
Google+

1
00:00:00,400 --> 00:00:12,960
10 seconds

2
00:00:12,970 --> 00:00:21,590
[Music]

3
00:00:26,150 --> 00:00:23,590
welcome everyone this is a view of

4
00:00:28,150 --> 00:00:26,160
nasa's jet propulsion laboratory nestled

5
00:00:30,630 --> 00:00:28,160
in the foothills of the san gabriel

6
00:00:32,470 --> 00:00:30,640
mountains near pasadena california

7
00:00:35,670 --> 00:00:32,480
while you're looking down from the skies

8
00:00:38,549 --> 00:00:35,680
at jpl today jplers will be looking to

9
00:00:41,430 --> 00:00:38,559
the skies to weigh that saturn

10
00:00:43,990 --> 00:00:41,440
and maybe doing some hula hooping too

11
00:00:45,990 --> 00:00:44,000
hello i'm gay hill people are gathering

12
00:00:48,630 --> 00:00:46,000
on the mall behind me for a rare

13
00:00:50,869 --> 00:00:48,640

opportunity one of our spacecraft nasa's

14
00:00:53,430 --> 00:00:50,879
cassini will be imaging saturn and its

15
00:00:56,069 --> 00:00:53,440
rings today and our planet will be

16
00:00:58,470 --> 00:00:56,079
included in that picture it's not often

17
00:01:00,630 --> 00:00:58,480
a spacecraft turns his camera towards

18
00:01:02,709 --> 00:01:00,640
earth to take a picture of home this

19
00:01:05,750 --> 00:01:02,719
time we know about it ahead of time to

20
00:01:07,910 --> 00:01:05,760
give people a heads up no pun intended

21
00:01:09,590 --> 00:01:07,920
to organize something that allows the

22
00:01:11,830 --> 00:01:09,600
world to get involved

23
00:01:14,950 --> 00:01:11,840
the cassini team is inviting people to

24
00:01:17,910 --> 00:01:14,960
look up and wave at saturn when the

25
00:01:20,149 --> 00:01:17,920
cameras are snapping a picture of earth

26
00:01:24,830 --> 00:01:20,159
so here's the imaging window it will

27
00:01:29,670 --> 00:01:24,840
start at 2 27 pacific daylight time 5 27

28
00:01:32,390 --> 00:01:29,680
eastern or 2127 universal time now once

29
00:01:35,109 --> 00:01:32,400
it begins it'll take about 14 minutes to

30
00:01:37,429 --> 00:01:35,119
acquire the earth portion of the image

31
00:01:40,469 --> 00:01:37,439
and while that's happening folks will be

32
00:01:42,710 --> 00:01:40,479
waving at saturn so go ahead send us a

33
00:01:45,910 --> 00:01:42,720
picture of you waving at saturn by using

34
00:01:47,190 --> 00:01:45,920
the hashtag wave at saturn when posting

35
00:01:50,310 --> 00:01:47,200
on twitter

36
00:01:53,350 --> 00:01:50,320
facebook instagram and google plus it

37
00:01:55,749 --> 00:01:53,360
may be used in a special collage created

38
00:01:57,910 --> 00:01:55,759

by the cassini team and we're already

39
00:02:00,950 --> 00:01:57,920
getting pictures here and one of them is

40
00:02:04,230 --> 00:02:00,960
from amateur astronomer david tyler from

41
00:02:06,870 --> 00:02:04,240
blackwell heath england that's a picture

42
00:02:09,589 --> 00:02:06,880
that he took overnight we also received

43
00:02:12,390 --> 00:02:09,599
this cartoon from jim hunt

44
00:02:14,309 --> 00:02:12,400
this is his self-portrait of himself

45
00:02:16,790 --> 00:02:14,319
waving at saturn

46
00:02:18,949 --> 00:02:16,800
all right let's begin to fill you in on

47
00:02:21,190 --> 00:02:18,959
what's happening we have scott edgington

48
00:02:23,589 --> 00:02:21,200
with us he is the deputy project

49
00:02:26,229 --> 00:02:23,599
scientist for cassini so scott tell

50
00:02:27,270 --> 00:02:26,239
folks what what this way that saturn is

51
00:02:29,270 --> 00:02:27,280
all about

52
00:02:32,070 --> 00:02:29,280
well we're here to

53
00:02:34,390 --> 00:02:32,080
to participate in a worldwide event to

54
00:02:36,869 --> 00:02:34,400
to in conjunction with the cassini

55
00:02:38,710 --> 00:02:36,879
spacecraft to wave at saturn we're going

56
00:02:40,470 --> 00:02:38,720
to be behind the planet and we're going

57
00:02:42,390 --> 00:02:40,480
to snap pictures of the earth while

58
00:02:45,110 --> 00:02:42,400
while we're behind the planet

59
00:02:47,350 --> 00:02:45,120
now now cassini is really doing some

60
00:02:49,110 --> 00:02:47,360
serious business though it's not just to

61
00:02:51,430 --> 00:02:49,120
get this image of earth

62
00:02:53,589 --> 00:02:51,440
tell us why cassini is up there

63
00:02:56,790 --> 00:02:53,599

well you have a video here

64
00:02:59,670 --> 00:02:56,800
we could illustrate we're there to study

65
00:03:01,589 --> 00:02:59,680
saturn the atmosphere the rings around

66
00:03:03,750 --> 00:03:01,599
saturn

67
00:03:05,990 --> 00:03:03,760
we're also there to study the magnetic

68
00:03:07,670 --> 00:03:06,000
field of saturn the magnetic bubble

69
00:03:09,430 --> 00:03:07,680
surrounding saturn

70
00:03:11,430 --> 00:03:09,440
we're there to study this interesting

71
00:03:13,910 --> 00:03:11,440
moon called titan it's a very earth-like

72
00:03:15,990 --> 00:03:13,920
moon uh we call it typically call it a

73
00:03:18,070 --> 00:03:16,000
frozen earth

74
00:03:21,830 --> 00:03:18,080
and then we're also there to study the

75
00:03:24,630 --> 00:03:21,840
other icy satellites including enceladus

76
00:03:27,030 --> 00:03:24,640
enceladus is interesting because it has

77
00:03:29,190 --> 00:03:27,040
geysers that is sending off all this

78
00:03:31,830 --> 00:03:29,200
water ice into the surrounding

79
00:03:32,789 --> 00:03:31,840
environment and how are we going to

80
00:03:35,270 --> 00:03:32,799
image

81
00:03:36,949 --> 00:03:35,280
this picture it's going to be a mosaic

82
00:03:38,789 --> 00:03:36,959
can you walk us through what the

83
00:03:41,190 --> 00:03:38,799
spacecraft will be doing

84
00:03:43,830 --> 00:03:41,200
yes if you imagine this is saturn you

85
00:03:44,869 --> 00:03:43,840
are the sun shining on saturn

86
00:03:46,789 --> 00:03:44,879
and then

87
00:03:48,869 --> 00:03:46,799
you have the dark side of saturn okay

88
00:03:50,070 --> 00:03:48,879

cassini will be flying

89
00:03:52,550 --> 00:03:50,080
behind

90
00:03:54,949 --> 00:03:52,560
saturn into its shadow

91
00:03:57,429 --> 00:03:54,959
and then you have a mosaic

92
00:03:59,190 --> 00:03:57,439
we can show the actual footprint of how

93
00:04:00,869 --> 00:03:59,200
this mosaic will be made we can roll

94
00:04:03,190 --> 00:04:00,879
that now there it is

95
00:04:04,710 --> 00:04:03,200
there it is you could see each footprint

96
00:04:08,070 --> 00:04:04,720
being laid

97
00:04:10,710 --> 00:04:08,080
across saturn and the ring system so

98
00:04:13,270 --> 00:04:10,720
each one of those is a posted stamp

99
00:04:15,830 --> 00:04:13,280
image of saturn and the rings

100
00:04:18,789 --> 00:04:15,840
and those will be woven together yes

101
00:04:20,310 --> 00:04:18,799
those will be woven together uh you know

102
00:04:22,629 --> 00:04:20,320
take some time to piece them all

103
00:04:24,870 --> 00:04:22,639
together and uh they will be taken in

104
00:04:26,390 --> 00:04:24,880
color too so you're gonna get a natural

105
00:04:28,390 --> 00:04:26,400
color image

106
00:04:31,430 --> 00:04:28,400
so what can people expect

107
00:04:32,310 --> 00:04:31,440
this image of earth will they be able to

108
00:04:35,350 --> 00:04:32,320
see

109
00:04:37,350 --> 00:04:35,360
pictures of people waving up at saturn

110
00:04:40,469 --> 00:04:37,360
unfortunately not uh

111
00:04:42,230 --> 00:04:40,479
our camera is a one megapixel camera

112
00:04:45,350 --> 00:04:42,240
it's the best one megapixel camera out

113
00:04:48,390 --> 00:04:45,360

there by the way and uh so uh but with

114
00:04:50,710 --> 00:04:48,400
that the distance from saturn to to

115
00:04:51,430 --> 00:04:50,720
earth is about a billion kilometers

116
00:04:55,510 --> 00:04:51,440
so

117
00:04:57,749 --> 00:04:55,520
gonna be about two pixels one or two

118
00:05:00,469 --> 00:04:57,759
pixels so what might we see that picture

119
00:05:02,390 --> 00:05:00,479
when will it be out that that one pixel

120
00:05:04,390 --> 00:05:02,400
one or two pixel picture well it takes

121
00:05:06,710 --> 00:05:04,400
about a day or two to get the data all

122
00:05:08,710 --> 00:05:06,720
the data onto the ground and once it's

123
00:05:10,390 --> 00:05:08,720
on the ground it needs to be processed

124
00:05:14,150 --> 00:05:10,400
by our software

125
00:05:16,390 --> 00:05:14,160
to clean it up and take care of any uh

126
00:05:18,710 --> 00:05:16,400
instrument artifacts and then that will

127
00:05:20,550 --> 00:05:18,720
be released for the public so a few days

128
00:05:22,390 --> 00:05:20,560
a few days and the

129
00:05:24,710 --> 00:05:22,400
picture of the

130
00:05:26,870 --> 00:05:24,720
entire saturn and its rings will take

131
00:05:28,230 --> 00:05:26,880
several hours to bring in and when will

132
00:05:30,629 --> 00:05:28,240
we see that

133
00:05:32,629 --> 00:05:30,639
that takes a longer time to stitch

134
00:05:35,029 --> 00:05:32,639
together you have to align each of those

135
00:05:36,870 --> 00:05:35,039
footprints up just right to make sure

136
00:05:39,510 --> 00:05:36,880
that everything's aligned and not

137
00:05:41,909 --> 00:05:39,520
distorted and uh and then they'll make a

138
00:05:44,390 --> 00:05:41,919

color image of that so that takes some

139
00:05:46,390 --> 00:05:44,400
time to line everything up so is it so

140
00:05:48,790 --> 00:05:46,400
roughly three weeks no this is not the

141
00:05:51,990 --> 00:05:48,800
first time that we're getting an image

142
00:05:54,550 --> 00:05:52,000
of earth from a spacecraft is that right

143
00:05:56,310 --> 00:05:54,560
yes um of course we have all these earth

144
00:05:58,870 --> 00:05:56,320
orbiting satellites that take pictures

145
00:06:01,510 --> 00:05:58,880
of earth but the first deep space

146
00:06:05,350 --> 00:06:01,520
imaging of earth was done by voyager 1

147
00:06:09,029 --> 00:06:05,360
after the neptune encounter in 1990

148
00:06:11,189 --> 00:06:09,039
the second time was in 2006 with cassini

149
00:06:13,909 --> 00:06:11,199
uh where we did the same thing we took a

150
00:06:15,510 --> 00:06:13,919
mosaic and saturn earth was just right

151
00:06:18,150 --> 00:06:15,520
there and we snapped a picture of the

152
00:06:20,309 --> 00:06:18,160
earth this is the first time that we

153
00:06:22,230 --> 00:06:20,319
have told people that we are taking

154
00:06:24,710 --> 00:06:22,240
their picture so that makes it very

155
00:06:27,909 --> 00:06:24,720
special and gives us the opportunity to

156
00:06:29,909 --> 00:06:27,919
wave and hula hoop that's right well it

157
00:06:32,150 --> 00:06:29,919
will be a fun day and we have a lot of

158
00:06:34,070 --> 00:06:32,160
people out there we have people already

159
00:06:36,550 --> 00:06:34,080
tweeting their photos to us and thank

160
00:06:39,110 --> 00:06:36,560
you very much this is going to be great

161
00:06:40,309 --> 00:06:39,120
all right we are about six minutes past

162
00:06:43,110 --> 00:06:40,319
the hour

163
00:06:46,150 --> 00:06:43,120

and uh as scott mentioned cassini has

164
00:06:49,590 --> 00:06:46,160
been a very very successful mission it

165
00:06:51,830 --> 00:06:49,600
celebrates sweet 16 this year 16 years

166
00:06:55,570 --> 00:06:51,840
of operation and here's a look at some

167
00:07:11,430 --> 00:07:08,390
[Music]

168
00:07:19,760 --> 00:07:11,440
and liftoff of the cassini spacecraft on

169
00:07:19,770 --> 00:07:33,909
[Music]

170
00:07:54,130 --> 00:07:36,230
we have a doppler signature with engine

171
00:08:54,050 --> 00:08:03,590
[Music]

172
00:09:09,880 --> 00:08:54,060
[Applause]

173
00:09:13,160 --> 00:09:10,760
[Music]

174
00:09:19,829 --> 00:09:13,170
[Applause]

175
00:09:24,150 --> 00:09:21,829
the cassini mission has been extended

176
00:09:28,150 --> 00:09:24,160
twice and will continue to operate at

177
00:09:31,030 --> 00:09:28,160
saturn until september 2017

178
00:09:33,750 --> 00:09:31,040
and it is about nine minutes past the

179
00:09:38,870 --> 00:09:33,760
hour and the time to begin the wave once

180
00:09:41,590 --> 00:09:38,880
again is 2 27 pacific time 5 27 eastern

181
00:09:45,110 --> 00:09:41,600
do not forget to send us your waves via

182
00:09:46,310 --> 00:09:45,120
social media use the hashtag wave at

183
00:09:51,030 --> 00:09:46,320
saturn

184
00:09:53,990 --> 00:09:51,040
gotten a couple of pics first one here

185
00:09:57,269 --> 00:09:54,000
is from johnson space center

186
00:09:59,590 --> 00:09:57,279
those are all their student interns for

187
00:10:01,750 --> 00:09:59,600
the summer and they are standing by live

188
00:10:04,630 --> 00:10:01,760

in mission control that's a photo they

189
00:10:07,430 --> 00:10:04,640
shot just a moment a few months ago and

190
00:10:09,910 --> 00:10:07,440
there it is hashtag wave at saturn we

191
00:10:12,790 --> 00:10:09,920
also have a picture from canada they are

192
00:10:16,630 --> 00:10:12,800
also doing a bit of a wave party

193
00:10:19,990 --> 00:10:16,640
and we have a picture coming to us from

194
00:10:21,910 --> 00:10:20,000
the eddington astronomical society you

195
00:10:24,949 --> 00:10:21,920
are going to hear more from them they

196
00:10:27,750 --> 00:10:24,959
are having a wave party at a castle an

197
00:10:29,910 --> 00:10:27,760
800 year old castle and will be hearing

198
00:10:31,990 --> 00:10:29,920
from a member of theirs

199
00:10:34,069 --> 00:10:32,000
so now let me introduce you to a

200
00:10:36,150 --> 00:10:34,079
scientist who will be working on this

201
00:10:39,110 --> 00:10:36,160
image joe burns is a member of the

202
00:10:42,150 --> 00:10:39,120
cassini imaging team he joins us via

203
00:10:43,990 --> 00:10:42,160
skype from cornell university in ithaca

204
00:10:47,110 --> 00:10:44,000
new york hi joe

205
00:10:49,030 --> 00:10:47,120
hi how are you gay i'm just fine so tell

206
00:10:51,350 --> 00:10:49,040
us a little bit about the special

207
00:10:52,550 --> 00:10:51,360
geometry of what we have to do to get

208
00:10:54,870 --> 00:10:52,560
this picture

209
00:10:56,790 --> 00:10:54,880
yeah as scott mentioned we've got to get

210
00:10:58,470 --> 00:10:56,800
into the shadow of saturn behind saturn

211
00:10:59,829 --> 00:10:58,480
and look back toward the the sun we

212
00:11:01,829 --> 00:10:59,839
can't look directly at the sun because

213
00:11:03,750 --> 00:11:01,839

it would damage our spacecraft

214
00:11:05,350 --> 00:11:03,760
but right in that vicinity of the sun

215
00:11:06,949 --> 00:11:05,360
within a couple of degrees will be the

216
00:11:09,110 --> 00:11:06,959
earth and so we can see that and we can

217
00:11:11,430 --> 00:11:09,120
also see the rings in a very special

218
00:11:14,389 --> 00:11:11,440
sort of light here's here's an image

219
00:11:16,069 --> 00:11:14,399
from 2006 where we did this once before

220
00:11:18,710 --> 00:11:16,079
and you see it looks totally different

221
00:11:20,870 --> 00:11:18,720
than the saturn that you see on approach

222
00:11:22,630 --> 00:11:20,880
and that's because these particles are

223
00:11:24,150 --> 00:11:22,640
highlighted very small particles are

224
00:11:26,150 --> 00:11:24,160
highlighted because they're in what's

225
00:11:27,670 --> 00:11:26,160
called forward scattered light with the

226
00:11:29,990 --> 00:11:27,680
sun coming in over their shoulder

227
00:11:30,870 --> 00:11:30,000
essentially you see the same thing with

228
00:11:32,949 --> 00:11:30,880
uh

229
00:11:34,550 --> 00:11:32,959
with cobwebs if you if the sun is on the

230
00:11:35,990 --> 00:11:34,560
opposite side or your source of light is

231
00:11:38,069 --> 00:11:36,000
on the opposite side of the cobweb it

232
00:11:40,630 --> 00:11:38,079
will be highlighted whereas if it's seen

233
00:11:42,630 --> 00:11:40,640
in back reflected light you don't

234
00:11:44,470 --> 00:11:42,640
barely see the thing or dust and i'll

235
00:11:48,069 --> 00:11:44,480
try and illustrate that in in the case

236
00:11:49,269 --> 00:11:48,079
of my own hair look at this i can bring

237
00:11:51,269 --> 00:11:49,279
this

238
00:11:53,670 --> 00:11:51,279

up onto the

239
00:11:57,269 --> 00:11:53,680
put the sun behind me

240
00:11:58,470 --> 00:11:57,279
and you'll see the hair illuminated just

241
00:12:01,509 --> 00:11:58,480
on the edge

242
00:12:04,310 --> 00:12:01,519
and whereas if this were the sun my face

243
00:12:05,190 --> 00:12:04,320
itself wouldn't be illuminated at all so

244
00:12:07,829 --> 00:12:05,200
uh

245
00:12:10,949 --> 00:12:07,839
we get to see these very small particles

246
00:12:12,710 --> 00:12:10,959
and see quite a different view of the

247
00:12:15,190 --> 00:12:12,720
of the planet and its surroundings if i

248
00:12:17,670 --> 00:12:15,200
can have that next slide

249
00:12:20,470 --> 00:12:17,680
so joe what do scientists actually learn

250
00:12:21,590 --> 00:12:20,480
by seeing saturn in this sort of backlit

251
00:12:23,590 --> 00:12:21,600
way then

252
00:12:26,069 --> 00:12:23,600
well we see quite different particles

253
00:12:28,389 --> 00:12:26,079
and those particles are subject to

254
00:12:29,910 --> 00:12:28,399
radiation forces they're a very short

255
00:12:31,750 --> 00:12:29,920
lifetime so we can see whether or not

256
00:12:33,190 --> 00:12:31,760
they're

257
00:12:36,550 --> 00:12:33,200
we'll be seeing the same amount of

258
00:12:37,509 --> 00:12:36,560
material as we did nine years ago

259
00:12:39,190 --> 00:12:37,519
and

260
00:12:40,710 --> 00:12:39,200
that gives us an opportunity to see the

261
00:12:43,030 --> 00:12:40,720
way that the

262
00:12:44,710 --> 00:12:43,040
radiation forces push material around

263
00:12:46,629 --> 00:12:44,720

try to see whether or not the particles

264
00:12:48,870 --> 00:12:46,639
are coming off little moons you saw the

265
00:12:50,870 --> 00:12:48,880
jets coming out of enceladus and if we

266
00:12:53,590 --> 00:12:50,880
can go back to that image down in the

267
00:12:55,269 --> 00:12:53,600
bottom of you're looking at the top and

268
00:12:57,269 --> 00:12:55,279
reflected light in the bottom in this

269
00:12:59,829 --> 00:12:57,279
forward scattered light the bottom arc

270
00:13:02,870 --> 00:12:59,839
that's out on the outside of this image

271
00:13:04,870 --> 00:13:02,880
is in fact material that's thrown in by

272
00:13:06,629 --> 00:13:04,880
the satellite enceladus and in this

273
00:13:09,430 --> 00:13:06,639
image we also found three other little

274
00:13:11,110 --> 00:13:09,440
moons debris coming off small satellites

275
00:13:13,030 --> 00:13:11,120
will they be the same this time will our

276
00:13:14,949 --> 00:13:13,040
theories prove out to be correct or how

277
00:13:16,790 --> 00:13:14,959
will we have to improve them that's the

278
00:13:18,389 --> 00:13:16,800
sort of questions we're trying to do

279
00:13:20,710 --> 00:13:18,399
that's that's what i wanted to ask you

280
00:13:23,269 --> 00:13:20,720
joe so you've been there before you've

281
00:13:24,629 --> 00:13:23,279
been there in 2006. why do you want to

282
00:13:26,710 --> 00:13:24,639
go back this time

283
00:13:28,710 --> 00:13:26,720
well we think things will change uh

284
00:13:30,550 --> 00:13:28,720
again these particles coming out of

285
00:13:32,949 --> 00:13:30,560
enceladus change over the course of time

286
00:13:35,509 --> 00:13:32,959
will the ring be brighter or less bright

287
00:13:37,190 --> 00:13:35,519
will the uh so you can see the material

288
00:13:38,790 --> 00:13:37,200

coming out of enceladus there the bright

289
00:13:39,670 --> 00:13:38,800
spot in the middle forward scattered

290
00:13:42,310 --> 00:13:39,680
again

291
00:13:44,310 --> 00:13:42,320
we expect the solar radiation pressure

292
00:13:46,949 --> 00:13:44,320
to push the rings around

293
00:13:48,870 --> 00:13:46,959
and in the last image the sun was on the

294
00:13:50,710 --> 00:13:48,880
southern hemisphere right now it's

295
00:13:52,550 --> 00:13:50,720
coming into the it's in the northern

296
00:13:54,230 --> 00:13:52,560
hemisphere so the rain should be pushed

297
00:13:56,949 --> 00:13:54,240
to the southwest that will push to the

298
00:13:58,389 --> 00:13:56,959
north but in the past they

299
00:14:00,230 --> 00:13:58,399
image they didn't do quite what we

300
00:14:02,310 --> 00:14:00,240
expected so we've tried to develop

301
00:14:03,829 --> 00:14:02,320
further theories and now is their chance

302
00:14:06,069 --> 00:14:03,839
to test them and that's the way science

303
00:14:07,829 --> 00:14:06,079
works we see unusual things we try to

304
00:14:10,150 --> 00:14:07,839
explain them and then come back with

305
00:14:12,230 --> 00:14:10,160
better data to see whether or not we've

306
00:14:14,710 --> 00:14:12,240
done it right and we're really eager to

307
00:14:17,430 --> 00:14:14,720
see this data come back for sure

308
00:14:20,150 --> 00:14:17,440
what sort of particles are we looking

309
00:14:21,189 --> 00:14:20,160
for how small what sort of things will

310
00:14:23,430 --> 00:14:21,199
you see

311
00:14:25,030 --> 00:14:23,440
these particles are tend to be and again

312
00:14:27,189 --> 00:14:25,040
they're remember the ones in the case of

313
00:14:28,710 --> 00:14:27,199

the enceladus are coming in they're

314
00:14:30,629 --> 00:14:28,720
shooting out of the geyser they're water

315
00:14:32,150 --> 00:14:30,639
droplets they tend to be about the size

316
00:14:36,310 --> 00:14:32,160
of dust or

317
00:14:39,350 --> 00:14:36,320
a flower a familiar thing or smoke

318
00:14:40,949 --> 00:14:39,360
you see that in fog same sort of stuff

319
00:14:42,550 --> 00:14:40,959
very small particles so they're they

320
00:14:43,990 --> 00:14:42,560
have very short lifetimes because they

321
00:14:46,710 --> 00:14:44,000
can be pushed around and they can also

322
00:14:48,389 --> 00:14:46,720
be eroded away all right well joe thanks

323
00:14:49,750 --> 00:14:48,399
so much for taking time with us you

324
00:14:51,509 --> 00:14:49,760
going outside

325
00:14:53,750 --> 00:14:51,519
absolutely all right you got a couple of

326
00:14:55,590 --> 00:14:53,760
minutes left all right all right take

327
00:14:57,750 --> 00:14:55,600
care thanks for joining us

328
00:15:00,949 --> 00:14:57,760
it will take three hours for cassini to

329
00:15:04,230 --> 00:15:00,959
snap images of the entire saturn system

330
00:15:06,550 --> 00:15:04,240
for the tiny one pixel portrait of earth

331
00:15:09,030 --> 00:15:06,560
it will take the light from earth 80

332
00:15:11,910 --> 00:15:09,040
minutes to travel from here to cassini's

333
00:15:14,350 --> 00:15:11,920
cameras the one-way light time is 80

334
00:15:18,310 --> 00:15:14,360
minutes because saturn is

335
00:15:20,389 --> 00:15:18,320
900 million miles away how far is that

336
00:15:22,389 --> 00:15:20,399
well here are a couple of comparisons to

337
00:15:25,430 --> 00:15:22,399
give you some perspective

338
00:15:27,590 --> 00:15:25,440

how far is 900 million miles

339
00:15:31,110 --> 00:15:27,600
900 million miles is equivalent to

340
00:15:32,389 --> 00:15:31,120
nearly 16 billion football fields laid

341
00:15:36,710 --> 00:15:32,399
end to end

342
00:15:40,550 --> 00:15:36,720
the moon is 240 000 miles away 900

343
00:15:42,790 --> 00:15:40,560
million miles is equivalent to 1807

344
00:15:45,509 --> 00:15:42,800
round trips to the moon

345
00:15:49,189 --> 00:15:45,519
saturn is nearly 10 times as far from

346
00:15:52,389 --> 00:15:49,199
earth as the earth is from the sun

347
00:15:55,949 --> 00:15:52,399
so how long does it take to travel 900

348
00:15:59,990 --> 00:15:55,959
million miles well a 747 jet cruises at

349
00:16:03,749 --> 00:16:00,000
570 miles per hour it would take a 747

350
00:16:05,829 --> 00:16:03,759
jet 180 years to fly to saturn

351
00:16:08,069 --> 00:16:05,839
the fastest land animal the cheetah can

352
00:16:09,870 --> 00:16:08,079
go 70 miles per hour it would take a

353
00:16:13,189 --> 00:16:09,880
cheetah

354
00:16:15,590 --> 00:16:13,199
1467 years to run to saturn an average

355
00:16:19,629 --> 00:16:15,600
human's walking speed is 4 miles per

356
00:16:24,790 --> 00:16:19,639
hour it would take a human 25

357
00:16:28,870 --> 00:16:24,800
667 years 128 days and 6 hours to walk

358
00:16:34,389 --> 00:16:31,430
all right let's take a gauge again it is

359
00:16:37,110 --> 00:16:34,399
16 minutes past the hour we are about 10

360
00:16:39,110 --> 00:16:37,120
and a half minutes out from our wave and

361
00:16:41,269 --> 00:16:39,120
people are planning impromptu wave

362
00:16:43,829 --> 00:16:41,279
parties all over the place and again

363
00:16:45,990 --> 00:16:43,839

remember that hashtag wave at saturn

364
00:16:48,310 --> 00:16:46,000
including some folks at comic con in san

365
00:16:49,670 --> 00:16:48,320
diego california we've got a picture to

366
00:16:52,230 --> 00:16:49,680
show you

367
00:16:56,230 --> 00:16:52,240
there they are and i have to say two of

368
00:16:58,230 --> 00:16:56,240
those folks are jplers whitney um is the

369
00:17:00,310 --> 00:16:58,240
girl in the purple hair she is part of

370
00:17:02,949 --> 00:17:00,320
our media relations group and kim

371
00:17:05,429 --> 00:17:02,959
stedman she's in the purple shirt next

372
00:17:07,350 --> 00:17:05,439
to whitney and she is a part of the

373
00:17:09,669 --> 00:17:07,360
cassini group but they're at comic-con

374
00:17:11,750 --> 00:17:09,679
today and they are still waiting at

375
00:17:14,309 --> 00:17:11,760
saturn we have another picture to show

376
00:17:17,590 --> 00:17:14,319
you this was sent to us from the science

377
00:17:19,429 --> 00:17:17,600
center of iowa and they too will be

378
00:17:22,549 --> 00:17:19,439
ready to

379
00:17:24,390 --> 00:17:22,559
go ahead and wave at saturn just oh less

380
00:17:27,110 --> 00:17:24,400
than 10 minutes from now

381
00:17:30,150 --> 00:17:27,120
one wave party is taking place right now

382
00:17:31,350 --> 00:17:30,160
at the 800 year old

383
00:17:34,230 --> 00:17:31,360
castle

384
00:17:36,150 --> 00:17:34,240
and 800 that's enrico piazza he is part

385
00:17:38,310 --> 00:17:36,160
of the cassini team

386
00:17:40,070 --> 00:17:38,320
and he's he's getting them organized

387
00:17:42,310 --> 00:17:40,080
right now but it could be in a ruling

388
00:17:45,110 --> 00:17:42,320

crowd and one more time let's start this

389
00:17:48,070 --> 00:17:45,120
again one wave party taking place right

390
00:17:50,470 --> 00:17:48,080
now is at an 800-year castle in kendall

391
00:17:53,029 --> 00:17:50,480
england the eddington astronomical

392
00:17:55,190 --> 00:17:53,039
society is holding that party stuart

393
00:17:58,310 --> 00:17:55,200
atkinson is a part of that group and he

394
00:18:00,070 --> 00:17:58,320
joins us now by telephone hi stu

395
00:18:01,669 --> 00:18:00,080
hello there how are you doing oh we're

396
00:18:03,830 --> 00:18:01,679
just fine now what time is it there

397
00:18:06,710 --> 00:18:03,840
right now it is now

398
00:18:08,549 --> 00:18:06,720
10 18 p.m all right um the sky is

399
00:18:10,789 --> 00:18:08,559
getting dark a lovely lavender huge sky

400
00:18:12,549 --> 00:18:10,799
here marmalade sunset haven't half past

401
00:18:14,789 --> 00:18:12,559
nine and we have just seen saturn to a

402
00:18:16,710 --> 00:18:14,799
telescope for the first time fantastic

403
00:18:19,350 --> 00:18:16,720
how many people are out there we've got

404
00:18:21,430 --> 00:18:19,360
about 100 people here all right and it's

405
00:18:23,110 --> 00:18:21,440
a just a fantastic sight something like

406
00:18:25,430 --> 00:18:23,120
a little star above the trees above the

407
00:18:26,789 --> 00:18:25,440
ruined cars like 800 year old castle

408
00:18:29,190 --> 00:18:26,799
it's fascinating shining above it like a

409
00:18:31,270 --> 00:18:29,200
little golden secret very pretty we see

410
00:18:32,710 --> 00:18:31,280
some pictures that you sent us so is

411
00:18:33,590 --> 00:18:32,720
that your crowd there you have a good

412
00:18:36,070 --> 00:18:33,600
group

413
00:18:37,830 --> 00:18:36,080

people from all over south lakes we've

414
00:18:39,990 --> 00:18:37,840
got people from quite a long way come to

415
00:18:41,909 --> 00:18:40,000
our event here and they're seeing saturn

416
00:18:44,789 --> 00:18:41,919
everyone's very very pleased indeed sir

417
00:18:46,470 --> 00:18:44,799
and it this is a very special spot tell

418
00:18:48,710 --> 00:18:46,480
us a little bit about it

419
00:18:50,390 --> 00:18:48,720
the castle is 800 years old it was the

420
00:18:51,990 --> 00:18:50,400
actual family home of one of henry the

421
00:18:53,669 --> 00:18:52,000
eight's waves catherine parker last week

422
00:18:55,909 --> 00:18:53,679
henry gave actually so it's placed

423
00:18:57,590 --> 00:18:55,919
steeped in history and kendall itself

424
00:18:58,630 --> 00:18:57,600
was a birthplace of astronomical art

425
00:18:59,669 --> 00:18:58,640
eddington

426
00:19:01,590 --> 00:18:59,679
who helped understand with his

427
00:19:03,750 --> 00:19:01,600
relativity theory so we're a historic

428
00:19:05,830 --> 00:19:03,760
town and we're joining in this wave

429
00:19:07,350 --> 00:19:05,840
assassins we've got old history and

430
00:19:09,110 --> 00:19:07,360
modern technology in the same place so

431
00:19:12,070 --> 00:19:09,120
it's all it's all working very well so

432
00:19:14,630 --> 00:19:12,080
far so are you able to get saturn

433
00:19:15,909 --> 00:19:14,640
already in your telescopes yes we've got

434
00:19:17,909 --> 00:19:15,919
look at your saturn through about 10

435
00:19:19,430 --> 00:19:17,919
telescopes here

436
00:19:20,789 --> 00:19:19,440
very very small and minimal telescopes

437
00:19:22,630 --> 00:19:20,799
of course the bigger ones we can see the

438
00:19:24,150 --> 00:19:22,640

rings very clearly okay could you see

439
00:19:26,710 --> 00:19:24,160
tighten to one side like a little star

440
00:19:28,310 --> 00:19:26,720
it's a beautiful view so so what does it

441
00:19:30,150 --> 00:19:28,320
look like

442
00:19:32,150 --> 00:19:30,160
you've got the classic saturn in a small

443
00:19:33,669 --> 00:19:32,160
telescope little disc the rings around

444
00:19:35,669 --> 00:19:33,679
it this little little halo around the

445
00:19:37,990 --> 00:19:35,679
center and many people it's her first

446
00:19:39,270 --> 00:19:38,000
view of saturn so they're just amazed by

447
00:19:41,430 --> 00:19:39,280
what they're seeing many kids are just

448
00:19:43,590 --> 00:19:41,440
wowing and woos oh look at this mom this

449
00:19:46,310 --> 00:19:43,600
is cool and it's just a really good

450
00:19:48,789 --> 00:19:46,320
night so so they're excited about doing

451
00:19:50,150 --> 00:19:48,799
this wave then very excited yes people

452
00:19:52,390 --> 00:19:50,160
been reading the newspapers and on the

453
00:19:53,590 --> 00:19:52,400
internet of course and some didn't know

454
00:19:54,630 --> 00:19:53,600
we were doing it we just wandered past

455
00:19:56,630 --> 00:19:54,640
and what are you people doing when this

456
00:19:58,150 --> 00:19:56,640
hill would be telescope um but now

457
00:20:00,150 --> 00:19:58,160
they're here about ready to join with

458
00:20:02,789 --> 00:20:00,160
waving at fat in about

459
00:20:04,789 --> 00:20:02,799
10 minutes or so okay and and tell me

460
00:20:07,350 --> 00:20:04,799
how you feel about all this you know

461
00:20:08,950 --> 00:20:07,360
granted that the image of earth is just

462
00:20:10,230 --> 00:20:08,960
going to be a pixel but it's still

463
00:20:11,590 --> 00:20:10,240

special to you

464
00:20:13,750 --> 00:20:11,600
it is yeah because you're seeing our

465
00:20:15,029 --> 00:20:13,760
home a billion miles away i don't know

466
00:20:17,029 --> 00:20:15,039
why you wouldn't want to be looking at

467
00:20:18,390 --> 00:20:17,039
this picture or be part of this picture

468
00:20:20,150 --> 00:20:18,400
i mean we're at this castle finally

469
00:20:21,669 --> 00:20:20,160
anyone in the garden can do it in a park

470
00:20:23,750 --> 00:20:21,679
that can do it in the school fields

471
00:20:25,990 --> 00:20:23,760
it'll be part of this amazing experience

472
00:20:28,070 --> 00:20:26,000
and doesn't happen very often we can all

473
00:20:29,830 --> 00:20:28,080
just stop catch our breath

474
00:20:31,270 --> 00:20:29,840
and be part of this amazing portrait of

475
00:20:35,350 --> 00:20:31,280
our home planet i mean why wouldn't you

476
00:20:40,149 --> 00:20:37,750
well this is fantastic so you'll be

477
00:20:41,990 --> 00:20:40,159
waiting the same time we will here at

478
00:20:44,390 --> 00:20:42,000
jpl the crowd is starting to get a

479
00:20:47,029 --> 00:20:44,400
little bigger behind me yeah and and

480
00:20:49,350 --> 00:20:47,039
folks are excited so thanks again for

481
00:20:50,870 --> 00:20:49,360
sending all your pictures and send more

482
00:20:53,590 --> 00:20:50,880
we're going to send you a lot more very

483
00:20:56,070 --> 00:20:53,600
soon okay all right thank you stuart

484
00:20:58,390 --> 00:20:56,080
thank you bye all right bye-bye so it's

485
00:21:00,470 --> 00:20:58,400
about 20 minutes past the hour right now

486
00:21:02,870 --> 00:21:00,480
it's less than seven minutes away from

487
00:21:05,350 --> 00:21:02,880
the wave and as i mentioned the crowd

488
00:21:07,350 --> 00:21:05,360

out here is definitely getting bigger

489
00:21:09,750 --> 00:21:07,360
don't forget go ahead and post your

490
00:21:12,950 --> 00:21:09,760
photos with the hashtag way that saturn

491
00:21:16,149 --> 00:21:12,960
on twitter facebook instagram and google

492
00:21:19,029 --> 00:21:16,159
plus now let's go out to our mall and

493
00:21:21,669 --> 00:21:19,039
join jane houston jones jane is an

494
00:21:24,070 --> 00:21:21,679
outreach specialist with cassini and an

495
00:21:26,870 --> 00:21:24,080
uh amateur astronomer herself and she's

496
00:21:33,750 --> 00:21:26,880
also the host of jpl's video series

497
00:21:37,270 --> 00:21:35,430
hi there

498
00:21:39,830 --> 00:21:37,280
so what's it what's it like out there

499
00:21:41,990 --> 00:21:39,840
you're getting a big crowd yeah i can um

500
00:21:44,630 --> 00:21:42,000
i almost can't hear myself talk there's

501
00:21:46,710 --> 00:21:44,640
so many people out here

502
00:21:48,870 --> 00:21:46,720
it's fantastic so tell me where are

503
00:21:50,870 --> 00:21:48,880
people going to be looking most of the

504
00:21:53,510 --> 00:21:50,880
people here are going to be looking to

505
00:21:56,830 --> 00:21:53,520
their east which i'll just point this

506
00:22:00,630 --> 00:21:56,840
way it's kind of down the main drag of

507
00:22:02,390 --> 00:22:00,640
jpl and right now saturn has just risen

508
00:22:04,549 --> 00:22:02,400
above the horizon

509
00:22:08,549 --> 00:22:04,559
so even though we can't see it in the

510
00:22:10,950 --> 00:22:08,559
daytime it's already above our horizon

511
00:22:13,190 --> 00:22:10,960
well you have a couple of um images that

512
00:22:15,270 --> 00:22:13,200
you can show us oh look at that crowd

513
00:22:16,390 --> 00:22:15,280

definitely yeah people must have gotten

514
00:22:17,590 --> 00:22:16,400
the memo eh

515
00:22:22,710 --> 00:22:17,600
right

516
00:22:23,990 --> 00:22:22,720
shots and you to kind of get an idea of

517
00:22:26,230 --> 00:22:24,000
where to look

518
00:22:28,149 --> 00:22:26,240
saturn's not going to be way way up high

519
00:22:30,149 --> 00:22:28,159
in the sky and of course it is the

520
00:22:32,789 --> 00:22:30,159
daytime so folks here won't be able to

521
00:22:36,310 --> 00:22:32,799
see but can you describe where to look

522
00:22:38,950 --> 00:22:36,320
yes um look almost due east so wherever

523
00:22:41,909 --> 00:22:38,960
you are in the u.s look kind of to your

524
00:22:45,190 --> 00:22:41,919
east or to your southeast if you're kind

525
00:22:47,750 --> 00:22:45,200
of on the east coast and very very close

526
00:22:49,590 --> 00:22:47,760
to the horizon maybe less than 15

527
00:22:51,430 --> 00:22:49,600
degrees above the horizon

528
00:22:52,950 --> 00:22:51,440
and that's where that's where you should

529
00:22:55,669 --> 00:22:52,960
face and wave

530
00:22:57,990 --> 00:22:55,679
all right now people would definitely

531
00:23:00,630 --> 00:22:58,000
want to see saturn at night it's

532
00:23:03,110 --> 00:23:00,640
probably you know one of the the

533
00:23:04,710 --> 00:23:03,120
favorite planets to look at at night

534
00:23:06,630 --> 00:23:04,720
where should they look again at that

535
00:23:09,590 --> 00:23:06,640
time and there are little things that

536
00:23:11,510 --> 00:23:09,600
can help guide them right um

537
00:23:14,789 --> 00:23:11,520
almost in the same area you'll be

538
00:23:18,149 --> 00:23:14,799

looking to your uh to your east up about

539
00:23:19,350 --> 00:23:18,159
30 or 40 or 50 degrees up and you'll see

540
00:23:21,909 --> 00:23:19,360
a golden

541
00:23:25,110 --> 00:23:21,919
star and the easy way to see it is that

542
00:23:27,270 --> 00:23:25,120
the moon is on one side and venus is on

543
00:23:29,669 --> 00:23:27,280
the other side so there'll be two good

544
00:23:32,310 --> 00:23:29,679
signposts to help people find

545
00:23:34,950 --> 00:23:32,320
all right so this is an event by the

546
00:23:36,789 --> 00:23:34,960
cassini team and one of the things

547
00:23:39,430 --> 00:23:36,799
that's going to be a real treat is

548
00:23:41,909 --> 00:23:39,440
taking all these images that people are

549
00:23:43,430 --> 00:23:41,919
tweeting in and posting on facebook what

550
00:23:45,830 --> 00:23:43,440
are you going to do with them we're

551
00:23:47,990 --> 00:23:45,840
going to make a collage so everyone who

552
00:23:50,070 --> 00:23:48,000
sends in either a photo they take of the

553
00:23:52,870 --> 00:23:50,080
planet or a photo they take of

554
00:23:55,750 --> 00:23:52,880
themselves or photos that they take of

555
00:23:58,230 --> 00:23:55,760
their friends or whatever their dogs

556
00:24:00,950 --> 00:23:58,240
especially if it's if it's a cute dog

557
00:24:03,830 --> 00:24:00,960
and send those into our facebook page or

558
00:24:05,990 --> 00:24:03,840
twitter and what you'll be able to do is

559
00:24:07,270 --> 00:24:06,000
eventually we'll put a little collage

560
00:24:09,669 --> 00:24:07,280
together

561
00:24:12,070 --> 00:24:09,679
of all those pictures in the in a saturn

562
00:24:13,590 --> 00:24:12,080
view and then you can download that

563
00:24:15,269 --> 00:24:13,600

what do you think about this jane the

564
00:24:19,190 --> 00:24:15,279
fact that okay

565
00:24:19,909 --> 00:24:19,200
um the way that saturn isn't a part of

566
00:24:24,070 --> 00:24:19,919
a

567
00:24:25,830 --> 00:24:24,080
people

568
00:24:28,630 --> 00:24:25,840
with science what do you think about

569
00:24:32,630 --> 00:24:28,640
that oh boy i've been looking at saturn

570
00:24:35,430 --> 00:24:32,640
through telescopes for 25 years and now

571
00:24:38,070 --> 00:24:35,440
i get a chance to have the cine

572
00:24:41,029 --> 00:24:38,080
spacecraft take a picture of me looking

573
00:24:43,190 --> 00:24:41,039
at it i think that's pretty awesome

574
00:24:45,510 --> 00:24:43,200
are people getting pretty excited i know

575
00:24:46,470 --> 00:24:45,520
you run the twitter for cassini what do

576
00:24:49,029 --> 00:24:46,480
you see

577
00:24:50,390 --> 00:24:49,039
well right now we're we're trending with

578
00:24:53,350 --> 00:24:50,400
the uh

579
00:24:55,510 --> 00:24:53,360
uh with the wave at saturn hashtag so

580
00:24:58,870 --> 00:24:55,520
that means a lot of people are using

581
00:25:01,350 --> 00:24:58,880
using twitter and using that hashtag so

582
00:25:03,510 --> 00:25:01,360
and all the people out here are are

583
00:25:06,149 --> 00:25:03,520
pretty excited why do you think that's

584
00:25:08,310 --> 00:25:06,159
the case that um this is something that

585
00:25:10,310 --> 00:25:08,320
people really embrace

586
00:25:12,710 --> 00:25:10,320
oh i hear enrique

587
00:25:13,669 --> 00:25:12,720
here two minutes so we're two minutes

588
00:25:17,510 --> 00:25:13,679

okay

589
00:25:20,070 --> 00:25:17,520
well we'll keep going until the

590
00:25:21,750 --> 00:25:20,080
countdown um you know while we can break

591
00:25:23,990 --> 00:25:21,760
away just for a second i wanted to show

592
00:25:26,950 --> 00:25:24,000
another picture we have some pictures

593
00:25:28,870 --> 00:25:26,960
from bond germany i'm gonna see there

594
00:25:31,669 --> 00:25:28,880
you go there's a group in bond germany

595
00:25:34,149 --> 00:25:31,679
so it's sort of like these are

596
00:25:36,070 --> 00:25:34,159
like your sidewalk astronomer sort of

597
00:25:38,870 --> 00:25:36,080
get-togethers and they're getting

598
00:25:41,110 --> 00:25:38,880
together to to look at the night sky but

599
00:25:42,470 --> 00:25:41,120
they're also waving at saturn it seems

600
00:25:44,950 --> 00:25:42,480
that's right

601
00:25:46,310 --> 00:25:44,960
all over the world all over the u.s

602
00:25:48,789 --> 00:25:46,320
people are going to be out waving at

603
00:25:50,470 --> 00:25:48,799
saturn and just like stewart is doing in

604
00:25:52,710 --> 00:25:50,480
england right now

605
00:25:54,789 --> 00:25:52,720
and you know nobody seems to mind that

606
00:25:58,710 --> 00:25:54,799
you know maybe we won't be able to be

607
00:26:00,549 --> 00:25:58,720
seen on that one pixel picture

608
00:26:02,390 --> 00:26:00,559
um nobody's going to mind because they

609
00:26:03,909 --> 00:26:02,400
can actually see saturn at night in a

610
00:26:06,070 --> 00:26:03,919
few hours and they can see it for the

611
00:26:09,190 --> 00:26:06,080
next few months too all right well give

612
00:26:11,510 --> 00:26:09,200
me an idea jane of who's coming out here

613
00:26:13,730 --> 00:26:11,520

um these are all jpellers they're the

614
00:26:16,390 --> 00:26:13,740
cassini team who's here

615
00:26:18,549 --> 00:26:16,400
[Laughter]

616
00:26:20,630 --> 00:26:18,559
everybody's waving

617
00:26:25,190 --> 00:26:20,640
all right hundreds hundreds of people

618
00:26:36,260 --> 00:26:28,310
okay we are 45 seconds out so we're just

619
00:26:36,270 --> 00:26:51,430
[Applause]

620
00:26:58,630 --> 00:26:54,950
you will have to wait for 15 minutes 15

621
00:27:02,310 --> 00:26:58,640
minutes is what it takes to stay

622
00:27:04,830 --> 00:27:03,430
seven

623
00:27:06,789 --> 00:27:04,840
six

624
00:27:07,909 --> 00:27:06,799
five four

625
00:27:08,950 --> 00:27:07,919
three

626
00:27:11,400 --> 00:27:08,960
two

627
00:27:16,040 --> 00:27:11,410
one

628
00:27:16,050 --> 00:27:23,430
[Music]

629
00:27:41,190 --> 00:27:24,840
i'm sorry

630
00:27:49,350 --> 00:27:44,450
so we have a quite a crowd out here

631
00:28:04,100 --> 00:27:51,430
there's gotta be several hundred this is

632
00:28:13,060 --> 00:28:11,190
[Applause]

633
00:28:15,990 --> 00:28:13,070
one more time

634
00:28:24,389 --> 00:28:16,000
[Applause]

635
00:28:43,510 --> 00:28:26,850
one more time

636
00:28:45,909 --> 00:28:44,870
all right

637
00:28:49,269 --> 00:28:45,919
we got

638
00:28:51,510 --> 00:28:49,279

always a jpler always fun-loving group

639
00:28:54,470 --> 00:28:51,520
there you have it that wraps things up

640
00:28:56,789 --> 00:28:54,480
for us here at jpl our thanks to stuart

641
00:28:59,669 --> 00:28:56,799
atkinson and the folks at the eddington

642
00:29:02,310 --> 00:28:59,679
astronomical society in kendall england

643
00:29:04,710 --> 00:29:02,320
joe burns at cornell scott edgington and

644
00:29:07,269 --> 00:29:04,720
jane houston jones with the cassini team

645
00:29:09,590 --> 00:29:07,279
this was really fun please continue to

646
00:29:11,990 --> 00:29:09,600
send us your way photos for the cassini

647
00:29:13,510 --> 00:29:12,000
team special collage and if you want

648
00:29:15,909 --> 00:29:13,520
more information on what's happening

649
00:29:18,950 --> 00:29:15,919
with cassini and any of the other jpl

650
00:29:21,230 --> 00:29:18,960
missions look us up on facebook at

651
00:29:28,630 --> 00:29:21,240
facebook.com

652
00:29:33,350 --> 00:29:30,870
but before we go we'd like to leave you

653
00:29:35,990 --> 00:29:33,360
with this montage of birth images taken

654
00:29:37,750 --> 00:29:36,000
from space and the words of carl sagan

655
00:29:39,830 --> 00:29:37,760
which inspired us all

656
00:29:42,389 --> 00:29:39,840
pictures like these are few and far

657
00:29:45,110 --> 00:29:42,399
between they're not easy to take special

658
00:29:47,430 --> 00:29:45,120
care has to be taken to not blind the

659
00:29:48,549 --> 00:29:47,440
cameras while looking in the direction

660
00:29:50,549 --> 00:29:48,559
of the sun

661
00:29:52,789 --> 00:29:50,559
where earth happens to be

662
00:29:54,549 --> 00:29:52,799
but the challenge is not the only part

663
00:29:56,549 --> 00:29:54,559

of our appreciation

664
00:29:58,789 --> 00:29:56,559
these images are special for their

665
00:30:02,310 --> 00:29:58,799
unique perspective of our world whether

666
00:30:05,110 --> 00:30:02,320
it's a blink book big blue marble or a

667
00:30:11,110 --> 00:30:05,120
pale blue dot it is ours thanks for

668
00:30:15,190 --> 00:30:13,669
consider again that dot

669
00:30:16,710 --> 00:30:15,200
that's here

670
00:30:18,549 --> 00:30:16,720
that's home

671
00:30:19,830 --> 00:30:18,559
that's us

672
00:30:21,510 --> 00:30:19,840
on it

673
00:30:23,430 --> 00:30:21,520
everyone you love

674
00:30:26,149 --> 00:30:23,440
everyone you know

675
00:30:28,070 --> 00:30:26,159
everyone you ever heard of every human

676
00:30:31,350 --> 00:30:28,080
being who ever was

677
00:30:35,269 --> 00:30:32,470
the earth

678
00:30:36,389 --> 00:30:35,279
is a very small stage