

# THE UFO RABBIT HOLE

A black and white portrait of a man with short hair and glasses, wearing a suit and tie. He is looking directly at the camera with a slight smile. The background is dark.

DR. AVI

LOEB

INTERVIEW

1  
00:00:16,130 --> 00:00:01,670

[Music]

2  
00:00:24,020 --> 00:00:16,140

[Applause]

3  
00:00:34,069 --> 00:00:24,030

[Music]

4  
00:00:36,770 --> 00:00:34,079  
welcome back to the UFO Rabbit Hole

5  
00:00:39,049 --> 00:00:36,780  
podcast I'm your host Kelly Chase

6  
00:00:42,410 --> 00:00:39,059  
in this episode I've had the pleasure of

7  
00:00:44,270 --> 00:00:42,420  
speaking with Dr Avi Loeb Dr Loeb was

8  
00:00:46,369 --> 00:00:44,280  
the longest serving chair of Harvard's

9  
00:00:50,029 --> 00:00:46,379  
Department of astronomy from 2011 to

10  
00:00:51,650 --> 00:00:50,039  
2020. in 2020 he was sworn in as a

11  
00:00:54,590 --> 00:00:51,660  
member of the president's Council of

12  
00:00:57,049 --> 00:00:54,600  
advisors on science and technology and

13  
00:00:59,150 --> 00:00:57,059

most relevant to today's conversation he

14

00:01:02,029 --> 00:00:59,160

is also currently the head of Harvard's

15

00:01:03,889 --> 00:01:02,039

Galileo project whose mission is the

16

00:01:05,509 --> 00:01:03,899

systematic scientific search for

17

00:01:08,090 --> 00:01:05,519

evidence of extraterrestrial

18

00:01:10,490 --> 00:01:08,100

technological artifacts

19

00:01:12,289 --> 00:01:10,500

more recently Dr Loeb has been in the

20

00:01:14,149 --> 00:01:12,299

news as a result of an article that he

21

00:01:16,609 --> 00:01:14,159

recently published alongside the

22

00:01:19,130 --> 00:01:16,619

director of the new all domain anomaly

23

00:01:21,950 --> 00:01:19,140

resolution office or Arrow Sean

24

00:01:24,289 --> 00:01:21,960

Kirkpatrick regarding the possibility of

25

00:01:27,469 --> 00:01:24,299

an alien Mothership in our solar system

26

00:01:29,330 --> 00:01:27,479

that created quite a stir and of course

27

00:01:31,190 --> 00:01:29,340

as you'll recall from my recent

28

00:01:34,310 --> 00:01:31,200

conversation with Christopher sharp of

29

00:01:35,929 --> 00:01:34,320

Liberation times Sean Kirkpatrick just

30

00:01:37,609 --> 00:01:35,939

testified in front of the Senate

31

00:01:40,550 --> 00:01:37,619

subcommittee on emerging threats and

32

00:01:42,830 --> 00:01:40,560

capabilities back in April as a result

33

00:01:44,870 --> 00:01:42,840

over the last few weeks there's been a

34

00:01:46,550 --> 00:01:44,880

lot of talk in the community about the

35

00:01:49,130 --> 00:01:46,560

relationship between arrow and the

36

00:01:51,350 --> 00:01:49,140

Galileo project with many expressing

37

00:01:54,109 --> 00:01:51,360

concern that the involvement between the

38

00:01:55,969 --> 00:01:54,119

two might eventually hinder the Galileo

39

00:01:58,310 --> 00:01:55,979

Project's ability to independently

40

00:02:00,350 --> 00:01:58,320

report their findings to the public

41

00:02:02,990 --> 00:02:00,360

there have also been questions about how

42

00:02:05,270 --> 00:02:03,000

the Galileo project may be intentionally

43

00:02:07,490 --> 00:02:05,280

or not propping up and lending

44

00:02:09,109 --> 00:02:07,500

credibility to allow in a way that may

45

00:02:10,850 --> 00:02:09,119

not be reflective of its actionable

46

00:02:12,170 --> 00:02:10,860

level of scientific rigor and

47

00:02:14,270 --> 00:02:12,180

transparency

48

00:02:16,010 --> 00:02:14,280

after certain statements made by Sean

49

00:02:17,809 --> 00:02:16,020

Kirkpatrick in front of the Senate

50

00:02:20,630 --> 00:02:17,819

subcommittee that were perceived by many

51  
00:02:23,210 --> 00:02:20,640  
to be an obfuscation if not an outright

52  
00:02:25,910 --> 00:02:23,220  
denial of the facts this has become a

53  
00:02:27,410 --> 00:02:25,920  
particular concern I asked Dr Loeb about

54  
00:02:29,510 --> 00:02:27,420  
some of these issues in this interview

55  
00:02:31,430 --> 00:02:29,520  
and I would like to thank him for being

56  
00:02:33,830 --> 00:02:31,440  
willing to answer these questions so

57  
00:02:35,990 --> 00:02:33,840  
thoughtfully and directly and I'll say

58  
00:02:38,089 --> 00:02:36,000  
that overall I found his statements on

59  
00:02:38,990 --> 00:02:38,099  
these topics to be well reasoned and

60  
00:02:40,850 --> 00:02:39,000  
credible

61  
00:02:43,250 --> 00:02:40,860  
obviously though you should listen for

62  
00:02:44,690 --> 00:02:43,260  
yourself and make your own determination

63  
00:02:46,610 --> 00:02:44,700

but I think that something that is

64

00:02:49,190 --> 00:02:46,620

important to understand as you listen to

65

00:02:51,710 --> 00:02:49,200

Dr Loeb is what the Galileo project

66

00:02:53,509 --> 00:02:51,720

actually is and how it goes about

67

00:02:55,670 --> 00:02:53,519

pursuing its mission

68

00:02:58,130 --> 00:02:55,680

there is a tendency in the community to

69

00:03:00,650 --> 00:02:58,140

project onto the Galileo project what we

70

00:03:02,390 --> 00:03:00,660

want it to be how we want it to operate

71

00:03:04,790 --> 00:03:02,400

and the kinds of things that we'd like

72

00:03:07,250 --> 00:03:04,800

it to pursue based on our own beliefs

73

00:03:09,350 --> 00:03:07,260

and pet theories and often these

74

00:03:11,570 --> 00:03:09,360

projections are created with very little

75

00:03:14,089 --> 00:03:11,580

awareness of how a scientific Endeavor

76

00:03:16,910 --> 00:03:14,099

like this actually is conducted

77

00:03:19,309 --> 00:03:16,920

you can't do real science by casting the

78

00:03:21,890 --> 00:03:19,319

widest possible net the scientific

79

00:03:24,050 --> 00:03:21,900

method requires a process of winnowing

80

00:03:26,809 --> 00:03:24,060

down of getting increasingly granular

81

00:03:29,210 --> 00:03:26,819

and isolating variables it involves

82

00:03:32,210 --> 00:03:29,220

asking very specific questions within

83

00:03:34,850 --> 00:03:32,220

very specific parameters in the Galileo

84

00:03:36,770 --> 00:03:34,860

project is doing exactly that by very

85

00:03:39,050 --> 00:03:36,780

specifically looking for technological

86

00:03:41,330 --> 00:03:39,060

objects that have come within near earth

87

00:03:42,649 --> 00:03:41,340

range from somewhere outside of our

88

00:03:45,410 --> 00:03:42,659

solar system

89

00:03:47,149 --> 00:03:45,420

it's fascinating and tantalizing work

90

00:03:49,610 --> 00:03:47,159

and as you'll hear in this interview

91

00:03:52,309 --> 00:03:49,620

they have some very serious leads to

92

00:03:54,170 --> 00:03:52,319

pursue if Dr Loeb and his team are

93

00:03:56,270 --> 00:03:54,180

successful what they will have

94

00:03:59,030 --> 00:03:56,280

accomplished will be of monumental

95

00:04:00,890 --> 00:03:59,040

importance they will have proven the

96

00:04:03,170 --> 00:04:00,900

existence of other intelligent

97

00:04:07,610 --> 00:04:03,180

technological civilizations within the

98

00:04:10,250 --> 00:04:07,620

universe and that's huge obviously but

99

00:04:12,289 --> 00:04:10,260

we also need to recognize that there are

100

00:04:14,990 --> 00:04:12,299

a lot of things that by the very nature

101

00:04:17,330 --> 00:04:15,000

of their scientific organization they

102

00:04:19,490 --> 00:04:17,340

are not investigating which includes

103

00:04:21,530 --> 00:04:19,500

most of the other established hypotheses

104

00:04:23,210 --> 00:04:21,540

for the origins of the UFO phenomenon

105

00:04:25,249 --> 00:04:23,220

that we've already discussed on this

106

00:04:27,050 --> 00:04:25,259

podcast they are very specifically

107

00:04:29,450 --> 00:04:27,060

looking for extraterrestrial

108

00:04:32,030 --> 00:04:29,460

technological civilizations from another

109

00:04:35,090 --> 00:04:32,040

solar system and if they find that

110

00:04:38,629 --> 00:04:35,100

evidence it may or may not explain part

111

00:04:41,390 --> 00:04:38,639

or all of the UFO phenomenon because as

112

00:04:43,310 --> 00:04:41,400

Dr Loeb points out in this episode if

113

00:04:46,189 --> 00:04:43,320

something is coming here from somewhere

114

00:04:48,170 --> 00:04:46,199

deep in space it very well could be from

115

00:04:49,790 --> 00:04:48,180

a civilization that was wiped out a

116

00:04:52,490 --> 00:04:49,800

billion years ago

117

00:04:54,590 --> 00:04:52,500

so while I find Dr Love's responses to

118

00:04:57,110 --> 00:04:54,600

my questions to be logical and

119

00:04:59,510 --> 00:04:57,120

legitimate and fair it does call into

120

00:05:01,850 --> 00:04:59,520

question for me why it is that Arrow

121

00:05:03,469 --> 00:05:01,860

seems so eager to align itself with the

122

00:05:06,170 --> 00:05:03,479

Galileo project

123

00:05:08,330 --> 00:05:06,180

the UFO phenomenon very clearly seems to

124

00:05:10,850 --> 00:05:08,340

be the result of an intelligence that is

125

00:05:13,310 --> 00:05:10,860

very much local to and present on Earth

126

00:05:15,290 --> 00:05:13,320

as Avi himself points out in this

127

00:05:17,689 --> 00:05:15,300

episode there is a one-to-one

128

00:05:20,930 --> 00:05:17,699

correlation between population density

129

00:05:22,730 --> 00:05:20,940

and UFO sightings which suggests that

130

00:05:25,670 --> 00:05:22,740

this is happening all the time

131

00:05:27,770 --> 00:05:25,680

everywhere on the planet the idea that

132

00:05:29,870 --> 00:05:27,780

we're going to be able to explain even a

133

00:05:32,090 --> 00:05:29,880

fraction of those sightings with probes

134

00:05:34,610 --> 00:05:32,100

coming from millions or even billions of

135

00:05:37,249 --> 00:05:34,620

light years away is certainly possible

136

00:05:39,830 --> 00:05:37,259

but it also seems pretty unlikely given

137

00:05:43,129 --> 00:05:39,840

the ubiquity of the UFO presence

138

00:05:45,529 --> 00:05:43,139

so to me this alignment between arrow

139

00:05:47,570 --> 00:05:45,539

and the Galileo project seems like more

140

00:05:49,670 --> 00:05:47,580

of the usual distraction and sleight of

141

00:05:51,469 --> 00:05:49,680

hand on behalf of the government in

142

00:05:54,650 --> 00:05:51,479

order to increasingly muddy the waters

143

00:05:57,490 --> 00:05:54,660

on the nature of the UFO phenomenon now

144

00:06:00,770 --> 00:05:57,500

I can't prove that it's just my opinion

145

00:06:03,050 --> 00:06:00,780

and as always I'd very much encourage

146

00:06:04,790 --> 00:06:03,060

you not to take my word for that look

147

00:06:05,870 --> 00:06:04,800

into this more deeply and decide for

148

00:06:07,790 --> 00:06:05,880

yourself

149

00:06:10,189 --> 00:06:07,800

but I will say this

150

00:06:13,010 --> 00:06:10,199

as we discussed back in episode 11 about

151  
00:06:14,810 --> 00:06:13,020  
the emergence of UFO lore our modern

152  
00:06:16,430 --> 00:06:14,820  
conception of the UFO phenomenon

153  
00:06:18,529 --> 00:06:16,440  
specifically that it represents

154  
00:06:20,810 --> 00:06:18,539  
extraterrestrial beings coming to Earth

155  
00:06:23,990 --> 00:06:20,820  
in saucer-shaped craft and sometimes

156  
00:06:25,610 --> 00:06:24,000  
abducting people is largely a result of

157  
00:06:27,650 --> 00:06:25,620  
how it has been betrayed by the

158  
00:06:29,930 --> 00:06:27,660  
government and in the media

159  
00:06:32,330 --> 00:06:29,940  
When the UFO phenomenon first emerged in

160  
00:06:34,550 --> 00:06:32,340  
the public awareness in 1947 the

161  
00:06:37,370 --> 00:06:34,560  
Extraterrestrial hypothesis was just one

162  
00:06:39,770 --> 00:06:37,380  
of many possible explanations but over

163  
00:06:42,290 --> 00:06:39,780

time through repetition and constant

164

00:06:44,570 --> 00:06:42,300

association between the two the public

165

00:06:47,809 --> 00:06:44,580

at large have become conditioned to see

166

00:06:49,670 --> 00:06:47,819

UFOs and aliens as being one in the same

167

00:06:51,830 --> 00:06:49,680

to the point that it's hard for people

168

00:06:53,930 --> 00:06:51,840

new to this topic to even wrap their

169

00:06:55,370 --> 00:06:53,940

heads around the idea that it could be

170

00:06:58,610 --> 00:06:55,380

something else

171

00:07:00,230 --> 00:06:58,620

and while I'm not ruling anything out I

172

00:07:02,689 --> 00:07:00,240

think that the best argument against the

173

00:07:04,610 --> 00:07:02,699

Extraterrestrial hypothesis is that it's

174

00:07:06,890 --> 00:07:04,620

the only one that the government and by

175

00:07:08,150 --> 00:07:06,900

extension the media ever seem to

176

00:07:10,909 --> 00:07:08,160

acknowledge

177

00:07:13,430 --> 00:07:10,919

that said I have nothing but respect for

178

00:07:15,350 --> 00:07:13,440

what the Galileo project is doing I

179

00:07:17,150 --> 00:07:15,360

think it is of profound importance to

180

00:07:18,830 --> 00:07:17,160

our species as a whole and I wish them

181

00:07:19,969 --> 00:07:18,840

nothing but luck in success and the work

182

00:07:22,129 --> 00:07:19,979

that they're doing

183

00:07:24,469 --> 00:07:22,139

and if you'd like to hear more from the

184

00:07:26,930 --> 00:07:24,479

brilliant Dr Loeb he will be a speaker

185

00:07:28,670 --> 00:07:26,940

at contact in the desert happening June

186

00:07:31,370 --> 00:07:28,680

2nd through 4th in Indian Wells

187

00:07:33,469 --> 00:07:31,380

California they have a great lineup of

188

00:07:36,950 --> 00:07:33,479

speakers this year as well including

189

00:07:40,490 --> 00:07:36,960

Graham Hancock George Nori Richard Dolan

190

00:07:43,189 --> 00:07:40,500

Paul heineck Ben Hansen J Christopher

191

00:07:45,670 --> 00:07:43,199

King Cheryl and Linda Costa and many

192

00:07:48,350 --> 00:07:45,680

more tickets are on sale at contact

193

00:07:50,749 --> 00:07:48,360

inthedesert.com and the link is in the

194

00:07:53,629 --> 00:07:50,759

episode description alright without

195

00:07:55,730 --> 00:07:53,639

further Ado here is my conversation with

196

00:07:57,950 --> 00:07:55,740

Dr Avi Loeb

197

00:07:59,510 --> 00:07:57,960

the stated mission of the Galileo

198

00:08:00,950 --> 00:07:59,520

project is to bring the surge for

199

00:08:03,290 --> 00:08:00,960

extraterrestrial technological

200

00:08:05,210 --> 00:08:03,300

signatures of extraterrestrial

201

00:08:07,309 --> 00:08:05,220

technological civilizations from

202

00:08:09,350 --> 00:08:07,319

anecdotal observations and legends to

203

00:08:11,930 --> 00:08:09,360

the mainstream of transparent validated

204

00:08:13,309 --> 00:08:11,940

and systematic scientific research and I

205

00:08:15,110 --> 00:08:13,319

think it's really important to note that

206

00:08:17,029 --> 00:08:15,120

this effort is different from many other

207

00:08:18,950 --> 00:08:17,039

previous attempts to look for signs of

208

00:08:21,110 --> 00:08:18,960

extraterrestrial life because you're

209

00:08:24,050 --> 00:08:21,120

actually looking for physical objects as

210

00:08:27,050 --> 00:08:24,060

opposed to electromagnetic signals so

211

00:08:29,089 --> 00:08:27,060

the universe is a very big place so Dr

212

00:08:31,010 --> 00:08:29,099

Loeb where do you even begin looking

213

00:08:34,490 --> 00:08:31,020

when you're looking for signs of alien

214

00:08:37,430 --> 00:08:34,500

technology when we first obviously have

215

00:08:39,649 --> 00:08:37,440

to look in our backyard because Guided

216

00:08:42,290 --> 00:08:39,659

by experience when we go out to our

217

00:08:44,029 --> 00:08:42,300

backyard we often find the rocks that we

218

00:08:46,430 --> 00:08:44,039

are familiar with but every now and then

219

00:08:47,389 --> 00:08:46,440

we see a tennis ball that was thrown by

220

00:08:50,630 --> 00:08:47,399

a neighbor

221

00:08:53,449 --> 00:08:50,640

and in general it's good to check your

222

00:08:55,790 --> 00:08:53,459

backyard and especially the mailbox that

223

00:08:58,370 --> 00:08:55,800

you have in front of your house because

224

00:09:01,490 --> 00:08:58,380

there may be packages and the good news

225

00:09:03,769 --> 00:09:01,500

is the packages may have not arrived at

226

00:09:05,870 --> 00:09:03,779

the time that the sender is alive the

227

00:09:07,790 --> 00:09:05,880

sender may be dead by now and but they

228

00:09:10,730 --> 00:09:07,800

keep accumulating just like plastic in

229

00:09:12,530 --> 00:09:10,740

the ocean and interestingly enough we

230

00:09:15,470 --> 00:09:12,540

haven't checked our backyard until the

231

00:09:18,949 --> 00:09:15,480

last decade so when Enrico Fermi asked

232

00:09:21,470 --> 00:09:18,959

where is everybody he was a bit lazy he

233

00:09:23,750 --> 00:09:21,480

was looking around himself there in Los

234

00:09:25,310 --> 00:09:23,760

Alamos at lunch time and asking where

235

00:09:27,829 --> 00:09:25,320

where are our neighbors I don't see

236

00:09:29,630 --> 00:09:27,839

anyone but that's presumptuous because

237

00:09:31,490 --> 00:09:29,640

why would they come exactly to Los

238

00:09:33,650 --> 00:09:31,500

Alamos exactly at the time that he is

239

00:09:36,230 --> 00:09:33,660

having lunch over there and the age of

240

00:09:38,030 --> 00:09:36,240

the universe is 13.8 billion years most

241

00:09:40,370 --> 00:09:38,040

stars from billions of years before the

242

00:09:42,530 --> 00:09:40,380

sun and it's quite likely that if there

243

00:09:45,470 --> 00:09:42,540

were technological civilization they

244

00:09:47,329 --> 00:09:45,480

died by now we will probably not survive

245

00:09:50,449 --> 00:09:47,339

on Earth within a billion years because

246

00:09:51,889 --> 00:09:50,459

the sun will boil off all the oceans on

247

00:09:54,170 --> 00:09:51,899

Earth within a billionaires it will

248

00:09:57,290 --> 00:09:54,180

brighten up so the idea is it's much

249

00:09:59,449 --> 00:09:57,300

better not to search for radio signals

250

00:10:02,329 --> 00:09:59,459

the way we did for 70 years the way the

251  
00:10:04,630 --> 00:10:02,339  
City Community did because this is just

252  
00:10:06,889 --> 00:10:04,640  
like waiting for a phone call at home

253  
00:10:09,769 --> 00:10:06,899  
nobody may call you at the time that

254  
00:10:11,990 --> 00:10:09,779  
you're listening but if you check your

255  
00:10:15,350 --> 00:10:12,000  
mailbox for any packages you know these

256  
00:10:17,389 --> 00:10:15,360  
any chemical rocket that may have been

257  
00:10:19,730 --> 00:10:17,399  
launched over the past billions of years

258  
00:10:21,829 --> 00:10:19,740  
within the Milky Way galaxy did not

259  
00:10:23,870 --> 00:10:21,839  
escape from the Milky Way because its

260  
00:10:26,329 --> 00:10:23,880  
speed was an order of magnitude lower

261  
00:10:29,090 --> 00:10:26,339  
than the Escape speed from the gravity

262  
00:10:31,070 --> 00:10:29,100  
of the Milky Way so all these spacecraft

263  
00:10:33,170 --> 00:10:31,080

must be still around they're moving

264

00:10:36,350 --> 00:10:33,180

within the Milky Way galaxy there may be

265

00:10:38,930 --> 00:10:36,360

space trash by now the way Voyager would

266

00:10:41,090 --> 00:10:38,940

be in a billion years but we could look

267

00:10:44,329 --> 00:10:41,100

for them and what intrigued me the most

268

00:10:46,970 --> 00:10:44,339

is that in 2017 we discovered the first

269

00:10:49,730 --> 00:10:46,980

object from outside the solar system the

270

00:10:52,610 --> 00:10:49,740

size of a football field and as you know

271

00:10:54,889 --> 00:10:52,620

the biggest rocket that we are aiming to

272

00:10:57,490 --> 00:10:54,899

launch right now is actually Starship

273

00:11:01,310 --> 00:10:57,500

and it's not as big as a football field

274

00:11:03,170 --> 00:11:01,320

and this first object was very weird it

275

00:11:05,150 --> 00:11:03,180

didn't look like the Rocks we had seen

276

00:11:07,970 --> 00:11:05,160

in the solar system before it was given

277

00:11:10,370 --> 00:11:07,980

the name of which means a scout in the

278

00:11:13,790 --> 00:11:10,380

Hawaiian language and it was most likely

279

00:11:16,009 --> 00:11:13,800

flat it had a very extreme shape based

280

00:11:17,750 --> 00:11:16,019

on the reflection of sunlight and was

281

00:11:19,730 --> 00:11:17,760

pushed away from the Sun by some

282

00:11:22,370 --> 00:11:19,740

mysterious Force without showing any

283

00:11:24,230 --> 00:11:22,380

commentary evaporation so it wasn't

284

00:11:26,449 --> 00:11:24,240

clear what it is it didn't look like an

285

00:11:28,850 --> 00:11:26,459

asteroid or a comet that we are familiar

286

00:11:30,650 --> 00:11:28,860

with and this is what intrigued me is an

287

00:11:33,470 --> 00:11:30,660

astronomer to start thinking about

288

00:11:35,530 --> 00:11:33,480

objects near Earth and together with my

289

00:11:38,210 --> 00:11:35,540

student we discovered two other

290

00:11:42,530 --> 00:11:38,220

Interstellar objects actually that

291

00:11:45,230 --> 00:11:42,540

arrived to Earth before one in 2014 and

292

00:11:48,410 --> 00:11:45,240

the other one seven months before Momoa

293

00:11:51,350 --> 00:11:48,420

in 2017 and there were meteors they just

294

00:11:54,410 --> 00:11:51,360

collided with Earth roughly the size of

295

00:11:57,470 --> 00:11:54,420

half a meter to a meter so much smaller

296

00:12:00,230 --> 00:11:57,480

than a Momoa by a factor of 200 but they

297

00:12:02,269 --> 00:12:00,240

were weird in their own way they were

298

00:12:05,389 --> 00:12:02,279

tougher than all the meteors ever

299

00:12:08,389 --> 00:12:05,399

recorded in the NASA catalog of

300

00:12:10,970 --> 00:12:08,399

fireballs over the past decade and that

301  
00:12:13,630 --> 00:12:10,980  
made them tougher by at least an order

302  
00:12:17,090 --> 00:12:13,640  
of magnitude than even iron meteorites

303  
00:12:19,370 --> 00:12:17,100  
and so it's very peculiar what are these

304  
00:12:21,590 --> 00:12:19,380  
first Interstellar objects that look so

305  
00:12:23,870 --> 00:12:21,600  
different than the Rocks we are used to

306  
00:12:26,509 --> 00:12:23,880  
which leads to the possibility that they

307  
00:12:29,930 --> 00:12:26,519  
might be artificial in origin spacecraft

308  
00:12:33,889 --> 00:12:29,940  
perhaps and we are going to the Pacific

309  
00:12:36,170 --> 00:12:33,899  
Ocean in a few months in summer 2023 to

310  
00:12:39,170 --> 00:12:36,180  
retrieve any relics from the first

311  
00:12:41,150 --> 00:12:39,180  
Interstellar meteor and stay tuned I

312  
00:12:43,190 --> 00:12:41,160  
mean we will be able to examine the

313  
00:12:46,370 --> 00:12:43,200

composition of the fragments if we find

314

00:12:49,069 --> 00:12:46,380

any I very much hope we will find and

315

00:12:51,230 --> 00:12:49,079

that's what led me to this that's really

316

00:12:52,790 --> 00:12:51,240

interesting when I let people know that

317

00:12:55,009 --> 00:12:52,800

I was going to be interviewing you some

318

00:12:56,750 --> 00:12:55,019

of the most common questions that I got

319

00:12:58,970 --> 00:12:56,760

were about that expedition I know people

320

00:13:00,949 --> 00:12:58,980

are very excited about it one of the

321

00:13:03,170 --> 00:13:00,959

questions I got the most was how do you

322

00:13:04,790 --> 00:13:03,180

retrieve an Interstellar object like

323

00:13:06,050 --> 00:13:04,800

that from the ocean floor can you tell

324

00:13:08,990 --> 00:13:06,060

us how you're even able to spot

325

00:13:11,810 --> 00:13:09,000

something like that right so as a result

326

00:13:14,569 --> 00:13:11,820

of friction with air this object the

327

00:13:16,850 --> 00:13:14,579

disintegrated it basically created a

328

00:13:19,310 --> 00:13:16,860

fireball that's how it was discovered by

329

00:13:21,590 --> 00:13:19,320

a sensors that the US government owns

330

00:13:24,829 --> 00:13:21,600

either satellites or ground-based

331

00:13:28,370 --> 00:13:24,839

seismometers or other means so the

332

00:13:30,410 --> 00:13:28,380

fireball implies that it exploded and it

333

00:13:33,290 --> 00:13:30,420

released a few percent of the energy

334

00:13:35,090 --> 00:13:33,300

output of the Hiroshima atomic bomb and

335

00:13:38,569 --> 00:13:35,100

this was an object roughly the size of

336

00:13:41,569 --> 00:13:38,579

half a meter or so almost any material

337

00:13:43,610 --> 00:13:41,579

would disintegrate basically melt with

338

00:13:47,210 --> 00:13:43,620

so much energy being released from the

339

00:13:49,550 --> 00:13:47,220

friction with air and we know that it

340

00:13:51,470 --> 00:13:49,560

was very tough because it survived all

341

00:13:54,230 --> 00:13:51,480

the way down to the lower atmosphere of

342

00:13:57,769 --> 00:13:54,240

the earth roughly 10 kilometers above

343

00:14:00,170 --> 00:13:57,779

the ocean surface and we know that it

344

00:14:02,569 --> 00:14:00,180

the stress on the object was extremely

345

00:14:03,410 --> 00:14:02,579

high because it was moving fast very

346

00:14:07,009 --> 00:14:03,420

fast

347

00:14:08,930 --> 00:14:07,019

at about 40 kilometers per second and

348

00:14:11,030 --> 00:14:08,940

moreover the lower atmosphere of the

349

00:14:13,430 --> 00:14:11,040

earth is very dense so that's how we

350

00:14:16,129 --> 00:14:13,440

figure that it must have been tougher

351  
00:14:17,750 --> 00:14:16,139  
than iron and then the expectation I

352  
00:14:21,050 --> 00:14:17,760  
mean we don't really know what it's made

353  
00:14:22,910 --> 00:14:21,060  
of but if you imagine an iron meteorite

354  
00:14:25,730 --> 00:14:22,920  
under these circumstances it would

355  
00:14:29,090 --> 00:14:25,740  
basically melt and you would end up with

356  
00:14:32,690 --> 00:14:29,100  
droplets the size of the head of a pin a

357  
00:14:36,530 --> 00:14:32,700  
millimeter in size or so and they would

358  
00:14:38,269 --> 00:14:36,540  
drain down just like hot rain and when

359  
00:14:40,550 --> 00:14:38,279  
they meet the ocean surface they would

360  
00:14:43,250 --> 00:14:40,560  
raise some steam but then they would

361  
00:14:45,110 --> 00:14:43,260  
sink to the bottom of the ocean now we

362  
00:14:47,449 --> 00:14:45,120  
don't know what it was made of but if it

363  
00:14:49,430 --> 00:14:47,459

was made of material that is magnetic

364

00:14:52,790 --> 00:14:49,440

that responds to a magnet

365

00:14:55,970 --> 00:14:52,800

what we produced already is a sled with

366

00:14:58,910 --> 00:14:55,980

magnets that would basically hover above

367

00:15:01,250 --> 00:14:58,920

the ocean surface and attract all these

368

00:15:04,009 --> 00:15:01,260

particles that are magnetized the ocean

369

00:15:07,910 --> 00:15:04,019

surface is muck it's just mud it's not

370

00:15:09,769 --> 00:15:07,920

really magnetic and so we hope that we

371

00:15:14,090 --> 00:15:09,779

will be able to separate those particles

372

00:15:15,949 --> 00:15:14,100

that might be magnetic from the mac and

373

00:15:19,629 --> 00:15:15,959

it's sort of like a needle in a haystack

374

00:15:21,650 --> 00:15:19,639

but the background is mud so it could be

375

00:15:23,930 --> 00:15:21,660

straightforward to attract magnetic

376

00:15:26,810 --> 00:15:23,940

particles the only question is are there

377

00:15:28,790 --> 00:15:26,820

magnetic particles that will contaminate

378

00:15:30,949 --> 00:15:28,800

our sample that are from terrestrial

379

00:15:32,870 --> 00:15:30,959

origin and we'll be able to figure it

380

00:15:35,569 --> 00:15:32,880

out based on the composition

381

00:15:36,949 --> 00:15:35,579

and then if it's not magnetic there is a

382

00:15:40,009 --> 00:15:36,959

question how do we pick up those

383

00:15:42,590 --> 00:15:40,019

fragments and the idea there is that we

384

00:15:45,050 --> 00:15:42,600

have also a sluicing device which is

385

00:15:47,509 --> 00:15:45,060

similar to the way you look for gold

386

00:15:49,790 --> 00:15:47,519

which is based on the density of the

387

00:15:51,710 --> 00:15:49,800

particles so we want to separate those

388

00:15:53,750 --> 00:15:51,720

particles that are lock magnetic

389

00:15:57,410 --> 00:15:53,760

assuming that there are higher density

390

00:15:59,810 --> 00:15:57,420

because we know the object was tough wow

391

00:16:01,490 --> 00:15:59,820

well I there's so many people I know who

392

00:16:03,470 --> 00:16:01,500

are wishing you the best of luck in

393

00:16:04,970 --> 00:16:03,480

finding it that's absolutely fascinating

394

00:16:07,670 --> 00:16:04,980

and we can't wait to hear what you find

395

00:16:09,889 --> 00:16:07,680

there now obviously in that case we're

396

00:16:12,350 --> 00:16:09,899

talking about an Interstellar object so

397

00:16:14,509 --> 00:16:12,360

if you were to find evidence that it was

398

00:16:16,009 --> 00:16:14,519

somehow technological this object

399

00:16:18,230 --> 00:16:16,019

whatever it is then obviously it would

400

00:16:20,629 --> 00:16:18,240

be extraterrestrial kind of by

401

00:16:22,550 --> 00:16:20,639

definition but if we're looking in

402

00:16:25,790 --> 00:16:22,560

another situation if you found something

403

00:16:27,829 --> 00:16:25,800

that was a near-earth object or even

404

00:16:30,230 --> 00:16:27,839

something potentially that you found on

405

00:16:31,850 --> 00:16:30,240

Earth what are the standards that you

406

00:16:34,250 --> 00:16:31,860

would then use to try to determine

407

00:16:37,370 --> 00:16:34,260

whether or not this was extraterrestrial

408

00:16:40,490 --> 00:16:37,380

or perhaps from some other origin

409

00:16:43,610 --> 00:16:40,500

we know the composition of solar system

410

00:16:47,449 --> 00:16:43,620

objects there are many meteors on Earth

411

00:16:50,210 --> 00:16:47,459

that were analyzed but also cometary

412

00:16:53,030 --> 00:16:50,220

material of comets that we look at or

413

00:16:56,509 --> 00:16:53,040

even asteroids there was a mission of

414

00:16:59,689 --> 00:16:56,519

NASA called the Osiris rex that landed

415

00:17:02,030 --> 00:16:59,699

on the asteroid Ben when material from

416

00:17:03,889 --> 00:17:02,040

it will be brought to Earth we pretty

417

00:17:06,470 --> 00:17:03,899

much know what the solar system is made

418

00:17:08,449 --> 00:17:06,480

of because those asteroids or comets

419

00:17:11,390 --> 00:17:08,459

they were the building blocks that made

420

00:17:12,650 --> 00:17:11,400

the planets and that means that the same

421

00:17:15,590 --> 00:17:12,660

isotope

422

00:17:18,110 --> 00:17:15,600

that we find on Earth and on other

423

00:17:19,669 --> 00:17:18,120

planets so should be found also on

424

00:17:21,829 --> 00:17:19,679

objects that belong to the solar system

425

00:17:25,309 --> 00:17:21,839

it is it was all part of the same cloud

426

00:17:27,949 --> 00:17:25,319

of gas that was local and condensed to

427

00:17:30,350 --> 00:17:27,959

make the sun and the debris from the Sun

428

00:17:33,110 --> 00:17:30,360

and made the planets and all these rocks

429

00:17:36,169 --> 00:17:33,120

that were just like Lego pieces were put

430

00:17:38,750 --> 00:17:36,179

together to make the rocky planets so we

431

00:17:41,990 --> 00:17:38,760

know pretty much what the composition of

432

00:17:44,029 --> 00:17:42,000

the solar system is and it should be

433

00:17:45,770 --> 00:17:44,039

straightforward to tell the difference

434

00:17:46,970 --> 00:17:45,780

between something that came from outside

435

00:17:50,210 --> 00:17:46,980

because

436

00:17:52,250 --> 00:17:50,220

if it went through Interstellar space it

437

00:17:54,890 --> 00:17:52,260

must have originated in far away because

438

00:17:58,010 --> 00:17:54,900

most of the stars are far away most of

439

00:18:00,590 --> 00:17:58,020

the volume that contains stars in the

440

00:18:02,630 --> 00:18:00,600

Milky Way galaxy is far away so if you

441

00:18:04,669 --> 00:18:02,640

just do the statistics it's most likely

442

00:18:07,070 --> 00:18:04,679

that such an object came from very far

443

00:18:09,650 --> 00:18:07,080

away like tens of thousands of light

444

00:18:11,810 --> 00:18:09,660

years away in the conditions there were

445

00:18:14,210 --> 00:18:11,820

quite different because there was a

446

00:18:16,310 --> 00:18:14,220

different supernovae a different star

447

00:18:18,650 --> 00:18:16,320

that exploded in the vicinity of where

448

00:18:20,630 --> 00:18:18,660

the object came from and therefore the

449

00:18:22,730 --> 00:18:20,640

Isotopes would be different than the

450

00:18:24,470 --> 00:18:22,740

ones the Rashi of Isotopes the

451

00:18:26,390 --> 00:18:24,480

abundances of elements would be

452

00:18:29,029 --> 00:18:26,400

different from the one we find in the

453

00:18:31,490 --> 00:18:29,039

solar system and as a result we can tell

454

00:18:33,950 --> 00:18:31,500

the difference the only caveat that I

455

00:18:35,630 --> 00:18:33,960

would mention is that in the outer parts

456

00:18:37,970 --> 00:18:35,640

of the solar system there is the

457

00:18:40,430 --> 00:18:37,980

so-called old Cloud which contains

458

00:18:43,549 --> 00:18:40,440

objects that are very Loosely bound to

459

00:18:46,130 --> 00:18:43,559

the Sun and when stars are passing by

460

00:18:48,590 --> 00:18:46,140

they can dislodge some of these

461

00:18:51,049 --> 00:18:48,600

peripheral aerial objects from the solar

462

00:18:53,450 --> 00:18:51,059

system but they can also deliver objects

463

00:18:56,450 --> 00:18:53,460

from other stars to the vicinity of the

464

00:18:58,370 --> 00:18:56,460

outskirts of the solar system and so if

465

00:19:00,770 --> 00:18:58,380

there is an object that comes from the

466

00:19:02,750 --> 00:19:00,780

sort of periphery of the solar system it

467

00:19:06,110 --> 00:19:02,760

could have been borrowed from a passing

468

00:19:08,390 --> 00:19:06,120

star but what we know about this meteor

469

00:19:10,250 --> 00:19:08,400

is that it actually was not Loosely

470

00:19:12,770 --> 00:19:10,260

bound to the sun in fact it was moving

471

00:19:16,010 --> 00:19:12,780

at 60 kilometers per second outside the

472

00:19:18,529 --> 00:19:16,020

solar system faster than 95 percent of

473

00:19:21,230 --> 00:19:18,539

all the stars in the vicinity of the Sun

474

00:19:24,590 --> 00:19:21,240

and that means that it didn't originate

475

00:19:26,270 --> 00:19:24,600

most likely at the 90 95 confidence it

476  
00:19:28,909 --> 00:19:26,280  
didn't originate from any of the nearby

477  
00:19:31,549 --> 00:19:28,919  
stars and so it must have arrived from

478  
00:19:33,529 --> 00:19:31,559  
far away and that makes it quite

479  
00:19:35,690 --> 00:19:33,539  
different than anything we find in the

480  
00:19:38,270 --> 00:19:35,700  
solar system that's really interesting

481  
00:19:40,789 --> 00:19:38,280  
How likely is it that an object like

482  
00:19:43,870 --> 00:19:40,799  
that could get kicked up and sent that

483  
00:19:46,970 --> 00:19:43,880  
far to an entirely different star system

484  
00:19:49,370 --> 00:19:46,980  
is that something that happens commonly

485  
00:19:51,350 --> 00:19:49,380  
or is that something that's really rare

486  
00:19:54,169 --> 00:19:51,360  
well that's a very interesting question

487  
00:19:58,130 --> 00:19:54,179  
in fact 10 years before omuamoah was

488  
00:20:01,370 --> 00:19:58,140

discovered around 2007 I wrote the first

489

00:20:03,650 --> 00:20:01,380

paper that price to forecast how many

490

00:20:04,970 --> 00:20:03,660

rocks we expect from other stars based

491

00:20:07,490 --> 00:20:04,980

on what we know in the solar system

492

00:20:10,549 --> 00:20:07,500

assuming that other planetary systems

493

00:20:12,590 --> 00:20:10,559

are the same as the solar system and we

494

00:20:15,169 --> 00:20:12,600

predicted that the telescope in Hawaii

495

00:20:18,529 --> 00:20:15,179

that discovered will not see anything

496

00:20:20,510 --> 00:20:18,539

and that was a safe bet by a factor of a

497

00:20:22,789 --> 00:20:20,520

hundred to a hundred million basically

498

00:20:25,610 --> 00:20:22,799

there wouldn't be enough rocks for it to

499

00:20:27,590 --> 00:20:25,620

see and the same applies for the meteors

500

00:20:31,430 --> 00:20:27,600

we didn't expect any meteors from

501  
00:20:33,650 --> 00:20:31,440  
intestinal space within decades and the

502  
00:20:36,830 --> 00:20:33,660  
surprising fact is that we see we saw

503  
00:20:38,690 --> 00:20:36,840  
more we saw these meteors and that means

504  
00:20:41,450 --> 00:20:38,700  
that something is wrong in the mass

505  
00:20:44,390 --> 00:20:41,460  
budget calculation either other

506  
00:20:46,669 --> 00:20:44,400  
planetary systems eject a lot of rocks

507  
00:20:49,630 --> 00:20:46,679  
many more than expected from what we

508  
00:20:53,150 --> 00:20:49,640  
know about the solar system or

509  
00:20:55,070 --> 00:20:53,160  
perhaps you know these are artificial in

510  
00:20:57,590 --> 00:20:55,080  
order they were targeting the inner

511  
00:21:00,890 --> 00:20:57,600  
region of the solar system rather than

512  
00:21:03,710 --> 00:21:00,900  
spread randomly throughout space and I

513  
00:21:07,250 --> 00:21:03,720

wouldn't cast any vote on that until we

514

00:21:09,770 --> 00:21:07,260

figure out what these objects are and it

515

00:21:12,529 --> 00:21:09,780

really surprising that so much material

516

00:21:15,710 --> 00:21:12,539

in fact if we take the meteors and ask

517

00:21:17,510 --> 00:21:15,720

if we estimate how much heavy elements

518

00:21:19,789 --> 00:21:17,520

if they are randomly distributed

519

00:21:22,190 --> 00:21:19,799

throughout the Galaxy how many how much

520

00:21:24,830 --> 00:21:22,200

of the heavy elements produced in the

521

00:21:27,049 --> 00:21:24,840

galaxy do they carry and we found that

522

00:21:29,450 --> 00:21:27,059

they carry a substantial fraction like a

523

00:21:31,250 --> 00:21:29,460

third of the heavy elements and then you

524

00:21:33,890 --> 00:21:31,260

ask yourself how is it possible that

525

00:21:37,549 --> 00:21:33,900

stars lose so much from their vicinity

526

00:21:39,710 --> 00:21:37,559

it's not at all clear but you know on

527

00:21:42,529 --> 00:21:39,720

the other hand I did a calculation that

528

00:21:45,470 --> 00:21:42,539

showed that if for example was pushed

529

00:21:48,710 --> 00:21:45,480

away from the sun because it was thin

530

00:21:50,870 --> 00:21:48,720

and it reflected sunlight and by the way

531

00:21:52,970 --> 00:21:50,880

this is the way that another object that

532

00:21:55,250 --> 00:21:52,980

was discovered in September 2020 was

533

00:21:57,890 --> 00:21:55,260

pushed away from the Sun they had thin

534

00:22:01,549 --> 00:21:57,900

walls it ended up being a rocket booster

535

00:22:03,710 --> 00:22:01,559

that NASA launched in 1966 rediscovered

536

00:22:04,870 --> 00:22:03,720

by the same telescope in Hawaii that

537

00:22:09,230 --> 00:22:04,880

discovered

538

00:22:11,810 --> 00:22:09,240

and in 2020 and it was given the name

539

00:22:14,210 --> 00:22:11,820

2020 or so and obviously it was

540

00:22:16,669 --> 00:22:14,220

artificial in origin and and I said in a

541

00:22:18,830 --> 00:22:16,679

recent paper I said well you know if for

542

00:22:21,770 --> 00:22:18,840

example if you imagine Dyson spheres

543

00:22:24,649 --> 00:22:21,780

these are Mega structures that advanced

544

00:22:27,169 --> 00:22:24,659

civilizations may put around stars to

545

00:22:30,049 --> 00:22:27,179

harvest their energy if they are made of

546

00:22:32,930 --> 00:22:30,059

tiles that are sort of floating above

547

00:22:36,110 --> 00:22:32,940

the star just like kites by radiation

548

00:22:39,350 --> 00:22:36,120

pressure balancing gravity so that would

549

00:22:41,149 --> 00:22:39,360

be this would be light sails basically

550

00:22:43,669 --> 00:22:41,159

hovering above the star and harvesting

551  
00:22:45,649 --> 00:22:43,679  
the energy then when the star brightens

552  
00:22:47,810 --> 00:22:45,659  
up it will push them away and very

553  
00:22:51,049 --> 00:22:47,820  
easily release them from the planetary

554  
00:22:55,029 --> 00:22:51,059  
system and as a result they might appear

555  
00:22:58,490 --> 00:22:55,039  
as Interstellar objects that behave like

556  
00:23:01,490 --> 00:22:58,500  
so maybe your moonwalk was a piece of a

557  
00:23:02,990 --> 00:23:01,500  
broken Dyson Sphere who knows wow that's

558  
00:23:05,450 --> 00:23:03,000  
fascinating

559  
00:23:07,010 --> 00:23:05,460  
so obviously you've got this fantastic

560  
00:23:08,630 --> 00:23:07,020  
lead that you're following with this

561  
00:23:10,850 --> 00:23:08,640  
Interstellar object that you're hoping

562  
00:23:13,430 --> 00:23:10,860  
to retrieve traces of from the Pacific

563  
00:23:15,409 --> 00:23:13,440

Ocean which is the Galileo project have

564

00:23:16,610 --> 00:23:15,419

any other exciting leads that you're

565

00:23:19,850 --> 00:23:16,620

working on right now that you're able to

566

00:23:23,330 --> 00:23:19,860

share with us oh yeah so we have two

567

00:23:26,870 --> 00:23:23,340

other avenues that we do research on and

568

00:23:27,909 --> 00:23:26,880

one has to do with finding more objects

569

00:23:30,049 --> 00:23:27,919

like

570

00:23:32,870 --> 00:23:30,059

within a year there will be a new

571

00:23:36,890 --> 00:23:32,880

telescope in Chile called the Vera Rubin

572

00:23:39,770 --> 00:23:36,900

Observatory that has 3.2 billion pixels

573

00:23:42,890 --> 00:23:39,780

in its camera that's a thousand times

574

00:23:45,230 --> 00:23:42,900

more pixels than cell phones have and it

575

00:23:48,649 --> 00:23:45,240

would survey the southern Sky every four

576

00:23:51,669 --> 00:23:48,659

days and it has a good chance of finding

577

00:23:54,950 --> 00:23:51,679

a normal-like object every few months

578

00:23:57,470 --> 00:23:54,960

and then of course we need to identify

579

00:24:00,070 --> 00:23:57,480

those objects of interest and turns out

580

00:24:02,930 --> 00:24:00,080

that the astronomy Community not only

581

00:24:05,210 --> 00:24:02,940

ridicules the search for such object

582

00:24:07,789 --> 00:24:05,220

effects but also did not develop the

583

00:24:10,789 --> 00:24:07,799

software necessary to go through the

584

00:24:12,710 --> 00:24:10,799

pipeline of data from the very Rubin

585

00:24:15,049 --> 00:24:12,720

Observatory so we are doing it with my

586

00:24:18,110 --> 00:24:15,059

postdoc we developed the software that

587

00:24:19,610 --> 00:24:18,120

will identify Interstellar object and

588

00:24:22,789 --> 00:24:19,620

then of course we could look at them

589

00:24:25,610 --> 00:24:22,799

with a web telescope which is located at

590

00:24:27,470 --> 00:24:25,620

a million miles away from Earth so if we

591

00:24:30,350 --> 00:24:27,480

have the web telescope and a telescope

592

00:24:32,870 --> 00:24:30,360

on Earth looking at the same object they

593

00:24:34,549 --> 00:24:32,880

could in principle pinpoint the

594

00:24:36,710 --> 00:24:34,559

three-dimensional trajectory of the

595

00:24:39,409 --> 00:24:36,720

object very well it's called Parallax

596

00:24:41,810 --> 00:24:39,419

just like having two eyes looking at it

597

00:24:44,510 --> 00:24:41,820

at an object and being able to assess

598

00:24:46,490 --> 00:24:44,520

the distance so we can pinpoint the

599

00:24:48,710 --> 00:24:46,500

three-dimensional trajectory of such an

600

00:24:51,590 --> 00:24:48,720

object and then figure out whether it

601  
00:24:53,810 --> 00:24:51,600  
has any propulsion and moreover the web

602  
00:24:55,909 --> 00:24:53,820  
telescope could measure the infrared

603  
00:24:59,630 --> 00:24:55,919  
emission from the heat emitted by the

604  
00:25:02,450 --> 00:24:59,640  
object and from that infer it's an area

605  
00:25:04,909 --> 00:25:02,460  
and it's Albedo in terms of reflecting

606  
00:25:07,430 --> 00:25:04,919  
sunlight a lot of properties that were

607  
00:25:09,230 --> 00:25:07,440  
difficult to infer from Momoa so we have

608  
00:25:11,270 --> 00:25:09,240  
the web telescope we have the Vera Rubin

609  
00:25:13,190 --> 00:25:11,280  
Observatory that that's fantastic for

610  
00:25:15,830 --> 00:25:13,200  
the next objects to be found

611  
00:25:17,810 --> 00:25:15,840  
and then the second path of research for

612  
00:25:20,029 --> 00:25:17,820  
the Galileo project is looking for

613  
00:25:22,310 --> 00:25:20,039

unidentified aerial phenomena that the

614

00:25:23,690 --> 00:25:22,320

US government talks about and there is

615

00:25:27,590 --> 00:25:23,700

obviously a new office in government

616

00:25:30,710 --> 00:25:27,600

that normally resolution all domain in

617

00:25:33,409 --> 00:25:30,720

all domain office Aero it's called and

618

00:25:37,130 --> 00:25:33,419

what it's doing right now is looking at

619

00:25:38,870 --> 00:25:37,140

the 650 or so events that were reported

620

00:25:41,510 --> 00:25:38,880

by military personnel intelligence

621

00:25:44,210 --> 00:25:41,520

agencies and trying to figure out what

622

00:25:47,570 --> 00:25:44,220

these objects were and you know looking

623

00:25:49,610 --> 00:25:47,580

at past reports that were anecdotal is

624

00:25:52,730 --> 00:25:49,620

obviously something to do but the

625

00:25:54,649 --> 00:25:52,740

frustrating aspect of that is if you see

626  
00:25:57,350 --> 00:25:54,659  
something interesting you can't go back

627  
00:26:00,289 --> 00:25:57,360  
in time and say I need more data on this

628  
00:26:02,810 --> 00:26:00,299  
thing and in order to figure it out you

629  
00:26:05,810 --> 00:26:02,820  
can't do that and so what the Galileo

630  
00:26:07,370 --> 00:26:05,820  
project is saying well first you know

631  
00:26:10,070 --> 00:26:07,380  
most of the interesting data in

632  
00:26:12,169 --> 00:26:10,080  
government is classified in the past

633  
00:26:14,029 --> 00:26:12,179  
people try to press the government to

634  
00:26:16,370 --> 00:26:14,039  
release such data and that's to me a

635  
00:26:19,010 --> 00:26:16,380  
waste of time because the data was

636  
00:26:21,350 --> 00:26:19,020  
collected by classified sensors but the

637  
00:26:23,090 --> 00:26:21,360  
good news is the sky is not classified

638  
00:26:25,610 --> 00:26:23,100

so we can look at the sky that's what

639

00:26:26,810 --> 00:26:25,620

astronomers do for a living and that's

640

00:26:29,149 --> 00:26:26,820

what we are doing with the Galileo

641

00:26:31,789 --> 00:26:29,159

project we built a new Observatory at

642

00:26:35,630 --> 00:26:31,799

Harvard University that is functioning

643

00:26:38,330 --> 00:26:35,640

right now and collecting data 24 7 in

644

00:26:41,390 --> 00:26:38,340

the infrared Optical radio and audio

645

00:26:44,210 --> 00:26:41,400

and we are analyzing it the data with

646

00:26:45,950 --> 00:26:44,220

artificial intelligence software and I

647

00:26:49,130 --> 00:26:45,960

should say that within a few months or

648

00:26:51,350 --> 00:26:49,140

maybe a year we'll have much more data

649

00:26:53,870 --> 00:26:51,360

than was ever collected by all the

650

00:26:55,730 --> 00:26:53,880

reports in history because we are doing

651  
00:26:58,430 --> 00:26:55,740  
it routinely we are doing it with

652  
00:27:00,049 --> 00:26:58,440  
instruments that we fully understand and

653  
00:27:02,630 --> 00:27:00,059  
what you see in the past is people

654  
00:27:06,049 --> 00:27:02,640  
arguing with each other about

655  
00:27:09,169 --> 00:27:06,059  
interpretation of poor data uh you know

656  
00:27:11,510 --> 00:27:09,179  
fuzzy images blurry images people were

657  
00:27:15,470 --> 00:27:11,520  
expressing their views they were either

658  
00:27:17,330 --> 00:27:15,480  
Skeptics or Believers and the Skeptics

659  
00:27:19,310 --> 00:27:17,340  
would argue with the Believers forever

660  
00:27:21,890 --> 00:27:19,320  
and would say bad things about each

661  
00:27:23,570 --> 00:27:21,900  
other just like we see in politics you

662  
00:27:25,970 --> 00:27:23,580  
know you have the two extremes fighting

663  
00:27:28,610 --> 00:27:25,980

with each other the problem the point is

664

00:27:30,950 --> 00:27:28,620

that in science if you collect good

665

00:27:33,529 --> 00:27:30,960

enough evidence then everyone would

666

00:27:36,289 --> 00:27:33,539

agree on what it means

667

00:27:38,570 --> 00:27:36,299

so instead of arguing and instead of

668

00:27:39,890 --> 00:27:38,580

believing or not believing something I

669

00:27:41,870 --> 00:27:39,900

mean it's not religion what we're

670

00:27:43,490 --> 00:27:41,880

talking about we can look at these

671

00:27:45,529 --> 00:27:43,500

objects and collect much better data

672

00:27:46,970 --> 00:27:45,539

with state-of-the-art instruments and

673

00:27:49,549 --> 00:27:46,980

that's what the gorilla project is doing

674

00:27:50,990 --> 00:27:49,559

we are already doing it and then in the

675

00:27:53,390 --> 00:27:51,000

coming months we're planning to build

676

00:27:56,210 --> 00:27:53,400

more copies of our observatory in at

677

00:27:58,610 --> 00:27:56,220

Harvard and the number of copies that we

678

00:28:01,190 --> 00:27:58,620

make will depend on how much funding We

679

00:28:03,830 --> 00:28:01,200

have basically we need tens of millions

680

00:28:06,649 --> 00:28:03,840

of dollars in order to have tens of

681

00:28:08,870 --> 00:28:06,659

observatories spread throughout the

682

00:28:11,390 --> 00:28:08,880

United States and collecting enough data

683

00:28:13,730 --> 00:28:11,400

within a year that would allow us to get

684

00:28:15,890 --> 00:28:13,740

to the bottom of this puzzle and we

685

00:28:20,390 --> 00:28:15,900

could tell whether we are looking at a

686

00:28:23,690 --> 00:28:20,400

balloon an airplane a bird or maybe

687

00:28:26,149 --> 00:28:23,700

something extraterrestrial amazing in

688

00:28:28,430 --> 00:28:26,159

the process of collecting that data if

689

00:28:30,409 --> 00:28:28,440

your work LED you to believe that the

690

00:28:31,490 --> 00:28:30,419

UAP data that you were looking at if it

691

00:28:34,190 --> 00:28:31,500

led you to believe that it was

692

00:28:36,169 --> 00:28:34,200

potentially of another origin that was

693

00:28:38,630 --> 00:28:36,179

not extraterrestrial like hypothetically

694

00:28:39,769 --> 00:28:38,640

uh foreign Nation or a breakaway

695

00:28:42,169 --> 00:28:39,779

civilization or one of the many

696

00:28:43,970 --> 00:28:42,179

hypotheses that's out there is that

697

00:28:45,890 --> 00:28:43,980

something that the Galileo project would

698

00:28:47,269 --> 00:28:45,900

pursue or are you strictly looking for

699

00:28:49,669 --> 00:28:47,279

evidence of extraterrestrial

700

00:28:52,490 --> 00:28:49,679

technological civilization

701  
00:28:55,549 --> 00:28:52,500  
so anything that is human made as far as

702  
00:28:57,470 --> 00:28:55,559  
I'm concerned is boring and perhaps to

703  
00:29:00,230 --> 00:28:57,480  
share that the data with the government

704  
00:29:02,210 --> 00:29:00,240  
without even looking at it anything that

705  
00:29:03,710 --> 00:29:02,220  
looks like a bird I know of some

706  
00:29:05,870 --> 00:29:03,720  
zoologist that would be extremely

707  
00:29:09,110 --> 00:29:05,880  
interesting it's again boring for me

708  
00:29:11,570 --> 00:29:09,120  
so we will obviously see anything in the

709  
00:29:13,370 --> 00:29:11,580  
sky but I would like to see if there is

710  
00:29:14,930 --> 00:29:13,380  
even if there is one object from

711  
00:29:17,269 --> 00:29:14,940  
extraterrestrial origin that will be

712  
00:29:20,029 --> 00:29:17,279  
fascinating and obviously extremely

713  
00:29:22,250 --> 00:29:20,039

exciting we don't need most of the I

714

00:29:24,590 --> 00:29:22,260

mean it's obviously a mixed bag one

715

00:29:27,169 --> 00:29:24,600

thing to keep in mind is the reports on

716

00:29:28,970 --> 00:29:27,179

unidentified objects correlate with

717

00:29:30,909 --> 00:29:28,980

population density if you do the

718

00:29:34,250 --> 00:29:30,919

statistics you see that very clearly

719

00:29:36,110 --> 00:29:34,260

There Are Places on the globe where more

720

00:29:38,990 --> 00:29:36,120

people are monitoring the sky are the

721

00:29:40,549 --> 00:29:39,000

places where you hear more reports and

722

00:29:42,610 --> 00:29:40,559

that means that they are everywhere

723

00:29:44,630 --> 00:29:42,620

because otherwise you won't just get a

724

00:29:45,950 --> 00:29:44,640

one-to-one correlation with population

725

00:29:48,649 --> 00:29:45,960

density

726

00:29:52,070 --> 00:29:48,659

so it's clear that you know one thing

727

00:29:54,950 --> 00:29:52,080

that is everywhere is balloons balloons

728

00:29:57,350 --> 00:29:54,960

are everywhere either for meteorological

729

00:29:59,330 --> 00:29:57,360

purposes or just before because of I

730

00:30:02,149 --> 00:29:59,340

don't know perhaps parties or the

731

00:30:04,310 --> 00:30:02,159

government using balloons or at any

732

00:30:06,769 --> 00:30:04,320

event balloons are everywhere they make

733

00:30:08,450 --> 00:30:06,779

up at least half of the objects that

734

00:30:10,370 --> 00:30:08,460

were mentioned in the Director of

735

00:30:12,470 --> 00:30:10,380

National Intelligence report and

736

00:30:15,289 --> 00:30:12,480

obviously the US government shut the

737

00:30:17,090 --> 00:30:15,299

four of them down a few months ago so

738

00:30:19,610 --> 00:30:17,100

there are balloons in the sky and

739

00:30:22,430 --> 00:30:19,620

obviously there would be also drones and

740

00:30:24,409 --> 00:30:22,440

airplanes and birds and so the only

741

00:30:26,750 --> 00:30:24,419

question as far as I'm concerned is

742

00:30:29,810 --> 00:30:26,760

whether there is anything else I'm sure

743

00:30:32,330 --> 00:30:29,820

it's a mixed bag I'm sure the data is

744

00:30:34,130 --> 00:30:32,340

very poor but from the point of view of

745

00:30:37,669 --> 00:30:34,140

a scientist the fundamental question is

746

00:30:39,409 --> 00:30:37,679

there one object or more that is of

747

00:30:42,590 --> 00:30:39,419

extraterrestrial origin so we just want

748

00:30:44,330 --> 00:30:42,600

to find that one or more and of course

749

00:30:45,529 --> 00:30:44,340

the government needs to figure out most

750

00:30:48,230 --> 00:30:45,539

of them because they are National

751  
00:30:49,549 --> 00:30:48,240  
Security do threat absolutely now that

752  
00:30:52,190 --> 00:30:49,559  
makes a lot of sense

753  
00:30:54,110 --> 00:30:52,200  
so you recently co-authored a paper with

754  
00:30:56,090 --> 00:30:54,120  
Sean Kirkpatrick director of air out

755  
00:30:57,950 --> 00:30:56,100  
that was picked up by the media and as

756  
00:31:00,169 --> 00:30:57,960  
so often happens they ran with the most

757  
00:31:01,850 --> 00:31:00,179  
Sensational possible headline which was

758  
00:31:03,649 --> 00:31:01,860  
something along the lines of Harvard

759  
00:31:05,570 --> 00:31:03,659  
astrophysicist says that there could be

760  
00:31:08,029 --> 00:31:05,580  
a Mothership hiding in our solar system

761  
00:31:09,830 --> 00:31:08,039  
now having read the paper it was clear

762  
00:31:11,810 --> 00:31:09,840  
to me that while you were presenting

763  
00:31:13,549 --> 00:31:11,820

that as a possibility the argument that

764

00:31:15,529 --> 00:31:13,559

you were making was much more nuanced

765

00:31:17,090 --> 00:31:15,539

than that can you talk a little bit

766

00:31:19,430 --> 00:31:17,100

about what your attention was with that

767

00:31:22,610 --> 00:31:19,440

paper and what you were trying to convey

768

00:31:24,590 --> 00:31:22,620

Yeah so basically Sean wrote to me that

769

00:31:26,930 --> 00:31:24,600

he's visiting the area and asked to

770

00:31:29,330 --> 00:31:26,940

visit my home and I should say that

771

00:31:32,090 --> 00:31:29,340

since the pandemic started my book

772

00:31:34,250 --> 00:31:32,100

appeared in January 2021 called the

773

00:31:37,549 --> 00:31:34,260

Extraterrestrial it had it was

774

00:31:40,909 --> 00:31:37,559

translated to 25 languages 28 editions

775

00:31:43,310 --> 00:31:40,919

and I had about 2500 interviews since

776

00:31:46,010 --> 00:31:43,320

then over the past couple of years just

777

00:31:49,130 --> 00:31:46,020

last week I had the 20 requests from

778

00:31:51,529 --> 00:31:49,140

filmmakers and documentary producers to

779

00:31:53,570 --> 00:31:51,539

document my research I had also a

780

00:31:56,870 --> 00:31:53,580

playwright who wrote to me a couple of

781

00:31:58,610 --> 00:31:56,880

weeks ago with the title available on

782

00:32:03,169 --> 00:31:58,620

Broadway that was the title of his email

783

00:32:05,630 --> 00:32:03,179

and already writing a play that he hopes

784

00:32:07,669 --> 00:32:05,640

to get on Broadway and so there is a lot

785

00:32:10,190 --> 00:32:07,679

of there are lots of things happening

786

00:32:13,190 --> 00:32:10,200

and among those visitors of course were

787

00:32:15,710 --> 00:32:13,200

the ones that donated funds to the that

788

00:32:18,110 --> 00:32:15,720

established the girl project but also

789

00:32:20,269 --> 00:32:18,120

the expedition that was funded at one

790

00:32:23,149 --> 00:32:20,279

and a half million dollars and so I'm

791

00:32:25,010 --> 00:32:23,159

used to people coming to my home and

792

00:32:28,430 --> 00:32:25,020

then so when he asked I said of course

793

00:32:29,330 --> 00:32:28,440

and then during his visit he mentioned

794

00:32:34,310 --> 00:32:29,340

that

795

00:32:36,950 --> 00:32:34,320

uses what we know about physics and puts

796

00:32:39,769 --> 00:32:36,960

constraints on unidentified area

797

00:32:42,590 --> 00:32:39,779

phenomena where we might not have the

798

00:32:45,169 --> 00:32:42,600

full data on obviously when you have

799

00:32:47,029 --> 00:32:45,179

anecdotal reports from the past the data

800

00:32:50,269 --> 00:32:47,039

is incomplete nobody expected those

801  
00:32:52,669 --> 00:32:50,279  
objects so we wrote the paper and in the

802  
00:32:55,070 --> 00:32:52,679  
introduction I mentioned the the

803  
00:32:58,070 --> 00:32:55,080  
possibility of a Mothership that

804  
00:33:00,649 --> 00:32:58,080  
releases probes and that was inspired by

805  
00:33:04,070 --> 00:33:00,659  
the appearance of omuamua and the second

806  
00:33:07,130 --> 00:33:04,080  
Interstellar meteorite checked their

807  
00:33:09,470 --> 00:33:07,140  
parameters and realized that they had

808  
00:33:12,529 --> 00:33:09,480  
the same distance of closest approach to

809  
00:33:16,130 --> 00:33:12,539  
the sun they were separated by seven

810  
00:33:19,549 --> 00:33:16,140  
months and they also had the same speed

811  
00:33:22,430 --> 00:33:19,559  
far away from the Sun and that led me to

812  
00:33:25,130 --> 00:33:22,440  
consider the possibility that maybe the

813  
00:33:27,649 --> 00:33:25,140

meteor was a small probe roughly a meter

814

00:33:30,049 --> 00:33:27,659

in size that was released from a

815

00:33:33,110 --> 00:33:30,059

Mothership or muamua that was

816

00:33:34,909 --> 00:33:33,120

200 times bigger but then I checked and

817

00:33:37,070 --> 00:33:34,919

it turns out that they didn't originate

818

00:33:39,049 --> 00:33:37,080

from the same direction in the sky so

819

00:33:40,669 --> 00:33:39,059

they couldn't have been related but

820

00:33:42,950 --> 00:33:40,679

nevertheless in the introduction we

821

00:33:45,049 --> 00:33:42,960

mentioned that possibility because it

822

00:33:48,169 --> 00:33:45,059

makes a lot of sense to release small

823

00:33:50,269 --> 00:33:48,179

probes if you wanted to visit the

824

00:33:52,370 --> 00:33:50,279

planets in the habitable zone that

825

00:33:54,710 --> 00:33:52,380

allows you to go to many places not just

826

00:33:57,529 --> 00:33:54,720

one with a big spacecraft

827

00:33:59,389 --> 00:33:57,539

and that led to a lot of speculation by

828

00:34:01,970 --> 00:33:59,399

people but it was just a matter of

829

00:34:04,130 --> 00:34:01,980

thinking about one possibility and the

830

00:34:06,529 --> 00:34:04,140

other thing is we know that some of the

831

00:34:09,649 --> 00:34:06,539

reports involved objects that went from

832

00:34:12,889 --> 00:34:09,659

air to water and you can imagine water

833

00:34:15,710 --> 00:34:12,899

being fueled for Interstellar spacecraft

834

00:34:18,950 --> 00:34:15,720

in fact I wrote about it in a recent

835

00:34:21,829 --> 00:34:18,960

essay that I posted on medium.com just a

836

00:34:24,649 --> 00:34:21,839

couple of days ago how water can be used

837

00:34:27,829 --> 00:34:24,659

as a rocket fuel and it could be useful

838

00:34:30,950 --> 00:34:27,839

for us when we go to Mars or the moon

839

00:34:33,290 --> 00:34:30,960

when we build sustainable human bases

840

00:34:36,349 --> 00:34:33,300

there so we need to keep that in mind

841

00:34:38,750 --> 00:34:36,359

because that could be a motivation for a

842

00:34:41,629 --> 00:34:38,760

probe to arrive to the habitable zone of

843

00:34:44,869 --> 00:34:41,639

around Stars where there is liquid water

844

00:34:46,430 --> 00:34:44,879

that can serve as fuel at any event we

845

00:34:50,450 --> 00:34:46,440

just talked about General constraints

846

00:34:53,690 --> 00:34:50,460

that we can put on unidentified objects

847

00:34:56,930 --> 00:34:53,700

in the Earth's atmosphere and water and

848

00:34:58,730 --> 00:34:56,940

among them was the fact that if you

849

00:35:00,710 --> 00:34:58,740

don't know the distance to an object and

850

00:35:04,070 --> 00:35:00,720

you see the object moving fast across

851  
00:35:07,070 --> 00:35:04,080  
the sky you can tell based on physics as

852  
00:35:09,050 --> 00:35:07,080  
we know it that it must be closer to us

853  
00:35:11,870 --> 00:35:09,060  
than some distance because if it's very

854  
00:35:14,150 --> 00:35:11,880  
far it needs to move really fast in

855  
00:35:16,310 --> 00:35:14,160  
order to cross the sky and that would

856  
00:35:17,750 --> 00:35:16,320  
create a fireball as a result of the

857  
00:35:21,290 --> 00:35:17,760  
interaction with air

858  
00:35:23,390 --> 00:35:21,300  
the way we see it in meteors or in you

859  
00:35:24,710 --> 00:35:23,400  
know very very fast moving objects

860  
00:35:26,990 --> 00:35:24,720  
anywhere

861  
00:35:29,089 --> 00:35:27,000  
so that was this paper

862  
00:35:31,430 --> 00:35:29,099  
ah thank you so much that's a fantastic

863  
00:35:33,890 --> 00:35:31,440

explanation so as you might imagine

864

00:35:36,230 --> 00:35:33,900

given the recent Senate hearings in your

865

00:35:37,550 --> 00:35:36,240

work with shocker Patrick one of the

866

00:35:39,170 --> 00:35:37,560

most common questions that I got from

867

00:35:41,270 --> 00:35:39,180

people had to do with your thoughts on

868

00:35:43,130 --> 00:35:41,280

the hearings I know that you can't speak

869

00:35:45,170 --> 00:35:43,140

on his behalf but what do you make of

870

00:35:47,990 --> 00:35:45,180

the fact that Kirkpatrick said quote

871

00:35:49,790 --> 00:35:48,000

Aero has found no credible evidence thus

872

00:35:52,010 --> 00:35:49,800

far of extraterrestrial activity

873

00:35:54,470 --> 00:35:52,020

off-world technology or objects that

874

00:35:56,750 --> 00:35:54,480

defy the known laws of physics despite

875

00:35:58,370 --> 00:35:56,760

the lack of a Smoking Gun is it your

876

00:36:00,589 --> 00:35:58,380

impression that the government regards

877

00:36:02,390 --> 00:36:00,599

the Extraterrestrial hypothesis as a

878

00:36:04,010 --> 00:36:02,400

legitimate potential explanation for the

879

00:36:06,530 --> 00:36:04,020

UFO phenomenon

880

00:36:08,569 --> 00:36:06,540

yeah I think the government has objects

881

00:36:11,990 --> 00:36:08,579

that they cannot identify it's because

882

00:36:16,250 --> 00:36:12,000

the data is incomplete and in fact I was

883

00:36:18,170 --> 00:36:16,260

in November 2021 I attended the Forum at

884

00:36:19,970 --> 00:36:18,180

the Washington National Cathedral with

885

00:36:22,490 --> 00:36:19,980

Avril Haynes the Director of National

886

00:36:25,730 --> 00:36:22,500

Intelligence and Jeff Bezos the founder

887

00:36:28,069 --> 00:36:25,740

of blue Origins and in the green room I

888

00:36:29,690 --> 00:36:28,079

approached Avril Haynes and I said you

889

00:36:32,030 --> 00:36:29,700

just delivered six months ago you

890

00:36:35,030 --> 00:36:32,040

delivered the report to the US Congress

891

00:36:37,970 --> 00:36:35,040

about UAP is what do you think they are

892

00:36:39,890 --> 00:36:37,980

and I asked her because she was trained

893

00:36:42,410 --> 00:36:39,900

as a physicist for a bachelor's degree

894

00:36:44,210 --> 00:36:42,420

at the University of Chicago and she

895

00:36:46,430 --> 00:36:44,220

said I don't know

896

00:36:50,150 --> 00:36:46,440

and I believe her you know I don't think

897

00:36:52,849 --> 00:36:50,160

that I don't think the government uh has

898

00:36:54,829 --> 00:36:52,859

any conspiracies about this subject I

899

00:36:57,589 --> 00:36:54,839

just think they have data that is

900

00:36:59,450 --> 00:36:57,599

inconclusive and they see things that

901  
00:37:02,089 --> 00:36:59,460  
are behaving in ways that they didn't

902  
00:37:04,310 --> 00:37:02,099  
expect and they cannot easily put them

903  
00:37:06,829 --> 00:37:04,320  
into a category into a pin of something

904  
00:37:10,250 --> 00:37:06,839  
that they are familiar with either U.S

905  
00:37:12,410 --> 00:37:10,260  
technological objects or adversaries

906  
00:37:15,530 --> 00:37:12,420  
because we pretty much know what the

907  
00:37:17,450 --> 00:37:15,540  
technologies that humans make are so

908  
00:37:19,310 --> 00:37:17,460  
they don't know what they are okay so

909  
00:37:21,170 --> 00:37:19,320  
and the government is not a scientific

910  
00:37:23,510 --> 00:37:21,180  
organization they are mostly focused on

911  
00:37:25,790 --> 00:37:23,520  
National Security concerns so the

912  
00:37:26,930 --> 00:37:25,800  
easiest thing for them to say is forget

913  
00:37:29,089 --> 00:37:26,940

about it

914

00:37:31,370 --> 00:37:29,099

and that was the way it was it happened

915

00:37:34,069 --> 00:37:31,380

in decade over the past few decades

916

00:37:36,170 --> 00:37:34,079

where they would just ignore things that

917

00:37:38,270 --> 00:37:36,180

are not clearly a national security

918

00:37:40,370 --> 00:37:38,280

concern they would say we don't know

919

00:37:43,370 --> 00:37:40,380

what it is forget about it

920

00:37:44,870 --> 00:37:43,380

and now they want to figure it out I

921

00:37:48,829 --> 00:37:44,880

guess as a result of the Congress

922

00:37:51,170 --> 00:37:48,839

pressing on them and so they examine all

923

00:37:53,210 --> 00:37:51,180

these past reports more carefully more

924

00:37:56,510 --> 00:37:53,220

methodically that's what Sean talked

925

00:37:59,329 --> 00:37:56,520

about having two teams within Aero one

926

00:38:01,569 --> 00:37:59,339

of the intelligence experts the other

927

00:38:05,750 --> 00:38:01,579

one of scientists and Engineers that are

928

00:38:10,069 --> 00:38:05,760

expressing their ideas about what the

929

00:38:11,390 --> 00:38:10,079

data on particular cases of UAP what

930

00:38:13,550 --> 00:38:11,400

does it mean I mean what is the

931

00:38:16,190 --> 00:38:13,560

inference and then he Compares those

932

00:38:18,470 --> 00:38:16,200

inferences from the two teams and vets

933

00:38:20,030 --> 00:38:18,480

what is what sounds the most likely

934

00:38:22,310 --> 00:38:20,040

thing the problem with this approach as

935

00:38:24,170 --> 00:38:22,320

I said before is if you have limited

936

00:38:26,270 --> 00:38:24,180

data it wouldn't help much the experts

937

00:38:28,190 --> 00:38:26,280

can say whatever they want but you just

938

00:38:30,589 --> 00:38:28,200

don't have the tools to figure out what

939

00:38:33,530 --> 00:38:30,599

the object was because the data is

940

00:38:35,470 --> 00:38:33,540

limited and so they probably are doing

941

00:38:37,430 --> 00:38:35,480

the best they can and they do see

942

00:38:41,690 --> 00:38:37,440

objects that might be of National

943

00:38:43,609 --> 00:38:41,700

Security interest or mundane objects

944

00:38:46,130 --> 00:38:43,619

like balloons they probably see some of

945

00:38:47,569 --> 00:38:46,140

those and the rest that are the most

946

00:38:48,589 --> 00:38:47,579

interesting ones they don't know what

947

00:38:51,230 --> 00:38:48,599

they are

948

00:38:53,930 --> 00:38:51,240

so I think it would bring them to the

949

00:38:57,290 --> 00:38:53,940

same point that the Galileo project is

950

00:39:00,290 --> 00:38:57,300

already at which is to say okay in order

951  
00:39:03,410 --> 00:39:00,300  
to figure out what we have in the sky we

952  
00:39:05,750 --> 00:39:03,420  
better use equipment that is state of

953  
00:39:08,329 --> 00:39:05,760  
the art that we have full control over

954  
00:39:12,230 --> 00:39:08,339  
that we fully understand that we fully

955  
00:39:14,089 --> 00:39:12,240  
calibrate and do a systematic search for

956  
00:39:16,310 --> 00:39:14,099  
objects in the sky instead of just

957  
00:39:18,710 --> 00:39:16,320  
anecdotically you know seeing something

958  
00:39:20,870 --> 00:39:18,720  
unexpected not really planning for it

959  
00:39:23,750 --> 00:39:20,880  
having limited data because it was

960  
00:39:25,430 --> 00:39:23,760  
gathered by pilots in the cockpit of a

961  
00:39:28,370 --> 00:39:25,440  
fighter jet like that's not the best

962  
00:39:30,349 --> 00:39:28,380  
experiment to imagine pilots in the like

963  
00:39:32,510 --> 00:39:30,359

or eyewitness testimonies how do you

964

00:39:34,490 --> 00:39:32,520

know what people saw I mean when people

965

00:39:36,470 --> 00:39:34,500

report about car accidents they give

966

00:39:38,329 --> 00:39:36,480

very different reports even though they

967

00:39:41,270 --> 00:39:38,339

saw the same event when people report

968

00:39:42,770 --> 00:39:41,280

about offside in a soccer match they say

969

00:39:46,069 --> 00:39:42,780

very different things depending on which

970

00:39:48,109 --> 00:39:46,079

team they like and so we don't want

971

00:39:50,210 --> 00:39:48,119

to rely on on people we want to learn

972

00:39:51,890 --> 00:39:50,220

instruments so we have those instruments

973

00:39:54,230 --> 00:39:51,900

and it's not so expensive you know why

974

00:39:56,150 --> 00:39:54,240

and I just don't understand the approach

975

00:39:57,890 --> 00:39:56,160

that was taken in the past by people

976

00:39:59,630 --> 00:39:57,900

that were intrigued by these reports

977

00:40:01,010 --> 00:39:59,640

they were just saying either arguing

978

00:40:03,589 --> 00:40:01,020

that they know the answer even though

979

00:40:05,630 --> 00:40:03,599

the data doesn't look very convincing or

980

00:40:07,609 --> 00:40:05,640

they would dismiss it put the stigma on

981

00:40:10,010 --> 00:40:07,619

it and not even Explore it and that

982

00:40:11,990 --> 00:40:10,020

would believe the subject in the state

983

00:40:14,150 --> 00:40:12,000

that we find it today where we don't

984

00:40:15,950 --> 00:40:14,160

really know what these things are and

985

00:40:18,470 --> 00:40:15,960

then there are lots of speculations by

986

00:40:20,690 --> 00:40:18,480

believers who do not have the scientific

987

00:40:22,670 --> 00:40:20,700

expertise to infer what these objects

988

00:40:24,470 --> 00:40:22,680

are they just believe in it you know you

989

00:40:26,450 --> 00:40:24,480

can believe in anything you want you can

990

00:40:28,730 --> 00:40:26,460

believe that you are Napoleon

991

00:40:30,589 --> 00:40:28,740

I don't care you can insist that you are

992

00:40:32,870 --> 00:40:30,599

Napoleon you can even say I have an ID

993

00:40:35,450 --> 00:40:32,880

that shows the time but Napoleon is dead

994

00:40:37,310 --> 00:40:35,460

that I know so that would not hold water

995

00:40:38,930 --> 00:40:37,320

but you can say anything you want on

996

00:40:40,910 --> 00:40:38,940

objects that were observed in the past

997

00:40:42,290 --> 00:40:40,920

decades ago that for which we don't have

998

00:40:44,690 --> 00:40:42,300

enough evidence and you can argue

999

00:40:47,210 --> 00:40:44,700

forever about them my point is that this

1000

00:40:51,230 --> 00:40:47,220

is not a good way to spend your lives

1001  
00:40:53,930 --> 00:40:51,240  
a much better way in your energy is to

1002  
00:40:56,030 --> 00:40:53,940  
approach it like a kid basically say I

1003  
00:40:58,370 --> 00:40:56,040  
want to figure it out I want to get more

1004  
00:41:01,370 --> 00:40:58,380  
data I want to get to these objects and

1005  
00:41:03,470 --> 00:41:01,380  
collect better data than I hear about so

1006  
00:41:05,329 --> 00:41:03,480  
far that's the approach of a kid doesn't

1007  
00:41:08,210 --> 00:41:05,339  
pretend to know more than we actually

1008  
00:41:10,370 --> 00:41:08,220  
know and just goes ahead and collects

1009  
00:41:11,810 --> 00:41:10,380  
the information and that's the way the

1010  
00:41:14,270 --> 00:41:11,820  
Galileo project is approaching it

1011  
00:41:16,130 --> 00:41:14,280  
without prejudice and whatever we find

1012  
00:41:18,770 --> 00:41:16,140  
will be reported if it turns out that

1013  
00:41:20,450 --> 00:41:18,780

all of these objects are balloons so be

1014

00:41:23,150 --> 00:41:20,460

it I think it will bring the subject to

1015

00:41:25,190 --> 00:41:23,160

rest and we wouldn't need to argue waste

1016

00:41:26,870 --> 00:41:25,200

time on it but on the other hand there

1017

00:41:29,569 --> 00:41:26,880

may be something else

1018

00:41:31,130 --> 00:41:29,579

that makes a lot of sense so one of the

1019

00:41:33,349 --> 00:41:31,140

most striking things about the hearings

1020

00:41:34,790 --> 00:41:33,359

was the fact that despite saying that

1021

00:41:36,470 --> 00:41:34,800

there is no credible evidence for

1022

00:41:38,210 --> 00:41:36,480

objects that defy the known laws of

1023

00:41:39,829 --> 00:41:38,220

physics Kirkpatrick showed the committee

1024

00:41:42,290 --> 00:41:39,839

a video of what appeared to be a

1025

00:41:43,970 --> 00:41:42,300

metallic spherical object with no means

1026  
00:41:46,370 --> 00:41:43,980  
of propulsion maneuvering through the

1027  
00:41:49,430 --> 00:41:46,380  
air so would your argument here be then

1028  
00:41:51,410 --> 00:41:49,440  
that this is the right approach because

1029  
00:41:54,770 --> 00:41:51,420  
they don't know conclusively what this

1030  
00:41:56,210 --> 00:41:54,780  
is and so to say that conclusively that

1031  
00:41:57,710 --> 00:41:56,220  
it's breaking the laws of physics would

1032  
00:42:00,890 --> 00:41:57,720  
just be overstepping without having

1033  
00:42:02,870 --> 00:42:00,900  
enough data yeah I think with respect to

1034  
00:42:05,270 --> 00:42:02,880  
the laws of physics the important point

1035  
00:42:06,829 --> 00:42:05,280  
to understand is in order to show that

1036  
00:42:09,109 --> 00:42:06,839  
something violates the laws of physics

1037  
00:42:11,150 --> 00:42:09,119  
which is definitely possible okay that's

1038  
00:42:12,589 --> 00:42:11,160

what motivates most physicists I mean

1039

00:42:15,190 --> 00:42:12,599

they want to win the Nobel Prize for

1040

00:42:18,050 --> 00:42:15,200

finding something new but the point is

1041

00:42:20,870 --> 00:42:18,060

you have to have Exquisite data and

1042

00:42:23,750 --> 00:42:20,880

that's hard work you can't just see blog

1043

00:42:25,310 --> 00:42:23,760

about it or have a podcast interviews

1044

00:42:28,190 --> 00:42:25,320

where you say I believe there is no

1045

00:42:29,750 --> 00:42:28,200

physics that is not good enough you need

1046

00:42:32,630 --> 00:42:29,760

to demonstrate that the conventional

1047

00:42:34,310 --> 00:42:32,640

explanations for what you see do not

1048

00:42:37,190 --> 00:42:34,320

explain it because you have such good

1049

00:42:39,650 --> 00:42:37,200

data you pinpoint you can tell that

1050

00:42:41,390 --> 00:42:39,660

distance to the object and therefore you

1051

00:42:44,270 --> 00:42:41,400

can infer the speed of the object and

1052

00:42:47,990 --> 00:42:44,280

you can show that it's doing things that

1053

00:42:49,849 --> 00:42:48,000

cannot be explained by known physics you

1054

00:42:52,910 --> 00:42:49,859

need to do that you need to go an extra

1055

00:42:55,550 --> 00:42:52,920

mile and collect Exquisite data that

1056

00:42:57,890 --> 00:42:55,560

nobody can dispute and only then you can

1057

00:42:59,690 --> 00:42:57,900

claim new physics and what many people

1058

00:43:02,510 --> 00:42:59,700

in the public do not understand they

1059

00:43:06,109 --> 00:43:02,520

think oh if we see a hole in the clouds

1060

00:43:07,910 --> 00:43:06,119

or it may be a wormhole it may be a path

1061

00:43:09,829 --> 00:43:07,920

through which you can exceed the speed

1062

00:43:12,050 --> 00:43:09,839

of light why not I see a hole in the

1063

00:43:13,609 --> 00:43:12,060

cloud of course it could be that but the

1064

00:43:16,010 --> 00:43:13,619

hole in the cloud is most likely a

1065

00:43:18,470 --> 00:43:16,020

meteorological phenomenon you know that

1066

00:43:20,450 --> 00:43:18,480

has to do with the way air flows in the

1067

00:43:22,730 --> 00:43:20,460

atmosphere has nothing to do with a

1068

00:43:24,650 --> 00:43:22,740

wormhole a wormhole we don't even know

1069

00:43:26,930 --> 00:43:24,660

that the Wormhole solution to Einstein's

1070

00:43:29,450 --> 00:43:26,940

equations is a valid one so talking

1071

00:43:30,950 --> 00:43:29,460

about new physics just because you see a

1072

00:43:32,990 --> 00:43:30,960

hole in the clouds it's completely

1073

00:43:35,750 --> 00:43:33,000

irresponsible

1074

00:43:37,910 --> 00:43:35,760

so obviously if you have good enough

1075

00:43:39,710 --> 00:43:37,920

data you can argue something is doing

1076

00:43:42,230 --> 00:43:39,720

things that cannot be explained by

1077

00:43:45,829 --> 00:43:42,240

non-physics but you have to do the work

1078

00:43:48,050 --> 00:43:45,839

it's very hard work and you can't just

1079

00:43:49,970 --> 00:43:48,060

sit back on your seat and say oh I think

1080

00:43:51,890 --> 00:43:49,980

it's this or that that is not the way

1081

00:43:53,930 --> 00:43:51,900

science is done that's not the way by

1082

00:43:56,150 --> 00:43:53,940

which we acquire new knowledge about new

1083

00:43:58,190 --> 00:43:56,160

physics and many people do not

1084

00:44:01,130 --> 00:43:58,200

understand that they think that if there

1085

00:44:04,010 --> 00:44:01,140

is blurry images there is data that is

1086

00:44:06,050 --> 00:44:04,020

incomplete that is poor enough then I

1087

00:44:08,510 --> 00:44:06,060

can speculate whatever I want about it

1088

00:44:10,849 --> 00:44:08,520

and that would be good enough for me no

1089

00:44:12,410 --> 00:44:10,859

that's not good enough what it should

1090

00:44:15,530 --> 00:44:12,420

motivate I mean it could be that there

1091

00:44:17,870 --> 00:44:15,540

is no physics but to figure it out you

1092

00:44:20,089 --> 00:44:17,880

have to collect better data so basically

1093

00:44:22,190 --> 00:44:20,099

what I'm trying to say is that I was

1094

00:44:24,470 --> 00:44:22,200

intrigued by omuamua by the first

1095

00:44:27,170 --> 00:44:24,480

industrial objects and the conclusion

1096

00:44:28,730 --> 00:44:27,180

from that was not to say for sure that I

1097

00:44:31,130 --> 00:44:28,740

know that they were in interstellar

1098

00:44:33,410 --> 00:44:31,140

technological artifacts but to say that

1099

00:44:35,990 --> 00:44:33,420

they were possibly those things things

1100

00:44:38,270 --> 00:44:36,000

and to figure them out I need to collect

1101  
00:44:40,609 --> 00:44:38,280  
more data while my colleagues in

1102  
00:44:43,490 --> 00:44:40,619  
Academia were behaving just like those

1103  
00:44:45,650 --> 00:44:43,500  
believers they were on the opposite end

1104  
00:44:47,329 --> 00:44:45,660  
and saying oh we don't need the

1105  
00:44:49,069 --> 00:44:47,339  
additional data these must be rocks

1106  
00:44:50,690 --> 00:44:49,079  
forget about it so they were saying

1107  
00:44:52,609 --> 00:44:50,700  
forget about it the people that are

1108  
00:44:54,410 --> 00:44:52,619  
believers say I know what they are

1109  
00:44:56,750 --> 00:44:54,420  
forget about it everyone says forget

1110  
00:44:58,970 --> 00:44:56,760  
about it nobody takes the data that's

1111  
00:45:01,550 --> 00:44:58,980  
the reason we are at the point where we

1112  
00:45:03,410 --> 00:45:01,560  
are where we don't really know what uaps

1113  
00:45:05,809 --> 00:45:03,420

are what these Interstellar objects are

1114

00:45:08,030 --> 00:45:05,819

and I'm saying the only way to make

1115

00:45:10,010 --> 00:45:08,040

progress in our knowledge is to collect

1116

00:45:12,349 --> 00:45:10,020

better data so I'm sufficiently

1117

00:45:13,730 --> 00:45:12,359

intrigued to do that because my

1118

00:45:16,730 --> 00:45:13,740

colleagues in Academia are not doing

1119

00:45:18,410 --> 00:45:16,740

that and the public who claims they know

1120

00:45:20,809 --> 00:45:18,420

you know those people who claim they

1121

00:45:22,790 --> 00:45:20,819

know something about new physics they

1122

00:45:25,609 --> 00:45:22,800

also don't do the work the hard work to

1123

00:45:27,230 --> 00:45:25,619

collect new data so these are all lazy

1124

00:45:28,910 --> 00:45:27,240

positions to take where you don't do

1125

00:45:31,250 --> 00:45:28,920

anything you just argue what you think

1126

00:45:32,930 --> 00:45:31,260

these things are just like in politics

1127

00:45:34,970 --> 00:45:32,940

you know you have the two extremes for

1128

00:45:37,250 --> 00:45:34,980

arise each of them is pushing the other

1129

00:45:38,569 --> 00:45:37,260

side and I say that's not the way to

1130

00:45:40,970 --> 00:45:38,579

make progress the way to make progress

1131

00:45:43,190 --> 00:45:40,980

is through the hard work of the Galileo

1132

00:45:45,650 --> 00:45:43,200

project building instruments that will

1133

00:45:47,630 --> 00:45:45,660

collect better data and bring us to the

1134

00:45:50,030 --> 00:45:47,640

truth I appreciate that

1135

00:45:53,150 --> 00:45:50,040

so a question that we got a lot from

1136

00:45:55,490 --> 00:45:53,160

people also was because of the paper

1137

00:45:57,170 --> 00:45:55,500

that you did with Sean Kirkpatrick and

1138

00:45:59,210 --> 00:45:57,180

some of the collaboration between the

1139

00:46:01,670 --> 00:45:59,220

Galileo project and arrow some people

1140

00:46:03,230 --> 00:46:01,680

have expressed concern that the Galileo

1141

00:46:05,569 --> 00:46:03,240

project might in some way get rolled

1142

00:46:08,450 --> 00:46:05,579

into arrow in a way that might then

1143

00:46:10,609 --> 00:46:08,460

subject you to a classification system

1144

00:46:12,530 --> 00:46:10,619

that would restrict you from independent

1145

00:46:13,970 --> 00:46:12,540

reporting to the public is that

1146

00:46:15,950 --> 00:46:13,980

something that people should be

1147

00:46:17,450 --> 00:46:15,960

concerned about or are there firewalls

1148

00:46:19,849 --> 00:46:17,460

in place to prevent that sort of thing

1149

00:46:22,670 --> 00:46:19,859

from happening this is an excellent

1150

00:46:26,030 --> 00:46:22,680

question and personally I don't want to

1151  
00:46:28,190 --> 00:46:26,040  
sign any NDA because it will restrict my

1152  
00:46:31,609 --> 00:46:28,200  
ability to function as a scientist to

1153  
00:46:34,190 --> 00:46:31,619  
basically obtain the new data even you

1154  
00:46:36,670 --> 00:46:34,200  
know if I see classify data even if I

1155  
00:46:39,109 --> 00:46:36,680  
happen to reproduce that data with

1156  
00:46:41,569 --> 00:46:39,119  
unclassified sensors with the Galileo

1157  
00:46:44,210 --> 00:46:41,579  
project that will always be this cloud

1158  
00:46:48,290 --> 00:46:44,220  
of the concern that the government May

1159  
00:46:50,510 --> 00:46:48,300  
argue that I reveal Secrets uh despite

1160  
00:46:52,370 --> 00:46:50,520  
the fact that it was connect you know

1161  
00:46:55,250 --> 00:46:52,380  
the same data was collected by

1162  
00:46:58,010 --> 00:46:55,260  
unclassified sensors and as a result I

1163  
00:47:00,410 --> 00:46:58,020

prefer not to look at any classified

1164

00:47:03,410 --> 00:47:00,420

data it's up to me you know we have free

1165

00:47:06,109 --> 00:47:03,420

will I don't want to sign on any

1166

00:47:08,750 --> 00:47:06,119

classified data and not to see anything

1167

00:47:10,609 --> 00:47:08,760

so that I can operate as a scientist

1168

00:47:14,809 --> 00:47:10,619

with open data the public will see

1169

00:47:18,050 --> 00:47:14,819

whatever we find and that is my take on

1170

00:47:20,030 --> 00:47:18,060

it and as a result you know Arrow will

1171

00:47:23,569 --> 00:47:20,040

not share with us any classified

1172

00:47:26,270 --> 00:47:23,579

information and I see the more it I mean

1173

00:47:28,130 --> 00:47:26,280

this kind of partnership with what the

1174

00:47:29,990 --> 00:47:28,140

government is doing more of an

1175

00:47:33,470 --> 00:47:30,000

intellectual partnership where they are

1176

00:47:35,809 --> 00:47:33,480

interested mostly in objects that might

1177

00:47:38,750 --> 00:47:35,819

be a national security threat okay and

1178

00:47:41,270 --> 00:47:38,760

we don't care about those at all and so

1179

00:47:43,490 --> 00:47:41,280

what we are looking for is knowledge

1180

00:47:45,050 --> 00:47:43,500

that can be shared with all humans

1181

00:47:46,910 --> 00:47:45,060

that's called scientific knowledge

1182

00:47:49,790 --> 00:47:46,920

science is all about sharing knowledge

1183

00:47:52,130 --> 00:47:49,800

sharing data the government is mostly

1184

00:47:54,290 --> 00:47:52,140

interested in National Security concerns

1185

00:47:56,150 --> 00:47:54,300

and that means that they want to learn

1186

00:47:58,609 --> 00:47:56,160

more about what other nations are

1187

00:48:00,470 --> 00:47:58,619

producing and and that's exactly the

1188

00:48:02,210 --> 00:48:00,480

opposite they want to it to be

1189

00:48:04,609 --> 00:48:02,220

classified and not open to the pub

1190

00:48:07,130 --> 00:48:04,619

public and so forth and so what I'm

1191

00:48:10,490 --> 00:48:07,140

saying is we are interested in different

1192

00:48:12,950 --> 00:48:10,500

parts of the pie of data and therefore

1193

00:48:16,010 --> 00:48:12,960

we can work in parallel I mean I don't

1194

00:48:17,990 --> 00:48:16,020

see any conflict but I don't want to eat

1195

00:48:20,750 --> 00:48:18,000

their piece of the pie because it will

1196

00:48:23,030 --> 00:48:20,760

in a way prevent me from operating as a

1197

00:48:25,010 --> 00:48:23,040

free scientist on the piece that is

1198

00:48:28,309 --> 00:48:25,020

supposed to be shared with the public so

1199

00:48:30,050 --> 00:48:28,319

no worries I'm we are not going to be

1200

00:48:32,390 --> 00:48:30,060

acquired by government

1201  
00:48:35,270 --> 00:48:32,400  
amazing to hear thank you and one final

1202  
00:48:37,309 --> 00:48:35,280  
question if the Galileo project did find

1203  
00:48:39,290 --> 00:48:37,319  
evidence of extraterrestrial technology

1204  
00:48:40,370 --> 00:48:39,300  
what is your next move is that something

1205  
00:48:41,990 --> 00:48:40,380  
that would be shared with the public

1206  
00:48:44,030 --> 00:48:42,000  
immediately people are very curious

1207  
00:48:46,010 --> 00:48:44,040  
about what that process looks like

1208  
00:48:49,430 --> 00:48:46,020  
yeah I just need to make sure that we

1209  
00:48:51,950 --> 00:48:49,440  
are not a crying wolf right so that we

1210  
00:48:54,230 --> 00:48:51,960  
the statement we make is reliable that's

1211  
00:48:56,809 --> 00:48:54,240  
all and as soon as we figure this out

1212  
00:48:58,430 --> 00:48:56,819  
then it may take days it may take weeks

1213  
00:49:00,710 --> 00:48:58,440

it may take a month I don't know how

1214

00:49:03,950 --> 00:49:00,720

long depending on what we find

1215

00:49:06,109 --> 00:49:03,960

you will hear from us as soon as we are

1216

00:49:07,790 --> 00:49:06,119

confident in what we are saying just to

1217

00:49:10,309 --> 00:49:07,800

make sure that we are not you know

1218

00:49:12,349 --> 00:49:10,319

misleading the public and that could

1219

00:49:14,809 --> 00:49:12,359

involve the Expedition it depends on

1220

00:49:16,609 --> 00:49:14,819

what we find out there and my main

1221

00:49:19,010 --> 00:49:16,619

concern is that we might not find

1222

00:49:22,430 --> 00:49:19,020

anything we'll come back empty-handed

1223

00:49:24,950 --> 00:49:22,440

and that's my nightmare scenario but if

1224

00:49:27,230 --> 00:49:24,960

we find something and we analyze it and

1225

00:49:29,089 --> 00:49:27,240

whatever we find will be known to the

1226

00:49:31,309 --> 00:49:29,099

public as soon as we are confident in

1227

00:49:33,290 --> 00:49:31,319

the results so just so that you know

1228

00:49:37,069 --> 00:49:33,300

with me what you see is what you get

1229

00:49:38,510 --> 00:49:37,079

that's who I am and when I served as the

1230

00:49:40,430 --> 00:49:38,520

chair of the astronomy department at

1231

00:49:43,970 --> 00:49:40,440

Harvard for nine years the longest

1232

00:49:46,130 --> 00:49:43,980

serving chair between 2011 2020 and on

1233

00:49:48,410 --> 00:49:46,140

the first few days when I started my

1234

00:49:50,390 --> 00:49:48,420

wife said that I will probably not last

1235

00:49:52,309 --> 00:49:50,400

very long because I'm straightforward

1236

00:49:54,950 --> 00:49:52,319

and people can see through me and I'm

1237

00:49:57,349 --> 00:49:54,960

transparent and she thought that the

1238

00:49:59,750 --> 00:49:57,359

politician needs to have some opacity

1239

00:50:02,630 --> 00:49:59,760

something so that allows the politician

1240

00:50:05,030 --> 00:50:02,640

to maneuver but I was always transparent

1241

00:50:07,130 --> 00:50:05,040

and it ended up being a great asset

1242

00:50:08,870 --> 00:50:07,140

because people around me always trusted

1243

00:50:10,490 --> 00:50:08,880

me and never suspected that I'm

1244

00:50:12,950 --> 00:50:10,500

misleading them I manipulate

1245

00:50:14,270 --> 00:50:12,960

manipulating them and I ended up being

1246

00:50:15,410 --> 00:50:14,280

the longest serving chair of the

1247

00:50:17,990 --> 00:50:15,420

astronomy Department because everyone

1248

00:50:20,270 --> 00:50:18,000

trusted me and knew what I was always

1249

00:50:23,030 --> 00:50:20,280

transparent about the goals and about

1250

00:50:25,609 --> 00:50:23,040

the way I operate so I apply now the

1251  
00:50:27,950 --> 00:50:25,619  
same approach in this context and what I

1252  
00:50:29,510 --> 00:50:27,960  
told you is what I am basically and

1253  
00:50:32,150 --> 00:50:29,520  
let's see whether we find anything

1254  
00:50:34,370 --> 00:50:32,160  
that'd be exciting and even if not at

1255  
00:50:37,130 --> 00:50:34,380  
least we tried you know that would be my

1256  
00:50:39,109 --> 00:50:37,140  
legacy trying and perhaps younger people

1257  
00:50:41,930 --> 00:50:39,119  
will find what I'm looking for if I

1258  
00:50:43,730 --> 00:50:41,940  
don't find it well Dr Lowe thank you so

1259  
00:50:44,809 --> 00:50:43,740  
much for your time today and thank you

1260  
00:50:46,190 --> 00:50:44,819  
so much for the work that you're doing

1261  
00:50:47,690 --> 00:50:46,200  
in this field it's been an absolute

1262  
00:50:49,910 --> 00:50:47,700  
honor speaking with you

1263  
00:50:51,589 --> 00:50:49,920

thanks for having me great pleasure and

1264

00:50:52,160 --> 00:50:51,599

I'll be glad to speak again if we find

1265

00:50:58,990 --> 00:50:52,170

something

1266

00:51:11,569 --> 00:50:59,000

[Music]