1
00:00:07,030 --> 00:00:02,470
station this is the american geophysical

2
00:00:11,749 --> 00:00:09,589
a station we hear you loud and clear

3
00:00:13,509 --> 00:00:11,759
welcome aboard

4
00:00:15,749 --> 00:00:13,519
thank you and good afternoon station and

5
00:00:17,109 --> 00:00:15,759
on behalf of our agu members worldwide

6
00:00:20,630 --> 00:00:17,119
thank you for taking the time to speak

7
00:00:22,710 --> 00:00:20,640
with us our first question is for andre

8
00:00:24,790 --> 00:00:22,720
andre before launching to the station in

9
00:00:27,269 --> 00:00:24,800
november you said that working aboard

10
00:00:29,589 --> 00:00:27,279
the international space station is like

11
00:00:31,509 --> 00:00:29,599
quote standing with our toes in an ocean

12
00:00:32,950 --> 00:00:31,519
that's still to be discovered

13
00:00:34,630 --> 00:00:32,960

can you tell us more about what you

14
00:00:40,470 --> 00:00:34,640
meant by that and how your perspective

15
00:00:42,869 --> 00:00:41,270
well

16
00:00:45,670 --> 00:00:42,879
first of all the perspective didn't

17
00:00:47,750 --> 00:00:45,680
really change i still think that there's

18
00:00:49,510 --> 00:00:47,760
so much more to discover

19
00:00:50,790 --> 00:00:49,520
what i meant with standing with our toes

20
00:00:52,630 --> 00:00:50,800
in the water

21
00:00:54,389 --> 00:00:52,640
i don't know from whom the original

22
00:00:56,630 --> 00:00:54,399
quote was is that

23
00:00:59,510 --> 00:00:56,640
we're only at the beginning of of

24
00:01:01,910 --> 00:00:59,520
discovery uh discovery of the universe

25
00:01:04,869 --> 00:01:01,920
uh it's like like the whole ocean that

26
00:01:06,310 --> 00:01:04,879
is there to to uh to discover and you're

27
00:01:07,830 --> 00:01:06,320
only standing with your toes in the

28
00:01:10,789 --> 00:01:07,840
water so you still have to go with your

29
00:01:13,670 --> 00:01:10,799
feet your legs and uh all the way to uh

30
00:01:17,270 --> 00:01:13,680
to great depths and we do we will do the

31
00:01:20,149 --> 00:01:17,280
same thing with the universe and uh i

32
00:01:24,149 --> 00:01:20,159
i'm very privileged that i can be part

33
00:01:25,109 --> 00:01:24,159
of this first little step into the water

34
00:01:26,950 --> 00:01:25,119
joe

35
00:01:29,510 --> 00:01:26,960
your background includes geology

36
00:01:31,670 --> 00:01:29,520
hydrology environmental education work

37
00:01:33,429 --> 00:01:31,680
with the peace corps and teaching middle

38
00:01:35,030 --> 00:01:33,439

school science and math

39
00:01:36,630 --> 00:01:35,040
can you tell us how your space flights

40
00:01:42,789 --> 00:01:36,640
have affected your perspective on the

41
00:01:46,630 --> 00:01:44,389
yeah when you uh when you come up to

42
00:01:49,350 --> 00:01:46,640
space and you look back at the earth

43
00:01:51,350 --> 00:01:49,360
it's a it's just a beautiful sight

44
00:01:52,950 --> 00:01:51,360
and you have a chance to for the first

45
00:01:54,789 --> 00:01:52,960
time really to look at the big picture

46
00:01:57,510 --> 00:01:54,799
and a lot of what we do in geology is we

47
00:01:59,990 --> 00:01:57,520
look at small pieces and try to build

48
00:02:01,510 --> 00:02:00,000
together a bigger map and so from space

49
00:02:03,910 --> 00:02:01,520
we get to see that

50
00:02:05,830 --> 00:02:03,920
and you get to see the atmosphere you

51
00:02:07,429 --> 00:02:05,840
see how different parts of the earth

52
00:02:09,350 --> 00:02:07,439
interact with each other

53
00:02:11,990 --> 00:02:09,360
and so the importance of protecting the

54
00:02:14,070 --> 00:02:12,000
planet is very very evident from space

55
00:02:15,350 --> 00:02:14,080
and so i'm really glad to see that and

56
00:02:16,630 --> 00:02:15,360
when i get back

57
00:02:18,949 --> 00:02:16,640
and i go talk to students in the

58
00:02:20,630 --> 00:02:18,959
classroom it's really easy now to give

59
00:02:22,550 --> 00:02:20,640
them my perspective and to show them

60
00:02:24,550 --> 00:02:22,560
pictures to show how fragile the planet

61
00:02:27,190 --> 00:02:24,560
is and how much we need to do to protect

62
00:02:31,270 --> 00:02:29,670
dawn you've shot some amazing videos and

63
00:02:32,150 --> 00:02:31,280

photos during your three missions in

64
00:02:33,670 --> 00:02:32,160
space

65
00:02:35,270 --> 00:02:33,680
have you perceived the changes of the

66
00:02:36,309 --> 00:02:35,280
earth over that time

67
00:02:40,790 --> 00:02:36,319
and what have you seen that has

68
00:02:43,830 --> 00:02:42,070
one

69
00:02:47,430 --> 00:02:43,840
change that i've seen over earth is the

70
00:02:49,110 --> 00:02:47,440
uh the number of lights city lights at

71
00:02:50,790 --> 00:02:49,120
night time particularly over south

72
00:02:54,550 --> 00:02:50,800
america

73
00:02:56,869 --> 00:02:55,910
it was

74
00:02:57,830 --> 00:02:56,879
pretty

75
00:02:59,670 --> 00:02:57,840
dark

76
00:03:02,070 --> 00:02:59,680
and now it's

77
00:03:04,949 --> 00:03:02,080
amazing how lit up it is so

78
00:03:07,670 --> 00:03:04,959
so human beings are expanding and and we

79
00:03:09,910 --> 00:03:07,680
are advancing with our technology and

80
00:03:12,149 --> 00:03:09,920
electricity is part of that technology

81
00:03:15,670 --> 00:03:12,159
so it's it's a natural flow for human

82
00:03:18,470 --> 00:03:15,680
beings to expand and uh

83
00:03:21,030 --> 00:03:18,480
and in the process turn on their lights

84
00:03:23,350 --> 00:03:21,040
that's that's one of

85
00:03:24,630 --> 00:03:23,360
one effect that i've seen

86
00:03:26,070 --> 00:03:24,640
from

87
00:03:28,390 --> 00:03:26,080
this mission compared to my first

88
00:03:30,550 --> 00:03:28,400

mission

89
00:03:32,550 --> 00:03:30,560
this is a question for any of you

90
00:03:35,190 --> 00:03:32,560
we're expecting a solar maximum next

91
00:03:37,190 --> 00:03:35,200
year when the sun will be very active

92
00:03:38,949 --> 00:03:37,200
what do you do and what is it like to be

93
00:03:44,070 --> 00:03:38,959
on the space station during a major and

94
00:03:49,030 --> 00:03:46,630
well one consequence of solar max is

95
00:03:51,350 --> 00:03:49,040
that it inflates the atmosphere and it

96
00:03:52,390 --> 00:03:51,360
actually gets uh

97
00:03:55,429 --> 00:03:52,400
gets uh

98
00:03:57,030 --> 00:03:55,439
extends up to a higher uh altitude and

99
00:03:59,110 --> 00:03:57,040
and i think it actually protects space

100
00:04:02,470 --> 00:03:59,120
station a little bit more so

101
00:04:03,350 --> 00:04:02,480
so uh so so that's one aspect of a solar

102
00:04:06,550 --> 00:04:03,360
max

103
00:04:08,869 --> 00:04:06,560
another aspect is uh we could get some

104
00:04:09,990 --> 00:04:08,879
outstanding displays of aurora and there

105
00:04:12,309 --> 00:04:10,000
will be

106
00:04:15,030 --> 00:04:12,319
particle events uh

107
00:04:16,550 --> 00:04:15,040
eruption solar proton events

108
00:04:17,590 --> 00:04:16,560
that can

109
00:04:19,990 --> 00:04:17,600
can

110
00:04:22,069 --> 00:04:20,000
increase the the radiation that

111
00:04:24,870 --> 00:04:22,079
astronauts would receive in a low-earth

112
00:04:27,189 --> 00:04:24,880
orbit scenario

113
00:04:29,270 --> 00:04:27,199

this is another question for any of you

114
00:04:31,430 --> 00:04:29,280
by now you have all spent significant

115
00:04:33,909 --> 00:04:31,440
time in space and have hopefully had a

116
00:04:35,670 --> 00:04:33,919
lot of time to observe the earth now

117
00:04:38,070 --> 00:04:35,680
when you look out the window can you

118
00:04:40,070 --> 00:04:38,080
differentiate among landmark geological

119
00:04:47,510 --> 00:04:40,080
features on the earth for example can

120
00:04:53,270 --> 00:04:50,790
yes absolutely sometimes i'm surprised

121
00:04:56,550 --> 00:04:53,280
that i just look out the window even at

122
00:04:58,469 --> 00:04:56,560
night sometimes and i recognize the the

123
00:05:01,430 --> 00:04:58,479
area uh

124
00:05:04,629 --> 00:05:01,440
sometimes it's the colors uh australia

125
00:05:06,790 --> 00:05:04,639
is very distinct uh from for example

126
00:05:09,990 --> 00:05:06,800
sahara sometimes you you see a feature

127
00:05:12,629 --> 00:05:10,000
then you know that you're over tibet

128
00:05:16,310 --> 00:05:12,639
so it you learn the earth very well up

129
00:05:18,550 --> 00:05:16,320
here and uh and and and well i would say

130
00:05:20,469 --> 00:05:18,560
89 of the time

131
00:05:25,189 --> 00:05:20,479
i'm more or less right

132
00:05:29,749 --> 00:05:26,950
uh with the announcement yesterday that

133
00:05:32,390 --> 00:05:29,759
china's senjo 9 spacecraft docked with

134
00:05:33,830 --> 00:05:32,400
the tiangong-1 space lab module what do

135
00:05:38,469 --> 00:05:33,840
you think about china's plans to

136
00:05:41,830 --> 00:05:39,990
uh well

137
00:05:43,590 --> 00:05:41,840
before they launched there were six

138
00:05:45,909 --> 00:05:43,600

people in space

139
00:05:49,350 --> 00:05:45,919
and there's seven billion people on

140
00:05:51,749 --> 00:05:49,360
earth so we're like one in a billion

141
00:05:53,670 --> 00:05:51,759
now there are nine people in space and

142
00:05:55,830 --> 00:05:53,680
if you're a good engineer or scientist

143
00:05:58,710 --> 00:05:55,840
looking at that you'd say well that's

144
00:06:00,309 --> 00:05:58,720
like two in a billion so

145
00:06:02,230 --> 00:06:00,319
so the

146
00:06:05,270 --> 00:06:02,240
gradient of human beings going into

147
00:06:07,749 --> 00:06:05,280
space is moving in the right direction

148
00:06:09,510 --> 00:06:07,759
we we need to change these numbers so

149
00:06:12,870 --> 00:06:09,520
that more and more human beings can call

150
00:06:15,510 --> 00:06:12,880
space their home and we can expand off a

151
00:06:17,590 --> 00:06:15,520
planet earth and move out into our solar

152
00:06:20,950 --> 00:06:17,600
system so this is a step in the right

153
00:06:23,029 --> 00:06:20,960
direction and the more uh entities

154
00:06:24,150 --> 00:06:23,039
working on trying to achieve this the

155
00:06:27,350 --> 00:06:24,160
better

156
00:06:31,110 --> 00:06:29,270
don since you still have the microphone

157
00:06:33,110 --> 00:06:31,120
tell us during your pre-flight interview

158
00:06:35,590 --> 00:06:33,120
you said that adventures like living in

159
00:06:36,710 --> 00:06:35,600
space teach you lessons that can be used

160
00:06:38,150 --> 00:06:36,720
back home

161
00:06:40,230 --> 00:06:38,160
what lessons have you learned on the

162
00:06:44,309 --> 00:06:40,240
station that will you will use back on

163
00:06:48,950 --> 00:06:47,510

well one whimsical

164
00:06:52,309 --> 00:06:48,960
answer would be

165
00:06:55,270 --> 00:06:52,319
never pass up a chance to eat a pouch of

166
00:06:57,350 --> 00:06:55,280
mashed potatoes

167
00:06:59,909 --> 00:06:57,360
and of course that could be oriented

168
00:07:01,270 --> 00:06:59,919
towards my family when we're eating at

169
00:07:02,950 --> 00:07:01,280
the dinner table

170
00:07:05,670 --> 00:07:02,960
but

171
00:07:08,309 --> 00:07:05,680
lessons you learn lessons about yourself

172
00:07:09,350 --> 00:07:08,319
you learn lessons about humanity in

173
00:07:12,629 --> 00:07:09,360
general

174
00:07:15,589 --> 00:07:12,639
and you learn lessons in science about

175
00:07:17,670 --> 00:07:15,599
how things move and operate around you

176
00:07:20,710 --> 00:07:17,680
and and you take these lessons back with

177
00:07:23,990 --> 00:07:20,720
you and another example is just uh

178
00:07:26,309 --> 00:07:24,000
conservation of angular momentum uh i

179
00:07:28,150 --> 00:07:26,319
saw one of my vitamin tablets floating

180
00:07:29,589 --> 00:07:28,160
across the room and it was tumbling end

181
00:07:31,430 --> 00:07:29,599
over end

182
00:07:32,629 --> 00:07:31,440
and it hit the wall

183
00:07:35,189 --> 00:07:32,639
and

184
00:07:38,469 --> 00:07:35,199
it stopped tumbling end over end but

185
00:07:40,309 --> 00:07:38,479
moved off at a much faster speed than it

186
00:07:42,390 --> 00:07:40,319
then its center of

187
00:07:44,710 --> 00:07:42,400
mass was moving at the time it hit the

188
00:07:47,670 --> 00:07:44,720

wall so it exchanged angular momentum

189
00:07:49,430 --> 00:07:47,680
for linear momentum and you see

190
00:07:51,589 --> 00:07:49,440
textbook you read about these things in

191
00:07:54,469 --> 00:07:51,599
textbooks but then you get to see them

192
00:07:56,390 --> 00:07:54,479
here and that imprints your mind and

193
00:07:58,950 --> 00:07:56,400
then when i go back

194
00:08:01,029 --> 00:07:58,960
to earth and i start doing engineering

195
00:08:02,790 --> 00:08:01,039
that little tidbit is going to be stuck

196
00:08:05,350 --> 00:08:02,800
in my mind and who knows where it might

197
00:08:08,070 --> 00:08:05,360
surface for some new kind of uh

198
00:08:11,430 --> 00:08:09,830
and this is another question for dawn

199
00:08:12,469 --> 00:08:11,440
but i'd be curious to hear all of your

200
00:08:14,869 --> 00:08:12,479
answers

201
00:08:17,029 --> 00:08:14,879
dawn your june 11th blog post was a poem

202
00:08:18,790 --> 00:08:17,039
that included the line your last day on

203
00:08:20,790 --> 00:08:18,800
earth what would you do

204
00:08:22,230 --> 00:08:20,800
it makes us think of a bigger picture

205
00:08:23,909 --> 00:08:22,240
tell us what you think about during the

206
00:08:25,510 --> 00:08:23,919
quiet moments on the station or when

207
00:08:30,070 --> 00:08:25,520
you're looking out the window what are

208
00:08:34,389 --> 00:08:31,189
well

209
00:08:35,110 --> 00:08:34,399
funny you should mention that because

210
00:08:39,029 --> 00:08:35,120
i

211
00:08:41,670 --> 00:08:39,039
earth

212
00:08:44,870 --> 00:08:41,680
and i'm writing the compliment poem

213
00:08:47,430 --> 00:08:44,880

because we are

214
00:08:50,710 --> 00:08:47,440
a week away from returning

215
00:08:53,750 --> 00:08:50,720
and and the title of this one is last

216
00:08:56,470 --> 00:08:53,760
day in space and it's not done yet so

217
00:08:58,150 --> 00:08:56,480
you'll just have to wait and and see how

218
00:09:02,790 --> 00:08:58,160
it turns out i don't even know how it's

219
00:09:06,870 --> 00:09:05,110
well it's pretty nice when you can uh

220
00:09:09,350 --> 00:09:06,880
sit up in the cupola

221
00:09:10,790 --> 00:09:09,360
and you can get the node nice and dark

222
00:09:12,230 --> 00:09:10,800
the other crewmates are off doing

223
00:09:13,910 --> 00:09:12,240
something else and you have a chance to

224
00:09:16,550 --> 00:09:13,920
look back at the earth

225
00:09:18,230 --> 00:09:16,560
and you do think about how fortunate we

226
00:09:20,389 --> 00:09:18,240
are to have this opportunity we're very

227
00:09:22,470 --> 00:09:20,399
very lucky to be here it's an honor and

228
00:09:24,389 --> 00:09:22,480
a privilege and

229
00:09:26,150 --> 00:09:24,399
it just makes you think about how

230
00:09:28,470 --> 00:09:26,160
beautiful our planet is and how much

231
00:09:30,070 --> 00:09:28,480
more we have to learn and all the

232
00:09:31,910 --> 00:09:30,080
exciting times that are ahead of us so

233
00:09:33,910 --> 00:09:31,920
it's great to be here

234
00:09:35,269 --> 00:09:33,920
and i envy those kids that are out there

235
00:09:41,110 --> 00:09:35,279
now for the adventures that they're

236
00:09:46,070 --> 00:09:43,430
every time when i look out of the window

237
00:09:47,990 --> 00:09:46,080
it looks like the first time every time

238
00:09:50,230 --> 00:09:48,000

it's it's so magnificent that i think

239
00:09:52,630 --> 00:09:50,240
this is awesome and i try to to keep

240
00:09:55,590 --> 00:09:52,640
that moment and what we can do we can

241
00:09:58,310 --> 00:09:55,600
take our pictures uh when i try to to

242
00:10:00,230 --> 00:09:58,320
keep it in in my mind um this is

243
00:10:02,150 --> 00:10:00,240
probably the last time that uh the last

244
00:10:04,389 --> 00:10:02,160
week that i'm up here

245
00:10:07,030 --> 00:10:04,399
and it's a it's a fantastic pattern but

246
00:10:09,430 --> 00:10:07,040
also very fragile i wish everybody could

247
00:10:12,790 --> 00:10:09,440
could see this and realize that it's one

248
00:10:15,030 --> 00:10:12,800
planet uh with limited resources

249
00:10:16,710 --> 00:10:15,040
beautiful uh but fragile and i think

250
00:10:20,389 --> 00:10:16,720
this is one of the most important things

251
00:10:22,069 --> 00:10:20,399
that that i can bring back home

252
00:10:23,829 --> 00:10:22,079
thank you all very much for your time

253
00:10:25,910 --> 00:10:23,839
and wonderful answers and on behalf of

254
00:10:31,350 --> 00:10:25,920
all the agu andre and don we wish you a

255
00:10:36,310 --> 00:10:34,069
thanks for coming aboard and uh we'll

256
00:10:40,630 --> 00:10:36,320
look forward to

257
00:10:44,790 --> 00:10:42,870
a station this is houston acr that

258
00:10:46,630 --> 00:10:44,800
concludes the american geophysical union

259
00:10:55,990 --> 00:10:46,640
part of the event please stand by for a

260
00:10:56,000 --> 00:11:08,949
hi nasa can you hear me

261
00:11:08,959 --> 00:11:13,350
station we can hear you

262
00:11:13,360 --> 00:11:17,430
great can you hear me

263
00:11:17,440 --> 00:11:39,590

we hear you loud and clear

264
00:11:45,670 --> 00:11:43,190
5 25 straight up here we go three

265
00:11:50,470 --> 00:11:48,230
so the recent success of private space

266
00:11:52,389 --> 00:11:50,480
companies such as spacex changing the

267
00:11:53,670 --> 00:11:52,399
way mankind looks at space flight we've

268
00:11:55,829 --> 00:11:53,680
talked a lot about it on the fox

269
00:11:57,910 --> 00:11:55,839
business network and it also changes the

270
00:12:00,310 --> 00:11:57,920
way staples such as the international

271
00:12:02,710 --> 00:12:00,320
space station operate joining us now

272
00:12:03,910 --> 00:12:02,720
expedition 31 flight engineers nasa

273
00:12:06,150 --> 00:12:03,920
astronauts

274
00:12:08,629 --> 00:12:06,160
joe acaba don pettit is also there as

275
00:12:10,470 --> 00:12:08,639
well as andre kuipers who's from the

276
00:12:12,310 --> 00:12:10,480
european space agency native of the

277
00:12:13,590 --> 00:12:12,320
netherlands good to see all of you guys

278
00:12:16,150 --> 00:12:13,600
and welcome to everybody watching us

279
00:12:17,670 --> 00:12:16,160
live on nasa tv today but uh

280
00:12:19,750 --> 00:12:17,680
it's great to get a chance to talk and

281
00:12:20,870 --> 00:12:19,760
as i've said we have talked a lot about

282
00:12:21,750 --> 00:12:20,880
the story

283
00:12:23,509 --> 00:12:21,760
of

284
00:12:25,670 --> 00:12:23,519
private companies taking over for

285
00:12:27,350 --> 00:12:25,680
governments doing what you do

286
00:12:29,750 --> 00:12:27,360
i'll start with joe but i want everybody

287
00:12:31,190 --> 00:12:29,760
to answer it in succession don and andre

288
00:12:32,710 --> 00:12:31,200

pick right up on it what's the

289
00:12:33,829 --> 00:12:32,720
difference been in working with private

290
00:12:39,750 --> 00:12:33,839
companies and what do you think it means

291
00:12:43,509 --> 00:12:41,670
well it's been a pleasure working with

292
00:12:45,430 --> 00:12:43,519
spacex on their first mission to the

293
00:12:48,069 --> 00:12:45,440
international space station

294
00:12:50,230 --> 00:12:48,079
um i think it's a it's a great step in

295
00:12:51,910 --> 00:12:50,240
the right direction it means a lot for

296
00:12:54,310 --> 00:12:51,920
where we're going in the future if we

297
00:12:56,069 --> 00:12:54,320
can have private organizations helping

298
00:12:58,230 --> 00:12:56,079
us get to low earth orbit to do the

299
00:13:01,030 --> 00:12:58,240
science that we're doing here it really

300
00:13:02,710 --> 00:13:01,040
frees nasa up to do some bigger and

301
00:13:04,150 --> 00:13:02,720
greater things further away from earth

302
00:13:09,350 --> 00:13:04,160
so i think it's a great step in the

303
00:13:13,350 --> 00:13:11,430
and i think in space flight is not much

304
00:13:14,389 --> 00:13:13,360
different than what we have seen of

305
00:13:17,670 --> 00:13:14,399
course

306
00:13:19,990 --> 00:13:17,680
on earth be it in in shipping or of

307
00:13:21,829 --> 00:13:20,000
course in aviation the first steps the

308
00:13:23,750 --> 00:13:21,839
difficult steps the investments are done

309
00:13:25,350 --> 00:13:23,760
by governments and then companies take

310
00:13:27,430 --> 00:13:25,360
over and

311
00:13:28,790 --> 00:13:27,440
the same thing will happen in space

312
00:13:32,550 --> 00:13:28,800
flight be it

313
00:13:37,350 --> 00:13:32,560

cargo transportation or tourism so it's

314
00:13:42,230 --> 00:13:40,550
and private companies don't

315
00:13:46,310 --> 00:13:42,240
seem to be able to do things in a little

316
00:13:47,269 --> 00:13:46,320
more relaxed nature just in terms of of

317
00:13:49,829 --> 00:13:47,279
uh

318
00:13:52,550 --> 00:13:49,839
looking at their their mission control

319
00:13:55,430 --> 00:13:52,560
and and and how how they are are

320
00:13:57,269 --> 00:13:55,440
conducting themselves it it it's

321
00:14:01,110 --> 00:13:57,279
interesting to note the difference

322
00:14:03,030 --> 00:14:01,120
between the nasa mission control and the

323
00:14:05,750 --> 00:14:03,040
the spacex mission control just as an

324
00:14:07,030 --> 00:14:05,760
example yeah let me stick with uh don

325
00:14:09,269 --> 00:14:07,040
because i know you guys are passing

326
00:14:10,150 --> 00:14:09,279
along the microphone there and and ask

327
00:14:10,949 --> 00:14:10,160
the following question because there

328
00:14:12,629 --> 00:14:10,959
were a number of interesting

329
00:14:14,230 --> 00:14:12,639
observations that i heard from all three

330
00:14:15,590 --> 00:14:14,240
of you there that there weren't huge

331
00:14:18,389 --> 00:14:15,600
differences but it was more as nonsense

332
00:14:21,189 --> 00:14:18,399
more relaxed compared to what we've seen

333
00:14:23,110 --> 00:14:21,199
um in the past so with that let me get

334
00:14:24,870 --> 00:14:23,120
to the original point that was made

335
00:14:27,670 --> 00:14:24,880
about the science that you guys are

336
00:14:29,110 --> 00:14:27,680
doing up there if someone says hey

337
00:14:30,790 --> 00:14:29,120
governments not only the united states

338
00:14:33,189 --> 00:14:30,800

but europe and all the other governments

339
00:14:34,389 --> 00:14:33,199
are are spending so much money and now

340
00:14:36,870 --> 00:14:34,399
private companies are spending so much

341
00:14:39,350 --> 00:14:36,880
money on space exploration justify it

342
00:14:41,670 --> 00:14:39,360
for us why is it still worth it and what

343
00:14:45,030 --> 00:14:41,680
are you doing that will help us here up

344
00:14:47,590 --> 00:14:45,910
well

345
00:14:48,629 --> 00:14:47,600
yeah you have to remember that exploring

346
00:14:50,790 --> 00:14:48,639
space

347
00:14:53,030 --> 00:14:50,800
is not just about doing science science

348
00:14:57,030 --> 00:14:53,040
is part of exploring space uh

349
00:15:00,389 --> 00:14:57,040
exploration is a social endeavor that

350
00:15:03,990 --> 00:15:00,399
that a a society a government with their

351
00:15:08,230 --> 00:15:04,000
people decide to do and and with that

352
00:15:10,550 --> 00:15:08,240
will reap long-term benefits and history

353
00:15:13,990 --> 00:15:10,560
shows this you look at the countries

354
00:15:16,870 --> 00:15:14,000
that did transoceanic exploration in

355
00:15:19,829 --> 00:15:16,880
the 16th 17th and 18th century and and

356
00:15:23,350 --> 00:15:19,839
they basically defined the map of the

357
00:15:26,150 --> 00:15:23,360
world at that point in time and the same

358
00:15:27,670 --> 00:15:26,160
thing's going to happen with space and

359
00:15:31,910 --> 00:15:27,680
and the

360
00:15:35,110 --> 00:15:31,920
countries that decide to participate in

361
00:15:37,829 --> 00:15:35,120
exploration of space will be the same as

362
00:15:39,670 --> 00:15:37,839
the countries that tried that that

363
00:15:41,110 --> 00:15:39,680

participated in the trans-oceanic

364
00:15:45,189 --> 00:15:41,120
exploration they will be the ones that

365
00:15:47,110 --> 00:15:45,199
define the meaning of this epic in time