
NASA
Mario Runco
Former NASA Astronaut

1
00:00:03,400 --> 00:00:11,299
you

2
00:00:18,390 --> 00:00:15,019
the last one was less than a decade ago

3
00:00:24,930 --> 00:00:18,400
before then the most recent occurrence

4
00:00:29,940 --> 00:00:24,940
was in eighteen eighty two and the next

5
00:00:33,660 --> 00:00:29,950
time it'll be 21 17 when few if any of

6
00:00:36,150 --> 00:00:33,670
us will be alive to see it among the

7
00:00:38,309 --> 00:00:36,160
most rare the predictable celestial

8
00:00:40,799 --> 00:00:38,319
events the sight of the planet Venus

9
00:00:44,160 --> 00:00:40,809
slowly trekking across the face of the

10
00:00:46,799 --> 00:00:44,170
Sun has been witnessed by humans only

11
00:00:50,430 --> 00:00:46,809
fifty three times since two thousand

12
00:00:53,520 --> 00:00:50,440
years bc what about the heavens have

13
00:00:55,979 --> 00:00:53,530

these phenomena taught us and what else

14
00:00:58,799 --> 00:00:55,989
might we discover about our place in the

15
00:01:05,070 --> 00:00:58,809
universe during these next six plus

16
00:01:30,639 --> 00:01:05,080
hours the vainest transfer 2012 next on

17
00:01:35,419 --> 00:01:33,169
good morning good afternoon good night

18
00:01:38,389 --> 00:01:35,429
it depends wherever you may be watching

19
00:01:41,240 --> 00:01:38,399
us around the world this is NASA TVs

20
00:01:43,219 --> 00:01:41,250
coverage of 2012 venus transit I'm nasa

21
00:01:45,830 --> 00:01:43,229
TV senior producer al Feinberg with me

22
00:01:48,169 --> 00:01:45,840
office of communications colleague Dwane

23
00:01:50,449 --> 00:01:48,179
Brown and we've got some really cool

24
00:01:53,319 --> 00:01:50,459
stuff to talk about tonight that is

25
00:01:56,089 --> 00:01:53,329
right now I am so happy to be here and

26
00:02:00,080 --> 00:01:56,099
ladies and gentlemen you are in for a

27
00:02:02,209 --> 00:02:00,090
treat you are going to hear and see

28
00:02:04,819 --> 00:02:02,219
firsthand not just here in Washington DC

29
00:02:08,180 --> 00:02:04,829
but all over the world something that

30
00:02:11,509 --> 00:02:08,190
won't happen again for another 105 years

31
00:02:13,580 --> 00:02:11,519
now as I said I'm Dwane Brown with the

32
00:02:15,530 --> 00:02:13,590
office of communications but I have one

33
00:02:17,990 --> 00:02:15,540
of the coolest jobs in the world I get

34
00:02:19,789 --> 00:02:18,000
to work with special people who next to

35
00:02:22,759 --> 00:02:19,799
me and i'm going to introduce him but

36
00:02:24,559 --> 00:02:22,769
the incredible scientists engineers to

37
00:02:27,680 --> 00:02:24,569
do all the incredible science activities

38
00:02:29,150 --> 00:02:27,690

and all right now looking at what you

39
00:02:32,020 --> 00:02:29,160
guys are going to see the venus transit

40
00:02:34,220 --> 00:02:32,030
all over the world first things first

41
00:02:37,250 --> 00:02:34,230
safety for the folks watching this

42
00:02:38,750 --> 00:02:37,260
program really really listen carefully

43
00:02:41,509 --> 00:02:38,760
it's been on the internet it's been on

44
00:02:43,490 --> 00:02:41,519
TV and other things do not go outside

45
00:02:47,000 --> 00:02:43,500
and look at the Sun without some

46
00:02:48,680 --> 00:02:47,010
protection we've got these glasses and

47
00:02:51,650 --> 00:02:48,690
there are other types of components but

48
00:02:53,449 --> 00:02:51,660
safety first safety first always

49
00:02:54,830 --> 00:02:53,459
remember that and go to your internet

50
00:02:56,780 --> 00:02:54,840
and they'll give you some other ideas

51
00:02:58,339 --> 00:02:56,790
for that I tested this by the way

52
00:03:01,849 --> 00:02:58,349
yesterday their work just a little

53
00:03:04,190 --> 00:03:01,859
orange dot very safe and again if you

54
00:03:07,640 --> 00:03:04,200
don't have the glasses tell your friends

55
00:03:09,740 --> 00:03:07,650
to come watch NASA TV and WWE gov we're

56
00:03:11,089 --> 00:03:09,750
going to bring you it live and in color

57
00:03:13,129 --> 00:03:11,099
not just here from all over the world

58
00:03:15,140 --> 00:03:13,139
and we understand that there's now some

59
00:03:17,449 --> 00:03:15,150
some cloud weather on the east coast but

60
00:03:19,849 --> 00:03:17,459
that's okay you may get lucky but again

61
00:03:23,479 --> 00:03:19,859
you see it here and arriving in color

62
00:03:26,180 --> 00:03:23,489
now you know social media for you to

63
00:03:28,280 --> 00:03:26,190

folks who tweet Facebook and everything

64
00:03:31,250 --> 00:03:28,290
join the conversation and we have the

65
00:03:34,879 --> 00:03:31,260
best of the best working this night and

66
00:03:35,590 --> 00:03:34,889
he is going to be busy at Jason Towson

67
00:03:37,120 --> 00:03:35,600
you

68
00:03:38,410 --> 00:03:37,130
for the night man I know it's gonna be

69
00:03:40,090 --> 00:03:38,420
you gonna have a lot of fun with us

70
00:03:41,860 --> 00:03:40,100
right yeah we're gonna have a lot of fun

71
00:03:43,420 --> 00:03:41,870
tonight we're just having everybody

72
00:03:45,640 --> 00:03:43,430
follow along if you guys are online and

73
00:03:47,200 --> 00:03:45,650
you're sharing updates and so on make

74
00:03:50,020 --> 00:03:47,210
sure to be using the hash tag pound

75
00:03:52,840 --> 00:03:50,030
venus transit also make sure to follow

76
00:03:55,750 --> 00:03:52,850
along on at NASA on Twitter and to make

77
00:03:58,090 --> 00:03:55,760
sure to follow us on NASA facebook and

78
00:03:59,770 --> 00:03:58,100
google+ so we'll be looking out for good

79
00:04:01,360 --> 00:03:59,780
images will be sharing them along on

80
00:04:02,860 --> 00:04:01,370
social media and if you're taking

81
00:04:04,810 --> 00:04:02,870
pictures make sure to look us up on

82
00:04:06,820 --> 00:04:04,820
flickr if you go online the group name

83
00:04:09,520 --> 00:04:06,830
is venus transit and so add your photos

84
00:04:10,810 --> 00:04:09,530
as you take them and have a good transit

85
00:04:12,490 --> 00:04:10,820
remember to be safe out there everybody

86
00:04:14,410 --> 00:04:12,500
and we'll keep checking back with what's

87
00:04:17,380 --> 00:04:14,420
trending and everything else is going on

88
00:04:19,720 --> 00:04:17,390

and end a reminder Jason will also be

89
00:04:22,530 --> 00:04:19,730
keeping an eye on the different NASA

90
00:04:25,120 --> 00:04:22,540
missions and the imagery that will be

91
00:04:27,730 --> 00:04:25,130
come up we've got the Solar Dynamics

92
00:04:29,800 --> 00:04:27,740
Observatory we've got Hubble Space

93
00:04:31,450 --> 00:04:29,810
Telescope what else astronauts

94
00:04:33,580 --> 00:04:31,460
International Space Station that's right

95
00:04:35,950 --> 00:04:33,590
name it we got it but you know who we

96
00:04:37,720 --> 00:04:35,960
have sitting next to us now I know this

97
00:04:42,010 --> 00:04:37,730
guy okay so I think it's time to bring

98
00:04:45,850 --> 00:04:42,020
him more now this gentleman is Jim Green

99
00:04:48,490 --> 00:04:45,860
dr. Jim Green and he is the director of

100
00:04:53,170 --> 00:04:48,500
NASA's planetary science division he is

101
00:04:56,290 --> 00:04:53,180
the boss he is numero uno the man and

102
00:04:57,820 --> 00:04:56,300
all of a sudden the system and so we're

103
00:04:59,080 --> 00:04:57,830
going to go right to him me because

104
00:05:00,220 --> 00:04:59,090
you're going to start out with jen we're

105
00:05:02,260 --> 00:05:00,230
going to have other scientists but we're

106
00:05:04,840 --> 00:05:02,270
starting off with the boss first dr.

107
00:05:06,550 --> 00:05:04,850
Greene welcome thank you very much to

108
00:05:09,850 --> 00:05:06,560
Wayne how you feeling about this is a

109
00:05:12,700 --> 00:05:09,860
fantastic opportunity to talk about the

110
00:05:15,010 --> 00:05:12,710
fascinating planet called Venus you know

111
00:05:17,170 --> 00:05:15,020
Venus is our sister planet and we've

112
00:05:22,030 --> 00:05:17,180
learned so much about this particular

113
00:05:24,220 --> 00:05:22,040

object venus is a gift and it keeps on

114
00:05:27,160 --> 00:05:24,230
giving one of the things that we've

115
00:05:31,300 --> 00:05:27,170
learned by venus transit is how far away

116
00:05:33,310 --> 00:05:31,310
the earth and the sun are and that one

117
00:05:35,950 --> 00:05:33,320
unit of measurement called the

118
00:05:38,620 --> 00:05:35,960
astronomical unit we use throughout the

119
00:05:41,170 --> 00:05:38,630
solar system and its really changed our

120
00:05:43,659 --> 00:05:41,180
perspective of how big the solar system

121
00:05:46,060 --> 00:05:43,669
is how long it takes to go from Planet

122
00:05:48,570 --> 00:05:46,070
Aid a planet be and so it's one of those

123
00:05:50,659 --> 00:05:48,580
fundamental things but that's just

124
00:05:54,839 --> 00:05:50,669
the start of what Venus is done for us

125
00:05:59,070 --> 00:05:54,849
you know Venus was first observed in a

126
00:06:01,890 --> 00:05:59,080
telescope by Galileo in 1610 and when he

127
00:06:04,200 --> 00:06:01,900
saw it over a period of time it changed

128
00:06:06,629 --> 00:06:04,210
shape in the sense that as it got close

129
00:06:08,580 --> 00:06:06,639
to the earth it formed a crescent phase

130
00:06:11,760 --> 00:06:08,590
and as it got on the other side of the

131
00:06:13,350 --> 00:06:11,770
Sun it had that full face and in fact it

132
00:06:17,040 --> 00:06:13,360
looked like very much going through

133
00:06:19,589 --> 00:06:17,050
phases of the Moon now Galileo put all

134
00:06:22,550 --> 00:06:19,599
that information together and determined

135
00:06:26,520 --> 00:06:22,560
that Venus went around the Sun and

136
00:06:28,879 --> 00:06:26,530
therefore the Copernicus theory of the

137
00:06:31,890 --> 00:06:28,889
solar system was the correct one and

138
00:06:34,290 --> 00:06:31,900

when he started promoting that because

139
00:06:36,899 --> 00:06:34,300
he now had observations of the Sun

140
00:06:40,200 --> 00:06:36,909
censored so a sun-centered solar system

141
00:06:42,809 --> 00:06:40,210
it changed our culture it started the

142
00:06:45,719 --> 00:06:42,819
modern science and it changed religion

143
00:06:49,110 --> 00:06:45,729
and we owe Venus that now here's a

144
00:06:51,480 --> 00:06:49,120
transit that we're hope to see as you

145
00:06:54,719 --> 00:06:51,490
look in the screen of the object between

146
00:06:57,330 --> 00:06:54,729
us in the Sun that's Venus that's how it

147
00:07:01,260 --> 00:06:57,340
will look we only see that very rarely

148
00:07:05,550 --> 00:07:01,270
and in fact the next time that it will

149
00:07:08,040 --> 00:07:05,560
occur will be in 2117 most of us maybe

150
00:07:11,909 --> 00:07:08,050
all of us won't be here by then we'll

151
00:07:16,379 --> 00:07:11,919
see what happens from from other types

152
00:07:20,279 --> 00:07:16,389
of science but Venus is just such a

153
00:07:22,290 --> 00:07:20,289
beautiful transit that occurs and I hope

154
00:07:25,320 --> 00:07:22,300
you'll all have an opportunity to see it

155
00:07:27,659 --> 00:07:25,330
so let me turn it back to doing well Jim

156
00:07:29,430 --> 00:07:27,669
you know what I want to say I would be

157
00:07:31,290 --> 00:07:29,440
remiss without acknowledging our good

158
00:07:33,629 --> 00:07:31,300
friends who actually I'll you know that

159
00:07:35,579 --> 00:07:33,639
down in Hawaii the NASA edge guys and

160
00:07:37,260 --> 00:07:35,589
what you guys have been seeing them and

161
00:07:39,749 --> 00:07:37,270
you're going to see them throughout this

162
00:07:42,749 --> 00:07:39,759
Venus transit but we want to send out a

163
00:07:44,640 --> 00:07:42,759

shout out to them also don't forget

164
00:07:49,019 --> 00:07:44,650
about social media you make you met

165
00:07:53,459 --> 00:07:49,029
Jason and join the conversation ladies

166
00:07:58,499 --> 00:07:53,469
and gentlemen Jim venus transit we won't

167
00:08:01,620 --> 00:07:58,509
see this again 105 years why should we

168
00:08:02,350 --> 00:08:01,630
care not not so much we will go on to

169
00:08:04,179 --> 00:08:02,360
the scientific

170
00:08:05,290 --> 00:08:04,189
but you know the millions of folks are

171
00:08:06,850 --> 00:08:05,300
gonna be watching us all the way around

172
00:08:09,100 --> 00:08:06,860
we're going to be showing some of those

173
00:08:11,950 --> 00:08:09,110
sites and visiting why should the folks

174
00:08:14,679 --> 00:08:11,960
care about this well there's we care on

175
00:08:18,309 --> 00:08:14,689
many levels you know from a perspective

176
00:08:20,860 --> 00:08:18,319
of wanting to know more about our solar

177
00:08:23,409 --> 00:08:20,870
system here's an occurrence like an

178
00:08:26,170 --> 00:08:23,419
eclipse that's very rare and of course

179
00:08:28,929 --> 00:08:26,180
it attracts our natural interest in

180
00:08:31,179 --> 00:08:28,939
looking at these wandering objects and

181
00:08:33,069 --> 00:08:31,189
where they go and in this case venus is

182
00:08:34,719 --> 00:08:33,079
going to cross in front of the Sun so

183
00:08:37,170 --> 00:08:34,729
there's the wonder of the phenomena

184
00:08:39,969 --> 00:08:37,180
itself the second thing is that

185
00:08:43,060 --> 00:08:39,979
fundamental transit that is occurring is

186
00:08:45,160 --> 00:08:43,070
also scientific interest we've got a

187
00:08:47,199 --> 00:08:45,170
number of experiments that are going on

188
00:08:50,319 --> 00:08:47,209

we're going to be looking at Venus just

189
00:08:52,269 --> 00:08:50,329
as it starts its transit and we see the

190
00:08:54,610 --> 00:08:52,279
light from the Sun going through the

191
00:08:56,680 --> 00:08:54,620
atmosphere this is going to enable us to

192
00:08:59,110 --> 00:08:56,690
take a look at perhaps the temperature

193
00:09:02,410 --> 00:08:59,120
and the pressure at certain levels in

194
00:09:05,110 --> 00:09:02,420
the Venus atmosphere over most of the

195
00:09:07,180 --> 00:09:05,120
disk now we've never done that before in

196
00:09:09,939 --> 00:09:07,190
this way and this is a perfect

197
00:09:11,740 --> 00:09:09,949
opportunity for us to do us even Hubble

198
00:09:15,220 --> 00:09:11,750
will have an opportunity to make some

199
00:09:17,410 --> 00:09:15,230
transit observations so the scientists

200
00:09:19,540 --> 00:09:17,420
are excited about it I hope the public

201
00:09:22,079 --> 00:09:19,550
is excited about it it's certainly an

202
00:09:25,689 --> 00:09:22,089
important astronomical phenomena and

203
00:09:28,360 --> 00:09:25,699
historically this has been so important

204
00:09:30,639 --> 00:09:28,370
in terms of understanding our place in

205
00:09:34,269 --> 00:09:30,649
the solar system as I mentioned a

206
00:09:37,000 --> 00:09:34,279
sun-centered solar system our yardstick

207
00:09:39,519 --> 00:09:37,010
a cosmic yardstick one astronomical unit

208
00:09:44,199 --> 00:09:39,529
it started our measuring system in space

209
00:09:48,310 --> 00:09:44,209
and 50 years ago this year we launched

210
00:09:52,870 --> 00:09:48,320
our first space probe to Venus so it was

211
00:09:55,720 --> 00:09:52,880
a planetary object of extreme importance

212
00:09:58,660 --> 00:09:55,730
that changed everything for NASA

213
00:10:00,910 --> 00:09:58,670

planetary science and really created

214
00:10:05,740 --> 00:10:00,920
solar system exploration as we know it

215
00:10:07,360 --> 00:10:05,750
today and tell us again Jim what the

216
00:10:09,519 --> 00:10:07,370
we've talked a little bit about the

217
00:10:13,389 --> 00:10:09,529
significance historically speaking this

218
00:10:14,260 --> 00:10:13,399
is something talk about Captain James

219
00:10:17,590 --> 00:10:14,270
Cook for exam

220
00:10:21,970 --> 00:10:17,600
back in the was at the 1760s right yes

221
00:10:24,190 --> 00:10:21,980
indeed in fact these transits were

222
00:10:26,470 --> 00:10:24,200
gaining a lot of interest in Europe and

223
00:10:28,750 --> 00:10:26,480
in fact you couldn't always see it from

224
00:10:32,520 --> 00:10:28,760
your sometimes you had to travel to

225
00:10:36,190 --> 00:10:32,530
great distances and a lot of these early

226
00:10:38,890 --> 00:10:36,200
countries actually funded expeditions

227
00:10:42,160 --> 00:10:38,900
several expeditions to Tahiti for

228
00:10:44,950 --> 00:10:42,170
instance like to cook expedition went

229
00:10:46,360 --> 00:10:44,960
down to observe the transit and one of

230
00:10:49,330 --> 00:10:46,370
the reasons why they wanted to observe

231
00:10:52,390 --> 00:10:49,340
it is to is to look at the transit of

232
00:10:55,840 --> 00:10:52,400
two very distant locations on the earth

233
00:10:59,620 --> 00:10:55,850
and this would enable them based on the

234
00:11:01,660 --> 00:10:59,630
timing of each of those observations and

235
00:11:03,940 --> 00:11:01,670
a little trigonometry thanks to Sir

236
00:11:07,300 --> 00:11:03,950
Edmund Halley to be able to calculate

237
00:11:09,670 --> 00:11:07,310
that one astronomical unit so this was

238
00:11:13,150 --> 00:11:09,680

really the first time the countries were

239
00:11:16,510 --> 00:11:13,160
investing in science in expeditions to

240
00:11:19,180 --> 00:11:16,520
be able to do a really fabulous of

241
00:11:22,330 --> 00:11:19,190
science and understand our solar system

242
00:11:25,300 --> 00:11:22,340
as we know it today Jim we know you have

243
00:11:26,920 --> 00:11:25,310
to leave you're not going you'll be back

244
00:11:28,900 --> 00:11:26,930
little ladies you have you found an

245
00:11:31,080 --> 00:11:28,910
event right back I've got to go to event

246
00:11:33,850 --> 00:11:31,090
and it has something to do with this

247
00:11:35,920 --> 00:11:33,860
transit of venus is there any going up

248
00:11:38,110 --> 00:11:35,930
there is that is it here riggan actually

249
00:11:39,340 --> 00:11:38,120
go out and observe and yeah so we're

250
00:11:40,960 --> 00:11:39,350
going to it we're going to talk to a

251
00:11:44,200 --> 00:11:40,970
number of people that are on a roof

252
00:11:45,640 --> 00:11:44,210
right now looking at it and enjoying

253
00:11:47,710 --> 00:11:45,650
that and we're going to talk about the

254
00:11:49,660 --> 00:11:47,720
history we're going to talk about the

255
00:11:52,120 --> 00:11:49,670
science and we're going to talk about

256
00:11:54,970 --> 00:11:52,130
what transits also mean for other fields

257
00:11:57,340 --> 00:11:54,980
like astronomy and astrophysics you know

258
00:12:00,670 --> 00:11:57,350
we're using that same concept of

259
00:12:03,060 --> 00:12:00,680
transiting planets to find other solar

260
00:12:06,280 --> 00:12:03,070
systems around other stars in our galaxy

261
00:12:08,260 --> 00:12:06,290
so it's a historic event on many levels

262
00:12:09,910 --> 00:12:08,270
I'm asking what can I get one of those

263
00:12:11,410 --> 00:12:09,920

buttons what's not better sad I know if

264
00:12:13,630 --> 00:12:11,420
I audience can see that it looks pretty

265
00:12:15,850 --> 00:12:13,640
cool it is a great button but you have

266
00:12:18,610 --> 00:12:15,860
to go out and observe the transit it

267
00:12:20,650 --> 00:12:18,620
says I observed the venus transit of

268
00:12:23,890 --> 00:12:20,660
course you'll have to wear it this way

269
00:12:25,660 --> 00:12:23,900
if you observe the 2004 and this way you

270
00:12:26,590 --> 00:12:25,670
can what you can wear it when you

271
00:12:29,559 --> 00:12:26,600
observe the one

272
00:12:31,030 --> 00:12:29,569
tonight this late today in the DC area

273
00:12:33,280 --> 00:12:31,040
well Jim we want you to have a great

274
00:12:35,439 --> 00:12:33,290
time you will see a little bit later in

275
00:12:38,590 --> 00:12:35,449
the meantime we have somebody else

276
00:12:41,470 --> 00:12:38,600
standing by at the Johnson Space Center

277
00:12:43,480 --> 00:12:41,480
in Houston Mario runco is going to be

278
00:12:46,900 --> 00:12:43,490
with us shortly and talk a little bit

279
00:12:49,769 --> 00:12:46,910
more about this Venus transit and what

280
00:12:52,900 --> 00:12:49,779
it means historically scientifically and

281
00:12:55,660 --> 00:12:52,910
talking about his history again we have

282
00:12:58,300 --> 00:12:55,670
a little messy and and before we run the

283
00:12:59,710 --> 00:12:58,310
intro there again stay with us ladies

284
00:13:02,170 --> 00:12:59,720
and gentlemen join the conversation on

285
00:13:03,340 --> 00:13:02,180
social media twitter facebook and this

286
00:13:05,860 --> 00:13:03,350
is the first stop we're going to be

287
00:13:12,519 --> 00:13:05,870
going all over the world let's go to

288
00:13:14,710 --> 00:13:12,529

houston we are now on the eve of a

289
00:13:16,809 --> 00:13:14,720
second transit of a pair after which

290
00:13:19,030 --> 00:13:16,819
there will be no other till the 21st

291
00:13:20,949 --> 00:13:19,040
century of our era has dawned upon the

292
00:13:24,610 --> 00:13:20,959
earth and the june flowers are blooming

293
00:13:26,499 --> 00:13:24,620
in 2004 when the last transit season

294
00:13:28,420 --> 00:13:26,509
occur the intellectual world was

295
00:13:31,030 --> 00:13:28,430
awakening from the slumber of Ages and

296
00:13:32,620 --> 00:13:31,040
that wondrous scientific activity which

297
00:13:35,740 --> 00:13:32,630
has led our present advanced knowledge

298
00:13:37,509 --> 00:13:35,750
was just beginning what will be the

299
00:13:48,990 --> 00:13:37,519
state of science when the next transit

300
00:13:52,860 --> 00:13:50,640
back here at NASA headquarters in

301
00:13:54,960 --> 00:13:52,870
Washington DC al Feinberg senior

302
00:13:56,610 --> 00:13:54,970
producer NASA television my colleague

303
00:13:59,130 --> 00:13:56,620
Dwane Brown of the Office of

304
00:14:02,000 --> 00:13:59,140
Communications mission science missions

305
00:14:04,950 --> 00:14:02,010
are in direct and this historic event

306
00:14:08,750 --> 00:14:04,960
not the next one not for another hundred

307
00:14:12,690 --> 00:14:08,760
and five years I'll be around they've

308
00:14:14,340 --> 00:14:12,700
never mind barring a miracle of science

309
00:14:16,560 --> 00:14:14,350
well we're called science Mission

310
00:14:19,520 --> 00:14:16,570
Directorate and every night you know the

311
00:14:21,900 --> 00:14:19,530
right people we'd like to go now and

312
00:14:23,310 --> 00:14:21,910
we've got people were going to talk to

313
00:14:27,180 --> 00:14:23,320

all over the globe today we're going to

314
00:14:29,070 --> 00:14:27,190
be talking to folks in Australia the our

315
00:14:33,240 --> 00:14:29,080
NASA edge colleagues will be at Mauna

316
00:14:35,520 --> 00:14:33,250
Kea in Hawaii we've got our hopefully we

317
00:14:38,370 --> 00:14:35,530
can hear from somebody in Fairbanks

318
00:14:40,170 --> 00:14:38,380
Alaska female would be that would go and

319
00:14:41,490 --> 00:14:40,180
some other folks too but in the meantime

320
00:14:45,300 --> 00:14:41,500
let's go to the Johnson Space Center

321
00:14:47,910 --> 00:14:45,310
we're standing by is former astronaut

322
00:14:52,140 --> 00:14:47,920
Mario runco who is considered to be one

323
00:14:55,590 --> 00:14:52,150
of the experts at the regarding the

324
00:15:00,270 --> 00:14:55,600
venus transit good afternoon good good

325
00:15:02,130 --> 00:15:00,280
afternoon sir welcome and thank you good

326
00:15:05,310 --> 00:15:02,140
afternoon to you thanks for having me

327
00:15:07,110 --> 00:15:05,320
tell us something what this means to you

328
00:15:12,090 --> 00:15:07,120
personally this is this a pretty

329
00:15:14,700 --> 00:15:12,100
exciting event well actually it's a 4b

330
00:15:16,770 --> 00:15:14,710
it's an exciting event that goes back of

331
00:15:19,620 --> 00:15:16,780
my interest in space and astronomy tools

332
00:15:21,450 --> 00:15:19,630
since I was a young boy but more

333
00:15:24,860 --> 00:15:21,460
importantly today is the involvement

334
00:15:28,079 --> 00:15:24,870
with the international space station and

335
00:15:29,910 --> 00:15:28,089
the observing of the transit by

336
00:15:33,030 --> 00:15:29,920
astronauts on board particularly

337
00:15:39,240 --> 00:15:33,040
astronaut Don Pettit now we understand

338
00:15:43,110 --> 00:15:39,250

that Don is we r during crew sleep so

339
00:15:47,790 --> 00:15:43,120
there's a possibility that we're not

340
00:15:49,620 --> 00:15:47,800
going to be able to see too many shots

341
00:15:52,140 --> 00:15:49,630
is that right but Don's going to be

342
00:15:54,780 --> 00:15:52,150
getting up here periodically and taking

343
00:15:58,199 --> 00:15:54,790
some pictures and shipping them back

344
00:16:00,750 --> 00:15:58,209
down to earth is that right well that's

345
00:16:02,759 --> 00:16:00,760
correct and Dawn I let me clarify the

346
00:16:04,739 --> 00:16:02,769
crew sleep part of that a fish

347
00:16:06,749 --> 00:16:04,749
it's during crew sleep but I suspect

348
00:16:09,350 --> 00:16:06,759
this event to the crew and particularly

349
00:16:11,369 --> 00:16:09,360
dawn is like Christmas Eve and the

350
00:16:12,869 --> 00:16:11,379
presents are going to be under the tree

351
00:16:14,939 --> 00:16:12,879
and you're not going to sleep very well

352
00:16:19,169 --> 00:16:14,949
so don is actually going to be getting

353
00:16:23,100 --> 00:16:19,179
up and taking pictures of the transit of

354
00:16:25,799 --> 00:16:23,110
Venus beginning in shortly here within

355
00:16:27,509 --> 00:16:25,809
the hour and he is going to be taking

356
00:16:30,809 --> 00:16:27,519
the pictures using an 800 millimeter

357
00:16:32,220 --> 00:16:30,819
lens with a high-end nikon camera of

358
00:16:35,009 --> 00:16:32,230
course he has the appropriate safety

359
00:16:37,079 --> 00:16:35,019
solar filter on the end of it and the

360
00:16:40,410 --> 00:16:37,089
prescribed sunglasses to do the

361
00:16:42,119 --> 00:16:40,420
filtering he is and it's a first for the

362
00:16:44,429 --> 00:16:42,129
International Space Station going to

363
00:16:47,309 --> 00:16:44,439

remove an inner pain it's a safety pain

364
00:16:48,660 --> 00:16:47,319
to protect the windows from from being

365
00:16:49,949 --> 00:16:48,670
scratched and alike they're actually

366
00:16:52,289 --> 00:16:49,959
called scratch pains but those inner

367
00:16:54,389 --> 00:16:52,299
pains are not optical quality so those

368
00:16:57,389 --> 00:16:54,399
are going to come off to allow us to get

369
00:17:00,449 --> 00:16:57,399
more detailed sharper clearer images of

370
00:17:02,400 --> 00:17:00,459
the transit and as I understand it as

371
00:17:04,889 --> 00:17:02,410
soon as dawn is going to collect a

372
00:17:06,899 --> 00:17:04,899
battery of images he will load them up

373
00:17:10,559 --> 00:17:06,909
for downlink and we'll get those posted

374
00:17:12,809 --> 00:17:10,569
online as quickly as possible well sir

375
00:17:15,090 --> 00:17:12,819
this is Duane Brown and again thanks for

376
00:17:17,549 --> 00:17:15,100
joining us let's uh bring it a little

377
00:17:19,409 --> 00:17:17,559
bit down to earth here we talked about

378
00:17:22,649 --> 00:17:19,419
all of the places all over the world

379
00:17:24,960 --> 00:17:22,659
that are going to be monitoring and

380
00:17:27,870 --> 00:17:24,970
observing can you tell us the scene down

381
00:17:30,649 --> 00:17:27,880
in Houston Texas well what's the the the

382
00:17:33,450 --> 00:17:30,659
folks looking at and anything that

383
00:17:36,980 --> 00:17:33,460
really are they excited down there is

384
00:17:40,230 --> 00:17:36,990
the whole world is I'm quite sure right

385
00:17:43,200 --> 00:17:40,240
actually very much so it started off

386
00:17:45,629 --> 00:17:43,210
slowly of course as the transit got

387
00:17:48,510 --> 00:17:45,639
closer the interest of course built over

388
00:17:51,480 --> 00:17:48,520

time particularly once we found out that

389
00:17:54,149 --> 00:17:51,490
Dawn was going to be taking the images

390
00:17:56,340 --> 00:17:54,159
of course that swept up most of the

391
00:17:57,539 --> 00:17:56,350
people here immediately at the Johnson

392
00:18:00,810 --> 00:17:57,549
Space Center but in the wider community

393
00:18:02,730 --> 00:18:00,820
as well and and the historical

394
00:18:04,649 --> 00:18:02,740
perspective is quite interesting from

395
00:18:07,909 --> 00:18:04,659
from my point of view and I guess a

396
00:18:11,129 --> 00:18:07,919
variety of folks here is that it

397
00:18:14,399 --> 00:18:11,139
pinpoints in time the technology we have

398
00:18:15,460 --> 00:18:14,409
today to observe the transit of Venus

399
00:18:17,200 --> 00:18:15,470
you guys mentioned

400
00:18:20,620 --> 00:18:17,210
the Hubble Space Telescope we have the

401
00:18:22,720 --> 00:18:20,630
Soho satellite and others observing and

402
00:18:25,750 --> 00:18:22,730
we have the International Space Station

403
00:18:28,659 --> 00:18:25,760
of course we talked about James Cook the

404
00:18:30,840 --> 00:18:28,669
english explorer that that went to

405
00:18:33,520 --> 00:18:30,850
Tahiti to observe the transit of Venus

406
00:18:37,990 --> 00:18:33,530
like we are talking about him and

407
00:18:42,100 --> 00:18:38,000
previous observations juxtaposed in time

408
00:18:44,260 --> 00:18:42,110
in 2012 we're people in the future we'll

409
00:18:46,750 --> 00:18:44,270
talk about what is now in orbit the

410
00:18:48,880 --> 00:18:46,760
International Space Station probably the

411
00:18:51,970 --> 00:18:48,890
personalities in Don Pettit and and

412
00:18:54,520 --> 00:18:51,980
several of us dr. Greene etc and then

413
00:18:56,560 --> 00:18:54,530

and then who knows like you said as in

414
00:18:59,710 --> 00:18:56,570
the future what will what will hold in

415
00:19:01,720 --> 00:18:59,720
2117 on the next transit as to what we

416
00:19:03,789 --> 00:19:01,730
will be using what will be in orbit what

417
00:19:06,880 --> 00:19:03,799
spacecraft will have we may have even

418
00:19:10,149 --> 00:19:06,890
have people who have orbited Venus at

419
00:19:12,850 --> 00:19:10,159
that point in time this is dwayne well

420
00:19:15,180 --> 00:19:12,860
just a follow-up on that looking into

421
00:19:18,190 --> 00:19:15,190
the future and opening and venus and

422
00:19:22,149 --> 00:19:18,200
exciting times for NASA with the recent

423
00:19:24,190 --> 00:19:22,159
success of SpaceX and things in to put

424
00:19:26,980 --> 00:19:24,200
it in context the synergy between

425
00:19:28,630 --> 00:19:26,990
science and human spaceflight describe

426
00:19:34,090 --> 00:19:28,640
that force I think the future is bright

427
00:19:36,220 --> 00:19:34,100
for both absolutely and I'll put that in

428
00:19:40,510 --> 00:19:36,230
a historical perspective because years

429
00:19:44,230 --> 00:19:40,520
ago folks used to be an efficient out of

430
00:19:47,110 --> 00:19:44,240
a fan of robotic missions of exploration

431
00:19:49,180 --> 00:19:47,120
in that mode and and then there was the

432
00:19:51,399 --> 00:19:49,190
manned space program and and there were

433
00:19:54,549 --> 00:19:51,409
two separate camps but I think today

434
00:19:57,340 --> 00:19:54,559
nowadays most people understand that the

435
00:19:59,770 --> 00:19:57,350
two are very synergistic the robotics

436
00:20:01,480 --> 00:19:59,780
mission certainly can go farther afield

437
00:20:04,840 --> 00:20:01,490
a lot more quickly because we don't have

438
00:20:08,740 --> 00:20:04,850

to worry about keeping people safe and

439
00:20:09,970 --> 00:20:08,750
alive for a two-way transit maybe one

440
00:20:11,890 --> 00:20:09,980
day they'll be one way where they'll

441
00:20:14,080 --> 00:20:11,900
just send them out and they they will

442
00:20:17,080 --> 00:20:14,090
establish colonies and they won't return

443
00:20:20,890 --> 00:20:17,090
but I think the real question the what

444
00:20:23,409 --> 00:20:20,900
really makes the the exploration

445
00:20:26,230 --> 00:20:23,419
exciting that brings people in is having

446
00:20:29,260 --> 00:20:26,240
people it directly involved and and what

447
00:20:32,110 --> 00:20:29,270
what what the human brings to the table

448
00:20:34,210 --> 00:20:32,120
example if we go to Mars the the aspect

449
00:20:35,590 --> 00:20:34,220
and actually let me mention the mars

450
00:20:37,540 --> 00:20:35,600
science laboratory is going to arrive

451
00:20:39,990 --> 00:20:37,550
there this summer it's a it's a new

452
00:20:43,650 --> 00:20:40,000
robotic probe that's about the size of a

453
00:20:46,060 --> 00:20:43,660
Volkswagen Beetle the most capable

454
00:20:49,240 --> 00:20:46,070
exploration rover we've had to date it

455
00:20:51,430 --> 00:20:49,250
is going to be there but it is it is

456
00:20:53,170 --> 00:20:51,440
limited in its variety and that's a

457
00:20:55,780 --> 00:20:53,180
limitation of our technology today and

458
00:20:57,070 --> 00:20:55,790
what it can do it's very capable more so

459
00:20:59,950 --> 00:20:57,080
than anything we've sent there in the

460
00:21:04,000 --> 00:20:59,960
past but the real ingenuity the thinking

461
00:21:05,710 --> 00:21:04,010
the the discovery the creative aspect to

462
00:21:08,260 --> 00:21:05,720
know what's important to know what to

463
00:21:10,270 --> 00:21:08,270

look for beyond the programming is where

464
00:21:12,490 --> 00:21:10,280
the human being comes in and indeed that

465
00:21:15,490 --> 00:21:12,500
happened in our lunar exploration when

466
00:21:17,350 --> 00:21:15,500
we brought back rocks from Apollo there

467
00:21:19,270 --> 00:21:17,360
are certain ones that were noted to be

468
00:21:21,490 --> 00:21:19,280
different and picked up and brought back

469
00:21:22,930 --> 00:21:21,500
and they taught us so much about the

470
00:21:26,440 --> 00:21:22,940
moon the evolution of the solar system

471
00:21:29,590 --> 00:21:26,450
and so I think it's really a win-win

472
00:21:31,450 --> 00:21:29,600
situation for both we need the robotic

473
00:21:34,150 --> 00:21:31,460
probes certainly to answer some of the

474
00:21:36,250 --> 00:21:34,160
preliminary scientific questions but to

475
00:21:38,410 --> 00:21:36,260
solve the riddle to find out if there's

476
00:21:40,240 --> 00:21:38,420
life for example to dig underneath the

477
00:21:44,020 --> 00:21:40,250
rock that can't be moved by the robot

478
00:21:46,210 --> 00:21:44,030
you want the person there Oh Mario thank

479
00:21:49,630 --> 00:21:46,220
you so much for joining us we're going

480
00:21:51,250 --> 00:21:49,640
to be going to another guest in a few

481
00:21:54,790 --> 00:21:51,260
minutes but we want to thank you very

482
00:21:57,580 --> 00:21:54,800
much and we hope you enjoy this evening

483
00:21:59,260 --> 00:21:57,590
as much as we know we will and police

484
00:22:01,060 --> 00:21:59,270
say had it on for us up in the station

485
00:22:05,500 --> 00:22:01,070
and we'll look forward to seeing his

486
00:22:09,880 --> 00:22:05,510
imagery thank you sir ok thank you very

487
00:22:12,040 --> 00:22:09,890
much happy viewing right Thanks okay

488
00:22:14,230 --> 00:22:12,050

Dwayne it if this is this is going to be

489
00:22:16,450 --> 00:22:14,240
quite an evening yeah we just started

490
00:22:19,440 --> 00:22:16,460
and if there's more to come yeah

491
00:22:22,090 --> 00:22:19,450
absolutely we're going to go I think

492
00:22:24,940 --> 00:22:22,100
Jason Townsend our social media maven

493
00:22:28,480 --> 00:22:24,950
has an image is that right Jason that

494
00:22:30,700 --> 00:22:28,490
you you have for us is that right we've

495
00:22:31,960 --> 00:22:30,710
beginning to get some good images in

496
00:22:35,800 --> 00:22:31,970
here from the Solar Dynamics Observatory

497
00:22:38,680 --> 00:22:35,810
we just retweeted a camila sto for those

498
00:22:40,660 --> 00:22:38,690
of you who follow her on Twitter we put

499
00:22:42,150 --> 00:22:40,670
her out and there's an image that's from

500
00:22:45,570 --> 00:22:42,160
the the 211 wave

501
00:22:46,860 --> 00:22:45,580
from sto and it's been put out on the at

502
00:22:48,960 --> 00:22:46,870
NASA account so if you're not following

503
00:22:50,190 --> 00:22:48,970
along follow us on Twitter we're at at

504
00:22:52,050 --> 00:22:50,200
NASA we're getting ready to post it up

505
00:22:54,450 --> 00:22:52,060
onto facebook and everything but it's a

506
00:22:55,980 --> 00:22:54,460
beautiful shot with Venus just beginning

507
00:22:58,380 --> 00:22:55,990
to pop into the field of view here and

508
00:23:00,270 --> 00:22:58,390
begin its transit across the Sun so

509
00:23:01,860 --> 00:23:00,280
stick with us remember to follow along

510
00:23:04,890 --> 00:23:01,870
if you're Alan social media talking

511
00:23:07,140 --> 00:23:04,900
about this make sure to use pound venus

512
00:23:09,030 --> 00:23:07,150
transit that's the hashtag for tonight

513
00:23:12,450 --> 00:23:09,040

and join the conversation hop online

514
00:23:14,220 --> 00:23:12,460
thanks guys all right thanks Jason and

515
00:23:15,900 --> 00:23:14,230
we'll get those imagery up for you as

516
00:23:19,470 --> 00:23:15,910
soon as possible so you can see it right

517
00:23:20,730 --> 00:23:19,480
here with us as well we are going to be

518
00:23:22,950 --> 00:23:20,740
going to the Goddard Space Flight Center

519
00:23:27,570 --> 00:23:22,960
where we're going to be chatting with

520
00:23:30,180 --> 00:23:27,580
another expert to talk about this Venus

521
00:23:34,010 --> 00:23:30,190
transit and what this means and perhaps

522
00:23:38,640 --> 00:23:34,020
we can find out from dr. Jim Garvin

523
00:23:42,960 --> 00:23:38,650
exactly why this happens like every 105

524
00:23:43,980 --> 00:23:42,970
years yeah and you know when one Jim you

525
00:23:45,690 --> 00:23:43,990
know we got a lot of gentleman Jim

526
00:23:47,580 --> 00:23:45,700
Garvin just have Jim Green so popular

527
00:23:49,950 --> 00:23:47,590
lane but these guys are the best of the

528
00:23:51,810 --> 00:23:49,960
best and you know what the Gulf Space

529
00:23:53,220 --> 00:23:51,820
Flight Center in Greenbelt Maryland they

530
00:23:55,650 --> 00:23:53,230
have the home to the Hubble Space

531
00:23:58,560 --> 00:23:55,660
Telescope their home to the James Webb

532
00:24:00,750 --> 00:23:58,570
Space Telescope the next generation is

533
00:24:04,230 --> 00:24:00,760
some folks call Hubble two point oh and

534
00:24:06,090 --> 00:24:04,240
this is why we're so excited I'll not

535
00:24:08,010 --> 00:24:06,100
only to be a part of this but the

536
00:24:08,940 --> 00:24:08,020
incredible things on the horizon for the

537
00:24:10,470 --> 00:24:08,950
National Aeronautics and Space

538
00:24:13,650 --> 00:24:10,480

Administration in God Space Flight

539
00:24:16,050 --> 00:24:13,660
Center is playing a extremely vital part

540
00:24:19,710 --> 00:24:16,060
in making that happen to hell but this

541
00:24:21,270 --> 00:24:19,720
is about Venus and I don't know we're

542
00:24:24,120 --> 00:24:21,280
here we're going to be going around the

543
00:24:26,160 --> 00:24:24,130
world we got our main man Jason doing

544
00:24:28,500 --> 00:24:26,170
social media and we missing anything

545
00:24:29,940 --> 00:24:28,510
here I mean well I think we took we

546
00:24:33,990 --> 00:24:29,950
talked a little bit when we can we can

547
00:24:35,190 --> 00:24:34,000
start showing up perhaps a little bit of

548
00:24:37,230 --> 00:24:35,200
information about some of the other

549
00:24:40,500 --> 00:24:37,240
locales will be going to at some point

550
00:24:42,900 --> 00:24:40,510
there you can see guys the folks at NASA

551
00:24:45,720 --> 00:24:42,910
edge we're going to be going to them at

552
00:24:49,260 --> 00:24:45,730
six oh three Eastern which is coming up

553
00:24:52,730 --> 00:24:49,270
in another guess 13 14 minutes and they

554
00:24:55,950 --> 00:24:52,740
are going to get us into the ingress of

555
00:24:58,050 --> 00:24:55,960
Venus as it starts crossing the

556
00:25:02,040 --> 00:24:58,060
face of the Sun now some of the other

557
00:25:05,220 --> 00:25:02,050
locales let's go and show you that's

558
00:25:08,370 --> 00:25:05,230
there they are there in Hawaii there's

559
00:25:10,950 --> 00:25:08,380
the horn flag is that right wow that is

560
00:25:13,010 --> 00:25:10,960
great and here are some of the other

561
00:25:16,020 --> 00:25:13,020
locales we've got the NASA edge Hawaii

562
00:25:18,950 --> 00:25:16,030
Milton Mount Wilson Observatory in

563
00:25:22,520 --> 00:25:18,960

California the Glenn Research Center in

564
00:25:24,990 --> 00:25:22,530
Cleveland at Alice Springs northern

565
00:25:28,650 --> 00:25:25,000
territory australia which is right in

566
00:25:32,040 --> 00:25:28,660
the smack dab in the middle of the of

567
00:25:34,200 --> 00:25:32,050
the down unda and that we've got the

568
00:25:36,540 --> 00:25:34,210
folks from the coca-cola space science

569
00:25:38,580 --> 00:25:36,550
center at Columbus State University in

570
00:25:42,030 --> 00:25:38,590
Georgia they're there they actually

571
00:25:44,870 --> 00:25:42,040
Duane they also have a team at in

572
00:25:48,510 --> 00:25:44,880
Mongolia I believe will also be there

573
00:25:51,000 --> 00:25:48,520
we're going to have a web stream coming

574
00:25:53,010 --> 00:25:51,010
from Norway and this one is one of my

575
00:25:54,570 --> 00:25:53,020
most yeah I was much really I was

576
00:25:56,640 --> 00:25:54,580
waiting for you how do you pronounce it

577
00:25:58,640 --> 00:25:56,650
and I believe its much hoole much will

578
00:26:02,760 --> 00:25:58,650
the United Kingdom that's in Lancashire

579
00:26:05,880 --> 00:26:02,770
Great Britain and that is where they're

580
00:26:08,990 --> 00:26:05,890
having a special web stream at the

581
00:26:14,160 --> 00:26:09,000
church st. Michael's Church where

582
00:26:17,040 --> 00:26:14,170
Jeremiah Horrocks was he and as part i

583
00:26:21,570 --> 00:26:17,050
think was Jeremiah Craven am i right who

584
00:26:25,470 --> 00:26:21,580
first observed the venus transit i think

585
00:26:27,150 --> 00:26:25,480
it was in 1631 now we'll look if that

586
00:26:29,700 --> 00:26:27,160
really we have all kinds of years and

587
00:26:31,920 --> 00:26:29,710
dates lying around real real cool so and

588
00:26:35,850 --> 00:26:31,930

Fairbanks Alaska will be it will be in

589
00:26:39,810 --> 00:26:35,860
Fairbanks the Indian astronomic

590
00:26:41,040 --> 00:26:39,820
Observatory in Hanley India and we're

591
00:26:43,220 --> 00:26:41,050
going to have a feed from the european

592
00:26:45,870 --> 00:26:43,230
space agency easa they're going to have

593
00:26:48,450 --> 00:26:45,880
some information coming down from the

594
00:26:52,730 --> 00:26:48,460
venus transit satellite that they have

595
00:26:55,760 --> 00:26:52,740
that is doing a polar orbit of Venus and

596
00:26:58,260 --> 00:26:55,770
that's coming through small barred

597
00:27:01,110 --> 00:26:58,270
Norway I believe that's where their

598
00:27:04,050 --> 00:27:01,120
space station is and interesting thing

599
00:27:05,010 --> 00:27:04,060
about Svalbard which I've I don't know

600
00:27:07,530 --> 00:27:05,020
if you're aware that

601
00:27:09,540 --> 00:27:07,540
but I is just a man of knowledge just

602
00:27:11,580 --> 00:27:09,550
keep keeping on man I'm looking find out

603
00:27:13,620 --> 00:27:11,590
a lot on the internet yeah well you know

604
00:27:15,690 --> 00:27:13,630
like maybe we should go to some of these

605
00:27:18,720 --> 00:27:15,700
clothes I think we can I'd love to do

606
00:27:24,960 --> 00:27:18,730
that actually but small board is the

607
00:27:27,300 --> 00:27:24,970
place where the world sends its seeds to

608
00:27:30,390 --> 00:27:27,310
be stored in the event of some

609
00:27:32,850 --> 00:27:30,400
catastrophe some world famine so that

610
00:27:35,640 --> 00:27:32,860
everything is protected there's a deep

611
00:27:38,040 --> 00:27:35,650
vault in this mountain and because it's

612
00:27:39,630 --> 00:27:38,050
so cold that you know it is another

613
00:27:44,160 --> 00:27:39,640

performs another layer of protection and

614
00:27:47,460 --> 00:27:44,170
it's the global seed center seed storage

615
00:27:49,710 --> 00:27:47,470
centers out and it's the point quite

616
00:27:50,580 --> 00:27:49,720
interesting but that's also there and

617
00:27:52,260 --> 00:27:50,590
then of course we've got the

618
00:27:53,850 --> 00:27:52,270
International Space Station well I guess

619
00:27:55,200 --> 00:27:53,860
it's safe to say and we've been saying

620
00:27:57,300 --> 00:27:55,210
this to begin to program and gentlemen

621
00:27:59,640 --> 00:27:57,310
this is a global watch for the venus

622
00:28:01,650 --> 00:27:59,650
transit and my colleague here al you

623
00:28:04,170 --> 00:28:01,660
know that's some of the places that we

624
00:28:06,240 --> 00:28:04,180
hope to bring some of the live coverage

625
00:28:08,940 --> 00:28:06,250
there but there are places in viewing

626
00:28:10,560 --> 00:28:08,950
areas all over the world fact al it's my

627
00:28:13,650 --> 00:28:10,570
understanding that they are stadiums

628
00:28:15,180 --> 00:28:13,660
that are going to be hosting thousands

629
00:28:17,970 --> 00:28:15,190
and thousands of people just for the

630
00:28:21,390 --> 00:28:17,980
viewing you know sports stadiums i think

631
00:28:23,460 --> 00:28:21,400
that is very very very cool it is global

632
00:28:27,710 --> 00:28:23,470
follow the conversation on social media

633
00:28:30,480 --> 00:28:27,720
all of you Facebook Twitter YouTube

634
00:28:32,310 --> 00:28:30,490
watch it I know you're out there we got

635
00:28:34,740 --> 00:28:32,320
a main man JSON Townsend we're going to

636
00:28:37,500 --> 00:28:34,750
have fun and this is just beginning keep

637
00:28:39,420 --> 00:28:37,510
staying with this out I'm hopefully we

638
00:28:41,580 --> 00:28:39,430

can get outside and even see this but if

639
00:28:44,730 --> 00:28:41,590
not I'm happy and i can't wait for a

640
00:28:47,930 --> 00:28:44,740
next guess well in a few minutes in a

641
00:28:51,660 --> 00:28:47,940
few minutes we're going to be starting

642
00:28:54,330 --> 00:28:51,670
the ingress 603 eastern time and we'll

643
00:28:55,530 --> 00:28:54,340
be going to NASA edge and then maybe we

644
00:28:57,030 --> 00:28:55,540
can get outside because there's still

645
00:28:58,680 --> 00:28:57,040
some hours with light hair and hopefully

646
00:29:01,770 --> 00:28:58,690
there's no cloud cover but now let's go

647
00:29:03,360 --> 00:29:01,780
over to our colleague dr. Jim Garvin the

648
00:29:06,060 --> 00:29:03,370
chief scientist at the Goddard Space

649
00:29:08,970 --> 00:29:06,070
Flight Center a great hockey fan as well

650
00:29:13,200 --> 00:29:08,980
but Jim tell us about tonight and why

651
00:29:15,820 --> 00:29:13,210
this is so exciting well hi Alan Duane

652
00:29:18,620 --> 00:29:15,830
it's great to be here at

653
00:29:22,640 --> 00:29:18,630
tonight's really special because this is

654
00:29:24,800 --> 00:29:22,650
a very rare astronomical event and what

655
00:29:27,830 --> 00:29:24,810
we can learn from it is really a dry run

656
00:29:30,140 --> 00:29:27,840
for how we can observe like planets or

657
00:29:33,640 --> 00:29:30,150
earth-sized planets transit other sons

658
00:29:36,590 --> 00:29:33,650
so while this is an event here and now

659
00:29:38,840 --> 00:29:36,600
so a proving ground for how we can

660
00:29:40,790 --> 00:29:38,850
discover extrasolar planets and even

661
00:29:42,980 --> 00:29:40,800
start to tell whether they're more like

662
00:29:44,930 --> 00:29:42,990
Venus or more like Earth so for all of

663
00:29:47,360 --> 00:29:44,940

us interested in the solar system we can

664
00:29:51,560 --> 00:29:47,370
actually think beyond into the larger

665
00:29:54,850 --> 00:29:51,570
universe from this event now for those

666
00:29:58,070 --> 00:29:54,860
of you not in the know in the past

667
00:30:01,580 --> 00:29:58,080
several years I guess through one of the

668
00:30:03,740 --> 00:30:01,590
NASA missions Kepler there have been

669
00:30:06,740 --> 00:30:03,750
identified at least what seven hundred

670
00:30:10,430 --> 00:30:06,750
planets outside of our solar system

671
00:30:14,450 --> 00:30:10,440
called XO solar planets and using the

672
00:30:18,260 --> 00:30:14,460
same phenomenon a transit in front of a

673
00:30:20,270 --> 00:30:18,270
planet or in front of a star similar to

674
00:30:24,500 --> 00:30:20,280
what Venus is doing in front of our star

675
00:30:26,630 --> 00:30:24,510
the Sun is that right Jim that's right

676
00:30:28,700 --> 00:30:26,640
then in fact that's why this is so

677
00:30:30,710 --> 00:30:28,710
important we're now from a space-age

678
00:30:32,750 --> 00:30:30,720
perspective a spaceborne perspective

679
00:30:35,810 --> 00:30:32,760
seeing what we're trying to understand

680
00:30:39,380 --> 00:30:35,820
around other stars and in fact trying to

681
00:30:41,360 --> 00:30:39,390
trying to use Venus as a proving case to

682
00:30:44,660 --> 00:30:41,370
understand the difference between a big

683
00:30:47,450 --> 00:30:44,670
hot orange ball planet like Venus vs are

684
00:30:48,920 --> 00:30:47,460
pale blue dot earth is one of the most

685
00:30:51,170 --> 00:30:48,930
important kind of things we can do and

686
00:30:52,940 --> 00:30:51,180
as we look forward in exploring the

687
00:30:54,410 --> 00:30:52,950
universe that's one of the things we

688
00:30:56,180 --> 00:30:54,420

want to be able to tell the atmosphere

689
00:30:57,860 --> 00:30:56,190
of Venus is in a different state than

690
00:31:01,040 --> 00:30:57,870
that of our own planet which of course

691
00:31:02,660 --> 00:31:01,050
is where we live and hospitable so as as

692
00:31:04,910 --> 00:31:02,670
important as this is right here in our

693
00:31:07,190 --> 00:31:04,920
solar system it's also important as we

694
00:31:08,930 --> 00:31:07,200
look beyond and it also reminds us as we

695
00:31:10,790 --> 00:31:08,940
think about Venus on this historic date

696
00:31:12,860 --> 00:31:10,800
how little we know of our sister planet

697
00:31:15,560 --> 00:31:12,870
I mean to me that's one of the exciting

698
00:31:18,560 --> 00:31:15,570
things we got to get there to understand

699
00:31:23,190 --> 00:31:21,060
Jim this is Duane again thanks for

700
00:31:25,080 --> 00:31:23,200
joining us and you know and I told our

701
00:31:26,609 --> 00:31:25,090
audience at the top of the program I

702
00:31:28,649 --> 00:31:26,619
have one of the coolest jobs working

703
00:31:30,749 --> 00:31:28,659
with incredible scientists as yourself

704
00:31:34,019 --> 00:31:30,759
i'm at i've read a little bit because i

705
00:31:37,200 --> 00:31:34,029
know you're working an incredible strat

706
00:31:39,419 --> 00:31:37,210
new strategy for mars and i know this is

707
00:31:42,779 --> 00:31:39,429
about Venus but kind of put it in

708
00:31:46,019 --> 00:31:42,789
context about Mars what's going on and

709
00:31:48,450 --> 00:31:46,029
how perhaps Venus and Mars I know you

710
00:31:50,340 --> 00:31:48,460
had mentioned earth how they may love

711
00:31:52,830 --> 00:31:50,350
how they certainly differ but any

712
00:31:54,269 --> 00:31:52,840
similarities but before you do that tell

713
00:31:58,830 --> 00:31:54,279

us what's on the horizon for the news

714
00:32:00,899 --> 00:31:58,840
Maha Mars planning program well first

715
00:32:04,440 --> 00:32:00,909
Wayne what's most exciting in the near

716
00:32:06,869 --> 00:32:04,450
term for Mars is we're we're a month or

717
00:32:09,210 --> 00:32:06,879
two away from a historic landing of the

718
00:32:11,700 --> 00:32:09,220
first surface observatory of the class

719
00:32:14,190 --> 00:32:11,710
of in history called the Mars Science

720
00:32:17,399 --> 00:32:14,200
Lab and I think the Mars Science Lab in

721
00:32:19,350 --> 00:32:17,409
that rover Curiosity an investment in 10

722
00:32:21,389 --> 00:32:19,360
years 12 years of work by the Mars

723
00:32:24,389 --> 00:32:21,399
community really puts into perspective

724
00:32:26,100 --> 00:32:24,399
we've come out of the kindergarten age

725
00:32:28,320 --> 00:32:26,110
of exploring Mars into a much higher

726
00:32:30,210 --> 00:32:28,330
state and the Mars Science Lab will be

727
00:32:32,009 --> 00:32:30,220
asking the kinds of questions that we

728
00:32:34,440 --> 00:32:32,019
ask even about places here on earth on

729
00:32:37,350 --> 00:32:34,450
another world with a robotic laboratory

730
00:32:39,090 --> 00:32:37,360
of robotic surface observatory so as we

731
00:32:41,340 --> 00:32:39,100
plan the future of Mars we're going to

732
00:32:43,019 --> 00:32:41,350
learn from the Mars Science Lab and

733
00:32:45,090 --> 00:32:43,029
that's landings coming up in August

734
00:32:47,940 --> 00:32:45,100
fifth and sixth here on earth another

735
00:32:50,369 --> 00:32:47,950
big solar system event in this year and

736
00:32:52,350 --> 00:32:50,379
that landing will help us in the science

737
00:32:54,359 --> 00:32:52,360
from that mission help us to understand

738
00:32:56,669 --> 00:32:54,369

the kind of questions as we probe the

739
00:32:58,200 --> 00:32:56,679
world of Mars compare it to earth the

740
00:33:00,090 --> 00:32:58,210
kind of questions that were left for the

741
00:33:02,369 --> 00:33:00,100
planet Venus we've never done anything

742
00:33:05,009 --> 00:33:02,379
like the voyages of exploration we've

743
00:33:06,869 --> 00:33:05,019
done at Mars as you know Dwayne the Mars

744
00:33:08,220 --> 00:33:06,879
exploration Rovers even going all the

745
00:33:10,739 --> 00:33:08,230
way back to the Viking mission the

746
00:33:12,899 --> 00:33:10,749
Mariner 9 those missions at Mars have

747
00:33:14,940 --> 00:33:12,909
opened the Martian frontier and now as

748
00:33:17,759 --> 00:33:14,950
we watch this historic transit of Venus

749
00:33:19,440 --> 00:33:17,769
we wonder about that Venus frontier what

750
00:33:21,299 --> 00:33:19,450
could we find I'd like to tell the kids

751
00:33:23,879 --> 00:33:21,309
there's a pony out there we just have to

752
00:33:26,159 --> 00:33:23,889
find it so but let me come back Mars is

753
00:33:28,169 --> 00:33:26,169
in a very important state of changing

754
00:33:30,599 --> 00:33:28,179
knowledge we know where we need to go we

755
00:33:31,549 --> 00:33:30,609
know what we could possibly find and so

756
00:33:33,440 --> 00:33:31,559
we're planning

757
00:33:35,539 --> 00:33:33,450
big team across across the country

758
00:33:37,580 --> 00:33:35,549
across the world a workshop in Houston

759
00:33:39,649 --> 00:33:37,590
in about two weeks in fact to bring

760
00:33:41,899 --> 00:33:39,659
together those ideas we're planning what

761
00:33:44,330 --> 00:33:41,909
that future could be responding to what

762
00:33:46,340 --> 00:33:44,340
the Mars Science Lab will tell us and we

763
00:33:47,659 --> 00:33:46,350

can't really foresee that until until

764
00:33:49,669 --> 00:33:47,669
she makes those of those measurements

765
00:33:51,169 --> 00:33:49,679
but also responding to what we've

766
00:33:53,419 --> 00:33:51,179
learned for the last decade of the Mars

767
00:33:55,610 --> 00:33:53,429
exploration program how do we explore a

768
00:33:58,399 --> 00:33:55,620
potentially habitable world how do we

769
00:34:01,730 --> 00:33:58,409
find those those fingerprints those

770
00:34:03,680 --> 00:34:01,740
clues it's kind of like CSI does Mars to

771
00:34:05,749 --> 00:34:03,690
what might be preservation of past

772
00:34:08,059 --> 00:34:05,759
records of life if there was ever ever

773
00:34:10,190 --> 00:34:08,069
any how would we find extant life if it

774
00:34:12,200 --> 00:34:10,200
ever were to exist on Mars these tough

775
00:34:14,899 --> 00:34:12,210
questions are part of the planning

776
00:34:16,550 --> 00:34:14,909
horizon we have guided by the strong

777
00:34:18,409 --> 00:34:16,560
recommendations from the National

778
00:34:20,899 --> 00:34:18,419
Academy of Sciences which has given us

779
00:34:22,909 --> 00:34:20,909
if you will a blueprint for planetary

780
00:34:25,010 --> 00:34:22,919
exploration for the next decade from

781
00:34:27,770 --> 00:34:25,020
what they call a decadal survey so for

782
00:34:29,899 --> 00:34:27,780
Mars lots coming Mars Science Lab and

783
00:34:32,119 --> 00:34:29,909
maven the next two missions and after

784
00:34:34,700 --> 00:34:32,129
that an open frontier of possibilities

785
00:34:37,069 --> 00:34:34,710
of course central to them is finding a

786
00:34:39,260 --> 00:34:37,079
way to bring back materials from Mars to

787
00:34:41,419 --> 00:34:39,270
our earth labs so we can basically

788
00:34:43,490 --> 00:34:41,429

generate science there will be a gift

789
00:34:45,440 --> 00:34:43,500
that keeps on giving those samples like

790
00:34:47,149 --> 00:34:45,450
we have from the moon the ones we need

791
00:34:49,790 --> 00:34:47,159
from Mars will be that kind of legacy

792
00:34:53,210 --> 00:34:49,800
now what that does for us though Dwayne

793
00:34:55,550 --> 00:34:53,220
and Al is bring us back to Venus so why

794
00:34:57,980 --> 00:34:55,560
aren't we there on Venus with this great

795
00:35:00,230 --> 00:34:57,990
program of exploring Mars heading out to

796
00:35:02,329 --> 00:35:00,240
Pluto going back to Jupiter exploring

797
00:35:04,160 --> 00:35:02,339
Saturn what's wrong with Venus you might

798
00:35:06,380 --> 00:35:04,170
ask particularly on this moment of the

799
00:35:08,569 --> 00:35:06,390
transit as it's about to begin and the

800
00:35:11,540 --> 00:35:08,579
problem is Venus is one president one

801
00:35:13,040 --> 00:35:11,550
set is really hot and to get to Venus

802
00:35:14,720 --> 00:35:13,050
and do the kind of things we want to do

803
00:35:18,230 --> 00:35:14,730
the kind of things we're doing on Mars

804
00:35:19,700 --> 00:35:18,240
takes new technology creativity new

805
00:35:21,620 --> 00:35:19,710
classes of instruments because the

806
00:35:23,900 --> 00:35:21,630
environment there at the surface is just

807
00:35:27,109 --> 00:35:23,910
so inhospitable it's unimaginably

808
00:35:29,089 --> 00:35:27,119
different than Earth and Mars so here we

809
00:35:31,190 --> 00:35:29,099
sit as we're about to explore Mars in

810
00:35:33,290 --> 00:35:31,200
the major next step and we think back at

811
00:35:36,760 --> 00:35:33,300
our sister planet Venus and say well

812
00:35:42,940 --> 00:35:36,770
someday we got to get back there Jim

813
00:35:44,900 --> 00:35:42,950

question with this Venus transit

814
00:35:48,140 --> 00:35:44,910
obviously there

815
00:35:50,630 --> 00:35:48,150
is there are expectations scientific

816
00:35:54,010 --> 00:35:50,640
expectations about some of the things we

817
00:35:56,480 --> 00:35:54,020
might learn can you prioritize for us

818
00:36:00,319 --> 00:35:56,490
maybe the top three things that you

819
00:36:05,990 --> 00:36:00,329
would like to see us learn through this

820
00:36:07,940 --> 00:36:06,000
from this Venus transit of 2012 well I

821
00:36:09,890 --> 00:36:07,950
think I think al there's there's at

822
00:36:11,839 --> 00:36:09,900
least at least three and let me give

823
00:36:13,700 --> 00:36:11,849
them to you in sort of no absolute

824
00:36:15,470 --> 00:36:13,710
priority order because it all depends on

825
00:36:17,299 --> 00:36:15,480
the scientists making the observations

826
00:36:20,000 --> 00:36:17,309
how important they are and it's always

827
00:36:21,200 --> 00:36:20,010
hard to judge our kids if you will the

828
00:36:23,329 --> 00:36:21,210
first thing we're going to be doing is

829
00:36:25,010 --> 00:36:23,339
using the Solar Dynamics Observatory we

830
00:36:27,680 --> 00:36:25,020
will be for the first time having a

831
00:36:30,710 --> 00:36:27,690
high-resolution spaceborne view of in

832
00:36:33,859 --> 00:36:30,720
sort of movie mode of what's going on as

833
00:36:35,450 --> 00:36:33,869
Venus occults the Sun tonight for the

834
00:36:38,539 --> 00:36:35,460
for the six to seven hours that it will

835
00:36:41,029 --> 00:36:38,549
last and by timing precisely the

836
00:36:42,650 --> 00:36:41,039
information we collect from the various

837
00:36:46,190 --> 00:36:42,660
imaging systems and imaging spectrometer

838
00:36:49,160 --> 00:36:46,200

Zaun s do we can better better quantify

839
00:36:51,109 --> 00:36:49,170
exactly where things are in its in its

840
00:36:53,930 --> 00:36:51,119
instruments fields of you and that kind

841
00:36:56,359 --> 00:36:53,940
of geometric improvement will be

842
00:36:57,680 --> 00:36:56,369
extremely important for calibrating

843
00:36:59,660 --> 00:36:57,690
those instruments to make even better

844
00:37:02,210 --> 00:36:59,670
measurements of the Sun as part of the

845
00:37:05,000 --> 00:37:02,220
sdl mission number two we are going to

846
00:37:07,430 --> 00:37:05,010
try a very novel new kind of experiment

847
00:37:10,069 --> 00:37:07,440
again a practice for things we might be

848
00:37:12,049 --> 00:37:10,079
able to do is we look to other Suns and

849
00:37:14,539 --> 00:37:12,059
planets around them by using the Hubble

850
00:37:16,160 --> 00:37:14,549
Space Telescope in a which is a very

851
00:37:18,859 --> 00:37:16,170
challenging kind of observation but a

852
00:37:22,130 --> 00:37:18,869
very exciting one to observe the faint

853
00:37:24,260 --> 00:37:22,140
variations in the end the change in

854
00:37:26,059 --> 00:37:24,270
light as Venus crosses this across as

855
00:37:27,680 --> 00:37:26,069
the Sun as reflected on the surface of

856
00:37:30,319 --> 00:37:27,690
the Moon now we've looked at the moon

857
00:37:32,480 --> 00:37:30,329
with humble as an object of exploration

858
00:37:34,760 --> 00:37:32,490
in 2005 and before but this will be

859
00:37:37,039 --> 00:37:34,770
different we'll be watching the moon to

860
00:37:39,650 --> 00:37:37,049
see the effects of the transit of Venus

861
00:37:42,049 --> 00:37:39,660
on the Sun and try to see very very

862
00:37:44,120 --> 00:37:42,059
faint you know less than one percent

863
00:37:46,880 --> 00:37:44,130

changes in the reflectivity of the light

864
00:37:48,680 --> 00:37:46,890
on the moon from Venus on the Sun to

865
00:37:50,510 --> 00:37:48,690
understand some of the subtleties of the

866
00:37:53,180 --> 00:37:50,520
atmospheric chemistry of Venus and Venus

867
00:37:56,150 --> 00:37:53,190
atmosphere is like a giant chemistry lab

868
00:37:58,030 --> 00:37:56,160
of planetary evolution it's so big it's

869
00:38:00,220 --> 00:37:58,040
changed we think dramatic

870
00:38:01,810 --> 00:38:00,230
since the time the planet was born over

871
00:38:03,160 --> 00:38:01,820
four and a half billion years ago so

872
00:38:05,320 --> 00:38:03,170
it's a record book and we want to

873
00:38:07,210 --> 00:38:05,330
measure its chemistry using every

874
00:38:09,340 --> 00:38:07,220
inventive technique we can so the hubble

875
00:38:11,350 --> 00:38:09,350
experiment is another one other

876
00:38:14,470 --> 00:38:11,360
satellites reci and some of the

877
00:38:16,180 --> 00:38:14,480
satellites that are from ISA and Japan

878
00:38:19,270 --> 00:38:16,190
will be making independent observations

879
00:38:21,790 --> 00:38:19,280
all coordinated as a giant science

880
00:38:24,580 --> 00:38:21,800
network or family across the world and

881
00:38:27,010 --> 00:38:24,590
so those together will try to peel but

882
00:38:29,170 --> 00:38:27,020
try to extract if you will subtleties of

883
00:38:30,580 --> 00:38:29,180
the makeup of that atmosphere of Venus

884
00:38:33,670 --> 00:38:30,590
which we just haven't gotten that far

885
00:38:35,860 --> 00:38:33,680
probing we have limited success with our

886
00:38:38,230 --> 00:38:35,870
measurements thus far here in the United

887
00:38:39,610 --> 00:38:38,240
States understanding this massive

888
00:38:43,480 --> 00:38:39,620

atmosphere of our nearest neighbor

889
00:38:45,820 --> 00:38:43,490
planet Jim this is dewayne it's always a

890
00:38:47,710 --> 00:38:45,830
pleasure to have you a part of the shows

891
00:38:50,140 --> 00:38:47,720
like this Simone you for a long time

892
00:38:52,870 --> 00:38:50,150
thank you for your time and enjoy this

893
00:38:56,470 --> 00:38:52,880
evening and we'll see you at Mars and

894
00:38:59,260 --> 00:38:56,480
enjoy the show thanks Jim thanks Duane

895
00:39:01,120 --> 00:38:59,270
now always a pleasure take care for

896
00:39:02,800 --> 00:39:01,130
tonight enjoy yes wait I know I'm

897
00:39:04,630 --> 00:39:02,810
enjoying it so ladies and gentlemen who

898
00:39:06,040 --> 00:39:04,640
if you've just joined us welcome to NASA

899
00:39:10,690 --> 00:39:06,050
television here at NASA headquarters

900
00:39:13,780 --> 00:39:10,700
well we're taking you on a ride right of

901
00:39:17,980 --> 00:39:13,790
a lifetime and I'll social media

902
00:39:21,660 --> 00:39:17,990
audience twitter facebook youtube Jason

903
00:39:24,970 --> 00:39:21,670
Townson Twitter join the conversation

904
00:39:27,880 --> 00:39:24,980
it's all around the world we're just

905
00:39:29,950 --> 00:39:27,890
beginning and now I think it's time to

906
00:39:31,870 --> 00:39:29,960
really go to the place where a lot of

907
00:39:33,550 --> 00:39:31,880
cool stuff is happening stuff is

908
00:39:36,730 --> 00:39:33,560
happening we're going to go to Mauna Kea

909
00:39:38,320 --> 00:39:36,740
Hawaii and our colleagues from NASA edge

910
00:39:41,350 --> 00:39:38,330
and they're going to be taking us