 --> 00:11:31,129
change due to to participate with my

201
00:11:27,559 --> 00:11:33,679
photograph that M did you look at the

202
00:11:31,129 --> 00:11:36,200
with with respect to the Hubble images

203
00:11:33,679 --> 00:11:37,879
did you see the Hubble image and then

204
00:11:36,200 --> 00:11:39,800
try to recreate that somehow with

205
00:11:37,879 --> 00:11:41,210
photography or did you already have some

206
00:11:39,799 --> 00:11:43,759
images and tried to match them up with

207
00:11:41,210 --> 00:11:45,440
things that that you thought would be a

208
00:11:43,759 --> 00:11:51,830
good match with with Hubble photographs

209
00:11:45,440 --> 00:11:56,060
or Hubble images and when I discovered

210
00:11:51,830 --> 00:12:00,139
the house mattress and what's very

211
00:11:56,059 --> 00:12:03,649
prevalent to me and because and I

212
00:12:00,139 --> 00:12:08,389
discovered that the universe changes

213
00:12:03,649 --> 00:12:11,209
constantly so I decided to make song

214
00:12:08,389 --> 00:12:15,080

Hubble images with more women shot to do

215

00:12:11,210 --> 00:12:17,040
and the collation baryonic that's

216

00:12:15,080 --> 00:12:19,528
outstanding wow that's the

217

00:12:17,039 --> 00:12:22,198
the the ones with via that where you

218

00:12:19,528 --> 00:12:23,939
matched up the Hubble of the the

219

00:12:22,198 --> 00:12:26,309
Horsehead Nebula I thought was right on

220

00:12:23,940 --> 00:12:28,259
as those were really great photos and it

221

00:12:26,309 --> 00:12:30,149
is someone that I i love doing

222

00:12:28,259 --> 00:12:32,789
photography myself I was blown away by

223

00:12:30,149 --> 00:12:34,919
photography skills as well as i make

224

00:12:32,789 --> 00:12:37,078
videos and like you're blending in the

225

00:12:34,919 --> 00:12:38,610
two things that really are passionate to

226

00:12:37,078 --> 00:12:40,289
me and i really really love the way that

227

00:12:38,610 --> 00:12:43,289
it came out so i thought was absolutely

228

00:12:40,289 --> 00:12:46,528
fantastic yeah it was really good I'm

229
00:12:43,289 --> 00:12:50,818
happy that you have enjoyed as much as I

230
00:12:46,528 --> 00:12:55,740
did create didn't do any questions you

231
00:12:50,818 --> 00:12:57,689
like to ask I understand that this is

232
00:12:55,740 --> 00:13:05,129
like a selection that you actually have

233
00:12:57,690 --> 00:13:11,810
more photographs very only a collection

234
00:13:05,129 --> 00:13:17,519
is actually larger yes the hotel has a

235
00:13:11,809 --> 00:13:20,369
20 photograph but in the video to do the

236
00:13:17,519 --> 00:13:28,589
day assembling I need to concentrate all

237
00:13:20,370 --> 00:13:31,709
day I choose the the rest I think do you

238
00:13:28,589 --> 00:13:33,660
have any are you a an artist by trade

239
00:13:31,708 --> 00:13:35,219
you do you do this for a living or do

240
00:13:33,659 --> 00:13:37,289
you do something you do you have a day

241
00:13:35,220 --> 00:13:38,819
job that's what we could call it in

242
00:13:37,289 --> 00:13:44,399
America do you have a job that isn't it

243
00:13:38,818 --> 00:13:48,000
being an artist yeah it's like I hope I

244
00:13:44,399 --> 00:13:53,429
not work like reception is in my free

245
00:13:48,000 --> 00:13:58,589
time I I take photograph and and I make

246
00:13:53,429 --> 00:14:01,438
music in the other and poet you've got a

247
00:13:58,589 --> 00:14:05,610
real future as an artist if you choose

248
00:14:01,438 --> 00:14:08,838
to pursue that even stronger la s

249
00:14:05,610 --> 00:14:10,800
beautiful yeah arnis you can

250
00:14:08,839 --> 00:14:12,180
congratulations disarray we appreciate

251
00:14:10,799 --> 00:14:15,719
you at you you're showing up for our

252
00:14:12,179 --> 00:14:16,979
hangout and you're gonna get an amazing

253
00:14:15,720 --> 00:14:18,389
prize what it would have a min by the

254
00:14:16,980 --> 00:14:21,240
way we didn't talk about that oh yeah

255
00:14:18,389 --> 00:14:23,688
yes I'm so jealous oh yeah we're all

256
00:14:21,240 --> 00:14:23,688
jealous

257

00:14:24,159 --> 00:14:30,469
so I hope you saw the anniversary image

258
00:14:26,889 --> 00:14:33,319
yesterday that was released we've got

259
00:14:30,470 --> 00:14:36,259
you guys both a mounted image on like

260
00:14:33,320 --> 00:14:37,940
metal of that of that image it's a

261
00:14:36,259 --> 00:14:40,159
pretty really high quality on on the

262
00:14:37,940 --> 00:14:42,260
back yesterday we we skipped around and

263
00:14:40,159 --> 00:14:45,079
we got some astronauts and some

264
00:14:42,259 --> 00:14:46,639
astronomers who work here on hubble to

265
00:14:45,080 --> 00:14:48,680
sign the back so that's signed by

266
00:14:46,639 --> 00:14:50,299
astronauts and astronomers and then

267
00:14:48,679 --> 00:14:53,000
we've also got which is really special

268
00:14:50,299 --> 00:14:55,849
and these pieces of the first solar

269
00:14:53,000 --> 00:14:57,799
array from Hubble so that was there from

270
00:14:55,850 --> 00:15:00,019
1990 till nineteen ninety-three on

271
00:14:57,799 --> 00:15:01,939

hubble and then it was brought down to

272

00:15:00,019 --> 00:15:04,009

earth and we've got these little bits of

273

00:15:01,940 --> 00:15:07,100

that solar aware array mounted in

274

00:15:04,009 --> 00:15:08,629

perspex and so it's literally a piece of

275

00:15:07,100 --> 00:15:12,560

Hubble that spent three years in space

276

00:15:08,629 --> 00:15:16,009

in a little bit of planning they look

277

00:15:12,559 --> 00:15:18,229

really tho those are becoming your ways

278

00:15:16,009 --> 00:15:21,830

I think that's where they're really

279

00:15:18,230 --> 00:15:25,519

great yeah really are all very jealous

280

00:15:21,830 --> 00:15:29,290

yeah yeah that's definitely can i change

281

00:15:25,519 --> 00:15:31,759

my contract and negotiate my belly yeah

282

00:15:29,289 --> 00:15:34,849

I'll tell you that it was quite a

283

00:15:31,759 --> 00:15:38,289

madhouse yesterday but we we got we got

284

00:15:34,850 --> 00:15:42,050

um the astronauts to sign something

285

00:15:38,289 --> 00:15:45,469

great I was on howell actually she be

286
00:15:42,049 --> 00:15:48,199
manhandled astronaut oh I did ya come

287
00:15:45,470 --> 00:15:50,810
around four where's everything and

288
00:15:48,200 --> 00:15:53,590
hurtling cats right that's actually

289
00:15:50,809 --> 00:15:57,799
Carol's day job that's her danger my dad

290
00:15:53,590 --> 00:16:02,540
oh she has that's around go here go here

291
00:15:57,799 --> 00:16:04,539
sit down sign is those are right

292
00:16:02,539 --> 00:16:07,149
congratulations and thank you for for

293
00:16:04,539 --> 00:16:09,679
taking part in the contest yes

294
00:16:07,149 --> 00:16:11,689
congratulations okay so that's so now

295
00:16:09,679 --> 00:16:14,479
the Hubble generation what do we mean by

296
00:16:11,690 --> 00:16:17,510
that Georgia people who were born in

297
00:16:14,480 --> 00:16:19,129
Hubble's lifetime never known a world

298
00:16:17,509 --> 00:16:21,500
without Hubble so the winners in that

299
00:16:19,129 --> 00:16:25,210
category are oh hey leion Martin

300
00:16:21,500 --> 00:16:28,149
congratulation hi guys congratulations

301
00:16:25,210 --> 00:16:31,129
you don't know a world without Hubble

302
00:16:28,149 --> 00:16:33,730
does that mean anything to you and

303
00:16:31,129 --> 00:16:33,730
imagine it

304
00:16:36,039 --> 00:16:39,669
what's great about Hubble is that it was

305
00:16:37,899 --> 00:16:41,320
designed to be serviced by the space

306
00:16:39,669 --> 00:16:42,819
shuttle and but and it's probably unique

307
00:16:41,320 --> 00:16:45,009
in almost anything we've ever put in

308
00:16:42,820 --> 00:16:46,600
space because I don't know if there's

309
00:16:45,009 --> 00:16:49,079
very been very many other things like

310
00:16:46,600 --> 00:16:52,060
that that's been designed to be got

311
00:16:49,078 --> 00:16:53,439
grabbed and put and fixed and upgraded

312
00:16:52,059 --> 00:16:55,028
throughout the years which is why it's

313
00:16:53,440 --> 00:16:56,769
about that but up there so long we don't

314

00:16:55,028 --> 00:16:58,179
do that with as far as I know any other

315
00:16:56,769 --> 00:17:00,669
thing maybe Carol can correct me if I'm

316
00:16:58,179 --> 00:17:02,799
wrong but um and so that's why it's

317
00:17:00,669 --> 00:17:05,918
lasted for 25 years and we actually have

318
00:17:02,799 --> 00:17:08,889
a Hubble generation so why don't you

319
00:17:05,919 --> 00:17:10,329
introduce are you do you want to which

320
00:17:08,890 --> 00:17:12,069
we just get to the video well I think

321
00:17:10,328 --> 00:17:13,298
you should introduce your video yeah

322
00:17:12,068 --> 00:17:15,399
what did you all good idea that's a

323
00:17:13,298 --> 00:17:19,209
better idea miss italia morning tell us

324
00:17:15,400 --> 00:17:23,079
about your video um okay our video is um

325
00:17:19,209 --> 00:17:25,509
I guess it has like some stuff motion to

326
00:17:23,078 --> 00:17:30,428
it we have photos so that hubble took

327
00:17:25,509 --> 00:17:33,039
and it basically goes through how we

328
00:17:30,429 --> 00:17:34,960

started seeing the stars for sort of

329

00:17:33,039 --> 00:17:36,909

like from the ground you couldn't get

330

00:17:34,960 --> 00:17:39,940

out there we were able able to paint and

331

00:17:36,910 --> 00:17:41,798

how through signs and through Hubble

332

00:17:39,940 --> 00:17:45,610

eventually step by step we were able to

333

00:17:41,798 --> 00:17:50,408

actually have a sort of eyes in space to

334

00:17:45,609 --> 00:17:52,539

see the end of this true man I guess

335

00:17:50,409 --> 00:17:55,210

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

336

00:17:52,539 --> 00:17:58,119

experienced a world without uncle in our

337

00:17:55,210 --> 00:18:00,039

lifetimes then seeing like that's where

338

00:17:58,119 --> 00:18:01,658

to kind of thinking is like what were

339

00:18:00,039 --> 00:18:04,629

people thinking about the universe

340

00:18:01,659 --> 00:18:07,809

before Hubble on successive discoveries

341

00:18:04,630 --> 00:18:09,760

before that yeah so now while while

342

00:18:07,808 --> 00:18:11,349

Scott gets it ready for us to watch I

343
00:18:09,759 --> 00:18:13,929
want to remind everybody that I put the

344
00:18:11,349 --> 00:18:15,279
links to both of these videos on the

345
00:18:13,929 --> 00:18:16,720
description box so it's in the

346
00:18:15,279 --> 00:18:18,908
description box of this hangout so you

347
00:18:16,720 --> 00:18:21,159
can watch them both on youtube also

348
00:18:18,909 --> 00:18:22,720
because it'll be slightly better quality

349
00:18:21,159 --> 00:18:24,390
because we're rebroadcasting it's going

350
00:18:22,720 --> 00:18:27,700
to make maybe maybe a little bit more

351
00:18:24,390 --> 00:18:29,110
jerky in the video then would be if you

352
00:18:27,700 --> 00:18:30,429
watch it on youtube so i encourage you

353
00:18:29,109 --> 00:18:33,069
to go straight to the videos themselves

354
00:18:30,429 --> 00:18:34,450
and check them out as well and scott

355
00:18:33,069 --> 00:18:36,759
whenever you're ready we can maybe take

356
00:18:34,450 --> 00:18:40,860
a look at the at the second with is the

357
00:18:36,759 --> 00:18:40,859
winner of the Hubble generation category

358
00:21:40,398 --> 00:21:46,258
incredible whoa very well done well done

359
00:21:43,679 --> 00:21:51,419
guys but my very first question is I got

360
00:21:46,259 --> 00:21:54,118
to know how long did that take to do I

361
00:21:51,419 --> 00:21:56,159
guess you saw the days two solid days

362
00:21:54,118 --> 00:21:57,778
via two solid days at least I don't

363
00:21:56,159 --> 00:21:59,460
believe it not for a second i had to

364
00:21:57,778 --> 00:22:01,798
have taken longer than that that would

365
00:21:59,460 --> 00:22:04,470
issued it is just the shooting alone now

366
00:22:01,798 --> 00:22:10,700
hailey did a weaker rap with all the

367
00:22:04,470 --> 00:22:13,829
artwork she drew like the telescope yeah

368
00:22:10,700 --> 00:22:15,749
so how about is rad get a piece of the

369
00:22:13,829 --> 00:22:19,099
solar array I want pieces of your

370
00:22:15,749 --> 00:22:23,450
artwork all right you did those

371

00:22:19,099 --> 00:22:25,939
artifacts to now those are amazing yeah

372
00:22:23,450 --> 00:22:28,379
yeah you good you could sell it on eBay

373
00:22:25,940 --> 00:22:31,288
beautiful work beautifully not my

374
00:22:28,378 --> 00:22:34,709
favorite part is the Hubble has to come

375
00:22:31,288 --> 00:22:36,089
to the telescope is great yeah you do

376
00:22:34,710 --> 00:22:39,419
that you just you have like a black

377
00:22:36,089 --> 00:22:41,428
background or what um for which scene

378
00:22:39,419 --> 00:22:44,429
again how do pray any about how do you

379
00:22:41,429 --> 00:22:46,590
do it without me uh well essentially for

380
00:22:44,429 --> 00:22:49,710
everything that was like hand animation

381
00:22:46,589 --> 00:22:51,480
we built a black box of foam core two am

382
00:22:49,710 --> 00:22:51,990
I gonna move feeling like you know the

383
00:22:51,480 --> 00:22:55,170
sides

384
00:22:51,990 --> 00:22:57,058
back and then we create they become a

385
00:22:55,170 --> 00:22:59,580

hole in the ceiling of that little black

386

00:22:57,058 --> 00:23:00,990

box and then we had like a light going

387

00:22:59,579 --> 00:23:03,750

through so it's almost like a stage

388

00:23:00,990 --> 00:23:07,170

atmosphere where as soon as I've one

389

00:23:03,750 --> 00:23:09,390

looks like this so say it's not motion

390

00:23:07,170 --> 00:23:11,789

of Hubble here he is as this platform as

391

00:23:09,390 --> 00:23:14,820

a stick and then he says mounted on this

392

00:23:11,789 --> 00:23:16,889

as soon as he comes from the black box

393

00:23:14,819 --> 00:23:18,480

like from behind to like that point

394

00:23:16,890 --> 00:23:20,880

where the light is coming through in the

395

00:23:18,480 --> 00:23:23,610

hole it's almost like a stage so then it

396

00:23:20,880 --> 00:23:25,920

can create a dynamic to the area were

397

00:23:23,609 --> 00:23:32,789

like their character is so sweet I'm

398

00:23:25,920 --> 00:23:36,150

Anna knows way that would like some

399

00:23:32,789 --> 00:23:38,970

videos from like then NASA hums like the

400
00:23:36,150 --> 00:23:41,130
site and such so I loved all of that but

401
00:23:38,970 --> 00:23:43,470
I have to say map it it's like it's an

402
00:23:41,130 --> 00:23:46,410
old classic technique though that is

403
00:23:43,470 --> 00:23:48,960
what's so amazing about it that's I mean

404
00:23:46,410 --> 00:23:52,440
people used to do puppetry and things

405
00:23:48,960 --> 00:23:55,259
like that it's fantastic i love the way

406
00:23:52,440 --> 00:23:58,500
that you guys did the fly through of the

407
00:23:55,259 --> 00:24:01,500
ultra deep field yes an analog that was

408
00:23:58,500 --> 00:24:03,929
fantastic I that's why I think I was my

409
00:24:01,500 --> 00:24:06,599
favorite part of it is like I I've used

410
00:24:03,929 --> 00:24:08,429
that footage all the time in many videos

411
00:24:06,599 --> 00:24:10,049
I make and I'm seeing it now in a

412
00:24:08,429 --> 00:24:12,540
completely different way and made me

413
00:24:10,049 --> 00:24:15,089
rethink it well Tony must be happy that

414
00:24:12,539 --> 00:24:18,799
both of you I mean you know both videos

415
00:24:15,089 --> 00:24:22,319
had healthy because Tony feels not me

416
00:24:18,799 --> 00:24:25,139
videos oh that's right Carol you're

417
00:24:22,319 --> 00:24:28,919
gonna get the message here later or you

418
00:24:25,140 --> 00:24:30,480
never take though well my favorite part

419
00:24:28,920 --> 00:24:32,190
even with all of that was still was the

420
00:24:30,480 --> 00:24:34,079
was the whiteboard parts where you

421
00:24:32,190 --> 00:24:37,259
actually injected a bit of perspective

422
00:24:34,079 --> 00:24:38,939
into it that's very nice I think was my

423
00:24:37,259 --> 00:24:40,529
absolute favorite part because to

424
00:24:38,940 --> 00:24:42,960
provide perspective the way you did

425
00:24:40,529 --> 00:24:44,609
having that hand up there and then

426
00:24:42,960 --> 00:24:48,000
drawing how many galaxies might be in

427
00:24:44,609 --> 00:24:50,490
there was really well done and I was my

428

00:24:48,000 --> 00:24:52,529
favorite part so um I think that's the

429
00:24:50,490 --> 00:24:54,839
part that gives you that lump that's

430
00:24:52,529 --> 00:24:57,000
right again yeah I said nobody i did

431
00:24:54,839 --> 00:24:59,000
that as well yeah I think yeah the way

432
00:24:57,000 --> 00:25:01,470
you gave it perspective and scale and

433
00:24:59,000 --> 00:25:03,269
you really come away feeling like you

434
00:25:01,470 --> 00:25:05,460
experience something quite special like

435
00:25:03,269 --> 00:25:05,788
that like Desiree you you've got you've

436
00:25:05,460 --> 00:25:07,288
got a

437
00:25:05,788 --> 00:25:10,829
future in our so what do you guys do in

438
00:25:07,288 --> 00:25:15,388
your real and your in your actual non

439
00:25:10,829 --> 00:25:19,378
making video time your students are you

440
00:25:15,388 --> 00:25:26,278
I don't know I need though their or

441
00:25:19,378 --> 00:25:27,808
their hobby or their contest will start

442
00:25:26,278 --> 00:25:29,159

at what Carol Carol it's our turn the

443

00:25:27,808 --> 00:25:30,778

East I did one now we've got to do

444

00:25:29,159 --> 00:25:32,940

something we have to do another yeah

445

00:25:30,778 --> 00:25:34,499

i'll let you guys know what about you

446

00:25:32,940 --> 00:25:38,599

guys Hallie hey Liam Martin what you

447

00:25:34,499 --> 00:25:42,358

guys do um I'm a camera system videos

448

00:25:38,598 --> 00:25:50,249

huh I'm the camera system in the film

449

00:25:42,358 --> 00:25:55,710

industry already working long so and

450

00:25:50,249 --> 00:26:00,358

like slate good for you good for you

451

00:25:55,710 --> 00:26:02,220

what you Martin I work hard time on the

452

00:26:00,358 --> 00:26:07,319

phone on the street but I'm in school

453

00:26:02,220 --> 00:26:10,848

now for astronomy Oh dandy okay there

454

00:26:07,319 --> 00:26:14,038

you go I Saint Mary's University no no

455

00:26:10,848 --> 00:26:16,589

well good luck with that yes that's a

456

00:26:14,038 --> 00:26:18,919

great nation we actually have a plan for

457
00:26:16,589 --> 00:26:21,209
the piece of the solar panel there's a

458
00:26:18,919 --> 00:26:23,580
Observatory here that does public tours

459
00:26:21,210 --> 00:26:25,710
and we're gonna display there so

460
00:26:23,579 --> 00:26:28,079
families can come and everybody can just

461
00:26:25,710 --> 00:26:32,308
see Saul that's nice I'm so great you

462
00:26:28,079 --> 00:26:36,628
guys that's really wonderful is going to

463
00:26:32,308 --> 00:26:39,148
ask you what you're good well I want to

464
00:26:36,628 --> 00:26:41,488
thank all of the winners you guys are

465
00:26:39,148 --> 00:26:43,918
truly inspirational thank you for

466
00:26:41,489 --> 00:26:45,598
sharing your video with us Desiree Haley

467
00:26:43,919 --> 00:26:48,389
Martin thank you for joining us in this

468
00:26:45,598 --> 00:26:52,168
hangout I congratulations to all of you

469
00:26:48,388 --> 00:26:56,758
yeah well done very nice thank you very

470
00:26:52,169 --> 00:26:58,649
much for over right you guys guys are

471
00:26:56,759 --> 00:26:59,999
welcome to stay or you you could hang

472
00:26:58,648 --> 00:27:02,339
out with us for a little bit longer but

473
00:26:59,999 --> 00:27:04,919
i just want to give my congratulations

474
00:27:02,339 --> 00:27:06,658
broom reminding everybody go see i've

475
00:27:04,919 --> 00:27:07,919
posted all these videos all over the

476
00:27:06,659 --> 00:27:09,929
place they're on our twitter page by the

477
00:27:07,919 --> 00:27:11,940
way if you're not following us on

478
00:27:09,929 --> 00:27:13,830
twitter at Hubble telescope you need to

479
00:27:11,940 --> 00:27:16,109
go to Twitter right now type that in and

480
00:27:13,829 --> 00:27:17,999
click follow you also need to subscribe

481
00:27:16,108 --> 00:27:18,509
to us I'm Hubble slight channel on you

482
00:27:17,999 --> 00:27:22,240
too

483
00:27:18,509 --> 00:27:25,569
it's because we are we are all over the

484
00:27:22,240 --> 00:27:27,279
place on in the unit in the internet

485

00:27:25,569 --> 00:27:28,599
sphere so we hope you'll follow us and

486
00:27:27,279 --> 00:27:29,829
we'll let you know everything

487
00:27:28,599 --> 00:27:32,649
interesting that's going on about hover

488
00:27:29,829 --> 00:27:35,829
so the I posted the links to their all

489
00:27:32,650 --> 00:27:37,000
of their videos here and we want and you

490
00:27:35,829 --> 00:27:39,908
can check them out watching as many

491
00:27:37,000 --> 00:27:42,159
times as you want and was it a success

492
00:27:39,909 --> 00:27:45,880
Georgia I think you only have to watch

493
00:27:42,159 --> 00:27:48,520
those videos judge for yourselves yes

494
00:27:45,880 --> 00:27:51,520
yeah there were so many irie honestly I

495
00:27:48,519 --> 00:27:52,900
was looking at you know just just a

496
00:27:51,519 --> 00:27:54,700
short list because I don't have a lot of

497
00:27:52,900 --> 00:27:57,370
time but I was looking and there were so

498
00:27:54,700 --> 00:28:00,730
many great submissions I don't know how

499
00:27:57,369 --> 00:28:02,769

you guys were able to choose the best I

500

00:28:00,730 --> 00:28:05,048

me I mean it do you guys did an amazing

501

00:28:02,769 --> 00:28:07,000

job there were just so many amazing

502

00:28:05,048 --> 00:28:08,980

things that came through so I want to

503

00:28:07,000 --> 00:28:11,950

applaud all the people that made their

504

00:28:08,980 --> 00:28:14,700

submissions because it really inspired

505

00:28:11,950 --> 00:28:17,620

me just seeing all these different

506

00:28:14,700 --> 00:28:19,840

contexts of the way that Hubble hasn't

507

00:28:17,619 --> 00:28:21,819

has inspired them and really kind of

508

00:28:19,839 --> 00:28:24,038

just rejuvenated some of my creative

509

00:28:21,819 --> 00:28:27,428

mind as well with the things that I

510

00:28:24,038 --> 00:28:29,019

create yeah and that's worth mentioning

511

00:28:27,429 --> 00:28:30,460

actually first of all yes definitely

512

00:28:29,019 --> 00:28:32,740

worth thanking everyone on the short

513

00:28:30,460 --> 00:28:34,840

list as well and but will also be

514
00:28:32,740 --> 00:28:37,509
putting all the rest of the videos on

515
00:28:34,839 --> 00:28:39,548
the Space Telescope website and source

516
00:28:37,509 --> 00:28:40,990
code blood org Space Telescope dog will

517
00:28:39,548 --> 00:28:42,220
be putting those all up in the next

518
00:28:40,990 --> 00:28:44,259
couple of weeks so that you can browse

519
00:28:42,220 --> 00:28:45,909
through all of them because we just want

520
00:28:44,259 --> 00:28:47,048
to acknowledge everyone who entered a

521
00:28:45,909 --> 00:28:49,750
video because they were all fantastic

522
00:28:47,048 --> 00:28:51,490
they all have very little flair their

523
00:28:49,750 --> 00:28:53,679
own little take on what Hubble had done

524
00:28:51,490 --> 00:28:55,029
and what Hubble meant to them so we will

525
00:28:53,679 --> 00:28:57,700
be putting them all up to acknowledge

526
00:28:55,029 --> 00:28:59,859
all of those as well yes and you know I

527
00:28:57,700 --> 00:29:02,110
think it just well actually before I get

528
00:28:59,859 --> 00:29:04,689
there on a couple of comments Michael

529
00:29:02,109 --> 00:29:06,490
Michael jobin on the Q&A app comments

530
00:29:04,690 --> 00:29:09,340
real quick that the the Deep Field

531
00:29:06,490 --> 00:29:12,009
images are what the HST is I think all

532
00:29:09,339 --> 00:29:13,990
about our unison cara cara and the the

533
00:29:12,009 --> 00:29:15,548
others of nebulae and galaxies could be

534
00:29:13,990 --> 00:29:17,700
done by smaller space telescopes well

535
00:29:15,548 --> 00:29:20,019
that's not fair Michael I mean come on

536
00:29:17,700 --> 00:29:21,970
they could be done by space telescopes

537
00:29:20,019 --> 00:29:24,038
yes but not at the resolution and

538
00:29:21,970 --> 00:29:26,079
clarity with which humble guess so

539
00:29:24,038 --> 00:29:27,970
there's always the atmosphere in the way

540
00:29:26,079 --> 00:29:30,069
with ground-based telescope Hubble is

541
00:29:27,970 --> 00:29:31,990
uniquely purchased above us to not have

542

00:29:30,069 --> 00:29:35,619
to do that but yes I couldn't agree

543
00:29:31,990 --> 00:29:42,339
hopefully feels good there's no by all

544
00:29:35,619 --> 00:29:44,619
of you gotta care net Carol what else we

545
00:29:42,339 --> 00:29:47,169
have here I hope you want season I'm

546
00:29:44,619 --> 00:29:48,669
just gonna say I reckon a good I haven't

547
00:29:47,170 --> 00:29:50,860
actually counted by racking a good

548
00:29:48,670 --> 00:29:53,200
eighty percent plus of the 02 helpful

549
00:29:50,859 --> 00:29:56,919
videos that came in had the Deep Field

550
00:29:53,200 --> 00:29:59,650
video Oh a little bit of a buzz me

551
00:29:56,920 --> 00:30:01,450
inspires people yeah well I mean we've

552
00:29:59,650 --> 00:30:04,630
talked about it so many times it's it's

553
00:30:01,450 --> 00:30:06,039
truly I next to the video that these

554
00:30:04,630 --> 00:30:07,420
guys have made nothing really gives us

555
00:30:06,039 --> 00:30:08,889
that much perspective other than looking

556
00:30:07,420 --> 00:30:12,570

at that image mute really shows you how

557

00:30:08,890 --> 00:30:14,710

what our place is in the universe so in

558

00:30:12,569 --> 00:30:16,269

one of the things Carol I don't know if

559

00:30:14,710 --> 00:30:17,500

you want to talk about this or not but

560

00:30:16,269 --> 00:30:20,650

I'd kind of like to bring up the subject

561

00:30:17,500 --> 00:30:22,539

of the sort of partner multinational

562

00:30:20,650 --> 00:30:24,730

partnership that is part of Hubble's

563

00:30:22,539 --> 00:30:26,589

mission one of the things I've

564

00:30:24,730 --> 00:30:29,410

discovered this week is that it working

565

00:30:26,589 --> 00:30:31,839

with Georgia and and with the guys over

566

00:30:29,410 --> 00:30:33,340

at NASA Goddard is that you know you see

567

00:30:31,839 --> 00:30:37,049

all these things like Space Telescope

568

00:30:33,339 --> 00:30:39,659

torg Hubble site Hubble site org and

569

00:30:37,049 --> 00:30:44,710

there's also a Goddard a Hubble page

570

00:30:39,660 --> 00:30:46,360

these are all parallel social streams

571
00:30:44,710 --> 00:30:49,509
that kind of highlight the partnership

572
00:30:46,359 --> 00:30:52,178
that we have in this mission for example

573
00:30:49,509 --> 00:30:54,009
George is in charge of the European

574
00:30:52,179 --> 00:30:57,309
Space Agency component of Hubble

575
00:30:54,009 --> 00:30:58,629
outreach and so what I think if you look

576
00:30:57,308 --> 00:31:00,579
at our twitter page you'll see things

577
00:30:58,630 --> 00:31:03,100
like our twitter handles you'll see

578
00:31:00,579 --> 00:31:04,569
three different twitter feeds for

579
00:31:03,099 --> 00:31:07,889
example you'll see ours Hubble Space

580
00:31:04,569 --> 00:31:10,599
Telescope yours is hubble space I don't

581
00:31:07,890 --> 00:31:11,710
sub Hubble underscore space and then

582
00:31:10,599 --> 00:31:14,199
there's another one that NASA Goddard

583
00:31:11,710 --> 00:31:15,880
runs NASA Goddard and so there are three

584
00:31:14,200 --> 00:31:17,799
streams all of them are verified we're

585
00:31:15,880 --> 00:31:19,630
all real we're all part of the Hubble

586
00:31:17,799 --> 00:31:21,399
mission but we all tell a slightly

587
00:31:19,630 --> 00:31:22,690
different story and Caroline wonder if

588
00:31:21,400 --> 00:31:26,559
you want to talk a little bit about the

589
00:31:22,690 --> 00:31:29,140
multinational nature of mission well I I

590
00:31:26,558 --> 00:31:32,200
think starting with the social media

591
00:31:29,140 --> 00:31:34,120
side we always get frustrated because

592
00:31:32,200 --> 00:31:36,880
sometimes people say why do you have so

593
00:31:34,119 --> 00:31:39,428
many streams but you you point out

594
00:31:36,880 --> 00:31:42,640
something interesting is that each one

595
00:31:39,429 --> 00:31:44,950
of these sources of information has a

596
00:31:42,640 --> 00:31:45,980
different perspective and so it gives

597
00:31:44,950 --> 00:31:47,900
you a different way

598
00:31:45,980 --> 00:31:50,660
of looking at the mission and how it

599

00:31:47,900 --> 00:31:52,850
affects society so I think that's that's

600
00:31:50,660 --> 00:31:56,179
pretty important that we don't just have

601
00:31:52,849 --> 00:31:58,250
I mean it's wonderful to live in an

602
00:31:56,179 --> 00:31:59,960
environment in which you we're not only

603
00:31:58,250 --> 00:32:02,210
getting the NASA point of view we're

604
00:31:59,960 --> 00:32:05,539
getting you know public's point of view

605
00:32:02,210 --> 00:32:07,519
in ESS point of view and a lots of

606
00:32:05,539 --> 00:32:10,279
different perspectives on the telescope

607
00:32:07,519 --> 00:32:12,829
what people are using it to do and how

608
00:32:10,279 --> 00:32:15,308
it affects them the other thing is i

609
00:32:12,829 --> 00:32:17,899
think that the international corporate

610
00:32:15,308 --> 00:32:21,160
cooperation and this both the science

611
00:32:17,900 --> 00:32:24,769
well the science is really multinational

612
00:32:21,160 --> 00:32:26,660
any more big programs have many many

613
00:32:24,769 --> 00:32:28,129

people on them I'm part I'm actually

614

00:32:26,660 --> 00:32:30,200
part of the team that did the

615

00:32:28,130 --> 00:32:33,950
anniversary image and we're a

616

00:32:30,200 --> 00:32:37,910
multinational and some of the other

617

00:32:33,950 --> 00:32:40,750
programs that are being pursued to you

618

00:32:37,910 --> 00:32:44,120
use to Hubble and other telescope data

619

00:32:40,750 --> 00:32:46,220
are certainly multinational in the early

620

00:32:44,119 --> 00:32:49,369
days of Hubble it used to be kind of

621

00:32:46,220 --> 00:32:52,130
small teams in one or two collaborators

622

00:32:49,369 --> 00:32:54,589
but now we need so much expertise that

623

00:32:52,130 --> 00:32:56,960
that people who do different things and

624

00:32:54,589 --> 00:33:00,379
have the perspective on the data and how

625

00:32:56,960 --> 00:33:02,390
to process it and how to model it and

626

00:33:00,380 --> 00:33:04,460
all that it's it's very important from

627

00:33:02,390 --> 00:33:06,440
the science side and the technical side

628
00:33:04,460 --> 00:33:08,808
is also important as well because we

629
00:33:06,440 --> 00:33:13,279
have instruments in the canadian armed

630
00:33:08,808 --> 00:33:15,798
and and we really need those

631
00:33:13,279 --> 00:33:18,079
cooperations between the US Europe

632
00:33:15,798 --> 00:33:20,210
Canada and any of the other partners we

633
00:33:18,079 --> 00:33:22,519
can partner with because again it's a

634
00:33:20,210 --> 00:33:24,289
different technological perspective but

635
00:33:22,519 --> 00:33:27,700
then integrating it together gives

636
00:33:24,289 --> 00:33:32,480
everybody a piece of the action and so

637
00:33:27,700 --> 00:33:34,910
you know and nations have an affinity

638
00:33:32,480 --> 00:33:37,970
with the telescope because they have a

639
00:33:34,910 --> 00:33:40,669
part of it so I think it's it's a really

640
00:33:37,970 --> 00:33:43,730
great like this the solar panels I i can

641
00:33:40,669 --> 00:33:45,500
tell you my hat is off to ISA for for

642
00:33:43,730 --> 00:33:46,880
chopping it up in peace I couldn't

643
00:33:45,500 --> 00:33:48,410
believe it when i was told that was

644
00:33:46,880 --> 00:33:50,929
happening that would never happen in

645
00:33:48,410 --> 00:33:52,759
nasa they would rather warehouse it then

646
00:33:50,929 --> 00:33:54,679
chop chop it into little pieces and i

647
00:33:52,759 --> 00:33:58,779
think it's great to return to the public

648
00:33:54,679 --> 00:34:01,990
you know in displays and other means

649
00:33:58,779 --> 00:34:04,329
um pieces of this talisker so it's very

650
00:34:01,990 --> 00:34:06,250
cool but I think you hit a really good

651
00:34:04,329 --> 00:34:07,210
point that I really agree with the tues

652
00:34:06,250 --> 00:34:08,949
when you're talking about these

653
00:34:07,210 --> 00:34:11,320
different perspectives and really that

654
00:34:08,949 --> 00:34:13,980
that is what science is we're trying to

655
00:34:11,320 --> 00:34:17,169
understand what's going on there but it

656

00:34:13,980 --> 00:34:18,760
is storytelling we're telling the story

657
00:34:17,168 --> 00:34:20,168
of what's going on in the universe and

658
00:34:18,760 --> 00:34:23,770
we're all going to have different ways

659
00:34:20,168 --> 00:34:25,839
of finding out those answers and and

660
00:34:23,769 --> 00:34:27,309
being able to bounce those ideas off and

661
00:34:25,840 --> 00:34:28,960
I think it's extremely important that

662
00:34:27,309 --> 00:34:31,529
it's not just coming from one place but

663
00:34:28,960 --> 00:34:33,490
it's coming from a global community of

664
00:34:31,530 --> 00:34:36,130
astronomers and engineers and

665
00:34:33,489 --> 00:34:38,129
astrophysicists that are able to look at

666
00:34:36,130 --> 00:34:41,829
the universe in it in a different way

667
00:34:38,130 --> 00:34:45,700
with the same amazing instrument and I

668
00:34:41,829 --> 00:34:47,199
just I've been going over for the past

669
00:34:45,699 --> 00:34:49,509
few week just some of the different

670
00:34:47,199 --> 00:34:53,259

papers and stuff like that and we have

671

00:34:49,510 --> 00:34:55,300

what 12,700 academic papers as come from

672

00:34:53,260 --> 00:34:57,250

the Hubble Space Telescope and it's from

673

00:34:55,300 --> 00:34:59,710

people from all over the world and

674

00:34:57,250 --> 00:35:02,949

that's extremely important that it's

675

00:34:59,710 --> 00:35:07,420

made such a huge impact on our knowledge

676

00:35:02,949 --> 00:35:10,119

of the universe as a species over this

677

00:35:07,420 --> 00:35:11,710

past quarter century I yes I have a

678

00:35:10,119 --> 00:35:13,569

great appreciation for the scientific

679

00:35:11,710 --> 00:35:15,670

output since I'm supposed to at least

680

00:35:13,570 --> 00:35:18,010

read the abstracts of every paper and

681

00:35:15,670 --> 00:35:22,809

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

682

00:35:18,010 --> 00:35:25,510

than I I mean it's really a fire of

683

00:35:22,809 --> 00:35:27,670

things that are being discovered and we

684

00:35:25,510 --> 00:35:30,850

just we've just completed a week of a

685
00:35:27,670 --> 00:35:34,690
conference looking at not only what

686
00:35:30,849 --> 00:35:36,699
Hubble has produced in the past but

687
00:35:34,690 --> 00:35:38,500
looking forward what is it going to do

688
00:35:36,699 --> 00:35:40,389
in the future and then how is it going

689
00:35:38,500 --> 00:35:42,190
to be in synergy with the James Webb and

690
00:35:40,389 --> 00:35:44,409
then from there James Webb will take

691
00:35:42,190 --> 00:35:46,990
over when Hubble is no longer operating

692
00:35:44,409 --> 00:35:50,649
and there's just some amazing science

693
00:35:46,989 --> 00:35:52,989
that has been done and the great to mess

694
00:35:50,650 --> 00:35:55,570
two big messages is that the longevity

695
00:35:52,989 --> 00:35:58,629
of the telescope is very important

696
00:35:55,570 --> 00:36:00,250
because you know when I was in fourth

697
00:35:58,630 --> 00:36:02,650
grade it was all about taking snapshots

698
00:36:00,250 --> 00:36:05,050
and trying to model that but since the

699
00:36:02,650 --> 00:36:08,050
telescope has been consistently in orbit

700
00:36:05,050 --> 00:36:10,240
and it's so well calibrated that it's

701
00:36:08,050 --> 00:36:12,548
possible to compare the very first

702
00:36:10,239 --> 00:36:16,568
observations of an object with those

703
00:36:12,548 --> 00:36:19,599
were taken last week you can see changes

704
00:36:16,568 --> 00:36:21,759
in astronomical objects and that can be

705
00:36:19,599 --> 00:36:24,099
modeled and we're really understanding a

706
00:36:21,759 --> 00:36:27,748
lot more about the universe because of

707
00:36:24,099 --> 00:36:30,400
that very consistent data set and

708
00:36:27,748 --> 00:36:32,978
whereas when you have other telescopes

709
00:36:30,400 --> 00:36:35,410
in the mix that's great and it augments

710
00:36:32,978 --> 00:36:37,748
the entire picture but having one

711
00:36:35,409 --> 00:36:42,219
telescope that's been doing all these

712
00:36:37,748 --> 00:36:45,098
observations is really invaluable so the

713

00:36:42,219 --> 00:36:46,208
one of the things I wanted to let

714
00:36:45,099 --> 00:36:48,789
everybody know is I want to remind

715
00:36:46,208 --> 00:36:50,139
everybody that you can we're hoping

716
00:36:48,789 --> 00:36:51,309
you'll you'll leave us some comments and

717
00:36:50,139 --> 00:36:52,389
questions throughout this hangout so

718
00:36:51,309 --> 00:36:54,519
that we can talk a little bit more

719
00:36:52,389 --> 00:36:56,739
please please tell us what you think

720
00:36:54,518 --> 00:36:59,588
about Hubble and the impact it's had on

721
00:36:56,739 --> 00:37:01,838
your life careless I want to ask you a

722
00:36:59,588 --> 00:37:03,548
little bit about the anniversary image

723
00:37:01,838 --> 00:37:05,828
with yesterday that was I was at the

724
00:37:03,548 --> 00:37:07,869
museum yesterday and I think Scott has a

725
00:37:05,829 --> 00:37:09,249
has a very nice presentation of it as

726
00:37:07,869 --> 00:37:11,858
well and so while he's queuing data

727
00:37:09,248 --> 00:37:14,458

yesterday at the museum at a museum at

728

00:37:11,858 --> 00:37:16,528
in washington DC at about 9am

729

00:37:14,458 --> 00:37:20,438
administrator Bolden and John Grunsfeld

730

00:37:16,528 --> 00:37:22,719
unveiled an image that celebrates 25

731

00:37:20,438 --> 00:37:26,379
years of Hubble you want to talk about a

732

00:37:22,719 --> 00:37:29,229
little bit Carol sure um I do want to

733

00:37:26,380 --> 00:37:33,130
mention that also in January we revealed

734

00:37:29,228 --> 00:37:36,308
a precursor anniversary image of the

735

00:37:33,130 --> 00:37:38,798
favorite m16 the pillars which also were

736

00:37:36,309 --> 00:37:42,189
in the videos that we saw in many other

737

00:37:38,798 --> 00:37:45,818
videos with an infrared view and the

738

00:37:42,188 --> 00:37:47,498
point was we had taken mm 16 the Eagle

739

00:37:45,818 --> 00:37:50,228
Nebula the pillars of creation a long

740

00:37:47,498 --> 00:37:52,808
time ago with the original camera and

741

00:37:50,228 --> 00:37:55,328
now we've recently observed it just to

742
00:37:52,809 --> 00:37:57,880
show that the telescope really has

743
00:37:55,329 --> 00:38:01,359
improved it has much greater capability

744
00:37:57,880 --> 00:38:04,929
and to show the comparison of the visual

745
00:38:01,358 --> 00:38:06,938
with the infrared so for the anniversary

746
00:38:04,929 --> 00:38:09,910
itself we wanted to kick off the year

747
00:38:06,938 --> 00:38:12,639
with the m16 because it's such a legacy

748
00:38:09,909 --> 00:38:14,409
pillars of creation is a legacy iconic

749
00:38:12,639 --> 00:38:16,688
image that's right we did back in

750
00:38:14,409 --> 00:38:19,208
January if you want remember right and

751
00:38:16,688 --> 00:38:21,399
the anniversary image which Scott is

752
00:38:19,208 --> 00:38:24,068
showing this isn't I'm actually on the

753
00:38:21,400 --> 00:38:26,769
science team for this and it's just

754
00:38:24,068 --> 00:38:28,630
amazing region so

755
00:38:26,769 --> 00:38:30,369
what what you're seeing is a star

756
00:38:28,630 --> 00:38:34,180
cluster that's all the bright

757
00:38:30,369 --> 00:38:38,079
concentrated stars more or less in the

758
00:38:34,179 --> 00:38:40,659
center of the image uh and what happens

759
00:38:38,079 --> 00:38:42,610
here is this star cluster is not very

760
00:38:40,659 --> 00:38:44,769
old a couple of million years old and

761
00:38:42,610 --> 00:38:46,930
what happens is the gas in the dust that

762
00:38:44,769 --> 00:38:50,920
you kind of see off to the side that

763
00:38:46,929 --> 00:38:53,559
material condenses collapses due to its

764
00:38:50,920 --> 00:38:55,750
gravity and sometimes you can have

765
00:38:53,559 --> 00:38:58,239
shocks where clouds run into each other

766
00:38:55,750 --> 00:39:00,159
and they compress and what happens is in

767
00:38:58,239 --> 00:39:03,309
the center of that depending on how much

768
00:39:00,159 --> 00:39:05,379
material is there how violent the

769
00:39:03,309 --> 00:39:08,860
collapse how strong the gravity do the

770

00:39:05,380 --> 00:39:10,780
amount of material you can get a large

771
00:39:08,860 --> 00:39:12,490
or small star clusters so this is a

772
00:39:10,780 --> 00:39:14,950
healthy star cluster it's not the

773
00:39:12,489 --> 00:39:16,599
biggest star cluster we've ever seen but

774
00:39:14,949 --> 00:39:19,000
it's very healthy and the reason that

775
00:39:16,599 --> 00:39:21,969
the stars are different brightnesses is

776
00:39:19,000 --> 00:39:23,650
because they are different masses and so

777
00:39:21,969 --> 00:39:26,139
the different matter the brightest ones

778
00:39:23,650 --> 00:39:29,849
are the biggest mass and but you can

779
00:39:26,139 --> 00:39:32,650
also see this plethora of very tiny

780
00:39:29,849 --> 00:39:35,469
fainter stars that are less than the

781
00:39:32,650 --> 00:39:38,019
mass of the Sun the interesting thing is

782
00:39:35,469 --> 00:39:39,819
that that cluster those bright stars in

783
00:39:38,019 --> 00:39:43,179
the cluster have blown away and

784
00:39:39,820 --> 00:39:46,200

basically carved out away from the

785

00:39:43,179 --> 00:39:49,809

material out of which they were born the

786

00:39:46,199 --> 00:39:51,730

the the cloud and what you see is a

787

00:39:49,809 --> 00:39:53,529

residual so some of that stuff is being

788

00:39:51,730 --> 00:39:57,010

blown back and that's why you see those

789

00:39:53,530 --> 00:39:59,170

finger proteins which we've seen in many

790

00:39:57,010 --> 00:40:03,100

nebula and that means that the light is

791

00:39:59,170 --> 00:40:05,200

carving out and blowing back the

792

00:40:03,099 --> 00:40:07,539

material and so the fingers are more

793

00:40:05,199 --> 00:40:11,529

dense than the surrounding area and so

794

00:40:07,539 --> 00:40:13,869

it kind of pushes away some of the light

795

00:40:11,530 --> 00:40:17,470

or more diffuse material and the

796

00:40:13,869 --> 00:40:20,319

different colors represent the reason

797

00:40:17,469 --> 00:40:22,389

that we use these colors is first of all

798

00:40:20,320 --> 00:40:25,390

we want to show the colors of the stars

799
00:40:22,389 --> 00:40:26,739
as a balance of how to do the image

800
00:40:25,389 --> 00:40:29,319
processing the first thing you want to

801
00:40:26,739 --> 00:40:31,000
notice that the little red the little

802
00:40:29,320 --> 00:40:33,430
stars are red that's because they are

803
00:40:31,000 --> 00:40:35,769
cooler than the bright bluish stars and

804
00:40:33,429 --> 00:40:39,219
the second thing is that there are also

805
00:40:35,769 --> 00:40:40,179
some observations using very narrow

806
00:40:39,219 --> 00:40:42,789
bands that

807
00:40:40,179 --> 00:40:48,039
sample carbon nitrogen and oxygen and

808
00:40:42,789 --> 00:40:50,079
those caused the nebula to be it emits

809
00:40:48,039 --> 00:40:51,960
in those different wavelengths and that

810
00:40:50,079 --> 00:40:54,039
tells me something about its comforts

811
00:40:51,960 --> 00:40:56,108
composition so there's a lot of

812
00:40:54,039 --> 00:40:59,588
astrophysics going on in this picture

813
00:40:56,108 --> 00:41:02,469
and in addition on the website there is

814
00:40:59,588 --> 00:41:05,529
a movie of this region that our folks

815
00:41:02,469 --> 00:41:08,549
have done and which is just spectacular

816
00:41:05,530 --> 00:41:10,900
and I just wanted to mention whatever

817
00:41:08,550 --> 00:41:12,970
surprising result westerlund too has

818
00:41:10,900 --> 00:41:14,500
been known for a long time it was named

819
00:41:12,969 --> 00:41:16,659
after a guy named westerlund who

820
00:41:14,500 --> 00:41:19,030
discovered it looking at photographic

821
00:41:16,659 --> 00:41:20,980
plates this cluster is actually two

822
00:41:19,030 --> 00:41:25,390
clusters there's one behind the other

823
00:41:20,980 --> 00:41:27,460
and there is a paper a scientific paper

824
00:41:25,389 --> 00:41:29,769
coming out about the fact that there are

825
00:41:27,460 --> 00:41:32,019
two clusters and in fact overnight after

826
00:41:29,769 --> 00:41:35,619
the party last night one of our

827

00:41:32,019 --> 00:41:37,780
astronomers sent to our deputy director

828
00:41:35,619 --> 00:41:40,780
a whole theory about the two clusters

829
00:41:37,780 --> 00:41:43,180
and how the bow shock from the one went

830
00:41:40,780 --> 00:41:45,369
to the other and all that so you know he

831
00:41:43,179 --> 00:41:48,039
was thinking about this as soon as you

832
00:41:45,369 --> 00:41:49,329
saw the image right cuz he isnt he does

833
00:41:48,039 --> 00:41:52,000
that kind of work but he's actually not

834
00:41:49,329 --> 00:41:56,890
on the team so he immediately created a

835
00:41:52,000 --> 00:41:58,568
model yesterday afternoon about how this

836
00:41:56,889 --> 00:42:01,358
whole thing worked so it's actually two

837
00:41:58,568 --> 00:42:04,630
clusters one from the other they appear

838
00:42:01,358 --> 00:42:07,539
to be very closely the same age but it

839
00:42:04,630 --> 00:42:09,369
is suggestive that one cluster perhaps

840
00:42:07,539 --> 00:42:12,190
the smaller cluster triggered the

841
00:42:09,369 --> 00:42:14,260

formation of the larger one which is

842

00:42:12,190 --> 00:42:16,510
which is nearer to us so it's a very

843

00:42:14,260 --> 00:42:18,010
very interesting cluster and a lot of

844

00:42:16,510 --> 00:42:19,869
this was a complete surprise to us

845

00:42:18,010 --> 00:42:21,880
because it had never been studied very

846

00:42:19,869 --> 00:42:24,519
well before but it was a great choice

847

00:42:21,880 --> 00:42:26,349
for the program we got the observations

848

00:42:24,519 --> 00:42:29,139
and once we got the observations last

849

00:42:26,349 --> 00:42:31,230
fall we all kind of one who this is

850

00:42:29,139 --> 00:42:34,480
gonna be spectacular so we actually

851

00:42:31,230 --> 00:42:35,920
augmented the core observations with

852

00:42:34,480 --> 00:42:38,980
some others so that we can really

853

00:42:35,920 --> 00:42:41,619
enhance the clouds as well very nice so

854

00:42:38,980 --> 00:42:43,269
i wanted so i would remind everybody you

855

00:42:41,619 --> 00:42:45,400
can download this on hubble side org

856
00:42:43,269 --> 00:42:48,548
also go to Hubble 25th or to get both

857
00:42:45,400 --> 00:42:50,680
the image and the video the video is

858
00:42:48,548 --> 00:42:53,650
also posted on YouTube on our publicit 

859
00:42:50,679 --> 00:42:55,269
channel the channel so

860
00:42:53,650 --> 00:42:56,410
you check them out and watch them all

861
00:42:55,269 --> 00:42:58,650
you want I'm going to get to a couple

862
00:42:56,409 --> 00:43:01,358
comments here Craig Landon is saying

863
00:42:58,650 --> 00:43:03,278
can't let this anniversary go by without

864
00:43:01,358 --> 00:43:05,469
mentioning the shoemaker-levy comic

865
00:43:03,278 --> 00:43:07,389
collision the rise of the World Wide Web

866
00:43:05,469 --> 00:43:13,028
allowing us to download the Deep Field

867
00:43:07,389 --> 00:43:14,949
remember Netscape yeah sadly I do and

868
00:43:13,028 --> 00:43:17,588
the Astronomy Picture of the Day

869
00:43:14,949 --> 00:43:19,509
combining Kamal combined allowing us to

870
00:43:17,588 --> 00:43:21,219
watch what the scientific world is

871
00:43:19,510 --> 00:43:23,020
seeing that's an excellent point Craig

872
00:43:21,219 --> 00:43:24,939
it's uh is true without without the

873
00:43:23,019 --> 00:43:27,309
internet we wouldn't have access to this

874
00:43:24,940 --> 00:43:30,400
data so quickly and the images wouldn't

875
00:43:27,309 --> 00:43:32,170
be we'd have to get mailed a picture I

876
00:43:30,400 --> 00:43:35,048
guess or a printed picture or something

877
00:43:32,170 --> 00:43:38,108
like that so and ok and the

878
00:43:35,048 --> 00:43:39,730
shoemaker-levy comment event was one of

879
00:43:38,108 --> 00:43:42,489
the most spectacular it wasn't it Carol

880
00:43:39,730 --> 00:43:44,769
it was it was quite remarkable and

881
00:43:42,489 --> 00:43:47,019
actually it was brought up this week and

882
00:43:44,769 --> 00:43:48,909
I wanted to pitch a little bit about the

883
00:43:47,019 --> 00:43:51,519
solar system observations that have been

884

00:43:48,909 --> 00:43:53,170
done there have been a lot that you know

885
00:43:51,519 --> 00:43:56,369
for a while Hubble was kind of the Mars

886
00:43:53,170 --> 00:43:59,108
Weather Channel but also with the

887
00:43:56,369 --> 00:44:00,809
ultraviolet capability no kidding I mean

888
00:43:59,108 --> 00:44:03,699
they actually before there were

889
00:44:00,809 --> 00:44:05,349
satellites orbiting Mars Hubble

890
00:44:03,699 --> 00:44:06,909
observations were often used to see

891
00:44:05,349 --> 00:44:08,950
where the death storms were and we're

892
00:44:06,909 --> 00:44:11,618
good locations were for land there

893
00:44:08,949 --> 00:44:14,828
landers so Hubble actually contributed

894
00:44:11,619 --> 00:44:16,630
quite a lot to Mars exploration but on

895
00:44:14,829 --> 00:44:19,349
top of that observations in the

896
00:44:16,630 --> 00:44:22,660
ultraviolet have been done of Aurora on

897
00:44:19,349 --> 00:44:26,019
a several of the planets and in

898
00:44:22,659 --> 00:44:28,868

particular Jupiter and Saturn and the

899

00:44:26,019 --> 00:44:31,690

amazing thing to me which I guess some

900

00:44:28,869 --> 00:44:34,059

of us in the audience remembered and

901

00:44:31,690 --> 00:44:37,929

some of us did not is that one

902

00:44:34,059 --> 00:44:40,839

shoemaker-levy hit Jupiter it actually

903

00:44:37,929 --> 00:44:43,719

triggered a disruption in Jupiter's

904

00:44:40,838 --> 00:44:46,078

magnetic field with which manifests

905

00:44:43,719 --> 00:44:49,179

itself as bright spots in the Aurora

906

00:44:46,079 --> 00:44:51,190

which I hadn't appreciated that happen

907

00:44:49,179 --> 00:44:53,649

usually the auroral field and Jupiter's

908

00:44:51,190 --> 00:44:55,599

kind of a circular cap a bright cursor

909

00:44:53,650 --> 00:44:57,639

and so that these bright spots show up

910

00:44:55,599 --> 00:45:00,010

now we've known that bright spots show

911

00:44:57,639 --> 00:45:03,129

up also from the interaction between I

912

00:45:00,010 --> 00:45:05,079

oh and the other satellites of Jupiter

913
00:45:03,130 --> 00:45:07,300
but I didn't realize that you babe or

914
00:45:05,079 --> 00:45:09,070
leave me by hitting the planet

915
00:45:07,300 --> 00:45:12,100
actually disrupted the magnetic field

916
00:45:09,070 --> 00:45:15,250
and created a signature way up in the

917
00:45:12,099 --> 00:45:22,299
pole juber I mean that stuff you can't

918
00:45:15,250 --> 00:45:24,789
make that stuff up you could make it up

919
00:45:22,300 --> 00:45:26,830
but it wouldn't be as good well John

920
00:45:24,789 --> 00:45:28,750
Murphy is commenting the Hubble birthday

921
00:45:26,829 --> 00:45:36,610
is the same as mine well happy birthday

922
00:45:28,750 --> 00:45:38,619
hey Ben gays Lee désolée is commenting

923
00:45:36,610 --> 00:45:40,450
the Magnificent hubble deep sky images

924
00:45:38,619 --> 00:45:42,400
encouraged me to look further into the

925
00:45:40,449 --> 00:45:44,469
science behind them since then I've

926
00:45:42,400 --> 00:45:45,730
participated in many online astronomy

927
00:45:44,469 --> 00:45:47,619
courses you know it's a good point

928
00:45:45,730 --> 00:45:49,269
that's true it gets people kind of

929
00:45:47,619 --> 00:45:50,980
motivated to learn more about this stuff

930
00:45:49,269 --> 00:45:52,989
people so even I've heard of people

931
00:45:50,980 --> 00:45:54,490
becoming or trying to become astronomers

932
00:45:52,989 --> 00:45:56,109
or engineered or something as a result

933
00:45:54,489 --> 00:46:02,679
of it so that's that's really that's

934
00:45:56,110 --> 00:46:04,150
really important to let's see Michael

935
00:46:02,679 --> 00:46:06,250
jobin he's asked he's saying again that

936
00:46:04,150 --> 00:46:08,500
i bought a 12-foot c-band satellite

937
00:46:06,250 --> 00:46:14,199
earth station just to see the launch of

938
00:46:08,500 --> 00:46:17,619
HST in 1990 wow wow you are hardcore

939
00:46:14,199 --> 00:46:18,879
your bike was so Carol I have a question

940
00:46:17,619 --> 00:46:20,799
for you because I've been getting it on

941

00:46:18,880 --> 00:46:23,079
social media and I really don't know the

942
00:46:20,800 --> 00:46:24,580
answer to it one as we were you know

943
00:46:23,079 --> 00:46:26,500
that obviously this week there's been a

944
00:46:24,579 --> 00:46:29,980
lot of top ten images top 10 this is

945
00:46:26,500 --> 00:46:34,030
Matt's for Hubble is there a top 10 list

946
00:46:29,980 --> 00:46:36,490
of the the most site top ten papers of

947
00:46:34,030 --> 00:46:38,890
the most that involve Hubble data like

948
00:46:36,489 --> 00:46:41,319
the most cited the top 10 most cited

949
00:46:38,889 --> 00:46:44,440
Hubble data papers am I asking that in a

950
00:46:41,320 --> 00:46:46,809
way that makes yes yes unfortunately I

951
00:46:44,440 --> 00:46:51,369
don't have that list on the top of my

952
00:46:46,809 --> 00:46:55,090
head but certainly the whole series of

953
00:46:51,369 --> 00:46:56,889
the expansion of the universe which

954
00:46:55,090 --> 00:46:59,410
which I mean there's a whole series of

955
00:46:56,889 --> 00:47:02,319

those papers and so women ethical isn't

956

00:46:59,409 --> 00:47:04,929

that was a real I a big watershed from

957

00:47:02,320 --> 00:47:08,110

the Hubble Deep Field of course I'm

958

00:47:04,929 --> 00:47:09,909

saying I'm just yeah I know you are but

959

00:47:08,110 --> 00:47:12,360

then the follow up I'm just pandering to

960

00:47:09,909 --> 00:47:17,769

you don't worry it's about the XL

961

00:47:12,360 --> 00:47:21,190

acceleration of the universal which the

962

00:47:17,769 --> 00:47:23,739

trio Adam Brian and Saul

963

00:47:21,190 --> 00:47:25,480

won the Nobel Prize so that acceleration

964

00:47:23,739 --> 00:47:29,289

in the universe has then spawned a whole

965

00:47:25,480 --> 00:47:31,869

industry in dark energy so they all

966

00:47:29,289 --> 00:47:36,869

quote that paper of course so that

967

00:47:31,869 --> 00:47:39,760

that's another highly quoted paper I

968

00:47:36,869 --> 00:47:43,000

think there are several in the study of

969

00:47:39,760 --> 00:47:45,720

exoplanets we're like the first transit

970
00:47:43,000 --> 00:47:49,030
that was observed by Hubble and also the

971
00:47:45,719 --> 00:47:51,578
the other one were beta / Taurus where

972
00:47:49,030 --> 00:47:55,690
the the actual and in fact that was in

973
00:47:51,579 --> 00:47:57,940
one of the videos of it were a planet

974
00:47:55,690 --> 00:48:00,338
the trace of upon it was actually

975
00:47:57,940 --> 00:48:03,190
detected by Hubble those are kind of

976
00:48:00,338 --> 00:48:05,980
iconic papers I mean they were hard to

977
00:48:03,190 --> 00:48:07,539
do and very speculative at the time but

978
00:48:05,980 --> 00:48:09,818
they are always referenced in the

979
00:48:07,539 --> 00:48:12,789
subsequent observations done by Hubble

980
00:48:09,818 --> 00:48:16,838
so those and so it pretty much covers

981
00:48:12,789 --> 00:48:18,550
the gamut from from you know they dis

982
00:48:16,838 --> 00:48:21,099
older system all the way out but i would

983
00:48:18,550 --> 00:48:23,890
say probably the cosmology stuff this is

984
00:48:21,099 --> 00:48:25,210
them yeah okay well what we should do is

985
00:48:23,889 --> 00:48:26,710
maybe put that together somewhere and i

986
00:48:25,210 --> 00:48:29,019
should post on social media i have a

987
00:48:26,710 --> 00:48:31,179
great question for the contest winners

988
00:48:29,019 --> 00:48:33,460
this is from Cecil Morgan actually

989
00:48:31,179 --> 00:48:42,549
actually can I just tell you the most

990
00:48:33,460 --> 00:48:52,630
cited paper is a calibration paper to

991
00:48:42,550 --> 00:48:55,240
meet isn't always exciting operation of

992
00:48:52,630 --> 00:48:57,490
what text you or something I ain't go

993
00:48:55,239 --> 00:49:00,479
ahead think about sighs just because

994
00:48:57,489 --> 00:49:03,818
it's highly cited doesn't necessarily

995
00:49:00,480 --> 00:49:06,699
but important but it's so not a science

996
00:49:03,818 --> 00:49:08,500
worth all Cecil Morgan has asked a great

997
00:49:06,699 --> 00:49:10,118
question to our guests I want i'd like

998

00:49:08,500 --> 00:49:13,059
to get your thoughts this is a great one

999
00:49:10,119 --> 00:49:15,608
what are the contest winners favorite HS

1000
00:49:13,059 --> 00:49:18,279
de image let me start with you Desiree

1001
00:49:15,608 --> 00:49:21,779
now you're muted so I'm you yourself if

1002
00:49:18,280 --> 00:49:21,780
you could if there's a button at the top

1003
00:49:22,318 --> 00:49:28,779
you have that ok I'll go to it you're

1004
00:49:25,780 --> 00:49:30,550
muted ok I'll go down you go to hey Liam

1005
00:49:28,780 --> 00:49:34,540
Martin real quick what are you guys as

1006
00:49:30,550 --> 00:49:37,840
favorite edge HST image um

1007
00:49:34,539 --> 00:49:40,000
I guess I like the one that was just

1008
00:49:37,840 --> 00:49:43,930
released but Hubble to be the been

1009
00:49:40,000 --> 00:49:50,619
averse damage I was like yeah I cried

1010
00:49:43,929 --> 00:49:53,859
when I saw it was so touched by this

1011
00:49:50,619 --> 00:49:55,150
incredible image yeah they they are they

1012
00:49:53,860 --> 00:49:58,410

are moving aren't they I mean you see

1013

00:49:55,150 --> 00:50:03,820

him minutes like take your breath away

1014

00:49:58,409 --> 00:50:05,679

so much so many things going on yeah and

1015

00:50:03,820 --> 00:50:09,039

he really likes that like globular

1016

00:50:05,679 --> 00:50:12,609

clusters mom look at them oh okay a

1017

00:50:09,039 --> 00:50:15,809

woman after my own heart that's I love

1018

00:50:12,610 --> 00:50:18,550

clusters yeah yeah I'm with you on that

1019

00:50:15,809 --> 00:50:20,230

tony is a hard time about it in fact

1020

00:50:18,550 --> 00:50:22,930

everybody does I'm like oh why are we

1021

00:50:20,230 --> 00:50:25,780

doing this holster it's like it but

1022

00:50:22,929 --> 00:50:28,919

they're great I got ready buster I love

1023

00:50:25,780 --> 00:50:32,800

Buster remember I you subscribed

1024

00:50:28,920 --> 00:50:35,230

Hercules oh my gah fireworks nay foran

1025

00:50:32,800 --> 00:50:36,430

time frozen in time for over 20 min time

1026

00:50:35,230 --> 00:50:43,960

that's how you described Hercules my

1027
00:50:36,429 --> 00:50:45,759
first saw it that's beautiful Desiree do

1028
00:50:43,960 --> 00:50:50,730
you have a favorite HST image Hubble

1029
00:50:45,760 --> 00:50:56,710
image hmm I remember that the first

1030
00:50:50,730 --> 00:51:01,840
imagined that I also was and the pillars

1031
00:50:56,710 --> 00:51:04,240
of creating and it seemed very wonderful

1032
00:51:01,840 --> 00:51:08,230
not only because it's beautiful but also

1033
00:51:04,239 --> 00:51:11,289
the explanation I found on the Hubble

1034
00:51:08,230 --> 00:51:15,730
webpage I mean about the whole new star

1035
00:51:11,289 --> 00:51:16,900
are born there yeah that is one of that

1036
00:51:15,730 --> 00:51:19,420
has been that's been that's sort of like

1037
00:51:16,900 --> 00:51:22,720
that image is also kind of an icon of

1038
00:51:19,420 --> 00:51:24,880
home yeah that's a beautiful image yeah

1039
00:51:22,719 --> 00:51:27,279
that in there is a little you know

1040
00:51:24,880 --> 00:51:28,480
there's a whole like a hey Liam Martin

1041
00:51:27,280 --> 00:51:30,670
were saying it was a whole lot going on

1042
00:51:28,480 --> 00:51:32,710
in that image to its I guess is that a

1043
00:51:30,670 --> 00:51:36,039
Zetas theme we try to pick images that

1044
00:51:32,710 --> 00:51:39,550
where it's just so much fun Gerald's oh

1045
00:51:36,039 --> 00:51:42,219
I think um well of course we we look at

1046
00:51:39,550 --> 00:51:44,140
four images that actually well we have

1047
00:51:42,219 --> 00:51:46,359
two programs one is the science program

1048
00:51:44,139 --> 00:51:48,338
we do newsworthy things in the other is

1049
00:51:46,360 --> 00:51:51,130
heritage where we just picked images

1050
00:51:48,338 --> 00:51:53,679
that are really stunning that we want to

1051
00:51:51,130 --> 00:51:55,890
show and share with the public and I

1052
00:51:53,679 --> 00:51:58,568
think the Heritage Program which has

1053
00:51:55,889 --> 00:52:00,608
most of the images that people that

1054
00:51:58,568 --> 00:52:05,558
people think about except for the Hubble

1055

00:52:00,608 --> 00:52:07,239
Deep Field are chosen because the nebula

1056
00:52:05,559 --> 00:52:09,460
are so striking and each one is

1057
00:52:07,239 --> 00:52:10,989
different even in a class like planetary

1058
00:52:09,460 --> 00:52:15,278
nebula they're all different they're not

1059
00:52:10,989 --> 00:52:19,630
the same so it's like amazing someone's

1060
00:52:15,278 --> 00:52:21,608
feeling scared all right ah County yeah

1061
00:52:19,630 --> 00:52:24,190
so we talked about everyone else I know

1062
00:52:21,608 --> 00:52:26,018
we've talked about you and your Hubble

1063
00:52:24,190 --> 00:52:28,479
Deep Field so let me put that up and

1064
00:52:26,018 --> 00:52:31,209
then I want to hear from you about why

1065
00:52:28,478 --> 00:52:33,038
it's the most important image to you so

1066
00:52:31,210 --> 00:52:35,499
let me screen sure this real quick and

1067
00:52:33,039 --> 00:52:37,420
so this is and again all these images

1068
00:52:35,498 --> 00:52:40,748
that I'm sharing here this is on Hubble

1069
00:52:37,420 --> 00:52:43,479

25th or so you can see all these images

1070

00:52:40,748 --> 00:52:45,218

plus any of the associated videos and

1071

00:52:43,478 --> 00:52:47,649

press releases I go along with them and

1072

00:52:45,219 --> 00:52:50,858

high resolution copies and I believe

1073

00:52:47,650 --> 00:52:52,509

also Carolyn there are printable pdfs

1074

00:52:50,858 --> 00:52:55,568

for these images so people can make

1075

00:52:52,509 --> 00:52:57,909

posters is that right yes yes the Hubble

1076

00:52:55,568 --> 00:53:04,599

site has a place where you can go and

1077

00:52:57,909 --> 00:53:07,028

print out oh ma resolution yeah so Tony

1078

00:53:04,599 --> 00:53:08,920

tell me about your love of the Ltd field

1079

00:53:07,028 --> 00:53:11,409

cuz you want me to sign you bet is all

1080

00:53:08,920 --> 00:53:13,900

about I'm sorry there are the images you

1081

00:53:11,409 --> 00:53:17,739

can get in various formats but on the

1082

00:53:13,900 --> 00:53:22,509

hub hubble hubble 25th so there are

1083

00:53:17,739 --> 00:53:24,728

those 25 images um there are poster

1084
00:53:22,509 --> 00:53:27,639
ready yeah post already not just images

1085
00:53:24,728 --> 00:53:29,528
for framing but poster ready yeah you

1086
00:53:27,639 --> 00:53:31,719
can put a large format printer like some

1087
00:53:29,528 --> 00:53:33,940
place and I can't say names but you mark

1088
00:53:31,719 --> 00:53:36,579
boutique at Kinkos you can go and kick

1089
00:53:33,940 --> 00:53:40,960
ok we can ok I didn't know if he gets on

1090
00:53:36,579 --> 00:53:43,180
the website hey favorite your favorite

1091
00:53:40,960 --> 00:53:45,249
pro i was in college when this when the

1092
00:53:43,179 --> 00:53:48,868
first deep field came out the very first

1093
00:53:45,248 --> 00:53:50,858
one and then i thought it was great i

1094
00:53:48,869 --> 00:53:56,108
didn't really understand it and then

1095
00:53:50,858 --> 00:53:59,380
this came out in in two in go to 2004

1096
00:53:56,108 --> 00:54:00,969
and I learned how it was taken and once

1097
00:53:59,380 --> 00:54:01,608
I learned how was taken and that it was

1098
00:54:00,969 --> 00:54:02,749
kind of a risk

1099
00:54:01,608 --> 00:54:05,210
the image to make and we didn't even

1100
00:54:02,748 --> 00:54:06,858
know what we'd see and then they looked

1101
00:54:05,210 --> 00:54:09,278
at this area this guy for 11 days and

1102
00:54:06,858 --> 00:54:12,828
then saw all these galaxies it literally

1103
00:54:09,278 --> 00:54:14,210
changed my life I I was so inspired by

1104
00:54:12,829 --> 00:54:15,798
that that I made I started making videos

1105
00:54:14,210 --> 00:54:17,358
about it and things like that it was

1106
00:54:15,798 --> 00:54:19,429
that it was a very humbling image it was

1107
00:54:17,358 --> 00:54:21,498
one of the few images that really got me

1108
00:54:19,429 --> 00:54:23,239
gave me true perspective about what my

1109
00:54:21,498 --> 00:54:26,509
place was in the universe so that's why

1110
00:54:23,239 --> 00:54:28,849
it's my favorite and always will be and

1111
00:54:26,509 --> 00:54:34,369
I you know I will put up what mine is

1112

00:54:28,849 --> 00:54:37,099
and I I sit what I think is my favorite

1113
00:54:34,369 --> 00:54:41,298
image from all this is the Crab Nebula

1114
00:54:37,099 --> 00:54:43,568
so and then the reason behind this is as

1115
00:54:41,298 --> 00:54:48,579
make sure it gets screen share roughly

1116
00:54:43,568 --> 00:54:51,650
is this is something that humans saw

1117
00:54:48,579 --> 00:54:53,720
happen a thousand years ago so we saw

1118
00:54:51,650 --> 00:54:56,059
the supernova so this is something that

1119
00:54:53,719 --> 00:55:00,379
with Ryan saying Scott we're just seeing

1120
00:54:56,059 --> 00:55:04,009
your icon I'm seeing it are you I mean I

1121
00:55:00,380 --> 00:55:05,630
apologize I'm singing out I'm so so this

1122
00:55:04,009 --> 00:55:08,449
is a supernova remnant and so the

1123
00:55:05,630 --> 00:55:10,369
supernova that happened with this was

1124
00:55:08,449 --> 00:55:13,730
observed by humans and we've actually

1125
00:55:10,369 --> 00:55:15,950
you know have seen writings about this

1126
00:55:13,730 --> 00:55:17,630

and we've been able to study it over

1127

00:55:15,949 --> 00:55:19,788
time and first all it's a beautiful

1128

00:55:17,630 --> 00:55:22,910
image anyway but the fact that this is a

1129

00:55:19,789 --> 00:55:24,799
beautiful wonderful scientific we can

1130

00:55:22,909 --> 00:55:27,348
learn a lot of science about what's

1131

00:55:24,798 --> 00:55:31,818
going on here but it's happened within

1132

00:55:27,349 --> 00:55:33,920
the human timeline and we're a lot of

1133

00:55:31,818 --> 00:55:35,659
the other things like you know the ultra

1134

00:55:33,920 --> 00:55:37,249
deep field which i'm not going to bash

1135

00:55:35,659 --> 00:55:39,199
or anything like that but these things

1136

00:55:37,248 --> 00:55:40,669
are happening billions of years ago but

1137

00:55:39,199 --> 00:55:42,998
this is something that happens within

1138

00:55:40,670 --> 00:55:45,829
the human context and helps us

1139

00:55:42,998 --> 00:55:48,348
understand and get a different timeline

1140

00:55:45,829 --> 00:55:51,019
of what's going on in the universe so

1141
00:55:48,349 --> 00:55:55,759
for me I've always really loved to Crab

1142
00:55:51,018 --> 00:55:57,949
Nebula because of we as a species can

1143
00:55:55,759 --> 00:56:02,298
connect to it because we we've been able

1144
00:55:57,949 --> 00:56:03,379
to see it grow over time and that we

1145
00:56:02,298 --> 00:56:05,748
don't necessarily get that opportunity

1146
00:56:03,380 --> 00:56:06,950
with many astronomical images I know it

1147
00:56:05,748 --> 00:56:08,629
that's the things kind of blow me away

1148
00:56:06,949 --> 00:56:10,159
about the way the astronomy has exploded

1149
00:56:08,630 --> 00:56:11,568
this in the past couple of decades and

1150
00:56:10,159 --> 00:56:15,199
now we can make movies of things like

1151
00:56:11,568 --> 00:56:16,309
super novae and and galaxies rotating

1152
00:56:15,199 --> 00:56:17,779
things like that it's just really

1153
00:56:16,309 --> 00:56:22,578
amazing so Carol what's your favorite

1154
00:56:17,780 --> 00:56:24,829
you see people ask me that our news

1155
00:56:22,579 --> 00:56:26,510
chief just asked me to write that up for

1156
00:56:24,829 --> 00:56:28,280
somebody and I said I won't do it and I

1157
00:56:26,510 --> 00:56:30,800
won't because I don't have a favorite I

1158
00:56:28,280 --> 00:56:35,990
like so many of them that i can't choose

1159
00:56:30,800 --> 00:56:38,930
one over the other I rather babies yeah

1160
00:56:35,989 --> 00:56:42,469
I really like westerlund to which was

1161
00:56:38,929 --> 00:56:45,108
released yesterday but you know I I'm a

1162
00:56:42,469 --> 00:56:49,399
coaster person so I tend to like the

1163
00:56:45,108 --> 00:56:51,170
clusters like NGC 3603 NGC 602 I'm gonna

1164
00:56:49,400 --> 00:56:56,389
throw these numbers out but I love

1165
00:56:51,170 --> 00:56:58,820
globular clusters as well um uh they're

1166
00:56:56,389 --> 00:57:00,319
great i love you know and then also

1167
00:56:58,820 --> 00:57:04,579
observing the clusters and other

1168
00:57:00,320 --> 00:57:08,210
galaxies like m31 m93 so that's kind of

1169

00:57:04,579 --> 00:57:10,519
my theme is is clusters I think the

1170
00:57:08,210 --> 00:57:13,519
planetary nebulae are really fantastic

1171
00:57:10,519 --> 00:57:15,619
but if I can be pushed into a category

1172
00:57:13,519 --> 00:57:17,570
which would be the clusters but i can't

1173
00:57:15,619 --> 00:57:20,000
i can't pick one image because they're

1174
00:57:17,570 --> 00:57:22,880
also great for different reasons fair

1175
00:57:20,000 --> 00:57:29,050
enough georgia yeah georgia it's like

1176
00:57:22,880 --> 00:57:32,240
coming to build us i I really loved the

1177
00:57:29,050 --> 00:57:34,700
the infrared version as the m16 that we

1178
00:57:32,239 --> 00:57:37,368
put out in January so like the pillars

1179
00:57:34,699 --> 00:57:40,129
night yep infrared I thought when I saw

1180
00:57:37,369 --> 00:57:41,780
that I was just it's an image that you

1181
00:57:40,130 --> 00:57:43,730
really recognize and it is very iconic

1182
00:57:41,780 --> 00:57:45,470
and to see it in that different

1183
00:57:43,730 --> 00:57:46,818

wavelengths gave it just a completely

1184

00:57:45,469 --> 00:57:49,429

different look a completely different

1185

00:57:46,818 --> 00:57:52,219

feel I thought aesthetically that was

1186

00:57:49,429 --> 00:57:53,629

brilliant mm-hmm but in terms of the

1187

00:57:52,219 --> 00:57:55,429

actual feeling that you get when you

1188

00:57:53,630 --> 00:58:02,300

look at something I think the ultra deep

1189

00:57:55,429 --> 00:58:04,730

field asst yeah hahaha i was gonna say

1190

00:58:02,300 --> 00:58:07,369

so some of it is since I've been with in

1191

00:58:04,730 --> 00:58:09,079

het with heritage for long so long you

1192

00:58:07,369 --> 00:58:10,789

know some of it is actually the whole

1193

00:58:09,079 --> 00:58:13,400

process of our giving over getting the

1194

00:58:10,789 --> 00:58:15,108

images and exactly what filters to take

1195

00:58:13,400 --> 00:58:17,000

and all that the other one was the

1196

00:58:15,108 --> 00:58:18,858

Horsehead the Horsehead was a stunner

1197

00:58:17,000 --> 00:58:21,019

when we did it we had many arguments

1198
00:58:18,858 --> 00:58:24,230
about how we were going to do that image

1199
00:58:21,019 --> 00:58:26,119
and in the end we threw all our eggs in

1200
00:58:24,230 --> 00:58:28,400
the infrared basket and when we took it

1201
00:58:26,119 --> 00:58:28,769
we had all these arguments but we're not

1202
00:58:28,400 --> 00:58:32,940
going to

1203
00:58:28,769 --> 00:58:34,320
anything how much of it in house mosaic

1204
00:58:32,940 --> 00:58:39,809
gonna be done and all this stuff and

1205
00:58:34,320 --> 00:58:42,539
then we can kiss really and then then

1206
00:58:39,809 --> 00:58:44,699
the day you know we had processed it and

1207
00:58:42,539 --> 00:58:47,219
we all had our meeting we sent and it

1208
00:58:44,699 --> 00:58:51,689
came up on the screen and collectively

1209
00:58:47,219 --> 00:58:56,879
we all want looks way better than we

1210
00:58:51,690 --> 00:58:58,860
thought I really i did a beautiful job

1211
00:58:56,880 --> 00:59:00,420
of the 3d I agree that's that was an

1212
00:58:58,860 --> 00:59:01,829
outstanding image so we're going you got

1213
00:59:00,420 --> 00:59:03,059
a few couple of minutes left I just want

1214
00:59:01,829 --> 00:59:05,279
to get a couple of real quick comments

1215
00:59:03,059 --> 00:59:07,889
in from YouTube here is one well-known

1216
00:59:05,280 --> 00:59:10,100
from moon draw three from YouTube well

1217
00:59:07,889 --> 00:59:12,989
no one else has said it so i am going

1218
00:59:10,099 --> 00:59:14,969
happy birthday Hubble thank you for the

1219
00:59:12,989 --> 00:59:17,129
many wonderful images over the years and

1220
00:59:14,969 --> 00:59:20,209
hopefully many more to come you have

1221
00:59:17,130 --> 00:59:23,460
made this space geek happy same here

1222
00:59:20,210 --> 00:59:25,740
birthday Hubble okay couple of a couple

1223
00:59:23,460 --> 00:59:27,440
of things on on Twitter that I just want

1224
00:59:25,739 --> 00:59:30,750
to mention real quick-- lots of people

1225
00:59:27,440 --> 00:59:32,460
congratulating a Hubble on its oh

1226

00:59:30,750 --> 00:59:35,219
there's an e-book we should talk about

1227
00:59:32,460 --> 00:59:37,230
that there's no just coming up that's

1228
00:59:35,219 --> 00:59:39,329
that's on where can I get that Carol

1229
00:59:37,230 --> 00:59:42,780
shoot I wish I'd had that URL handy I

1230
00:59:39,329 --> 00:59:44,869
have that URL up that's why you drive

1231
00:59:42,780 --> 00:59:49,350
the internet Scott you're awesome thank

1232
00:59:44,869 --> 00:59:53,279
for that up here so you're that so this

1233
00:59:49,349 --> 00:59:55,319
is our ebook and it is fantastic and I

1234
00:59:53,280 --> 00:59:57,570
am NOT saying it because I'm biased but

1235
00:59:55,320 --> 01:00:00,390
it is it really isn't anything I've had

1236
00:59:57,570 --> 01:00:03,440
so much great feedback from many people

1237
01:00:00,389 --> 01:00:08,489
out here but you can go to Hubble 25th

1238
01:00:03,440 --> 01:00:10,320
org / images / 26 or you can actually

1239
01:00:08,489 --> 01:00:12,419
just see from the main page you can you

1240
01:00:10,320 --> 01:00:14,220

can go there and explore and find it and

1241

01:00:12,420 --> 01:00:15,570

it's it's going to be in our resources

1242

01:00:14,219 --> 01:00:17,849

you can get it from the apple itunes

1243

01:00:15,570 --> 01:00:20,730

store you can download it as a PDF and

1244

01:00:17,849 --> 01:00:23,960

an ePub so for many different types of

1245

01:00:20,730 --> 01:00:27,630

tablets you can get this and it is

1246

01:00:23,960 --> 01:00:29,760

wonderful yeah so definitely check it

1247

01:00:27,630 --> 01:00:32,660

out folks got a lot of tweets from

1248

01:00:29,760 --> 01:00:36,270

people you got the Canadian Space Agency

1249

01:00:32,659 --> 01:00:39,359

lots of people wishing a happy birthday

1250

01:00:36,269 --> 01:00:41,940

the everybody's got posting pictures and

1251

01:00:39,360 --> 01:00:42,329

and and just being wonderful all around

1252

01:00:41,940 --> 01:00:44,070

the two

1253

01:00:42,329 --> 01:00:45,269

sphere so thank you all very much I

1254

01:00:44,070 --> 01:00:47,610

didn't want to hear one thing from

1255
01:00:45,269 --> 01:00:49,619
Twitter because it blew it really made

1256
01:00:47,610 --> 01:00:52,710
me laugh thank you for letting me forget

1257
01:00:49,619 --> 01:00:55,019
that yes yes yeah so I put out a call to

1258
01:00:52,710 --> 01:00:58,380
action site you know let let us know how

1259
01:00:55,019 --> 01:01:00,929
Hubble has inspired you and we've got a

1260
01:00:58,380 --> 01:01:04,710
lot of responses but my favorite by far

1261
01:01:00,929 --> 01:01:08,519
is from Paul and I'm gonna just get one

1262
01:01:04,710 --> 01:01:14,240
real quick I Paul the force at all the

1263
01:01:08,519 --> 01:01:14,239
fourth on twitter has an amazing tattoo

1264
01:01:15,679 --> 01:01:27,059
that is hardcore look at that hello my

1265
01:01:24,239 --> 01:01:28,889
hat is off to you sir that is fantastic

1266
01:01:27,059 --> 01:01:31,170
and no talk about actually being

1267
01:01:28,889 --> 01:01:32,879
inspired and going the full length and

1268
01:01:31,170 --> 01:01:36,599
you went through some pain for that and

1269
01:01:32,880 --> 01:01:38,460
that she did that were fought easy but

1270
01:01:36,599 --> 01:01:40,559
it's good work to whoever did I was

1271
01:01:38,460 --> 01:01:42,990
really a good artist that's all I looks

1272
01:01:40,559 --> 01:01:45,119
like it's at tattoo Connor so there you

1273
01:01:42,989 --> 01:01:46,559
go there you go you want your very own

1274
01:01:45,119 --> 01:01:48,389
space testing well we're gonna plug

1275
01:01:46,559 --> 01:01:51,929
those guys because that is awesome you

1276
01:01:48,389 --> 01:01:54,690
thank you Paul that's outstanding okay

1277
01:01:51,929 --> 01:01:57,269
folks we are out of time sadly I hope

1278
01:01:54,690 --> 01:01:58,829
that you enjoyed the special Hubble hang

1279
01:01:57,269 --> 01:02:01,079
out that we've had for the 25th

1280
01:01:58,829 --> 01:02:05,549
anniversary here's hoping Hubble will

1281
01:02:01,079 --> 01:02:07,319
stand another 25 years and we Hubble

1282
01:02:05,550 --> 01:02:10,230
certainly has a lot of life left in it

1283

01:02:07,320 --> 01:02:11,730
next week we are hoping we'll be back at

1284
01:02:10,230 --> 01:02:13,920
a regular time Thursday three o'clock

1285
01:02:11,730 --> 01:02:16,170
we're hoping to do and schedule a

1286
01:02:13,920 --> 01:02:18,150
hangout on on frontier fields get an

1287
01:02:16,170 --> 01:02:20,610
update with the latest they are halfway

1288
01:02:18,150 --> 01:02:22,530
through the six clusters that they're

1289
01:02:20,610 --> 01:02:24,539
looking at we hope to have some people

1290
01:02:22,530 --> 01:02:26,250
on board we have not confirmed it yet so

1291
01:02:24,539 --> 01:02:28,380
that may change but we will be back next

1292
01:02:26,250 --> 01:02:30,480
Thursday three o'clock eastern daylight

1293
01:02:28,380 --> 01:02:32,130
time thank you all for watching happy

1294
01:02:30,480 --> 01:02:34,650
birthday Hubble thank you Scott and

1295
01:02:32,130 --> 01:02:37,230
Carol and congratulations Desiree and

1296
01:02:34,650 --> 01:02:41,400
Martin and Haley can grade you guys are

1297
01:02:37,230 --> 01:02:42,719

awesome great work yes thank you all

1298

01:02:41,400 --> 01:02:44,820

right that's it for this week folks

1299

01:02:42,719 --> 01:02:49,699

thank you for watching and as always

1300

01:02:44,820 --> 01:02:49,700

keep looking up keep looking up