

FADE TO BLACK

with **JIMMY CHURCH**
PRESENTS

ISAAC ARTHUR
EXOPLANETS AND ET

WED APR 13 LIVE

7:00 PM PT/10:00PM ET



1
00:04:48,160 --> 00:01:23,109
you

2
00:05:02,310 --> 00:04:59,270
[Music]

3
00:05:05,189 --> 00:05:02,320
the smoke radio for the masses headline

4
00:05:06,950 --> 00:05:05,199
edition july 8 1947

5
00:05:09,430 --> 00:05:06,960
the army air force's has announced that

6
00:05:11,189 --> 00:05:09,440
a flying disc has been found and is now

7
00:05:13,909 --> 00:05:11,199
in the possession of the army

8
00:05:15,909 --> 00:05:13,919
if the game is rigged change the game

9
00:05:18,710 --> 00:05:15,919
game changer

10
00:05:21,110 --> 00:05:18,720
i occasionally think how quickly

11
00:05:22,390 --> 00:05:21,120
our differences worldwide

12
00:05:25,110 --> 00:05:22,400
would vanish

13
00:05:28,500 --> 00:05:25,120

if we were facing an alien threat from

14

00:05:34,070 --> 00:05:31,270

[Applause]

15

00:05:36,790 --> 00:05:34,080

this is fade to black with your host

16

00:05:40,390 --> 00:05:36,800

jimmy church on the game changer radio

17

00:05:45,630 --> 00:05:42,550

i need your help to get to the year

18

00:05:51,430 --> 00:05:49,430

[Music]

19

00:05:54,410 --> 00:05:51,440

you're listening to fade to black with

20

00:06:01,430 --> 00:05:54,420

jimmy church on the game changer network

21

00:06:10,230 --> 00:06:04,830

good evening fade to

22

00:06:13,670 --> 00:06:11,909

for

23

00:06:15,590 --> 00:06:13,680

the

24

00:06:17,189 --> 00:06:15,600

[Music]

25

00:06:19,189 --> 00:06:17,199

masses

26

00:06:20,469 --> 00:06:19,199

yeah man all right enough for the

27

00:06:31,150 --> 00:06:20,479

goofing off

28

00:06:37,350 --> 00:06:35,510

103 days into the new year only 262

29

00:06:38,950 --> 00:06:37,360

days left

30

00:06:41,230 --> 00:06:38,960

we are live from a bunker somewhere in

31

00:06:44,950 --> 00:06:41,240

the middle of nowhere a total

32

00:06:46,710 --> 00:06:44,960

undisclosed location but it is beautiful

33

00:06:49,510 --> 00:06:46,720

in here

34

00:06:51,670 --> 00:06:49,520

it is

35

00:06:53,189 --> 00:06:51,680

i would like to welcome everybody

36

00:06:57,029 --> 00:06:53,199

listening all around the world all

37

00:07:01,510 --> 00:06:59,189

hither and tether to and fro back and

38

00:07:03,350 --> 00:07:01,520

forth up and down east and west north

39

00:07:05,510 --> 00:07:03,360

and south

40

00:07:07,909 --> 00:07:05,520

far and near

41

00:07:11,589 --> 00:07:07,919

this is fade to black for kjcr the game

42

00:07:13,990 --> 00:07:11,599

changer and annex networks racehobbs

43

00:07:16,460 --> 00:07:14,000

i am your host jimmy church what is

44

00:07:19,749 --> 00:07:16,470

cracking everybody how you doing

45

00:07:23,430 --> 00:07:21,830

how you doing

46

00:07:26,309 --> 00:07:23,440

all right

47

00:07:28,550 --> 00:07:26,319

excited about tonight's show

48

00:07:31,270 --> 00:07:28,560

because we have very special guest isaac

49

00:07:33,670 --> 00:07:31,280

arthur

50

00:07:35,270 --> 00:07:33,680

man man man

51
00:07:36,150 --> 00:07:35,280
you know i say this about every guest

52
00:07:41,270 --> 00:07:36,160
but

53
00:07:42,309 --> 00:07:41,280
when i talk about isaac arthur being

54
00:07:43,670 --> 00:07:42,319
here

55
00:07:46,990 --> 00:07:43,680
it's it's

56
00:07:50,790 --> 00:07:47,000
it's just fantastically

57
00:07:52,869 --> 00:07:50,800
ginormously great for me

58
00:07:55,110 --> 00:07:52,879
and tonight

59
00:07:56,390 --> 00:07:55,120
i'm going to talk about exo polit actual

60
00:07:58,390 --> 00:07:56,400
politics

61
00:08:01,350 --> 00:07:58,400
exoplanets

62
00:08:03,909 --> 00:08:01,360
and e.t and some o muammua and other

63
00:08:06,869 --> 00:08:03,919

stuff because isaac is here

64

00:08:09,029 --> 00:08:06,879

and i love science i love physics i love

65

00:08:10,790 --> 00:08:09,039

the universe and everything that goes

66

00:08:15,510 --> 00:08:10,800

along with it

67

00:08:17,749 --> 00:08:15,520

and and i have been following isaac

68

00:08:19,830 --> 00:08:17,759

uh since the beginning since the launch

69

00:08:21,270 --> 00:08:19,840

of his youtube channel

70

00:08:23,990 --> 00:08:21,280

and uh

71

00:08:26,550 --> 00:08:24,000

and if for me to have him on the show

72

00:08:30,390 --> 00:08:26,560

when he has influenced me

73

00:08:31,270 --> 00:08:30,400

so much it's just great it is absolutely

74

00:08:33,269 --> 00:08:31,280

great

75

00:08:35,909 --> 00:08:33,279

and uh so there you go tomorrow night

76

00:08:38,630 --> 00:08:35,919

right here linda moulton howe is with us

77

00:08:41,269 --> 00:08:38,640

and we are going to have a full night of

78

00:08:43,829 --> 00:08:41,279

antarctica spartan 1 and spartan 2

79

00:08:45,269 --> 00:08:43,839

and uh and i've also t you know and

80

00:08:49,110 --> 00:08:45,279

beyond

81

00:08:51,430 --> 00:08:49,120

and last week uh christina gomez and i

82

00:08:53,430 --> 00:08:51,440

uh and she's just fantastic and and

83

00:08:54,949 --> 00:08:53,440

christina and i did a show in antarctica

84

00:08:56,150 --> 00:08:54,959

last week and then

85

00:08:59,110 --> 00:08:56,160

uh

86

00:09:01,990 --> 00:08:59,120

antarctica came up a lot

87

00:09:04,070 --> 00:09:02,000

on thursday night when we had um

88

00:09:05,350 --> 00:09:04,080

uh did the show on the flat earth with a

89

00:09:09,269 --> 00:09:05,360

flat earth day

90

00:09:13,430 --> 00:09:09,279

antarctica antarctica all week long and

91

00:09:15,829 --> 00:09:13,440

then it was brought up again

92

00:09:17,350 --> 00:09:15,839

uh well a couple of times i'm trying to

93

00:09:19,590 --> 00:09:17,360

think we had

94

00:09:21,590 --> 00:09:19,600

uh somebody else last week that brought

95

00:09:22,870 --> 00:09:21,600

up antarctica anyway so it was just like

96

00:09:25,829 --> 00:09:22,880

antarctica

97

00:09:27,670 --> 00:09:25,839

and i already had linda scheduled

98

00:09:29,670 --> 00:09:27,680

and i thought you know what that's what

99

00:09:31,110 --> 00:09:29,680

we have to do the show on we have to

100

00:09:35,430 --> 00:09:31,120

continue this so we're going to do that

101
00:09:38,630 --> 00:09:35,440
tomorrow night um antarctica and also

102
00:09:41,190 --> 00:09:38,640
and it's kind of weird um

103
00:09:44,150 --> 00:09:41,200
and i'm just gonna say it like this

104
00:09:46,870 --> 00:09:44,160
after that flat earth show on thursday

105
00:09:48,230 --> 00:09:46,880
as crazy as that show was and it was

106
00:09:50,870 --> 00:09:48,240
certainly

107
00:09:52,470 --> 00:09:50,880
uh from where i'm sitting

108
00:09:53,990 --> 00:09:52,480
uh

109
00:09:55,590 --> 00:09:54,000
fascinating

110
00:09:58,389 --> 00:09:55,600
to

111
00:10:00,870 --> 00:09:58,399
hear the conviction

112
00:10:02,710 --> 00:10:00,880
of somebody you know like flat earth

113
00:10:05,509 --> 00:10:02,720

dave or any flat earther

114

00:10:07,430 --> 00:10:05,519

that is absolutely committed

115

00:10:11,190 --> 00:10:07,440

it's fascinating

116

00:10:13,430 --> 00:10:11,200

fascinating and so tonight

117

00:10:14,790 --> 00:10:13,440

we have on isaac arthur

118

00:10:18,389 --> 00:10:14,800

we get to

119

00:10:20,790 --> 00:10:18,399

get centered again oh

120

00:10:23,750 --> 00:10:20,800

we get to get back to what's real isaac

121

00:10:25,750 --> 00:10:23,760

arthur is with us tonight and uh no

122

00:10:28,630 --> 00:10:25,760

fader night tomorrow night no open lines

123

00:10:31,430 --> 00:10:28,640

this week so that's two weeks in a row

124

00:10:33,190 --> 00:10:31,440

and uh i will make sure that i book next

125

00:10:35,350 --> 00:10:33,200

thursday too as well and we'll go three

126

00:10:37,269 --> 00:10:35,360

weeks without uh fader night

127

00:10:40,870 --> 00:10:37,279

and uh so the next time that we do fader

128

00:10:42,230 --> 00:10:40,880

night it'll be all the more special

129

00:10:47,750 --> 00:10:42,240

all right

130

00:10:50,790 --> 00:10:47,760

and no matter what the comment was

131

00:10:53,590 --> 00:10:50,800

probably about yellowstone

132

00:10:56,069 --> 00:10:53,600

oh man

133

00:10:58,550 --> 00:10:56,079

but i gotta say

134

00:11:01,509 --> 00:10:58,560

uh no ufos

135

00:11:03,430 --> 00:11:01,519

no uh no science fiction no time travel

136

00:11:04,389 --> 00:11:03,440

no teleportation

137

00:11:05,190 --> 00:11:04,399

uh

138

00:11:08,710 --> 00:11:05,200

no

139

00:11:09,829 --> 00:11:08,720

right

140

00:11:16,550 --> 00:11:09,839

no

141

00:11:19,670 --> 00:11:16,560

it's

142

00:11:22,470 --> 00:11:19,680

and uh

143

00:11:24,550 --> 00:11:22,480

for those of you that have seen the show

144

00:11:27,269 --> 00:11:24,560

i gotta say so last night

145

00:11:31,750 --> 00:11:27,279

um i don't know what season i'm in three

146

00:11:37,509 --> 00:11:35,110

last night i saw the shootout

147

00:11:39,430 --> 00:11:37,519

with casey

148

00:11:44,710 --> 00:11:39,440

man man man

149

00:11:50,069 --> 00:11:47,269

i watched it three times i was like i

150

00:11:52,069 --> 00:11:50,079

gotta see that again man i gotta pack

151
00:11:54,710 --> 00:11:52,079
this baby up

152
00:11:56,550 --> 00:11:54,720
and watch that again yeah uh yellowstone

153
00:11:57,990 --> 00:11:56,560
yellowstone's incredible it's incredible

154
00:12:00,790 --> 00:11:58,000
just well written

155
00:12:02,949 --> 00:12:00,800
and uh lots of violence you know it may

156
00:12:06,150 --> 00:12:02,959
not be what you're expecting

157
00:12:07,110 --> 00:12:06,160
with john dutton but uh there you go

158
00:12:08,790 --> 00:12:07,120
okay

159
00:12:11,269 --> 00:12:08,800
uh i don't know what i was gonna say

160
00:12:12,550 --> 00:12:11,279
about yellowstone but i am sucked into

161
00:12:14,310 --> 00:12:12,560
it man

162
00:12:16,790 --> 00:12:14,320
i am sucked into it and i can already

163
00:12:20,310 --> 00:12:16,800

tell i know the new season is out but

164

00:12:22,629 --> 00:12:20,320

i'm going to be watching 1883

165

00:12:25,350 --> 00:12:22,639

the prequel

166

00:12:26,870 --> 00:12:25,360

it's absolutely incredible okay all

167

00:12:28,389 --> 00:12:26,880

right

168

00:12:31,910 --> 00:12:28,399

uh

169

00:12:41,269 --> 00:12:31,920

where am i at get your own crystal skull

170

00:12:50,629 --> 00:12:44,870

look at that

171

00:12:53,350 --> 00:12:50,639

you want one it's a baby einstein go to

172

00:12:55,110 --> 00:12:53,360

einstein the crystal skull.com check out

173

00:13:02,710 --> 00:12:55,120

the baby einsteins

174

00:13:08,150 --> 00:13:05,590

einstein the crystalskull.com

175

00:13:10,310 --> 00:13:08,160

i unboxed that last week you can watch

176

00:13:11,590 --> 00:13:10,320

the unboxing video right there on

177

00:13:13,590 --> 00:13:11,600

youtube

178

00:13:16,310 --> 00:13:13,600

and uh there you go einstein the crystal

179

00:13:17,750 --> 00:13:16,320

skull.com promo code jimmy 10 off of

180

00:13:20,470 --> 00:13:17,760

your order

181

00:13:22,389 --> 00:13:20,480

today coming up next month

182

00:13:24,470 --> 00:13:22,399

and i'm pretty busy for the next three

183

00:13:25,350 --> 00:13:24,480

or four months and uh coming up next

184

00:13:28,550 --> 00:13:25,360

month

185

00:13:31,190 --> 00:13:28,560

i'll be speaking at the x conference

186

00:13:35,829 --> 00:13:31,200

and it's uh starts one month from today

187

00:13:38,790 --> 00:13:35,839

may 13th and 14th next month and i'll be

188

00:13:40,710 --> 00:13:38,800

speaking on friday night may 13th

189

00:13:43,350 --> 00:13:40,720

and then right after i'm done there will

190

00:13:45,590 --> 00:13:43,360

be a live paranormal investigation from

191

00:13:46,629 --> 00:13:45,600

9 pm until midnight you can go and watch

192

00:13:48,470 --> 00:13:46,639

all of it

193

00:13:50,870 --> 00:13:48,480

and then it continues on saturday may

194

00:13:53,750 --> 00:13:50,880

14th for tickets and info this is an

195

00:13:55,670 --> 00:13:53,760

online only event

196

00:13:57,550 --> 00:13:55,680

great lineup of speakers by the way go

197

00:14:00,150 --> 00:13:57,560

to the

198

00:14:02,150 --> 00:14:00,160

xnetwork.com and get signed up for that

199

00:14:05,269 --> 00:14:02,160

that's coming up next month then the

200

00:14:07,829 --> 00:14:05,279

month after that in june june 18th one

201
00:14:10,470 --> 00:14:07,839
day event disclosure fest

202
00:14:12,150 --> 00:14:10,480
the mass meditation initiative one day

203
00:14:14,629 --> 00:14:12,160
only saturday

204
00:14:16,389 --> 00:14:14,639
june 18th in downtown los angeles

205
00:14:19,269 --> 00:14:16,399
california right next to chinatown at

206
00:14:21,910 --> 00:14:19,279
the los angeles state historic park i'll

207
00:14:24,949 --> 00:14:21,920
be hosting the event again this year

208
00:14:26,230 --> 00:14:24,959
i've hosted every year since it started

209
00:14:29,670 --> 00:14:26,240
and

210
00:14:32,150 --> 00:14:29,680
it's all simple disclosurefest.org

211
00:14:35,910 --> 00:14:32,160
just go to disclosurefest.org complete

212
00:14:36,790 --> 00:14:35,920
list there is a lot of speakers a lot of

213
00:14:39,590 --> 00:14:36,800

uh

214

00:14:42,949 --> 00:14:39,600
musicians and bands and talent

215

00:14:45,670 --> 00:14:42,959
and yoga and dancing it's it's just

216

00:14:47,110 --> 00:14:45,680
crazy workshops go and check it out all

217

00:14:47,790 --> 00:14:47,120
of that over

218

00:14:49,509 --> 00:14:47,800
at

219

00:14:52,790 --> 00:14:49,519
disclosurefest.org and then i'll be in

220

00:14:55,509 --> 00:14:52,800
egypt this october with billy carson go

221

00:14:58,310 --> 00:14:55,519
to forbidden knowledge.com

222

00:14:59,750 --> 00:14:58,320
for the complete schedule and info my

223

00:15:01,829 --> 00:14:59,760
birthday

224

00:15:03,189 --> 00:15:01,839
in october october 10th will be

225

00:15:06,550 --> 00:15:03,199
celebrated

226

00:15:08,150 --> 00:15:06,560

in egypt at the temple of luxor

227

00:15:10,150 --> 00:15:08,160

you

228

00:15:13,110 --> 00:15:10,160

want to be there with us

229

00:15:15,110 --> 00:15:13,120

all right so go to forbidden knowledge

230

00:15:18,870 --> 00:15:15,120

dot com follow me on twitter at

231

00:15:21,430 --> 00:15:18,880

jchurchradio the sandbox is hashtag f2b

232

00:15:23,430 --> 00:15:21,440

on twitter uh we've got chat rooms open

233

00:15:25,750 --> 00:15:23,440

you can go and do that speaker or over

234

00:15:29,110 --> 00:15:25,760

at youtube and of course uh right here

235

00:15:30,790 --> 00:15:29,120

on twitter which is hashtag f2b and

236

00:15:32,310 --> 00:15:30,800

over on facebook

237

00:15:33,990 --> 00:15:32,320

all right all right let's get to the

238

00:15:36,550 --> 00:15:34,000

breaking news

239

00:15:38,389 --> 00:15:36,560

it's uh very interesting developments

240

00:15:39,670 --> 00:15:38,399

today after that subway shooting in

241

00:15:45,030 --> 00:15:39,680

brooklyn

242

00:15:47,749 --> 00:15:45,040

james

243

00:15:49,829 --> 00:15:47,759

was arrested by patrol officers from the

244

00:15:52,150 --> 00:15:49,839

ninth precinct in the east village of

245

00:15:54,470 --> 00:15:52,160

new york city earlier today

246

00:15:57,670 --> 00:15:54,480

the new york police department arrested

247

00:15:59,430 --> 00:15:57,680

james after he called in

248

00:16:02,389 --> 00:15:59,440

on himself

249

00:16:04,790 --> 00:16:02,399

on its crime stoppers hotline and told

250

00:16:07,749 --> 00:16:04,800

authorities he was at a mcdonald's on

251

00:16:09,749 --> 00:16:07,759

the lower east side of manhattan

252

00:16:12,629 --> 00:16:09,759

officers did not find him there but

253

00:16:14,389 --> 00:16:12,639

spotted him just around the corner the

254

00:16:16,870 --> 00:16:14,399

brooklyn u.s attorney said that the

255

00:16:19,749 --> 00:16:16,880

subway shooting suspect will be charged

256

00:16:23,749 --> 00:16:19,759

in federal court

257

00:16:27,030 --> 00:16:23,759

huge milestone today the james webb

258

00:16:30,550 --> 00:16:27,040

space telescope notched a cool

259

00:16:32,949 --> 00:16:30,560

milestone literally uh during its

260

00:16:35,590 --> 00:16:32,959

months-long calibration for deep space

261

00:16:38,389 --> 00:16:35,600

observations the final instrument aboard

262

00:16:41,430 --> 00:16:38,399

the 10 billion james webb space

263

00:16:42,550 --> 00:16:41,440

telescope finally achieved its operating

264

00:16:44,550 --> 00:16:42,560

temperature

265

00:16:46,710 --> 00:16:44,560

of just above

266

00:16:48,870 --> 00:16:46,720

absolute zero

267

00:16:51,269 --> 00:16:48,880

the successful cooling ensures that the

268

00:16:54,710 --> 00:16:51,279

observatory will be able to probe cosmic

269

00:16:56,629 --> 00:16:54,720

objects in infrared light the telescope

270

00:16:59,829 --> 00:16:56,639

has been cooling ever since its launch

271

00:17:01,910 --> 00:16:59,839

on december 25th 2021 christmas day

272

00:17:05,270 --> 00:17:01,920

bringing it to the frigid temperatures

273

00:17:08,390 --> 00:17:05,280

necessary for the miri m-i-r-i

274

00:17:10,069 --> 00:17:08,400

to accurately detect infrared light

275

00:17:11,510 --> 00:17:10,079

which manifests

276

00:17:14,630 --> 00:17:11,520

as heat

277

00:17:16,710 --> 00:17:14,640

mary needs to be at a temperature

278

00:17:20,230 --> 00:17:16,720

that's a little below seven degrees

279

00:17:22,909 --> 00:17:20,240

kelvin which is equivalent to

280

00:17:28,630 --> 00:17:26,470

447 degrees fahrenheit

281

00:17:31,909 --> 00:17:28,640

and that's chile and that's a cool

282

00:17:33,750 --> 00:17:31,919

milestone the first all private

283

00:17:36,070 --> 00:17:33,760

astronaut team gets down to science

284

00:17:38,630 --> 00:17:36,080

aboard the international space station

285

00:17:41,750 --> 00:17:38,640

the crew of the ax1 mission michael

286

00:17:45,270 --> 00:17:41,760

lopez uh larry connor

287

00:17:46,870 --> 00:17:45,280

eaton steve and mark pathy are currently

288

00:17:49,190 --> 00:17:46,880

hard at work conducting different types

289

00:17:51,669 --> 00:17:49,200

of research on the iss to help further

290

00:17:54,390 --> 00:17:51,679

advance human space flight

291

00:17:55,750 --> 00:17:54,400

some of the onboard experiments carried

292

00:17:57,590 --> 00:17:55,760

out in cooperation with several

293

00:17:58,630 --> 00:17:57,600

institutions including the cleveland

294

00:18:03,669 --> 00:17:58,640

clinic

295

00:18:07,150 --> 00:18:03,679

include an eeg enabled space helmet

296

00:18:10,230 --> 00:18:07,160

and the first two-way

297

00:18:12,029 --> 00:18:10,240

holoportation experiment to be for to be

298

00:18:14,230 --> 00:18:12,039

performed in space

299

00:18:15,590 --> 00:18:14,240

holoportation i know what you're like

300

00:18:19,470 --> 00:18:15,600

what

301
00:18:23,990 --> 00:18:21,110
holoportation

302
00:18:25,669 --> 00:18:24,000
is producing a hologram of a person on

303
00:18:26,950 --> 00:18:25,679
the iss

304
00:18:30,150 --> 00:18:26,960
to earth

305
00:18:32,710 --> 00:18:30,160
and beaming a hologram of someone from

306
00:18:34,710 --> 00:18:32,720
earth to the space station

307
00:18:37,590 --> 00:18:34,720
at the same time

308
00:18:39,190 --> 00:18:37,600
and communicating

309
00:18:42,390 --> 00:18:39,200
star wars

310
00:18:44,390 --> 00:18:42,400
remember princess leah

311
00:18:45,990 --> 00:18:44,400
popped out of

312
00:18:47,830 --> 00:18:46,000
r2d2

313
00:18:49,110 --> 00:18:47,840

it's like that

314

00:18:52,470 --> 00:18:49,120

all right

315

00:18:57,750 --> 00:18:52,480

the iconic blue guitar kurt cobain

316

00:19:00,470 --> 00:18:57,760

rocked out with in uh nirvana's 90s hit

317

00:19:01,590 --> 00:19:00,480

smells like teen spirit in that music

318

00:19:04,230 --> 00:19:01,600

video

319

00:19:05,909 --> 00:19:04,240

is expected to fetch up to around 1

320

00:19:07,430 --> 00:19:05,919

million dollars when it goes up for

321

00:19:10,150 --> 00:19:07,440

auction next month

322

00:19:11,070 --> 00:19:10,160

with smells like teen spirit racking up

323

00:19:16,310 --> 00:19:11,080

more than

324

00:19:19,750 --> 00:19:16,320

1.4 billion views on youtube the 1969

325

00:19:21,190 --> 00:19:19,760

blue fender mustang is arguably one of

326

00:19:23,430 --> 00:19:21,200

the most seen

327

00:19:24,950 --> 00:19:23,440

and famous guitars

328

00:19:27,590 --> 00:19:24,960

in rock

329

00:19:30,789 --> 00:19:27,600

the cobain guitar is the star lot in the

330

00:19:33,909 --> 00:19:30,799

auction house's music icons auction

331

00:19:37,190 --> 00:19:33,919

taking place in new york and online

332

00:19:39,830 --> 00:19:37,200

from may 20th to the 22nd

333

00:19:42,710 --> 00:19:39,840

you got a spare mill

334

00:19:44,789 --> 00:19:42,720

you want to you know i i would if if you

335

00:19:47,270 --> 00:19:44,799

if you win the auction

336

00:19:49,590 --> 00:19:47,280

i'll hang the mustang

337

00:19:51,990 --> 00:19:49,600

here in the bunker right behind me

338

00:19:53,669 --> 00:19:52,000

uh it'll stay there it'll never move

339

00:19:55,270 --> 00:19:53,679

i'll just hang it right there and you

340

00:19:56,789 --> 00:19:55,280

can tell everybody

341

00:19:57,830 --> 00:19:56,799

that's my guitar

342

00:19:59,029 --> 00:19:57,840

okay

343

00:20:00,789 --> 00:19:59,039

all right

344

00:20:02,230 --> 00:20:00,799

that blue fender mustang that black

345

00:20:04,950 --> 00:20:02,240

headstock it's a good looking guitar

346

00:20:07,029 --> 00:20:04,960

it's got the racing stripes

347

00:20:08,950 --> 00:20:07,039

yeah let's get this show cracking happy

348

00:20:10,950 --> 00:20:08,960

birthday to today

349

00:20:15,110 --> 00:20:10,960

ron perlman

350

00:20:18,549 --> 00:20:15,120

is 72. now you know hellboy right we can

351
00:20:21,590 --> 00:20:18,559
go there so many great movies

352
00:20:24,070 --> 00:20:21,600
but now it's don't look up ron perlman

353
00:20:27,750 --> 00:20:24,080
is 72 al green

354
00:20:30,230 --> 00:20:27,760
today is 76 let's get together i watched

355
00:20:33,110 --> 00:20:30,240
a bunch of al green in concert videos

356
00:20:36,390 --> 00:20:33,120
today saw the old stuff too when he had

357
00:20:39,190 --> 00:20:36,400
that different look that hip look and

358
00:20:43,190 --> 00:20:39,200
then of course you know he grew up e

359
00:20:44,789 --> 00:20:43,200
street band stickman max weinberg today

360
00:20:48,789 --> 00:20:44,799
is 71

361
00:20:50,149 --> 00:20:48,799
and wasp guitarist randy piper today is

362
00:20:52,870 --> 00:20:50,159
64.

363
00:20:55,190 --> 00:20:52,880

our dead guy's birthday today

364

00:20:58,950 --> 00:20:55,200

is hillel slovak

365

00:21:03,750 --> 00:21:01,990

hillel was a founding member and the

366

00:21:05,990 --> 00:21:03,760

guitarist for

367

00:21:07,990 --> 00:21:06,000

the red hot chili peppers with whom he

368

00:21:11,430 --> 00:21:08,000

recorded two albums

369

00:21:12,470 --> 00:21:11,440

freaky styley and the uplift mofo party

370

00:21:14,789 --> 00:21:12,480

plan

371

00:21:16,390 --> 00:21:14,799

hillel also

372

00:21:19,110 --> 00:21:16,400

taught flea

373

00:21:21,110 --> 00:21:19,120

how to play the bass

374

00:21:23,909 --> 00:21:21,120

that's a fader fact right there

375

00:21:25,750 --> 00:21:23,919

hillel influenced an entire generations

376

00:21:28,470 --> 00:21:25,760

of musicians right here in hollywood

377

00:21:31,270 --> 00:21:28,480

california seriously

378

00:21:34,310 --> 00:21:31,280

during his career he developed a serious

379

00:21:36,549 --> 00:21:34,320

heroin addiction he attempted to quit

380

00:21:38,950 --> 00:21:36,559

many times but died of an overdose in

381

00:21:42,390 --> 00:21:38,960

his hollywood california apartment

382

00:21:44,630 --> 00:21:42,400

on june 25th 1988

383

00:21:47,270 --> 00:21:44,640

at the age of 26.

384

00:21:51,350 --> 00:21:47,280

happy birthday hillel

385

00:21:54,070 --> 00:21:51,360

otd on this day in history

386

00:21:57,190 --> 00:21:54,080

1928

387

00:21:58,789 --> 00:21:57,200

the first non-stop flight

388

00:22:00,549 --> 00:21:58,799

from europe

389

00:22:02,070 --> 00:22:00,559

to north america

390

00:22:05,190 --> 00:22:02,080

goes down

391

00:22:07,029 --> 00:22:05,200

and it wasn't london to new york

392

00:22:08,950 --> 00:22:07,039

nope

393

00:22:11,430 --> 00:22:08,960

it was ireland

394

00:22:13,510 --> 00:22:11,440

to greenlee island

395

00:22:15,909 --> 00:22:13,520

in canada

396

00:22:18,870 --> 00:22:15,919

that's right

397

00:22:21,190 --> 00:22:18,880

greenlee island was the first place

398

00:22:24,070 --> 00:22:21,200

they could safely land

399

00:22:25,669 --> 00:22:24,080

as they were crossing the atlantic

400

00:22:27,510 --> 00:22:25,679

he tried to get to new york couldn't do

401
00:22:29,190 --> 00:22:27,520
it they were 40 degrees off course

402
00:22:30,870 --> 00:22:29,200
number one but number two

403
00:22:33,029 --> 00:22:30,880
got an oil leak

404
00:22:35,270 --> 00:22:33,039
and it was either ditching in the in the

405
00:22:36,789 --> 00:22:35,280
ocean or fighting and the first thing

406
00:22:39,830 --> 00:22:36,799
they found

407
00:22:42,549 --> 00:22:39,840
was greenlee

408
00:22:44,950 --> 00:22:42,559
nobody there to greet him

409
00:22:49,669 --> 00:22:44,960
it's a true story on this day

410
00:22:54,789 --> 00:22:52,070
you ready

411
00:22:59,990 --> 00:22:54,799
house sparrows

412
00:23:03,190 --> 00:23:00,000
and house finches you know little birds

413
00:23:04,549 --> 00:23:03,200

both of them use discarded cigarette

414

00:23:07,110 --> 00:23:04,559

butts

415

00:23:10,070 --> 00:23:07,120

in their nests

416

00:23:12,390 --> 00:23:10,080

for pest control

417

00:23:14,710 --> 00:23:12,400

that's right

418

00:23:17,190 --> 00:23:14,720

they do

419

00:23:19,190 --> 00:23:17,200

look it up

420

00:23:20,950 --> 00:23:19,200

and that

421

00:23:22,630 --> 00:23:20,960

is your fader fact man i had to double

422

00:23:25,190 --> 00:23:22,640

check that one today man i vetted that

423

00:23:26,630 --> 00:23:25,200

thing i looked at it it was like matt

424

00:23:29,669 --> 00:23:26,640

yes

425

00:23:34,070 --> 00:23:31,830

tonight very special guest isaac arthur

426

00:23:35,190 --> 00:23:34,080

is joining us

427

00:23:39,270 --> 00:23:35,200

we're going to be talking about

428

00:23:41,750 --> 00:23:39,280

exoplanets and e.t tonight and omua muah

429

00:23:43,190 --> 00:23:41,760

tomorrow night linda moulton howe is

430

00:23:44,870 --> 00:23:43,200

with us so there's no fader night

431

00:23:45,990 --> 00:23:44,880

tomorrow night there's no open lines

432

00:23:48,149 --> 00:23:46,000

tomorrow night because we're going to

433

00:23:51,190 --> 00:23:48,159

spend the entire evening

434

00:23:52,549 --> 00:23:51,200

discussing antarctica and spartan 1 and

435

00:23:54,870 --> 00:23:52,559

spartan 2

436

00:23:56,789 --> 00:23:54,880

and then beyond all of that is tomorrow

437

00:24:01,669 --> 00:23:56,799

night with linda moulton howe

438

00:24:01,679 --> 00:24:09,190

river moon coffee

439

00:24:15,750 --> 00:24:13,990

river mooncoffee.com i would like to uh

440

00:24:17,269 --> 00:24:15,760

i'd like to do a river moon coffee

441

00:24:20,950 --> 00:24:17,279

commercial from

442

00:24:25,269 --> 00:24:23,590

yellowstone

443

00:24:27,590 --> 00:24:25,279

john dutton always drinking his coffee

444

00:24:29,430 --> 00:24:27,600

in the morning he's got that same cup

445

00:24:32,870 --> 00:24:29,440

all right i'll be out there

446

00:24:36,149 --> 00:24:32,880

yellowstone in the morning river moon

447

00:24:36,159 --> 00:24:39,669

saddling up my horse

448

00:24:44,149 --> 00:24:41,990

i know all the parts now to a horse

449

00:24:45,750 --> 00:24:44,159

saddle i didn't know one part to a horse

450

00:24:48,870 --> 00:24:45,760

saddle

451
00:24:54,070 --> 00:24:51,750
i know everything about training horses

452
00:24:56,549 --> 00:24:54,080
i can break a horse now

453
00:24:58,230 --> 00:24:56,559
yellowstone i could break a horse i am

454
00:25:00,149 --> 00:24:58,240
convinced

455
00:25:05,029 --> 00:25:00,159
i could break a horse i could make a

456
00:25:08,390 --> 00:25:06,710
i didn't even know they did that did you

457
00:25:10,789 --> 00:25:08,400
guys know

458
00:25:12,390 --> 00:25:10,799
that that thing

459
00:25:16,390 --> 00:25:12,400
get the horse to put on the brakes like

460
00:25:20,149 --> 00:25:18,710
all right tonight isaac arthur is with

461
00:25:21,350 --> 00:25:20,159
us

462
00:25:22,390 --> 00:25:21,360
and uh

463
00:25:25,830 --> 00:25:22,400

we're going to be talking about

464

00:25:28,470 --> 00:25:25,840

exoplanet tt and oh mumu and i suppose

465

00:25:30,950 --> 00:25:28,480

this is when i'm supposed to talk about

466

00:25:33,669 --> 00:25:30,960

the billions of rocky earth-like planets

467

00:25:35,669 --> 00:25:33,679

that are in the goldilocks zone right

468

00:25:37,909 --> 00:25:35,679

here in our milky way

469

00:25:39,750 --> 00:25:37,919

you know a little tune-up you know for

470

00:25:41,430 --> 00:25:39,760

the show tonight but

471

00:25:44,070 --> 00:25:41,440

nah

472

00:25:45,750 --> 00:25:44,080

i have something else in mind

473

00:25:48,549 --> 00:25:45,760

and uh

474

00:25:50,070 --> 00:25:48,559

i need to i need to get it out before i

475

00:25:51,750 --> 00:25:50,080

forget about it

476
00:25:54,870 --> 00:25:51,760
and it just becomes a part of the ether

477
00:25:57,590 --> 00:25:54,880
you know just disappears forever

478
00:26:01,350 --> 00:25:57,600
and it's and it's

479
00:26:06,630 --> 00:26:03,590
steve morillo and his wife pat just

480
00:26:07,990 --> 00:26:06,640
spent the weekend at my house and we sat

481
00:26:11,269 --> 00:26:08,000
around for a couple of days and just

482
00:26:14,070 --> 00:26:11,279
talked like we always do and steve is

483
00:26:15,269 --> 00:26:14,080
one of my best and closest friends and

484
00:26:16,710 --> 00:26:15,279
trust me

485
00:26:17,909 --> 00:26:16,720
we click

486
00:26:20,070 --> 00:26:17,919
we do

487
00:26:22,950 --> 00:26:20,080
we click we understand each other you

488
00:26:25,590 --> 00:26:22,960

know and so far we haven't messed it up

489

00:26:27,750 --> 00:26:25,600

right it's all good

490

00:26:29,350 --> 00:26:27,760

anyway um

491

00:26:31,350 --> 00:26:29,360

i know that i've talked about the beer

492

00:26:32,149 --> 00:26:31,360

can ufo sighting a million times on the

493

00:26:35,190 --> 00:26:32,159

show

494

00:26:38,549 --> 00:26:35,200

and i do get asked about it often but

495

00:26:41,590 --> 00:26:38,559

one of the best parts of that sighting

496

00:26:44,149 --> 00:26:41,600

and the experience was that steve was

497

00:26:45,909 --> 00:26:44,159

sitting next to me when it all went down

498

00:26:48,149 --> 00:26:45,919

you can hear his voice in the video that

499

00:26:49,750 --> 00:26:48,159

lucinda shot during all of the

500

00:26:51,350 --> 00:26:49,760

excitement she was here this weekend too

501
00:26:55,190 --> 00:26:51,360
as well spent the night

502
00:26:58,070 --> 00:26:55,200
and his description of what he saw was

503
00:27:01,909 --> 00:26:58,080
absolutely in the moment she captured it

504
00:27:04,830 --> 00:27:01,919
in real time not after not the next day

505
00:27:08,070 --> 00:27:04,840
but as it all went down

506
00:27:10,470 --> 00:27:08,080
and as steve and i roll through life

507
00:27:12,390 --> 00:27:10,480
over the next decade or two together

508
00:27:15,430 --> 00:27:12,400
we'll always have that beer can ufo to

509
00:27:18,549 --> 00:27:15,440
talk about when we play dominoes

510
00:27:21,269 --> 00:27:18,559
at the ufo researcher retirement home in

511
00:27:23,830 --> 00:27:21,279
studio city california

512
00:27:25,269 --> 00:27:23,840
but here's the deal

513
00:27:27,430 --> 00:27:25,279

steve and i

514

00:27:29,110 --> 00:27:27,440

haven't really talked about it

515

00:27:31,510 --> 00:27:29,120

the beer can

516

00:27:33,830 --> 00:27:31,520

since it happened

517

00:27:36,710 --> 00:27:33,840

and i know this sounds strange but

518

00:27:38,710 --> 00:27:36,720

others have talked about it and they ask

519

00:27:41,510 --> 00:27:38,720

us questions about it but

520

00:27:43,990 --> 00:27:41,520

but just the two of us you know well

521

00:27:46,950 --> 00:27:44,000

we haven't brought it up

522

00:27:50,230 --> 00:27:46,960

until this past weekend

523

00:27:53,029 --> 00:27:50,240

we relive the whole thing

524

00:27:54,789 --> 00:27:53,039

kind of privately you know blow by blow

525

00:27:57,190 --> 00:27:54,799

you know start to finish

526
00:27:59,590 --> 00:27:57,200
which isn't much honestly because it was

527
00:28:02,789 --> 00:27:59,600
only 15 seconds at the most uh beginning

528
00:28:05,190 --> 00:28:02,799
to end but then steve said what is still

529
00:28:08,070 --> 00:28:05,200
the crazy part of it all

530
00:28:10,870 --> 00:28:08,080
he said to me this weekend he said it

531
00:28:12,710 --> 00:28:10,880
was huge it was spinning and then it

532
00:28:15,430 --> 00:28:12,720
just disappeared out of the clear blue

533
00:28:20,070 --> 00:28:17,669
and he also said something that didn't

534
00:28:22,310 --> 00:28:20,080
fit what i saw

535
00:28:23,510 --> 00:28:22,320
he said and i quote

536
00:28:24,470 --> 00:28:23,520
it had

537
00:28:26,070 --> 00:28:24,480
two

538
00:28:29,430 --> 00:28:26,080

bright spots

539

00:28:32,310 --> 00:28:29,440

one on each side and you can see them as

540

00:28:33,990 --> 00:28:32,320

it spun around

541

00:28:37,029 --> 00:28:34,000

now remember we haven't talked about

542

00:28:39,830 --> 00:28:37,039

this for four years but when i tried to

543

00:28:41,669 --> 00:28:39,840

correct him on this and i said hey man

544

00:28:43,909 --> 00:28:41,679

it only had one circle

545

00:28:45,190 --> 00:28:43,919

you know and he kind of looked down and

546

00:28:47,190 --> 00:28:45,200

thought about it and i could see what

547

00:28:49,190 --> 00:28:47,200

was going through his you know and i

548

00:28:51,350 --> 00:28:49,200

didn't change his mind

549

00:28:53,750 --> 00:28:51,360

i could tell he was confused

550

00:28:54,789 --> 00:28:53,760

you know here we have two people same

551
00:28:57,669 --> 00:28:54,799
event

552
00:28:59,590 --> 00:28:57,679
different memories very interesting

553
00:29:01,590 --> 00:28:59,600
i'm right though by the way

554
00:29:04,070 --> 00:29:01,600
anyway for me

555
00:29:06,630 --> 00:29:04,080
my thoughts at the time haven't changed

556
00:29:08,870 --> 00:29:06,640
at all through to today

557
00:29:10,950 --> 00:29:08,880
and that is this

558
00:29:12,630 --> 00:29:10,960
when it popped out from behind mount

559
00:29:14,310 --> 00:29:12,640
adams

560
00:29:15,909 --> 00:29:14,320
i kind of went into a little bit of

561
00:29:18,310 --> 00:29:15,919
shock i did

562
00:29:21,110 --> 00:29:18,320
but i didn't flinch

563
00:29:23,350 --> 00:29:21,120

and i just wanted to really take a good

564

00:29:25,990 --> 00:29:23,360

look at it you know and remember it top

565

00:29:27,110 --> 00:29:26,000

to bottom and i did it's burned into my

566

00:29:29,990 --> 00:29:27,120

memory

567

00:29:32,710 --> 00:29:31,590

that whole thing only took about 10

568

00:29:35,430 --> 00:29:32,720

seconds

569

00:29:37,750 --> 00:29:35,440

and that's when i started shouting and i

570

00:29:39,990 --> 00:29:37,760

was like pictures pictures ufo ufo you

571

00:29:42,549 --> 00:29:40,000

know and and steve who's sitting right

572

00:29:43,590 --> 00:29:42,559

here when when i pointed at the mountain

573

00:29:47,029 --> 00:29:43,600

i could

574

00:29:52,389 --> 00:29:47,039

and

575

00:29:55,990 --> 00:29:52,399

next to me to my right he saw it all he

576

00:29:58,070 --> 00:29:56,000

saw the whole thing two friends

577

00:30:00,389 --> 00:29:58,080

witnesses to one of the most incredible

578

00:30:02,870 --> 00:30:00,399

ufo sightings ever

579

00:30:04,789 --> 00:30:02,880

daylight big moving

580

00:30:06,549 --> 00:30:04,799

and it was going to last for a while and

581

00:30:08,950 --> 00:30:06,559

we were going to sit there and enjoy it

582

00:30:11,590 --> 00:30:08,960

it was slowly moving east

583

00:30:14,389 --> 00:30:11,600

there was nothing but open cloudless sky

584

00:30:16,310 --> 00:30:14,399

for like 50 miles

585

00:30:18,630 --> 00:30:16,320

i took one last look and then i jumped

586

00:30:20,870 --> 00:30:18,640

back on the binoculars and between that

587

00:30:23,110 --> 00:30:20,880

last naked eye glance

588

00:30:25,510 --> 00:30:23,120

and the two seconds it took me to you

589

00:30:27,750 --> 00:30:25,520

know look through the eyepiece you know

590

00:30:30,549 --> 00:30:27,760

like this

591

00:30:32,149 --> 00:30:30,559

steve said the words

592

00:30:34,070 --> 00:30:32,159

it faced out man

593

00:30:36,470 --> 00:30:34,080

it's gone

594

00:30:38,149 --> 00:30:36,480

i scanned the mountain and in the sky

595

00:30:39,750 --> 00:30:38,159

with the binoculars and hopes that it

596

00:30:41,269 --> 00:30:39,760

was still there somewhere but it was

597

00:30:42,389 --> 00:30:41,279

indeed gone

598

00:30:46,310 --> 00:30:42,399

and

599

00:30:50,710 --> 00:30:46,320

ended up getting the best of both in the

600

00:30:52,630 --> 00:30:50,720

ufo world i got to see it first

601
00:30:54,710 --> 00:30:52,640
and he saw it

602
00:30:56,470 --> 00:30:54,720
last

603
00:30:59,190 --> 00:30:56,480
now to be honest

604
00:31:00,950 --> 00:30:59,200
my my close friend got the best part he

605
00:31:04,310 --> 00:31:00,960
got the holy grail

606
00:31:06,389 --> 00:31:04,320
he got to witness a giant 400 foot tall

607
00:31:09,830 --> 00:31:06,399
ufo just fade away

608
00:31:10,980 --> 00:31:09,840
phase out disappear

609
00:31:14,070 --> 00:31:10,990
i can't wait

610
00:31:17,590 --> 00:31:14,080
[Laughter]

611
00:31:21,350 --> 00:31:17,600
i can't wait to tell our ufo tall tale

612
00:31:23,830 --> 00:31:21,360
you know in 20 years on bingo night

613
00:31:27,110 --> 00:31:23,840

at the happy trails ufo adult living

614

00:31:29,669 --> 00:31:27,120

center in downtown burbank california

615

00:31:33,990 --> 00:31:29,679

so if you think about it

616

00:31:35,990 --> 00:31:34,000

steve and i got that going for us

617

00:31:37,990 --> 00:31:36,000

we do

618

00:31:39,350 --> 00:31:38,000

this is fade to black i am your host

619

00:31:42,389 --> 00:31:39,360

jimmy church

620

00:31:44,070 --> 00:31:42,399

tonight on this very program

621

00:31:45,990 --> 00:31:44,080

isaac arthur

622

00:31:48,870 --> 00:31:46,000

isaac joins us we're going to be talking

623

00:31:51,110 --> 00:31:48,880

about tonight's exoplanets

624

00:31:53,190 --> 00:31:51,120

and e.t

625

00:31:54,710 --> 00:31:53,200

and no more tomorrow night linda moulton

626
00:31:56,470 --> 00:31:54,720
house here we're going to have a full

627
00:31:58,230 --> 00:31:56,480
evening

628
00:32:01,269 --> 00:31:58,240
all night long

629
00:32:03,590 --> 00:32:01,279
antarctica and spartan 1 and spartan 2.

630
00:32:06,070 --> 00:32:03,600
all of that tomorrow night and beyond

631
00:32:08,630 --> 00:32:06,080
no fader night this week no open lines

632
00:32:09,590 --> 00:32:08,640
you get

633
00:32:11,269 --> 00:32:09,600
nothing

634
00:32:13,750 --> 00:32:11,279
i'm yours jimmy church this is fade to

635
00:32:15,590 --> 00:32:13,760
black on the game changer and on x

636
00:32:17,269 --> 00:32:15,600
networks racehobs

637
00:32:19,029 --> 00:32:17,279
we'll be right back with isaac arthur

638
00:32:25,300 --> 00:32:19,039

right after this short break stay with

639

00:32:36,389 --> 00:32:34,149

[Music]

640

00:32:38,630 --> 00:32:36,399

this is nicole church daughter of you

641

00:32:39,549 --> 00:32:38,640

know who and you're listening to fade to

642

00:32:41,190 --> 00:32:39,559

black on

643

00:32:44,149 --> 00:32:41,200

jimmychurchradio.com and the game

644

00:32:47,830 --> 00:32:46,230

you're listening to jimmy church and

645

00:32:54,230 --> 00:32:47,840

made to black

646

00:33:00,710 --> 00:32:56,549

you're listening to jimmy church fade to

647

00:33:08,230 --> 00:33:02,870

fate to black will now pause for alien

648

00:33:12,389 --> 00:33:10,470

introducing the game changer blend from

649

00:33:14,870 --> 00:33:12,399

river moon coffee that delivers a

650

00:33:17,990 --> 00:33:14,880

customized blend made specifically for

651

00:33:20,950 --> 00:33:18,000

the fader knots if the game is rigged

652

00:33:23,830 --> 00:33:20,960

change the game it's a boulder cup with

653

00:33:25,990 --> 00:33:23,840

some bite game changer is the coffee of

654

00:33:28,389 --> 00:33:26,000

choice for those that prefer an organic

655

00:33:31,990 --> 00:33:28,399

dark roast that is slightly lighter and

656

00:33:34,230 --> 00:33:32,000

milder but it's still dark with wild

657

00:33:36,870 --> 00:33:34,240

notes of pecans and chocolate with a

658

00:33:39,190 --> 00:33:36,880

rich balanced full-bodied cup that is

659

00:33:41,830 --> 00:33:39,200

roasted to perfection for a great coffee

660

00:33:45,110 --> 00:33:41,840

to start your day as an after dinner

661

00:33:47,909 --> 00:33:45,120

coffee or anywhere in between artisan

662

00:33:50,549 --> 00:33:47,919

small batch roasted to perfection usda

663

00:33:52,870 --> 00:33:50,559

certified organic all river moon coffee

664

00:33:55,750 --> 00:33:52,880

is freshly roasted and packaged in the

665

00:33:57,909 --> 00:33:55,760

usa just go to rivermooncoffee.com or

666

00:34:01,750 --> 00:33:57,919

click on the banners over on our site

667

00:34:03,830 --> 00:34:01,760

and use the promo code f2b blend for 15

668

00:34:07,029 --> 00:34:03,840

off of your order today

669

00:34:12,470 --> 00:34:09,669

this is the only way forward

670

00:34:14,869 --> 00:34:12,480

this is made to black

671

00:34:16,550 --> 00:34:14,879

make contact

672

00:34:19,430 --> 00:34:16,560

this is jimmy church of fade to black

673

00:34:21,750 --> 00:34:19,440

and you can get our podcast for just two

674

00:34:24,069 --> 00:34:21,760

dollars per month all you have to do is

675

00:34:26,869 --> 00:34:24,079

click on the podcast banner over at

676
00:34:29,510 --> 00:34:26,879
jimmychurchradio.com

677
00:34:32,149 --> 00:34:29,520
hi folks it's trembling times and fear

678
00:34:33,990 --> 00:34:32,159
is pushing emotions which in turn pushes

679
00:34:36,069 --> 00:34:34,000
health the wrong direction do you ever

680
00:34:38,470 --> 00:34:36,079
get an egg because life is uneasy try

681
00:34:40,389 --> 00:34:38,480
life change tea get the tea.com life

682
00:34:42,470 --> 00:34:40,399
change tea works on your digestive tract

683
00:34:45,030 --> 00:34:42,480
helping to move food through quicker and

684
00:34:46,790 --> 00:34:45,040
comfortably so your health is spot on

685
00:34:48,869 --> 00:34:46,800
life change team may not help with world

686
00:34:51,430 --> 00:34:48,879
issues but it will help with your

687
00:34:53,990 --> 00:34:51,440
digestive issues a glass a day helps

688
00:34:56,550 --> 00:34:54,000

keep the intruders away so

689

00:34:59,670 --> 00:34:56,560

change your life today log on to get the

690

00:35:01,990 --> 00:34:59,680

tea.com that's get the tea dot com if

691

00:35:04,950 --> 00:35:02,000

your health game is off get on by

692

00:35:06,790 --> 00:35:04,960

ordering life change tea get the tea.com

693

00:35:09,430 --> 00:35:06,800

and while you're on our site look around

694

00:35:11,349 --> 00:35:09,440

at the great non-gmo organic supplements

695

00:35:14,069 --> 00:35:11,359

and if you're a sales shopper go to our

696

00:35:15,750 --> 00:35:14,079

specials page and see what's for you

697

00:35:17,349 --> 00:35:15,760

i've been drinking the tea for 12 years

698

00:35:20,550 --> 00:35:17,359

and i'm sure glad for its health

699

00:35:21,910 --> 00:35:20,560

benefits again that's get the tea.com

700

00:35:23,190 --> 00:35:21,920

get the tea

701
00:35:25,829 --> 00:35:23,200
dot com

702
00:35:27,109 --> 00:35:25,839
the tea that makes you go

703
00:35:29,030 --> 00:35:27,119
do you have an interest in the

704
00:35:31,109 --> 00:35:29,040
paranormal that you'll love

705
00:35:33,589 --> 00:35:31,119
thenxnetwork.com

706
00:35:36,230 --> 00:35:33,599
the x is your streaming audio and video

707
00:35:39,990 --> 00:35:36,240
for everything supernatural strange and

708
00:35:42,230 --> 00:35:40,000
mysterious like ufos bigfoot ghosts and

709
00:35:45,109 --> 00:35:42,240
so much more from hosts like jimmy

710
00:35:47,470 --> 00:35:45,119
church whitley strieber micah hanks and

711
00:35:49,750 --> 00:35:47,480
christina gomez visit the

712
00:35:51,829 --> 00:35:49,760
unexnetwork.com show page for a complete

713
00:35:54,230 --> 00:35:51,839

list of all the paranormal programs

714

00:35:57,510 --> 00:35:54,240

you'll find on the x be sure to follow

715

00:36:00,230 --> 00:35:57,520

us on twitter for updates at kunxdb

716

00:36:03,030 --> 00:36:00,240

follow our facebook group an x network

717

00:36:06,550 --> 00:36:03,040

find the podcast on spotify iheart

718

00:36:07,430 --> 00:36:06,560

audible and apple podcast it's time it's

719

00:36:11,030 --> 00:36:07,440

new

720

00:36:16,150 --> 00:36:11,040

it's the x x

721

00:36:19,910 --> 00:36:18,550

fade to black

722

00:36:22,550 --> 00:36:19,920

is not

723

00:36:26,710 --> 00:36:22,560

your father's radio show

724

00:36:28,710 --> 00:36:26,720

on the game changer radio network

725

00:36:33,270 --> 00:36:28,720

hi this is rob reiner from anvil and

726
00:36:40,560 --> 00:36:35,870
what's up i'm chris what up this is kyle

727
00:36:52,950 --> 00:36:46,510
[Music]

728
00:36:57,109 --> 00:36:55,109
all right fade to black i am your host

729
00:36:59,270 --> 00:36:57,119
jimmy church tonight one of my all-time

730
00:37:00,740 --> 00:36:59,280
favorite guests good friend isaac arthur

731
00:37:02,069 --> 00:37:00,750
is back with us

732
00:37:03,109 --> 00:37:02,079
[Music]

733
00:37:05,270 --> 00:37:03,119
tonight's

734
00:37:06,950 --> 00:37:05,280
full night of science physics our

735
00:37:09,829 --> 00:37:06,960
universe

736
00:37:12,470 --> 00:37:09,839
and uh i'll say it who or what or may

737
00:37:14,230 --> 00:37:12,480
something be visiting us uh we're gonna

738
00:37:15,349 --> 00:37:14,240

debate this

739

00:37:16,950 --> 00:37:15,359

tonight we're gonna talk about

740

00:37:19,270 --> 00:37:16,960

exoplanets though

741

00:37:21,510 --> 00:37:19,280

and uh of course a little et thrown in

742

00:37:23,750 --> 00:37:21,520

and some omumua to make sure that we've

743

00:37:24,950 --> 00:37:23,760

got all bases covered

744

00:37:27,430 --> 00:37:24,960

isaac

745

00:37:29,190 --> 00:37:27,440

is the host of science and futurism with

746

00:37:31,190 --> 00:37:29,200

isaac arthur right there on youtube with

747

00:37:32,589 --> 00:37:31,200

over are you ready for this

748

00:37:36,950 --> 00:37:32,599

now

749

00:37:39,270 --> 00:37:36,960

684 000 subscribers covering topics like

750

00:37:41,589 --> 00:37:39,280

colonizing the solar system interstellar

751
00:37:43,750 --> 00:37:41,599
travel the fermi paradox he's worn that

752
00:37:45,109 --> 00:37:43,760
out to it's the best artificial

753
00:37:47,510 --> 00:37:45,119
intelligence and other topics

754
00:37:50,310 --> 00:37:47,520
representing possible future paths and

755
00:37:52,230 --> 00:37:50,320
challenges for humanity he received his

756
00:37:54,870 --> 00:37:52,240
degree in physics from kent state

757
00:37:57,589 --> 00:37:54,880
university graduating top of his class

758
00:37:59,670 --> 00:37:57,599
at the age of 20 and then was recruited

759
00:38:02,829 --> 00:37:59,680
by the cia

760
00:38:05,510 --> 00:38:02,839
that's right he is an agent he is a

761
00:38:07,589 --> 00:38:05,520
misinformation disinformation agent and

762
00:38:09,270 --> 00:38:07,599
he lives right there next to wright

763
00:38:10,470 --> 00:38:09,280

patterson air force base so i'm just

764

00:38:13,030 --> 00:38:10,480

saying

765

00:38:14,630 --> 00:38:13,040

nah he's the best he served in iraq with

766

00:38:19,109 --> 00:38:14,640

the united states army

767

00:38:21,430 --> 00:38:19,119

and uh i'm just gonna say this you guys

768

00:38:23,829 --> 00:38:21,440

figure this out on your own he worked as

769

00:38:27,190 --> 00:38:23,839

a civilian researcher at the air force

770

00:38:28,790 --> 00:38:27,200

institute of technology in dayton ohio

771

00:38:31,109 --> 00:38:28,800

hangar 18

772

00:38:32,470 --> 00:38:31,119

where they got the bodies

773

00:38:34,390 --> 00:38:32,480

and i would like to welcome back to fade

774

00:38:35,589 --> 00:38:34,400

to black isaac arthur isaac how you

775

00:38:37,270 --> 00:38:35,599

doing man

776

00:38:39,829 --> 00:38:37,280

jimmy it's great to be back on doing

777

00:38:41,750 --> 00:38:39,839

great yeah and and uh

778

00:38:45,270 --> 00:38:41,760

and and and you know you know what's

779

00:38:46,550 --> 00:38:45,280

funny um isaac that in our community

780

00:38:50,150 --> 00:38:46,560

um

781

00:38:52,150 --> 00:38:50,160

we anybody that's got your pedigree

782

00:38:54,790 --> 00:38:52,160

squinty eyes man we just look at you

783

00:38:56,630 --> 00:38:54,800

with squinty eyes we just

784

00:38:59,349 --> 00:38:56,640

i'll make it worse i was actually out in

785

00:39:01,430 --> 00:38:59,359

california not too far from you but a

786

00:39:03,589 --> 00:39:01,440

month ago uh talking to the rand

787

00:39:06,069 --> 00:39:03,599

corporation which i first got introduced

788

00:39:07,190 --> 00:39:06,079

to by the simpsons episode which uh was

789

00:39:09,829 --> 00:39:07,200

doing the conspiracy theories at the

790

00:39:11,190 --> 00:39:09,839

time so the rand corporation officially

791

00:39:11,990 --> 00:39:11,200

talked for them

792

00:39:14,069 --> 00:39:12,000

so

793

00:39:15,190 --> 00:39:14,079

you were at the round building in santa

794

00:39:17,190 --> 00:39:15,200

monica

795

00:39:18,470 --> 00:39:17,200

the rand uh building the big big

796

00:39:21,109 --> 00:39:18,480

building there was a mushroom cloud out

797

00:39:23,349 --> 00:39:21,119

front yeah yeah in uh in santa monica

798

00:39:25,510 --> 00:39:23,359

yep it's curved it's like a half circle

799

00:39:27,270 --> 00:39:25,520

it is yeah i guess it is yeah yeah yeah

800

00:39:29,750 --> 00:39:27,280

i used to sit outside of the rand

801
00:39:31,670 --> 00:39:29,760
corporation and try to get photographed

802
00:39:33,190 --> 00:39:31,680
right

803
00:39:34,550 --> 00:39:33,200
they'll let you take photographs inside

804
00:39:36,790 --> 00:39:34,560
the parts i was at anywhere they have a

805
00:39:37,589 --> 00:39:36,800
giant chessboard in there so yeah uh i

806
00:39:39,190 --> 00:39:37,599
was gonna say there's not much

807
00:39:41,589 --> 00:39:39,200
conspiratorial going on there but i

808
00:39:43,510 --> 00:39:41,599
don't think that's actually true so yeah

809
00:39:45,589 --> 00:39:43,520
let me tell you something they you were

810
00:39:47,910 --> 00:39:45,599
in the clean part of the building

811
00:39:49,750 --> 00:39:47,920
because you know i mean there's a lot of

812
00:39:50,790 --> 00:39:49,760
demented thought that goes down in that

813
00:39:52,630 --> 00:39:50,800

building

814

00:39:54,710 --> 00:39:52,640

you know what i mean they contemplate

815

00:39:57,430 --> 00:39:54,720

things that would just

816

00:39:59,990 --> 00:39:57,440

make your uh curdle your milk you know

817

00:40:01,910 --> 00:40:00,000

and you know it's their job and i get it

818

00:40:04,309 --> 00:40:01,920

and and that's what they do

819

00:40:07,109 --> 00:40:04,319

but the rand corporation is no joke you

820

00:40:08,630 --> 00:40:07,119

should if i would have known um that you

821

00:40:10,630 --> 00:40:08,640

were out here

822

00:40:12,550 --> 00:40:10,640

um i live

823

00:40:15,109 --> 00:40:12,560

next to skunk works

824

00:40:17,190 --> 00:40:15,119

right so lockheed martin is a couple of

825

00:40:20,710 --> 00:40:17,200

miles as a matter of fact

826

00:40:24,230 --> 00:40:20,720

um the road outside of my house

827

00:40:26,069 --> 00:40:24,240

t-bones and i'm not making this it ends

828

00:40:27,589 --> 00:40:26,079

at their front door

829

00:40:29,990 --> 00:40:27,599

right you just drive you make it look

830

00:40:32,230 --> 00:40:30,000

like you just drive i mean if you come

831

00:40:34,230 --> 00:40:32,240

out you come out to the house right and

832

00:40:36,829 --> 00:40:34,240

the first thing okay church let's go see

833

00:40:40,390 --> 00:40:36,839

it let's go see skunk works

834

00:40:43,589 --> 00:40:40,400

dude 120 seconds

835

00:40:46,069 --> 00:40:43,599

that's it it's right there man

836

00:40:48,150 --> 00:40:46,079

and uh it's nuts and it's all out there

837

00:40:49,030 --> 00:40:48,160

air force plan 42

838

00:40:51,109 --> 00:40:49,040

um

839

00:40:53,190 --> 00:40:51,119

one of the things that is going on out

840

00:40:55,750 --> 00:40:53,200

there right now isaac

841

00:40:59,430 --> 00:40:55,760

which is great interest for you

842

00:41:04,069 --> 00:40:59,440

is the new b21 not the b2

843

00:41:06,870 --> 00:41:04,079

the new b21 and it is getting ready

844

00:41:09,510 --> 00:41:06,880

for its initial flight test

845

00:41:11,190 --> 00:41:09,520

they've got air in the tires right

846

00:41:13,030 --> 00:41:11,200

they've got they're they're going

847

00:41:14,870 --> 00:41:13,040

through all the systems check and they

848

00:41:16,069 --> 00:41:14,880

they haven't enabled they probably won't

849

00:41:18,309 --> 00:41:16,079

announce you know when they're going to

850

00:41:21,030 --> 00:41:18,319

do this but i will see it

851

00:41:23,109 --> 00:41:21,040

and uh it's right there it's right there

852

00:41:25,190 --> 00:41:23,119

so cool i wanted to ask you this though

853

00:41:28,550 --> 00:41:25,200

i want to start off the show

854

00:41:33,910 --> 00:41:30,870

your youtube channel

855

00:41:36,470 --> 00:41:33,920

is big and and congratulations on that

856

00:41:38,790 --> 00:41:36,480

and i feel like i feel like i've been a

857

00:41:39,990 --> 00:41:38,800

part of the family since it started

858

00:41:41,910 --> 00:41:40,000

because

859

00:41:44,790 --> 00:41:41,920

i reached out to you and yeah yeah you

860

00:41:46,790 --> 00:41:44,800

had like 30 000 followers then and i and

861

00:41:50,150 --> 00:41:46,800

i watched it you know bill i mean

862

00:41:53,910 --> 00:41:50,160

obviously you know and uh

863

00:41:56,870 --> 00:41:53,920

but to see that and where it is today

864

00:41:59,030 --> 00:41:56,880

and the development and the evolution of

865

00:42:00,950 --> 00:41:59,040

everything and and what you have turned

866

00:42:03,190 --> 00:42:00,960

into and built this audience it's just

867

00:42:04,710 --> 00:42:03,200

absolutely incredible my friend it's uh

868

00:42:06,790 --> 00:42:04,720

it's been an awesome ride i'll say that

869

00:42:08,470 --> 00:42:06,800

i know you know all too well it's you

870

00:42:09,829 --> 00:42:08,480

get that audience with you for a while

871

00:42:10,710 --> 00:42:09,839

and it's just

872

00:42:13,430 --> 00:42:10,720

it

873

00:42:15,270 --> 00:42:13,440

if you love your job you never walk

874

00:42:16,790 --> 00:42:15,280

another day which is complete nonsense

875

00:42:18,790 --> 00:42:16,800

you'll just book 10 times harder but

876

00:42:21,349 --> 00:42:18,800

you'll like doing it but it's it's a

877

00:42:23,990 --> 00:42:21,359

great time isn't it

878

00:42:25,510 --> 00:42:24,000

okay so this leads me to my first

879

00:42:27,349 --> 00:42:25,520

question because

880

00:42:30,950 --> 00:42:27,359

you know your audience

881

00:42:32,230 --> 00:42:30,960

and i if i was going to make a guess i

882

00:42:35,589 --> 00:42:32,240

would say that

883

00:42:39,670 --> 00:42:35,599

probably half 50 of your audience

884

00:42:41,910 --> 00:42:39,680

100 believes in et and ufo and ufos are

885

00:42:44,710 --> 00:42:41,920

visiting earth today that's one of the

886

00:42:47,030 --> 00:42:44,720

reasons why they go and listen to you

887

00:42:49,670 --> 00:42:47,040

thank you hey we did a poll one time

888

00:42:52,230 --> 00:42:49,680

hold on hold on hold on don't let me

889

00:42:54,550 --> 00:42:52,240

this is my this isn't your show tonight

890

00:42:57,670 --> 00:42:54,560

this is my i ask the questions

891

00:42:58,870 --> 00:42:57,680

and it's this isaac hits his coffee like

892

00:42:59,910 --> 00:42:58,880

oh man it's going to be one of those

893

00:43:02,630 --> 00:42:59,920

shows

894

00:43:03,870 --> 00:43:02,640

um is but the other half of your

895

00:43:07,510 --> 00:43:03,880

audience

896

00:43:11,430 --> 00:43:07,520

scientifically fact-based pragmatic

897

00:43:13,190 --> 00:43:11,440

right and that's the other side

898

00:43:14,550 --> 00:43:13,200

here's the deal

899

00:43:16,230 --> 00:43:14,560

if you

900

00:43:17,670 --> 00:43:16,240

saw

901
00:43:19,349 --> 00:43:17,680
a ufo

902
00:43:20,790 --> 00:43:19,359
middle of the day

903
00:43:22,710 --> 00:43:20,800
crazy

904
00:43:24,550 --> 00:43:22,720
mothership not

905
00:43:26,710 --> 00:43:24,560
not some secret

906
00:43:30,150 --> 00:43:26,720
air force thing

907
00:43:32,470 --> 00:43:30,160
like a frigging ufo

908
00:43:33,510 --> 00:43:32,480
would you go and talk about it on your

909
00:43:35,990 --> 00:43:33,520
show

910
00:43:38,470 --> 00:43:36,000
oh yeah would you really would you would

911
00:43:41,349 --> 00:43:38,480
you alienate the half of your audience

912
00:43:43,190 --> 00:43:41,359
that would just go come on isaac are you

913
00:43:45,270 --> 00:43:43,200

a tinfoil hat

914

00:43:46,950 --> 00:43:45,280

i mean when we when we've done a pull

915

00:43:48,470 --> 00:43:46,960

out we checked in the audience was a

916

00:43:49,750 --> 00:43:48,480

little bit over half when the railway

917

00:43:51,670 --> 00:43:49,760

cam that i'm with the ones who think

918

00:43:53,349 --> 00:43:51,680

that alien life is probably nowhere near

919

00:43:54,790 --> 00:43:53,359

us right but could probably exist

920

00:43:56,870 --> 00:43:54,800

somewhere in the universe just you know

921

00:43:58,230 --> 00:43:56,880

not close uh and then everybody else

922

00:43:59,829 --> 00:43:58,240

broke up pretty evenly in the various

923

00:44:01,750 --> 00:43:59,839

camps but the biggest remaining camp

924

00:44:03,190 --> 00:44:01,760

after that was the you know the they

925

00:44:05,829 --> 00:44:03,200

they've been here regularly they've been

926

00:44:07,109 --> 00:44:05,839

here you know frequently and so i don't

927

00:44:10,230 --> 00:44:07,119

obviously wouldn't be alienating them at

928

00:44:11,750 --> 00:44:10,240

all but um you know we talk very vaguely

929

00:44:13,589 --> 00:44:11,760

about how we don't think there is going

930

00:44:15,109 --> 00:44:13,599

to be alien life anywhere near us and

931

00:44:16,309 --> 00:44:15,119

you know the audience still says

932

00:44:17,589 --> 00:44:16,319

otherwise

933

00:44:19,670 --> 00:44:17,599

so it would seem to me that be very

934

00:44:22,390 --> 00:44:19,680

likely that if i suddenly came out

935

00:44:24,710 --> 00:44:22,400

saying there was a ufo on my front lawn

936

00:44:26,390 --> 00:44:24,720

uh that a pretty good well once they

937

00:44:27,910 --> 00:44:26,400

assumed i wasn't drunk or making a joke

938

00:44:29,109 --> 00:44:27,920

at the expense would probably stick

939

00:44:30,790 --> 00:44:29,119

around anyway for the same ways the

940

00:44:31,990 --> 00:44:30,800

other folks do if people like you and

941

00:44:33,829 --> 00:44:32,000

they think that you're a good thinker

942

00:44:35,589 --> 00:44:33,839

they don't have to agree with you right

943

00:44:37,430 --> 00:44:35,599

right you know if they trust you then

944

00:44:39,190 --> 00:44:37,440

then when you tell them something

945

00:44:41,349 --> 00:44:39,200

i'd like to think that i would not abuse

946

00:44:43,670 --> 00:44:41,359

that but that if i if i tell them that i

947

00:44:45,030 --> 00:44:43,680

now believe in alien life's physios

948

00:44:46,870 --> 00:44:45,040

they'd probably believe me a lot of them

949

00:44:47,990 --> 00:44:46,880

probably would so

950

00:44:49,829 --> 00:44:48,000

the ones who thought i was just crazy

951
00:44:51,109 --> 00:44:49,839
would probably still want to draw anyway

952
00:44:53,430 --> 00:44:51,119
exactly

953
00:44:55,990 --> 00:44:53,440
so you'd be willing to just jump out of

954
00:44:57,670 --> 00:44:56,000
the closet and be the crazy dude you'd

955
00:44:58,950 --> 00:44:57,680
be willing to be me

956
00:45:02,710 --> 00:44:58,960
and trust you

957
00:45:05,910 --> 00:45:02,720
and just businesses were crazy anyway

958
00:45:07,910 --> 00:45:05,920
true true true av lope uh you know he's

959
00:45:09,349 --> 00:45:07,920
definitely uh and he is hardly a royalty

960
00:45:10,870 --> 00:45:09,359
and folks saying well he seems like he

961
00:45:12,790 --> 00:45:10,880
might have might have gone a little bit

962
00:45:14,710 --> 00:45:12,800
off the edge it's like well off the edge

963
00:45:17,190 --> 00:45:14,720

further forth it's still good off field

964

00:45:18,390 --> 00:45:17,200

if you're entirely settled but you know

965

00:45:20,870 --> 00:45:18,400

people are still completely respect him

966

00:45:23,270 --> 00:45:20,880

inside the community he thinks that was

967

00:45:25,030 --> 00:45:23,280

an alien artifact and uh he doesn't say

968

00:45:26,710 --> 00:45:25,040

he's 100 positive he just thinks it's

969

00:45:28,069 --> 00:45:26,720

more likely or not and some people

970

00:45:30,870 --> 00:45:28,079

twitter about that some people think

971

00:45:32,309 --> 00:45:30,880

it's funny some agree but otherwise he's

972

00:45:33,750 --> 00:45:32,319

still the same physics he's always been

973

00:45:35,990 --> 00:45:33,760

really good at his job

974

00:45:38,069 --> 00:45:36,000

he's a very smart guy and i've

975

00:45:41,030 --> 00:45:38,079

interviewed him a lot i've talked to him

976
00:45:42,870 --> 00:45:41,040
quite a bit off of the air too as well

977
00:45:43,910 --> 00:45:42,880
and

978
00:45:46,470 --> 00:45:43,920
he is

979
00:45:48,470 --> 00:45:46,480
he's not crazy

980
00:45:49,829 --> 00:45:48,480
his deal is

981
00:45:55,589 --> 00:45:49,839
data

982
00:45:58,870 --> 00:45:55,599
scientist is pushing him in that

983
00:46:01,750 --> 00:45:58,880
direction he is just following the data

984
00:46:03,510 --> 00:46:01,760
and what it represents now it's nothing

985
00:46:05,750 --> 00:46:03,520
that we can you know measure and

986
00:46:07,990 --> 00:46:05,760
quantify and throw in a laboratory right

987
00:46:11,430 --> 00:46:08,000
now and he understands that

988
00:46:12,870 --> 00:46:11,440

but for for from his perspective from

989

00:46:15,990 --> 00:46:12,880

where he sits

990

00:46:18,069 --> 00:46:16,000

that's what the data says to him

991

00:46:19,349 --> 00:46:18,079

and what scientists are supposed to do

992

00:46:21,109 --> 00:46:19,359

right tell people what they think it

993

00:46:22,710 --> 00:46:21,119

says now if it's way outside the

994

00:46:25,190 --> 00:46:22,720

mainstream you have certainly got

995

00:46:27,349 --> 00:46:25,200

permission and and cause to take your

996

00:46:28,309 --> 00:46:27,359

time to double check that and make sure

997

00:46:29,589 --> 00:46:28,319

you're not just throwing something out

998

00:46:31,430 --> 00:46:29,599

there because it seems like that false

999

00:46:33,270 --> 00:46:31,440

but he's decided that's what the data

1000

00:46:35,349 --> 00:46:33,280

says to him it's not without cause

1001

00:46:37,190 --> 00:46:35,359

there's reasons to think that and he

1002

00:46:38,870 --> 00:46:37,200

came out and said it i admire that i

1003

00:46:40,550 --> 00:46:38,880

don't agree with that but i admire that

1004

00:46:42,309 --> 00:46:40,560

now i think she hasn't been a good

1005

00:46:44,150 --> 00:46:42,319

scientist one bit quite the contrary it

1006

00:46:45,190 --> 00:46:44,160

means i'm a better scientist

1007

00:46:47,270 --> 00:46:45,200

sure

1008

00:46:49,589 --> 00:46:47,280

man i love you man you're so smart but

1009

00:46:53,030 --> 00:46:49,599

here's the here's the thing

1010

00:46:55,190 --> 00:46:53,040

okay so you see something crazy you know

1011

00:46:57,670 --> 00:46:55,200

it's not ours you don't know what it is

1012

00:46:59,030 --> 00:46:57,680

because none of us do when we see

1013

00:47:01,430 --> 00:46:59,040

something but

1014

00:47:05,349 --> 00:47:03,910

what would

1015

00:47:08,630 --> 00:47:05,359

convince you

1016

00:47:11,190 --> 00:47:08,640

to alter your perspective of things

1017

00:47:12,069 --> 00:47:11,200

visiting us the side the siding is one

1018

00:47:16,150 --> 00:47:12,079

thing

1019

00:47:19,349 --> 00:47:16,160

well to support that what what would

1020

00:47:23,030 --> 00:47:19,359

that be for you to change for you to add

1021

00:47:25,030 --> 00:47:23,040

your own chapter to the fermi paradox

1022

00:47:27,510 --> 00:47:25,040

if it was something specific to me that

1023

00:47:29,589 --> 00:47:27,520

has hit that extra factor because if you

1024

00:47:31,030 --> 00:47:29,599

plan to do a hoax on somebody or try to

1025

00:47:32,630 --> 00:47:31,040

convince them of you know i am the

1026
00:47:34,870 --> 00:47:32,640
perfect person to target for somebody

1027
00:47:36,470 --> 00:47:34,880
like that right so if there's a landing

1028
00:47:38,470 --> 00:47:36,480
ship outside my front yard that i know

1029
00:47:40,630 --> 00:47:38,480
witness to i have to consider that it's

1030
00:47:43,430 --> 00:47:40,640
very probably that somebody is is you

1031
00:47:45,030 --> 00:47:43,440
know hoaxing me pranking me et cetera or

1032
00:47:47,030 --> 00:47:45,040
even just trying to help me plant false

1033
00:47:48,870 --> 00:47:47,040
information so i that's kind of the

1034
00:47:51,430 --> 00:47:48,880
anthropic perspective i can't assume

1035
00:47:52,390 --> 00:47:51,440
myself as an observer to be isolated

1036
00:47:53,990 --> 00:47:52,400
from that event

1037
00:47:55,990 --> 00:47:54,000
but would take for me to believe in

1038
00:47:57,910 --> 00:47:56,000

alien life actually visiting earth on a

1039

00:48:00,150 --> 00:47:57,920

regular basis would just be you know

1040

00:48:01,670 --> 00:48:00,160

that i tend to feel like if it's there

1041

00:48:03,589 --> 00:48:01,680

for sure it's not going to be something

1042

00:48:05,109 --> 00:48:03,599

you really have to doubt if somebody

1043

00:48:06,950 --> 00:48:05,119

gets off a spaceship that just came down

1044

00:48:08,870 --> 00:48:06,960

to the sky and they have four arms and

1045

00:48:09,990 --> 00:48:08,880

four legs and they say we're from a

1046

00:48:11,589 --> 00:48:10,000

different planet

1047

00:48:14,150 --> 00:48:11,599

my initial assumption is that that is

1048

00:48:15,510 --> 00:48:14,160

probably the case

1049

00:48:16,870 --> 00:48:15,520

i i still want to go through the proper

1050

00:48:19,030 --> 00:48:16,880

motions of the same thing and say well

1051
00:48:19,829 --> 00:48:19,040
would you mind if we scanned you would

1052
00:48:21,349 --> 00:48:19,839
be

1053
00:48:24,470 --> 00:48:21,359
dna testing

1054
00:48:27,270 --> 00:48:24,480
nasa you know right right right right

1055
00:48:29,349 --> 00:48:27,280
but you know the idea is like uh i say

1056
00:48:31,030 --> 00:48:29,359
intelligence recognizes intelligence you

1057
00:48:32,710 --> 00:48:31,040
could be looking through old wreck or

1058
00:48:34,870 --> 00:48:32,720
you know stones and say well this looks

1059
00:48:35,990 --> 00:48:34,880
like a knife point or even a hammer and

1060
00:48:37,510 --> 00:48:36,000
i'm not sure but it could be an

1061
00:48:39,589 --> 00:48:37,520
artificial object you know millions of

1062
00:48:40,630 --> 00:48:39,599
years old and say you don't have that

1063
00:48:42,150 --> 00:48:40,640

problem you come across some of these

1064

00:48:42,950 --> 00:48:42,160

old workshops like this doesn't look

1065

00:48:45,430 --> 00:48:42,960

like

1066

00:48:47,510 --> 00:48:45,440

a set of wrenches a bunch of hammers

1067

00:48:49,349 --> 00:48:47,520

some clearly decayed electronics no this

1068

00:48:50,630 --> 00:48:49,359

is artificial you know you don't come

1069

00:48:52,950 --> 00:48:50,640

across something like that and be in

1070

00:48:54,309 --> 00:48:52,960

doubt it's definite so you can have a

1071

00:48:56,150 --> 00:48:54,319

lot of things that can point towards it

1072

00:48:58,309 --> 00:48:56,160

and not be certain but when it's

1073

00:48:59,510 --> 00:48:58,319

actually there to be absolutely certain

1074

00:49:00,710 --> 00:48:59,520

i don't think anyone's gonna be debating

1075

00:49:03,109 --> 00:49:00,720

anymore there'll just be a bunch of us

1076

00:49:04,870 --> 00:49:03,119

just say well we were wrong you know you

1077

00:49:05,670 --> 00:49:04,880

get wrong

1078

00:49:12,549 --> 00:49:05,680

i

1079

00:49:15,990 --> 00:49:12,559

years uh about the flat earth

1080

00:49:19,109 --> 00:49:16,000

and i didn't really want to do either of

1081

00:49:20,790 --> 00:49:19,119

the shows but um but i did them for a

1082

00:49:24,630 --> 00:49:20,800

couple of reasons one i have an open

1083

00:49:26,069 --> 00:49:24,640

mind two i'm very interested to see how

1084

00:49:28,309 --> 00:49:26,079

people's

1085

00:49:31,270 --> 00:49:28,319

methodology works not their mind

1086

00:49:32,309 --> 00:49:31,280

necessarily but how do they get to the

1087

00:49:34,230 --> 00:49:32,319

point

1088

00:49:36,069 --> 00:49:34,240

where they just absolutely throw

1089

00:49:38,069 --> 00:49:36,079

everything out the window and then go at

1090

00:49:40,230 --> 00:49:38,079

something like that and then

1091

00:49:42,710 --> 00:49:40,240

have the dedication to

1092

00:49:45,109 --> 00:49:42,720

and i respect that right i really do if

1093

00:49:47,270 --> 00:49:45,119

you believe in what you believe in i

1094

00:49:48,870 --> 00:49:47,280

have a lot of i don't have to agree

1095

00:49:50,230 --> 00:49:48,880

but i certainly have a lot of respect

1096

00:49:52,150 --> 00:49:50,240

for that

1097

00:49:53,829 --> 00:49:52,160

that's fascinating astronomy for flat

1098

00:49:55,190 --> 00:49:53,839

authors it was enough to make me do an

1099

00:49:56,870 --> 00:49:55,200

episode on it one time i was like how

1100

00:49:59,589 --> 00:49:56,880

would you grow up building a flat earth

1101

00:50:01,030 --> 00:49:59,599

so um although i had the title at flat

1102

00:50:03,109 --> 00:50:01,040

earth's mega structure was to make sure

1103

00:50:04,150 --> 00:50:03,119

that people would be um won't confuse i

1104

00:50:07,750 --> 00:50:04,160

was making an episode about how the

1105

00:50:10,870 --> 00:50:09,589

i haven't heard your flat earth episode

1106

00:50:12,390 --> 00:50:10,880

i need to go and check that out but

1107

00:50:15,990 --> 00:50:12,400

here's the thing

1108

00:50:18,549 --> 00:50:16,000

um i'm so glad that you are on the show

1109

00:50:19,589 --> 00:50:18,559

so i can get back to reality and get

1110

00:50:22,069 --> 00:50:19,599

centered

1111

00:50:25,270 --> 00:50:22,079

and even though you and i agree on just

1112

00:50:27,670 --> 00:50:25,280

about nothing right but

1113

00:50:29,750 --> 00:50:27,680

but here's here's the thing

1114

00:50:32,710 --> 00:50:29,760

is uh

1115

00:50:34,390 --> 00:50:32,720

i was told by his name's flat earth dave

1116

00:50:35,349 --> 00:50:34,400

last week

1117

00:50:36,549 --> 00:50:35,359

that

1118

00:50:42,230 --> 00:50:36,559

space

1119

00:50:44,870 --> 00:50:42,240

water

1120

00:50:45,910 --> 00:50:44,880

okay now hear me out on this

1121

00:50:47,750 --> 00:50:45,920

that

1122

00:50:51,510 --> 00:50:47,760

uh everything

1123

00:50:52,950 --> 00:50:51,520

every it it's all fake galileo made up

1124

00:50:55,270 --> 00:50:52,960

personality

1125

00:50:57,270 --> 00:50:55,280

copernicus written into the history

1126
00:51:00,309 --> 00:50:57,280
books just to throw us off the scene not

1127
00:51:03,270 --> 00:51:00,319
a real person tycho bray right of okay

1128
00:51:08,150 --> 00:51:03,280
so everything everything's fake

1129
00:51:10,150 --> 00:51:08,160
and that uh space itself is not a vacuum

1130
00:51:13,030 --> 00:51:10,160
it's water

1131
00:51:16,230 --> 00:51:13,040
water and that's where our rain comes

1132
00:51:17,510 --> 00:51:16,240
from it comes from space

1133
00:51:20,829 --> 00:51:17,520
now now

1134
00:51:25,990 --> 00:51:20,839
no

1135
00:51:27,670 --> 00:51:26,000
let's get back to reality and talk about

1136
00:51:29,589 --> 00:51:27,680
exoplanets man

1137
00:51:32,309 --> 00:51:29,599
well water is the most common molecule

1138
00:51:33,750 --> 00:51:32,319

besides hydrogen out there so i suppose

1139

00:51:35,430 --> 00:51:33,760

you know there are quasars out there

1140

00:51:37,910 --> 00:51:35,440

that spit out entire planets worth of

1141

00:51:39,910 --> 00:51:37,920

water every minute oh yeah one of those

1142

00:51:44,230 --> 00:51:39,920

two very large amount of it regularly i

1143

00:51:45,750 --> 00:51:44,240

i did see a photograph uh some imaging i

1144

00:51:47,750 --> 00:51:45,760

would have to go back and pull it up it

1145

00:51:48,549 --> 00:51:47,760

was very interesting to see

1146

00:51:52,150 --> 00:51:48,559

uh

1147

00:51:54,710 --> 00:51:52,160

a water vapor cloud out in deep space

1148

00:51:57,750 --> 00:51:54,720

right it was like as big as a galaxy

1149

00:51:59,670 --> 00:51:57,760

crazy right right

1150

00:52:01,190 --> 00:51:59,680

yeah yeah okay it was it was you

1151
00:52:02,710 --> 00:52:01,200
probably know what i'm talking about and

1152
00:52:04,470 --> 00:52:02,720
that image was just

1153
00:52:06,710 --> 00:52:04,480
i mean crazy

1154
00:52:08,069 --> 00:52:06,720
uh to but we don't need to say that

1155
00:52:09,270 --> 00:52:08,079
because flat earth dave's gonna hear

1156
00:52:11,030 --> 00:52:09,280
that and go see

1157
00:52:12,470 --> 00:52:11,040
i told you

1158
00:52:14,150 --> 00:52:12,480
you know i i had that with some folks

1159
00:52:15,510 --> 00:52:14,160
when i say like i do that epsilon d

1160
00:52:17,030 --> 00:52:15,520
extinction how we could probably go

1161
00:52:19,430 --> 00:52:17,040
ahead and resurrect things like mammoths

1162
00:52:20,309 --> 00:52:19,440
and dodos in the next 50 years or so

1163
00:52:22,390 --> 00:52:20,319

it's not you know we have that

1164

00:52:23,589 --> 00:52:22,400

technology now do we deal with a walk a

1165

00:52:26,230 --> 00:52:23,599

little bit of guessing here on there but

1166

00:52:27,430 --> 00:52:26,240

we have that tech now right

1167

00:52:28,950 --> 00:52:27,440

and if you say well you don't tell

1168

00:52:30,710 --> 00:52:28,960

people that because then they'll relax

1169

00:52:31,829 --> 00:52:30,720

about their environmental safeguards and

1170

00:52:33,589 --> 00:52:31,839

they'll be been working with species

1171

00:52:34,549 --> 00:52:33,599

going extinct because i said well we

1172

00:52:36,549 --> 00:52:34,559

should probably just get a sample of

1173

00:52:38,230 --> 00:52:36,559

everybody's dna as a you know last

1174

00:52:40,390 --> 00:52:38,240

course get all those you know endangered

1175

00:52:41,670 --> 00:52:40,400

animals to get their dna and they said

1176
00:52:43,349 --> 00:52:41,680
that make people not want to keep them

1177
00:52:45,030 --> 00:52:43,359
around anymore because it won't have to

1178
00:52:47,349 --> 00:52:45,040
say well i'm not going to lie to people

1179
00:52:48,549 --> 00:52:47,359
about this option to make it

1180
00:52:50,549 --> 00:52:48,559
less likely they're going to preserve

1181
00:52:51,990 --> 00:52:50,559
the planet i'm just saying you still

1182
00:52:53,750 --> 00:52:52,000
was over the planet but it's okay to

1183
00:52:55,030 --> 00:52:53,760
have this as a fallback

1184
00:52:56,950 --> 00:52:55,040
and so you do have that with you know

1185
00:52:58,390 --> 00:52:56,960
with these kind of things sometimes you

1186
00:53:00,309 --> 00:52:58,400
i don't worry about if we tell somebody

1187
00:53:02,150 --> 00:53:00,319
who's got a belief i might not agree

1188
00:53:04,710 --> 00:53:02,160

with something that helps support their

1189

00:53:06,630 --> 00:53:04,720

belief now when he you know now he knows

1190

00:53:08,549 --> 00:53:06,640

the whole galaxy's full of water you

1191

00:53:10,710 --> 00:53:08,559

know well

1192

00:53:13,349 --> 00:53:10,720

and it's and it that's it's that's

1193

00:53:15,030 --> 00:53:13,359

what's surrounding us now okay so let's

1194

00:53:17,190 --> 00:53:15,040

let's get off flat earth let's let's

1195

00:53:19,430 --> 00:53:17,200

let's let's let's get back to sanity

1196

00:53:21,510 --> 00:53:19,440

here they just walk off the edge

1197

00:53:22,870 --> 00:53:21,520

let's go off the edge and into

1198

00:53:25,670 --> 00:53:22,880

exoplanets

1199

00:53:27,910 --> 00:53:25,680

and uh because i could continue this if

1200

00:53:30,710 --> 00:53:27,920

i told you what he said was uh uh on the

1201

00:53:33,190 --> 00:53:30,720

other end of the uh the other side of

1202

00:53:34,549 --> 00:53:33,200

the ice wall you know that surrounds the

1203

00:53:37,270 --> 00:53:34,559

flat earth you know what he said the

1204

00:53:38,309 --> 00:53:37,280

antarctica the true antarctica he said

1205

00:53:39,910 --> 00:53:38,319

he said

1206

00:53:41,270 --> 00:53:39,920

terra firma

1207

00:53:43,270 --> 00:53:41,280

continues

1208

00:53:45,829 --> 00:53:43,280

to infinity

1209

00:53:50,870 --> 00:53:45,839

it on the other side of the ice wall

1210

00:53:55,750 --> 00:53:53,510

a thousand continents

1211

00:53:56,870 --> 00:53:55,760

okay so i don't want your reaction let's

1212

00:53:58,230 --> 00:53:56,880

not do this

1213

00:54:01,270 --> 00:53:58,240

now okay

1214

00:54:02,309 --> 00:54:01,280

let's let's start here

1215

00:54:05,349 --> 00:54:02,319

and

1216

00:54:06,950 --> 00:54:05,359

i want to start with the drake equation

1217

00:54:09,510 --> 00:54:06,960

and one of the reasons why i want to

1218

00:54:12,230 --> 00:54:09,520

start with that i'm in the the second

1219

00:54:14,630 --> 00:54:12,240

read of of this particular book which is

1220

00:54:16,390 --> 00:54:14,640

a collection of astrophysicists and

1221

00:54:17,910 --> 00:54:16,400

scientists and intellectuals around the

1222

00:54:18,950 --> 00:54:17,920

world just commenting on different

1223

00:54:21,349 --> 00:54:18,960

aspects

1224

00:54:24,230 --> 00:54:21,359

on the subject of aliens

1225

00:54:25,750 --> 00:54:24,240

and uh nobody from the ufo community

1226

00:54:27,109 --> 00:54:25,760

just just out there and it's it's

1227

00:54:29,030 --> 00:54:27,119

interesting but

1228

00:54:31,910 --> 00:54:29,040

um

1229

00:54:34,710 --> 00:54:31,920

they're essays okay so there's i've had

1230

00:54:38,390 --> 00:54:34,720

there's 50 60 essays in this book

1231

00:54:39,990 --> 00:54:38,400

and so but one of the essays is on the

1232

00:54:43,829 --> 00:54:40,000

drake equation

1233

00:54:46,390 --> 00:54:43,839

and how the original formula i mean the

1234

00:54:47,349 --> 00:54:46,400

original numbers pulled from drake

1235

00:54:49,589 --> 00:54:47,359

himself

1236

00:54:51,430 --> 00:54:49,599

put the number at like 10 000 planets i

1237

00:54:53,030 --> 00:54:51,440

think was what

1238

00:54:55,190 --> 00:54:53,040

am i right yeah it was ten thousand

1239

00:54:56,630 --> 00:54:55,200

right sounds about right it was it's

1240

00:54:58,710 --> 00:54:56,640

very much there was a lot of guessing on

1241

00:54:59,750 --> 00:54:58,720

those numbers anyway so but i think the

1242

00:55:01,430 --> 00:54:59,760

ten thousand was what they thought would

1243

00:55:03,030 --> 00:55:01,440

be the low win number for the galaxy

1244

00:55:04,870 --> 00:55:03,040

right right right so the numbers ten

1245

00:55:08,309 --> 00:55:04,880

thousand and but

1246

00:55:10,789 --> 00:55:08,319

um and in this essay uh they they

1247

00:55:11,829 --> 00:55:10,799

started to comment about

1248

00:55:15,270 --> 00:55:11,839

how

1249

00:55:16,390 --> 00:55:15,280

that number is so far off now

1250

00:55:18,309 --> 00:55:16,400

in that

1251
00:55:21,910 --> 00:55:18,319
once you start to plug in what we know

1252
00:55:24,150 --> 00:55:21,920
about the milky way today and not 1960

1253
00:55:26,950 --> 00:55:24,160
version of the milky way when there

1254
00:55:28,309 --> 00:55:26,960
wasn't any exoplanets right yet and none

1255
00:55:30,630 --> 00:55:28,319
of that happened

1256
00:55:31,829 --> 00:55:30,640
where today we start to plug in these

1257
00:55:34,789 --> 00:55:31,839
numbers

1258
00:55:36,870 --> 00:55:34,799
and we have a greater understanding of

1259
00:55:39,270 --> 00:55:36,880
not only the amount of exoplanets in the

1260
00:55:41,750 --> 00:55:39,280
milky way which is every single star

1261
00:55:44,150 --> 00:55:41,760
that we see right okay so

1262
00:55:46,390 --> 00:55:44,160
uh there's that part but now we

1263
00:55:49,670 --> 00:55:46,400

understand stars a bit better and what

1264

00:55:52,870 --> 00:55:49,680

types of stars the ages of stars and

1265

00:55:55,510 --> 00:55:52,880

and the equation which went to

1266

00:55:58,390 --> 00:55:55,520

um uh guess work

1267

00:56:00,710 --> 00:55:58,400

right right complete your arbitrary

1268

00:56:02,309 --> 00:56:00,720

numbers are going in uh to get to this

1269

00:56:06,150 --> 00:56:02,319

number of ten thousand but the number

1270

00:56:08,230 --> 00:56:06,160

today with the drake equation is a crazy

1271

00:56:11,109 --> 00:56:08,240

big number now

1272

00:56:12,549 --> 00:56:11,119

um what what do you make of that when we

1273

00:56:14,470 --> 00:56:12,559

look at how many

1274

00:56:17,190 --> 00:56:14,480

i mean every star in

1275

00:56:19,910 --> 00:56:17,200

in the milky way theoretically has a

1276

00:56:21,990 --> 00:56:19,920

planet so now we could have upwards of

1277

00:56:23,990 --> 00:56:22,000

uh you know avi loeb said last month on

1278

00:56:26,549 --> 00:56:24,000

the show when i said a trillion planets

1279

00:56:27,750 --> 00:56:26,559

because now much more more more yeah

1280

00:56:29,589 --> 00:56:27,760

yeah people ask me how many plants

1281

00:56:30,870 --> 00:56:29,599

eventually colonized and is say could it

1282

00:56:32,549 --> 00:56:30,880

be you know hundreds of billions because

1283

00:56:33,670 --> 00:56:32,559

that's how many stars are saying no

1284

00:56:35,349 --> 00:56:33,680

we're going to have qualities several on

1285

00:56:37,990 --> 00:56:35,359

our own solar system bunch that won't be

1286

00:56:40,150 --> 00:56:38,000

the system think probably trillions

1287

00:56:41,430 --> 00:56:40,160

minimal

1288

00:56:46,390 --> 00:56:41,440

so

1289

00:56:49,190 --> 00:56:46,400
of the drake equation which was

1290

00:56:50,150 --> 00:56:49,200
trying to you know formulate a number

1291

00:56:53,990 --> 00:56:50,160
from

1292

00:56:56,069 --> 00:56:54,000
uh uh a balanced mind right we're not

1293

00:56:58,470 --> 00:56:56,079
just based on what we knew

1294

00:57:00,150 --> 00:56:58,480
the galaxy is 100 years old as of today

1295

00:57:01,670 --> 00:57:00,160
in terms of how long we've had this

1296

00:57:03,510 --> 00:57:01,680
concept of the galaxy that's not today

1297

00:57:07,750 --> 00:57:03,520
sorry this year that's a 100 year old

1298

00:57:09,910 --> 00:57:07,760
concept it's 1922. 1922. edward and now

1299

00:57:11,750 --> 00:57:09,920
we and it was in a few more decades we

1300

00:57:13,750 --> 00:57:11,760
knew how all the galaxies and how old

1301

00:57:14,789 --> 00:57:13,760

the universe was however the galaxy was

1302

00:57:16,950 --> 00:57:14,799

of course we just recently found that

1303

00:57:18,390 --> 00:57:16,960

way to rename the age of the galaxy too

1304

00:57:21,750 --> 00:57:18,400

it's not as old as we thought it was

1305

00:57:23,910 --> 00:57:21,760

order right and so we say how do we know

1306

00:57:25,270 --> 00:57:23,920

about all this data back in the 50s and

1307

00:57:26,870 --> 00:57:25,280

60s they already write about how we

1308

00:57:28,549 --> 00:57:26,880

figure there'll probably be a plan

1309

00:57:29,990 --> 00:57:28,559

around well at least one in 10 systems

1310

00:57:31,910 --> 00:57:30,000

we're gonna have planets right at least

1311

00:57:33,829 --> 00:57:31,920

that maybe a little less maybe more

1312

00:57:35,750 --> 00:57:33,839

maybe every one but that was not too

1313

00:57:37,910 --> 00:57:35,760

much response say one in ten how many of

1314

00:57:39,430 --> 00:57:37,920

those could support life well i say well

1315

00:57:40,710 --> 00:57:39,440

maybe one and ten of those and at that

1316

00:57:42,549 --> 00:57:40,720

point you're already up to the point

1317

00:57:44,069 --> 00:57:42,559

where it'll be a billion and then it

1318

00:57:45,349 --> 00:57:44,079

turns out to be more because we find out

1319

00:57:47,270 --> 00:57:45,359

that there's a lot more stars in the

1320

00:57:49,510 --> 00:57:47,280

galaxy than we thought when i was a kid

1321

00:57:50,950 --> 00:57:49,520

we caught our star a yellow dwarf

1322

00:57:53,430 --> 00:57:50,960

because it was smaller than most the

1323

00:57:55,349 --> 00:57:53,440

stars around it that we could see most

1324

00:57:57,109 --> 00:57:55,359

stars we see are the really bright ones

1325

00:57:58,630 --> 00:57:57,119

but our sun isn't like the top five

1326

00:58:00,390 --> 00:57:58,640

percent from mass

1327

00:58:02,069 --> 00:58:00,400

and that's just a visible star that's

1328

00:58:03,829 --> 00:58:02,079

right you know the red dwarfs are almost

1329

00:58:05,270 --> 00:58:03,839

everything and there's no reason life

1330

00:58:06,349 --> 00:58:05,280

can't live around them

1331

00:58:10,150 --> 00:58:06,359

for a

1332

00:58:12,150 --> 00:58:10,160

long time oh yeah yeah i was writing

1333

00:58:13,829 --> 00:58:12,160

about uh an episode recently where we

1334

00:58:14,950 --> 00:58:13,839

had found there's there's a star not

1335

00:58:17,430 --> 00:58:14,960

even 100 light years like you know

1336

00:58:19,430 --> 00:58:17,440

backyard practically that's 12 billion

1337

00:58:22,309 --> 00:58:19,440

years old it's a binary system uh

1338

00:58:24,309 --> 00:58:22,319

epsilon for an asset yes 100 years away

1339

00:58:26,230 --> 00:58:24,319

right and it's not really all that

1340

00:58:28,069 --> 00:58:26,240

spectacular but it's 12

1341

00:58:30,390 --> 00:58:28,079

billion years old

1342

00:58:33,829 --> 00:58:30,400

and it's going to be there for another

1343

00:58:36,069 --> 00:58:33,839

trillion years oh the the secondary will

1344

00:58:38,069 --> 00:58:36,079

be there the primary which is 90 percent

1345

00:58:39,750 --> 00:58:38,079

of the mass of our sun is its super

1346

00:58:41,670 --> 00:58:39,760

giant face sorry not supergiant giant

1347

00:58:42,789 --> 00:58:41,680

phase now sub giant phase and instead of

1348

00:58:44,630 --> 00:58:42,799

being a little bit dim all the sudden

1349

00:58:46,470 --> 00:58:44,640

it's four times brighter so it's getting

1350

00:58:48,230 --> 00:58:46,480

ready to end it will go as a red dwarf

1351

00:58:50,470 --> 00:58:48,240

and then it'll shrink back down finally

1352

00:58:52,870 --> 00:58:50,480

it's one of those very few stars no less

1353

00:58:54,789 --> 00:58:52,880

massive than our sun have died yet

1354

00:58:56,950 --> 00:58:54,799

and it is one of the examples of why

1355

00:58:58,230 --> 00:58:56,960

that's that's the case it's just it's 12

1356

00:58:59,589 --> 00:58:58,240

billion years old it's just barely

1357

00:59:01,190 --> 00:58:59,599

getting the point of dying and it's

1358

00:59:03,190 --> 00:59:01,200

still got a red dwarf giant about that

1359

00:59:04,630 --> 00:59:03,200

sorry a red dwarf companion man that's

1360

00:59:05,910 --> 00:59:04,640

going to be having boards around for who

1361

00:59:08,789 --> 00:59:05,920

knows how long

1362

00:59:10,789 --> 00:59:08,799

yeah and and so when we

1363

00:59:13,670 --> 00:59:10,799

that's a long time to evolve live yeah

1364

00:59:14,789 --> 00:59:13,680

and so uh looking at the drake equation

1365

00:59:16,710 --> 00:59:14,799

today

1366

00:59:18,390 --> 00:59:16,720

uh just in a general sense have you

1367

00:59:21,589 --> 00:59:18,400

plugged in numbers to see what it would

1368

00:59:23,870 --> 00:59:21,599

crank out do you have an idea

1369

00:59:25,670 --> 00:59:23,880

of a number

1370

00:59:27,990 --> 00:59:25,680

of

1371

00:59:29,349 --> 00:59:28,000

habitable exoplanets in the goldilocks

1372

00:59:31,829 --> 00:59:29,359

zone

1373

00:59:34,150 --> 00:59:31,839

uh probably in the vicinity of 10

1374

00:59:35,829 --> 00:59:34,160

billion plus or minus yeah that's great

1375

00:59:37,589 --> 00:59:35,839

and that's that's that's very dependent

1376

00:59:38,470 --> 00:59:37,599

on it what qualifies as habitable

1377

00:59:39,910 --> 00:59:38,480

because

1378

00:59:41,349 --> 00:59:39,920

if the plant's a little bit too big a

1379

00:59:43,430 --> 00:59:41,359

little bit too small it won't be a hard

1380

00:59:45,109 --> 00:59:43,440

atmosphere or it'll be all ocean and we

1381

00:59:46,950 --> 00:59:45,119

don't know quite enough yet to say what

1382

00:59:47,910 --> 00:59:46,960

mass it needs to be to be earth-like

1383

00:59:49,430 --> 00:59:47,920

because that's probably going to be as

1384

00:59:52,390 --> 00:59:49,440

big a factor as this distance from its

1385

00:59:55,270 --> 00:59:52,400

stall yeah yeah isn't that fascinating i

1386

00:59:56,549 --> 00:59:55,280

mean it's just mind-blowing and

1387

00:59:57,589 --> 00:59:56,559

we're going to head to a break in about

1388

00:59:59,990 --> 00:59:57,599

two minutes

1389

01:00:03,270 --> 01:00:00,000

um last week it might have been two

1390

01:00:05,910 --> 01:00:03,280

weeks ago uh but just recently

1391

01:00:10,470 --> 01:00:05,920

the announcement was made that we found

1392

01:00:11,270 --> 01:00:10,480

uh a spiral of stars in our milky way

1393

01:00:14,470 --> 01:00:11,280

that

1394

01:00:15,589 --> 01:00:14,480

are now nearly as old as the big bang

1395

01:00:17,990 --> 01:00:15,599

and

1396

01:00:20,150 --> 01:00:18,000

it's like hold on a minute now because

1397

01:00:24,150 --> 01:00:20,160

we always look at our sun

1398

01:00:26,230 --> 01:00:24,160

as you know a 10 billion year life span

1399

01:00:28,150 --> 01:00:26,240

and that earth and our center about the

1400

01:00:31,270 --> 01:00:28,160

same age right we'll just go with four

1401

01:00:35,589 --> 01:00:31,280

and a half uh billion years or so

1402

01:00:38,470 --> 01:00:35,599

and uh and life is here now and so we

1403

01:00:39,270 --> 01:00:38,480

probably had about three billion years

1404

01:00:41,670 --> 01:00:39,280

of

1405

01:00:44,470 --> 01:00:41,680

decent you know the latest three billion

1406

01:00:46,230 --> 01:00:44,480

years for our planet that it took for us

1407

01:00:48,309 --> 01:00:46,240

to get to where we are today about three

1408

01:00:51,030 --> 01:00:48,319

billion years yeah give or take and then

1409

01:00:53,109 --> 01:00:51,040

we have the cambrian explosion 600

1410

01:00:54,470 --> 01:00:53,119

million years ago where like the real

1411

01:00:56,710 --> 01:00:54,480

life started

1412

01:00:59,190 --> 01:00:56,720

so but it took four and a half billion

1413

01:01:00,069 --> 01:00:59,200

years with our planet to get to this

1414

01:01:02,950 --> 01:01:00,079

point

1415

01:01:04,069 --> 01:01:02,960

but then we start looking at this spiral

1416

01:01:07,109 --> 01:01:04,079

you know

1417

01:01:08,789 --> 01:01:07,119

ring in our galaxy that is that old

1418

01:01:11,670 --> 01:01:08,799

where life

1419

01:01:13,670 --> 01:01:11,680

right could have really had a jump start

1420

01:01:15,829 --> 01:01:13,680

ah it's it's it's the you got all these

1421

01:01:17,910 --> 01:01:15,839

cannibalized galaxies from the oh all

1422

01:01:19,270 --> 01:01:17,920

galaxy eats other galaxies left and

1423

01:01:20,950 --> 01:01:19,280

right and

1424

01:01:21,990 --> 01:01:20,960

the it's probably amusing the one in

1425

01:01:25,829 --> 01:01:22,000

question i think you probably think it

1426
01:01:27,750 --> 01:01:25,839
was called the gaian sausage galaxy so

1427
01:01:29,270 --> 01:01:27,760
which is not a mispronunciation so

1428
01:01:33,510 --> 01:01:29,280
that's another show

1429
01:01:38,630 --> 01:01:33,520
it's another show

1430
01:01:41,589 --> 01:01:38,640
that it's possible

1431
01:01:44,710 --> 01:01:41,599
that there are planets out there that

1432
01:01:47,510 --> 01:01:44,720
could have had a jump start on us by as

1433
01:01:49,910 --> 01:01:47,520
much as you know eight mil eight billion

1434
01:01:51,430 --> 01:01:49,920
years yeah

1435
01:01:53,510 --> 01:01:51,440
i mean it'd be pushing at that point

1436
01:01:54,950 --> 01:01:53,520
like the material for our planet we as

1437
01:01:57,270 --> 01:01:54,960
we say it's probably mostly six billion

1438
01:01:58,789 --> 01:01:57,280

years old all the actual rocky metal

1439

01:02:02,390 --> 01:01:58,799

that's usually what we date that too

1440

01:02:04,230 --> 01:02:02,400

right and um you know you could see life

1441

01:02:07,510 --> 01:02:04,240

even 12 billion years ago

1442

01:02:10,390 --> 01:02:07,520

it's a stretch it's a stretch but it you

1443

01:02:11,829 --> 01:02:10,400

know 12 billion or you know what matters

1444

01:02:13,270 --> 01:02:11,839

is that it could have been a billion

1445

01:02:14,390 --> 01:02:13,280

years for us

1446

01:02:16,870 --> 01:02:14,400

it could have been a billion years for

1447

01:02:18,789 --> 01:02:16,880

us very easily our planet forms 100

1448

01:02:20,630 --> 01:02:18,799

million years earlier and the cambrian

1449

01:02:22,390 --> 01:02:20,640

explosion happens a half million years

1450

01:02:23,589 --> 01:02:22,400

ago any of those things right you

1451

01:02:27,270 --> 01:02:23,599

shouldn't need more than a million years

1452

01:02:29,829 --> 01:02:28,549

it's just the dinosaurs have gotten

1453

01:02:31,109 --> 01:02:29,839

smart enough it had to do with space

1454

01:02:32,470 --> 01:02:31,119

travel they should have been there you

1455

01:02:34,950 --> 01:02:32,480

know that's that's the problem that we

1456

01:02:36,309 --> 01:02:34,960

see with that life could be

1457

01:02:38,230 --> 01:02:36,319

life could have been ancient before

1458

01:02:39,990 --> 01:02:38,240

earth was even around yeah that's right

1459

01:02:41,910 --> 01:02:40,000

now let me okay

1460

01:02:43,589 --> 01:02:41,920

i just blew past the commercial by 30

1461

01:02:45,670 --> 01:02:43,599

seconds

1462

01:02:47,349 --> 01:02:45,680

here's the quick answer

1463

01:02:49,109 --> 01:02:47,359

let's say

1464

01:02:51,349 --> 01:02:49,119

the comet

1465

01:02:54,230 --> 01:02:51,359

asteroid whatever doesn't hit the earth

1466

01:02:57,190 --> 01:02:54,240

75 million years ago

1467

01:02:59,829 --> 01:02:57,200

do dinosaurs build radio telescopes

1468

01:02:59,839 --> 01:03:04,470

i think they already built them but then

1469

01:03:07,270 --> 01:03:06,150

yes right

1470

01:03:08,549 --> 01:03:07,280

yeah i think that if they were the

1471

01:03:10,870 --> 01:03:08,559

dominant life form they probably have

1472

01:03:11,910 --> 01:03:10,880

gotten to space sooner of course some

1473

01:03:13,750 --> 01:03:11,920

say they might have been on their way

1474

01:03:15,670 --> 01:03:13,760

out already by the new way maybe you

1475

01:03:17,430 --> 01:03:15,680

just put a been a little bit of a delay

1476

01:03:19,750 --> 01:03:17,440

on us before we took over the planet as

1477

01:03:22,230 --> 01:03:19,760

mammals but no i think that there's so

1478

01:03:23,910 --> 01:03:22,240

many places in our in our evolutionary

1479

01:03:26,150 --> 01:03:23,920

path that a limited time could have been

1480

01:03:27,510 --> 01:03:26,160

shaved out by luck and so we either have

1481

01:03:29,510 --> 01:03:27,520

to assume that we are the lucky first

1482

01:03:30,549 --> 01:03:29,520

ones or we have to assume that we

1483

01:03:31,990 --> 01:03:30,559

haven't been and that somebody should

1484

01:03:33,510 --> 01:03:32,000

have been he was suitable yes that's

1485

01:03:36,390 --> 01:03:33,520

right you have stands but wouldn't

1486

01:03:37,349 --> 01:03:36,400

dinosaurs need opposing thumbs to do

1487

01:03:39,029 --> 01:03:37,359

that

1488

01:03:40,390 --> 01:03:39,039

let's take a break

1489

01:03:42,470 --> 01:03:40,400

take a break right here it might have

1490

01:03:44,470 --> 01:03:42,480

been what to do you know that saluting

1491

01:03:46,309 --> 01:03:44,480

hypothesis how how old can you really

1492

01:03:47,750 --> 01:03:46,319

tell you know how how much do you really

1493

01:03:49,589 --> 01:03:47,760

tell the fossil record about what they

1494

01:03:51,589 --> 01:03:49,599

had i don't think they they had really

1495

01:03:52,789 --> 01:03:51,599

the brain capacity for that but you know

1496

01:03:53,990 --> 01:03:52,799

what do you really get in the fossil

1497

01:03:57,029 --> 01:03:54,000

record

1498

01:03:58,789 --> 01:03:57,039

dinosaurs isaac arthur is one of us this

1499

01:04:00,789 --> 01:03:58,799

is faith to black i'm your host jimmy

1500

01:04:03,109 --> 01:04:00,799

church more with isaac after this short

1501
01:04:04,130 --> 01:04:03,119
break tonight it's exoplanets stay with

1502
01:04:20,950 --> 01:04:04,140
us

1503
01:04:26,660 --> 01:04:23,109
this is fade to black with jimmy church

1504
01:04:28,150 --> 01:04:26,670
on the game changer radio network

1505
01:04:30,630 --> 01:04:28,160
[Music]

1506
01:04:34,069 --> 01:04:30,640
your 1 million gigawatt paranormal

1507
01:04:36,230 --> 01:04:34,079
powerhouse kunx db

1508
01:04:38,390 --> 01:04:36,240
the x

1509
01:04:40,549 --> 01:04:38,400
this is billy carson founder and ceo of

1510
01:04:42,309 --> 01:04:40,559
forbidden knowledge dot tv forbidden

1511
01:04:44,069 --> 01:04:42,319
knowledge dot tv is the fastest growing

1512
01:04:45,910 --> 01:04:44,079
and one of the most watched networks in

1513
01:04:47,510 --> 01:04:45,920

the world i would like to personally

1514

01:04:50,390 --> 01:04:47,520

invite you to check out our expanding

1515

01:04:52,470 --> 01:04:50,400

library of tv film lectures and special

1516

01:04:54,549 --> 01:04:52,480

presentations forbidden knowledge dot tv

1517

01:04:57,829 --> 01:04:54,559

has over six 000 videos covering lost

1518

01:04:59,750 --> 01:04:57,839

history health ufos spirituality and our

1519

01:05:02,150 --> 01:04:59,760

future we are committed to our community

1520

01:05:04,230 --> 01:05:02,160

and with my personal invitation you can

1521

01:05:06,549 --> 01:05:04,240

right now get your free 30-day

1522

01:05:08,549 --> 01:05:06,559

membership at forbidden knowledge dot tv

1523

01:05:14,309 --> 01:05:08,559

your own library of information starts

1524

01:05:18,549 --> 01:05:16,390

because you never got that pony you

1525

01:05:20,230 --> 01:05:18,559

always wanted

1526

01:05:22,630 --> 01:05:20,240

damn it

1527

01:05:27,190 --> 01:05:22,640

jimmy church and fade to black on the

1528

01:05:32,789 --> 01:05:30,390

listen i know and you know that you've

1529

01:05:35,029 --> 01:05:32,799

always wanted your first crystal skull

1530

01:05:37,190 --> 01:05:35,039

or maybe you're a collector just like me

1531

01:05:39,029 --> 01:05:37,200

but you just don't know where to go to

1532

01:05:41,029 --> 01:05:39,039

find the real thing

1533

01:05:43,670 --> 01:05:41,039

then i met carolyn ford over at

1534

01:05:46,069 --> 01:05:43,680

einsteinthecrystalskull.com

1535

01:05:48,069 --> 01:05:46,079

carolyn is the guardian of einstein one

1536

01:05:50,549 --> 01:05:48,079

of the most respected ancient crystal

1537

01:05:52,390 --> 01:05:50,559

skulls in the world all of her unique

1538

01:05:54,710 --> 01:05:52,400

skulls have been imprinted sitting with

1539

01:05:56,710 --> 01:05:54,720

einstein in his sacred lodge and are

1540

01:05:59,430 --> 01:05:56,720

carved from the finest gemstone and

1541

01:06:01,430 --> 01:05:59,440

materials imprinting is the process of

1542

01:06:05,029 --> 01:06:01,440

receiving the ancient wisdom from the

1543

01:06:07,430 --> 01:06:05,039

master skull or master computer einstein

1544

01:06:09,190 --> 01:06:07,440

the ancient crystal skull to see

1545

01:06:12,510 --> 01:06:09,200

carolyn's current collection of crystal

1546

01:06:14,150 --> 01:06:12,520

skulls just visit her store at

1547

01:06:16,710 --> 01:06:14,160

einsteinthecrystalskull.com or click on

1548

01:06:19,270 --> 01:06:16,720

the banner over on our site don't forget

1549

01:06:22,150 --> 01:06:19,280

to use the promo code jimmy at checkout

1550

01:06:25,109 --> 01:06:22,160

to receive 10 off of your order today

1551

01:06:27,990 --> 01:06:25,119

that's promo code jimmy finding your

1552

01:06:31,589 --> 01:06:28,000

first or next crystal skull is easy just

1553

01:06:34,549 --> 01:06:31,599

visit einstein the crystal skull.com

1554

01:06:36,069 --> 01:06:34,559

hi racehobbs with the x obviously if

1555

01:06:38,309 --> 01:06:36,079

you're listening to this you have an

1556

01:06:41,670 --> 01:06:38,319

interest in unexplained phenomena like

1557

01:06:44,069 --> 01:06:41,680

ghosts bigfoot and ufos and by now you

1558

01:06:47,109 --> 01:06:44,079

know that we have our own ex blog the

1559

01:06:48,950 --> 01:06:47,119

next newsletter and the unex magazine

1560

01:06:50,950 --> 01:06:48,960

quarterly but most of you don't know

1561

01:06:53,029 --> 01:06:50,960

that we have started our very own

1562

01:06:55,349 --> 01:06:53,039

paranormal conference and this year for

1563

01:06:57,270 --> 01:06:55,359

safety this two-day ex-con will be

1564

01:06:59,589 --> 01:06:57,280

virtual so you can attend from the

1565

01:07:01,829 --> 01:06:59,599

comfort of your home ex-con presenters

1566

01:07:04,390 --> 01:07:01,839

include whitley strieber micah hanks

1567

01:07:06,789 --> 01:07:04,400

margie k and preston dennett lisa martin

1568

01:07:09,990 --> 01:07:06,799

and wayne lawrence lee spiegel debbie

1569

01:07:13,029 --> 01:07:10,000

zaglemeyer dan terry kate bravoski and

1570

01:07:14,710 --> 01:07:13,039

ray hernandez there will also be a live

1571

01:07:17,430 --> 01:07:14,720

paranormal investigation by the

1572

01:07:19,750 --> 01:07:17,440

riverside iowa paranormal team so come

1573

01:07:22,789 --> 01:07:19,760

hang out with us in the safety of home

1574

01:07:26,230 --> 01:07:22,799

as we set out to explain the unexplained

1575

01:07:30,029 --> 01:07:26,240

friday may 13th and saturday the 14th

1576

01:07:43,750 --> 01:07:30,039

2022 and tickets are on sale now go to

1577

01:07:47,510 --> 01:07:45,670

hi this is ray sobs here repping the

1578

01:07:52,069 --> 01:07:47,520

planet and you're listening to my good

1579

01:07:54,309 --> 01:07:52,079

friend jimmy church fade to black

1580

01:07:56,390 --> 01:07:54,319

this is toby kebble you're listening to

1581

01:07:59,430 --> 01:07:56,400

jimmy church jimmychurchradio.com

1582

01:08:01,670 --> 01:07:59,440

don't hurt me jimmy i'm only little hey

1583

01:08:06,870 --> 01:08:01,680

i'm adrian grenier and this is ari gold

1584

01:08:10,870 --> 01:08:09,270

hey i'm adrian grenier and i'm ari gold

1585

01:08:13,109 --> 01:08:10,880

we're the honey brothers

1586

01:08:14,710 --> 01:08:13,119

and you're listening to jimmy church a

1587

01:08:16,390 --> 01:08:14,720

revolution

1588

01:08:18,390 --> 01:08:16,400

this is jimmy church of fade to black

1589

01:08:20,709 --> 01:08:18,400

and you can become an official fate or

1590

01:08:21,590 --> 01:08:20,719

not by just going to our membership

1591

01:08:24,950 --> 01:08:21,600

section

1592

01:08:29,349 --> 01:08:27,030

hello this is serena wright taylor from

1593

01:08:31,669 --> 01:08:29,359

conscious life expo and you're listening

1594

01:08:34,070 --> 01:08:31,679

to fade to black with jimmy church who

1595

01:08:37,269 --> 01:08:34,080

holds the lucky pony record for the best

1596

01:08:39,510 --> 01:08:37,279

astrological chart since 1963.

1597

01:08:41,189 --> 01:08:39,520

true story

1598

01:08:42,789 --> 01:08:41,199

this is micah hanks of the grealian

1599

01:08:44,760 --> 01:08:42,799

report and you're listening to jimmy

1600

01:08:48,730 --> 01:08:44,770

church on fade to black

1601
01:08:49,110 --> 01:08:48,740
[Music]

1602
01:08:57,960 --> 01:08:49,120
[Applause]

1603
01:09:06,950 --> 01:09:05,110
[Music]

1604
01:09:09,189 --> 01:09:06,960
welcome back fade to black i am your

1605
01:09:10,470 --> 01:09:09,199
host jimmy church tonight isaac arthur

1606
01:09:12,950 --> 01:09:10,480
is with us

1607
01:09:15,189 --> 01:09:12,960
the host of science and futurism with

1608
01:09:17,189 --> 01:09:15,199
isaac arthur right there on youtube and

1609
01:09:20,390 --> 01:09:17,199
if you haven't already go and subscribe

1610
01:09:24,229 --> 01:09:20,400
to his channel and and get busy

1611
01:09:25,430 --> 01:09:24,239
i recommend to everybody uh uh with um

1612
01:09:28,709 --> 01:09:25,440
isaac

1613
01:09:31,910 --> 01:09:28,719

uh kind of do what i did all right

1614

01:09:34,470 --> 01:09:31,920

start with his uh i think it's i think

1615

01:09:38,789 --> 01:09:34,480

it's like 1100 hours

1616

01:09:40,149 --> 01:09:38,799

on the fermi paradox and and start there

1617

01:09:42,870 --> 01:09:40,159

and

1618

01:09:44,470 --> 01:09:42,880

those original videos um

1619

01:09:47,189 --> 01:09:44,480

uh

1620

01:09:49,430 --> 01:09:47,199

that first one

1621

01:09:51,189 --> 01:09:49,440

how how long was that you were doing

1622

01:09:53,030 --> 01:09:51,199

longer shows then

1623

01:09:53,990 --> 01:09:53,040

oh well the the no no they're still

1624

01:09:55,669 --> 01:09:54,000

about the same length with the

1625

01:09:57,430 --> 01:09:55,679

occasionally one that was a lot longer

1626

01:09:59,590 --> 01:09:57,440

here and there we actually have our

1627

01:10:00,950 --> 01:09:59,600

longest episode ever coming up in june

1628

01:10:03,350 --> 01:10:00,960

um but the

1629

01:10:05,350 --> 01:10:03,360

the fermi paradox compendium was 74

1630

01:10:07,270 --> 01:10:05,360

minutes long and that's called

1631

01:10:09,910 --> 01:10:07,280

current record horror has been for about

1632

01:10:13,270 --> 01:10:09,920

six years now and we'll lose that title

1633

01:10:17,350 --> 01:10:13,280

in june man i have listened to that over

1634

01:10:19,750 --> 01:10:17,360

and over and over again i admit it and i

1635

01:10:21,990 --> 01:10:19,760

i just steal from it i'm just i'm i'm a

1636

01:10:23,990 --> 01:10:22,000

thief i i've told you this for many

1637

01:10:25,350 --> 01:10:24,000

years man i just steal

1638

01:10:28,070 --> 01:10:25,360

um but

1639

01:10:29,110 --> 01:10:28,080

okay so we're talking about exoplanets

1640

01:10:31,990 --> 01:10:29,120

isaac

1641

01:10:34,310 --> 01:10:32,000

and exoplanets are wonderful we know

1642

01:10:35,830 --> 01:10:34,320

that every star that we can see in the

1643

01:10:38,070 --> 01:10:35,840

night sky

1644

01:10:39,990 --> 01:10:38,080

has a planet now right we can we can

1645

01:10:42,310 --> 01:10:40,000

erase that

1646

01:10:45,350 --> 01:10:42,320

you know that wonderment you know is is

1647

01:10:47,110 --> 01:10:45,360

you know pondering that that's over with

1648

01:10:48,070 --> 01:10:47,120

but here's the deal

1649

01:10:50,550 --> 01:10:48,080

um

1650

01:10:54,950 --> 01:10:50,560

we have a son

1651

01:10:58,310 --> 01:10:54,960

that has been remarkably stable

1652

01:10:59,990 --> 01:10:58,320

for five billion years it has uh you can

1653

01:11:01,590 --> 01:11:00,000

jump in and correct me because i'm not

1654

01:11:05,350 --> 01:11:01,600

the phd here

1655

01:11:07,110 --> 01:11:05,360

but um it we have a hydrogen core with a

1656

01:11:09,750 --> 01:11:07,120

surrounded by helium

1657

01:11:12,630 --> 01:11:11,030

hold on

1658

01:11:13,990 --> 01:11:12,640

just

1659

01:11:14,709 --> 01:11:14,000

let me finish

1660

01:11:16,790 --> 01:11:14,719

well

1661

01:11:21,430 --> 01:11:16,800

in in that

1662

01:11:25,270 --> 01:11:21,440

uh that is it at this stage of our son

1663

01:11:27,990 --> 01:11:25,280

we have been given five billion years of

1664

01:11:30,149 --> 01:11:28,000

relative stability

1665

01:11:31,910 --> 01:11:30,159

our planet hasn't fried out right there

1666

01:11:32,950 --> 01:11:31,920

hasn't been a burp there hasn't been

1667

01:11:35,910 --> 01:11:32,960

crazy

1668

01:11:38,630 --> 01:11:35,920

fluctuations in heat both cold or hot

1669

01:11:42,070 --> 01:11:38,640

you know coming from our sun

1670

01:11:45,669 --> 01:11:42,080

that when we look at an exoplanet

1671

01:11:48,070 --> 01:11:45,679

what is your requirement for that sun to

1672

01:11:50,870 --> 01:11:48,080

be so stable and

1673

01:11:53,510 --> 01:11:50,880

if other suns out there that are in the

1674

01:11:56,709 --> 01:11:53,520

same age range as ours

1675

01:11:59,110 --> 01:11:56,719

with a hydrogen helium fusion thing

1676

01:12:01,750 --> 01:11:59,120

going on are they

1677

01:12:03,510 --> 01:12:01,760

going to be as stable as ours

1678

01:12:06,070 --> 01:12:03,520

most we're not going to be at all most

1679

01:12:07,350 --> 01:12:06,080

stars are a lot more variable than ours

1680

01:12:09,750 --> 01:12:07,360

and not something without getting what's

1681

01:12:11,910 --> 01:12:09,760

called variable stars but the hydrogen

1682

01:12:13,189 --> 01:12:11,920

fusion process of the core turn hydrogen

1683

01:12:15,350 --> 01:12:13,199

the helium

1684

01:12:16,550 --> 01:12:15,360

um for our sun that really is very

1685

01:12:19,430 --> 01:12:16,560

different depending on the mass of the

1686

01:12:21,590 --> 01:12:19,440

stars involved how they burn them uh and

1687

01:12:24,070 --> 01:12:21,600

our sun has been stable for a long time

1688

01:12:25,990 --> 01:12:24,080

right how stable is hard to say and

1689

01:12:27,669 --> 01:12:26,000

here's the the other bit is how stable

1690

01:12:29,189 --> 01:12:27,679

compared to other stars right because we

1691

01:12:30,790 --> 01:12:29,199

can look back at some of our geological

1692

01:12:32,870 --> 01:12:30,800

records to see what the sun might have

1693

01:12:34,630 --> 01:12:32,880

been like ten thousand years ago maybe

1694

01:12:36,709 --> 01:12:34,640

in a million years ago for a nice layer

1695

01:12:38,149 --> 01:12:36,719

or something other from a storm

1696

01:12:39,910 --> 01:12:38,159

but we don't know what any of those

1697

01:12:41,910 --> 01:12:39,920

other stars looked like stability wise

1698

01:12:43,270 --> 01:12:41,920

except the last century or two we do

1699

01:12:45,590 --> 01:12:43,280

know is that most of them are a lot less

1700

01:12:47,270 --> 01:12:45,600

stable than our sun but there are some

1701

01:12:48,950 --> 01:12:47,280

that appear to be as stable so also we

1702

01:12:52,630 --> 01:12:48,960

don't appear to be a freak we're just an

1703

01:12:54,950 --> 01:12:52,640

outlier right we are we are not

1704

01:12:56,709 --> 01:12:54,960

necessarily the stable star out there

1705

01:12:59,430 --> 01:12:56,719

but we do appear to be

1706

01:13:01,030 --> 01:12:59,440

currently holding a tie for um not quite

1707

01:13:02,630 --> 01:13:01,040

a few other ones too

1708

01:13:05,189 --> 01:13:02,640

but uh that's probably gonna be a pretty

1709

01:13:06,470 --> 01:13:05,199

big deal on those because

1710

01:13:07,830 --> 01:13:06,480

i mean a lot depends on the atmosphere

1711

01:13:09,750 --> 01:13:07,840

on the makeup of a planet you know in

1712

01:13:12,310 --> 01:13:09,760

terms of how life is there but

1713

01:13:14,790 --> 01:13:12,320

a star getting really really really

1714

01:13:17,189 --> 01:13:14,800

flarey you know just or here for a while

1715

01:13:18,630 --> 01:13:17,199

being colder that's a problem we already

1716

01:13:20,310 --> 01:13:18,640

have a problem with it with all this

1717

01:13:22,470 --> 01:13:20,320

just as is with the faint young sun

1718

01:13:24,870 --> 01:13:22,480

paradox right right

1719

01:13:26,790 --> 01:13:24,880

the planet needed to have been

1720

01:13:28,709 --> 01:13:26,800

uh you know a certain temperature in the

1721

01:13:30,470 --> 01:13:28,719

past but based on what we know of how

1722

01:13:31,510 --> 01:13:30,480

stars evolve our sun should have been

1723

01:13:34,550 --> 01:13:31,520

about

1724

01:13:36,709 --> 01:13:34,560

70 of his biases right now back when the

1725

01:13:38,229 --> 01:13:36,719

life force started forming and

1726

01:13:39,430 --> 01:13:38,239

that doesn't match up too well though

1727

01:13:41,510 --> 01:13:39,440

there's you know there's a lot of things

1728

01:13:43,030 --> 01:13:41,520

we just don't know right now in terms of

1729

01:13:44,470 --> 01:13:43,040

what the real earth looked like back

1730

01:13:46,790 --> 01:13:44,480

then so that it's

1731

01:13:48,709 --> 01:13:46,800

i to call it a paradox the reason i say

1732

01:13:51,189 --> 01:13:48,719

furby paradox is that these are not

1733

01:13:53,350 --> 01:13:51,199

really paradoxes over thought to be

1734

01:13:54,790 --> 01:13:53,360

paradoxically they're more big puzzles

1735

01:13:55,910 --> 01:13:54,800

we have a piece of thing that's odds

1736

01:13:58,790 --> 01:13:55,920

with another bit of thing and we need

1737

01:14:00,390 --> 01:13:58,800

more information but our planet is not

1738

01:14:02,229 --> 01:14:00,400

likely be a normal one

1739

01:14:03,430 --> 01:14:02,239

our solar system is not likely to be a

1740

01:14:04,310 --> 01:14:03,440

normal one

1741

01:14:06,229 --> 01:14:04,320

and

1742

01:14:08,310 --> 01:14:06,239

it could just be an odds game on the

1743

01:14:09,990 --> 01:14:08,320

other hand there's again

1744

01:14:11,510 --> 01:14:10,000

even if it turns out that only one

1745

01:14:12,630 --> 01:14:11,520

percent of plants in the habitable zone

1746

01:14:14,390 --> 01:14:12,640

are the right kind of mass and

1747

01:14:16,310 --> 01:14:14,400

composition be earth-like

1748

01:14:18,790 --> 01:14:16,320

even turns out only one percent of stars

1749

01:14:21,189 --> 01:14:18,800

of of the sun's type all the kind that

1750

01:14:23,510 --> 01:14:21,199

are good for actually being stable that

1751

01:14:25,430 --> 01:14:23,520

one in ten thousand okay out of and you

1752

01:14:27,910 --> 01:14:25,440

know only 100 may be the right massively

1753

01:14:28,870 --> 01:14:27,920

in with star wise or age okay so one in

1754

01:14:32,550 --> 01:14:28,880

a million

1755

01:14:35,669 --> 01:14:32,560

that's 400 billion stars in this galaxy

1756

01:14:36,950 --> 01:14:35,679

that's 400 000 you know and this is the

1757

01:14:39,270 --> 01:14:36,960

thing to keep in mind about drake's

1758

01:14:40,630 --> 01:14:39,280

equation is we do trick ourselves

1759

01:14:42,070 --> 01:14:40,640

sometimes when we're working with this

1760

01:14:44,870 --> 01:14:42,080

you say well these things look like

1761

01:14:46,950 --> 01:14:44,880

they're one you know 100 or 1 in 10 or

1762

01:14:48,310 --> 01:14:46,960

even 100 percent and so we look at the

1763

01:14:50,390 --> 01:14:48,320

fact that well we don't know this one

1764

01:14:53,430 --> 01:14:50,400

yet but these other ones are like one in

1765

01:14:54,790 --> 01:14:53,440

ten all the time so this should be two

1766

01:14:56,470 --> 01:14:54,800

we don't know what the next step on that

1767

01:14:58,229 --> 01:14:56,480

becoming say technological is that might

1768

01:14:59,910 --> 01:14:58,239

be one in a billion

1769

01:15:01,270 --> 01:14:59,920

yeah its probability has nothing to do

1770

01:15:03,030 --> 01:15:01,280

with the odds the other ones it's like

1771

01:15:04,149 --> 01:15:03,040

saying well what are the odds you won

1772

01:15:06,310 --> 01:15:04,159

the lottery

1773

01:15:08,149 --> 01:15:06,320

well you know you've got that step there

1774

01:15:10,070 --> 01:15:08,159

of people who buy you know tickets one

1775

01:15:11,669 --> 01:15:10,080

in ten maybe you have people who live in

1776

01:15:13,669 --> 01:15:11,679

states or countries where it's legal one

1777

01:15:15,350 --> 01:15:13,679

in ten maybe and from that you assume

1778

01:15:17,590 --> 01:15:15,360

that the odds of winning that lottery is

1779

01:15:19,110 --> 01:15:17,600

probably one in ten too nope

1780

01:15:21,990 --> 01:15:19,120

so now we don't know what the

1781

01:15:24,149 --> 01:15:22,000

intelligence odds are we um

1782

01:15:26,310 --> 01:15:24,159

when we look at astrophysics today and

1783

01:15:28,470 --> 01:15:26,320

we look at uh

1784

01:15:30,630 --> 01:15:28,480

the numbers and the types of

1785

01:15:33,270 --> 01:15:30,640

objects out there in the universe

1786

01:15:35,030 --> 01:15:33,280

one of the things that i hear about a

1787

01:15:36,950 --> 01:15:35,040

lot and it it

1788

01:15:39,350 --> 01:15:36,960

and we always have to go back and

1789

01:15:42,310 --> 01:15:39,360

understand when we hear these numbers

1790

01:15:43,350 --> 01:15:42,320

the universe is only 13.8 billion years

1791

01:15:45,110 --> 01:15:43,360

old

1792

01:15:47,750 --> 01:15:45,120

but yet

1793

01:15:50,790 --> 01:15:47,760

we hear about

1794

01:15:54,070 --> 01:15:50,800

uh the vast majority of stars

1795

01:15:55,590 --> 01:15:54,080

have life spans of more than a trillion

1796

01:15:57,189 --> 01:15:55,600

years

1797

01:16:00,630 --> 01:15:57,199

now now

1798

01:16:02,709 --> 01:16:00,640

we're only 13.8 billion years old right

1799

01:16:06,470 --> 01:16:02,719

so a few stars have died yet

1800

01:16:08,550 --> 01:16:06,480

right a trillion-year-old star now over

1801

01:16:09,590 --> 01:16:08,560

a trillion years once it gets into that

1802

01:16:13,750 --> 01:16:09,600

phase

1803

01:16:15,910 --> 01:16:13,760

is it because of uh obviously its mass

1804

01:16:17,510 --> 01:16:15,920

and gravity issue and then with

1805

01:16:20,790 --> 01:16:17,520

temperature because

1806

01:16:23,750 --> 01:16:20,800

if you're not going to achieve

1807

01:16:26,630 --> 01:16:23,760

with enough gravity to to hit

1808

01:16:28,790 --> 01:16:26,640

a billion degrees or whatever it would

1809

01:16:31,750 --> 01:16:28,800

take for some crazy

1810

01:16:34,550 --> 01:16:31,760

uh fusion to take place

1811

01:16:37,110 --> 01:16:34,560

is that star

1812

01:16:40,070 --> 01:16:37,120

completely stable for the trillion years

1813

01:16:41,590 --> 01:16:40,080

once all of the crazy processes are over

1814

01:16:43,669 --> 01:16:41,600

well it kind of depends on the mass

1815

01:16:45,510 --> 01:16:43,679

range even there but you get these stars

1816

01:16:47,510 --> 01:16:45,520

that are the the life jump comes where

1817

01:16:49,510 --> 01:16:47,520

they get to be 25 percent of the mass of

1818

01:16:51,430 --> 01:16:49,520

our sun or less correct at that point

1819

01:16:53,590 --> 01:16:51,440

when they're less massive than that they

1820

01:16:55,430 --> 01:16:53,600

are fully convective which this context

1821

01:16:56,950 --> 01:16:55,440

means they store their contents

1822

01:16:58,709 --> 01:16:56,960

completely they don't get hydrogen i

1823

01:17:00,070 --> 01:16:58,719

hear the importance of the core the

1824

01:17:01,430 --> 01:17:00,080

stuff from the surface has a chance to

1825

01:17:03,430 --> 01:17:01,440

float around and bubble around like a

1826

01:17:05,510 --> 01:17:03,440

pot and our sun is pretty convective

1827

01:17:07,990 --> 01:17:05,520

right the big giants are not convective

1828

01:17:08,870 --> 01:17:08,000

that's why they blow up so easy um but

1829

01:17:10,149 --> 01:17:08,880

uh

1830

01:17:11,830 --> 01:17:10,159

these stars are gonna burn through all

1831

01:17:13,590 --> 01:17:11,840

their hydrogen pretty much all close to

1832

01:17:14,950 --> 01:17:13,600

all the hydrogen will happen at one

1833

01:17:17,110 --> 01:17:14,960

point in time is when they're about a

1834

01:17:18,709 --> 01:17:17,120

pretty big mixture of hydrogen helium we

1835

01:17:20,870 --> 01:17:18,719

think because now these stars exist yet

1836

01:17:22,310 --> 01:17:20,880

so it's modeling right um they'll go

1837

01:17:24,390 --> 01:17:22,320

into what we call a

1838

01:17:27,830 --> 01:17:24,400

blue dwarf phase instead of a red giant

1839

01:17:29,350 --> 01:17:27,840

phase and they'll just they'll heat up

1840

01:17:31,350 --> 01:17:29,360

as they they'll knock enough fusions or

1841

01:17:33,430 --> 01:17:31,360

contract down they heat up more as they

1842

01:17:35,189 --> 01:17:33,440

get that helium bone phase and then they

1843

01:17:36,149 --> 01:17:35,199

will heat and heat heat and then they'll

1844

01:17:37,830 --> 01:17:36,159

stop heating when they're going through

1845

01:17:39,590 --> 01:17:37,840

that and they'll just glow as a white

1846

01:17:40,709 --> 01:17:39,600

dwarf until they're

1847

01:17:42,950 --> 01:17:40,719

cooled off

1848

01:17:44,630 --> 01:17:42,960

and those stars will probably be very

1849

01:17:45,830 --> 01:17:44,640

stable though when you get that

1850

01:17:47,350 --> 01:17:45,840

changeable that would probably be a

1851

01:17:49,430 --> 01:17:47,360

significant curve that might take a

1852

01:17:51,189 --> 01:17:49,440

billion years to happen so it might be

1853

01:17:52,310 --> 01:17:51,199

one enough time for life to uh to adjust

1854

01:17:53,350 --> 01:17:52,320

to but

1855

01:17:55,510 --> 01:17:53,360

you know we just don't have the modeling

1856

01:17:57,350 --> 01:17:55,520

to say that right now on that but these

1857

01:17:59,750 --> 01:17:57,360

sub-giant red giant phases they're very

1858

01:18:01,669 --> 01:17:59,760

quick so to speak uh compared to

1859

01:18:03,590 --> 01:18:01,679

lifetime of star but also really long

1860

01:18:05,750 --> 01:18:03,600

you know they in terms of like real time

1861

01:18:07,350 --> 01:18:05,760

right uh supernova quick right but for

1862

01:18:09,669 --> 01:18:07,360

the other stars songs like a hoes or

1863

01:18:11,590 --> 01:18:09,679

these that go red giant that's a period

1864

01:18:12,470 --> 01:18:11,600

that takes as long as lisbon land-based

1865

01:18:15,030 --> 01:18:12,480

life

1866

01:18:17,430 --> 01:18:15,040

you know these are very long periods

1867

01:18:19,910 --> 01:18:17,440

that ecology might conceivably adapt to

1868

01:18:21,350 --> 01:18:19,920

especially for these smaller stars where

1869

01:18:23,030 --> 01:18:21,360

they don't you know their red giant

1870

01:18:24,070 --> 01:18:23,040

phase is not really all that necessarily

1871

01:18:27,350 --> 01:18:24,080

impressive

1872

01:18:29,830 --> 01:18:27,360

um and uh you know you have all that

1873

01:18:31,430 --> 01:18:29,840

time in these star systems where even if

1874

01:18:32,630 --> 01:18:31,440

life had only ever popped up on one

1875

01:18:34,709 --> 01:18:32,640

planet

1876

01:18:36,870 --> 01:18:34,719

one big asteroid impact that scatters

1877

01:18:38,550 --> 01:18:36,880

basic bacteria into space and some of

1878

01:18:40,709 --> 01:18:38,560

those tardigrades whatever survived the

1879

01:18:42,390 --> 01:18:40,719

land of of their neighbors and you know

1880

01:18:44,709 --> 01:18:42,400

the star expands today in a whole solar

1881

01:18:47,110 --> 01:18:44,719

system that's been colonized by that

1882

01:18:49,350 --> 01:18:47,120

event and it's just

1883

01:18:51,110 --> 01:18:49,360

that much time and again these things

1884

01:18:51,990 --> 01:18:51,120

are barely one percent their lifespan in

1885

01:18:53,910 --> 01:18:52,000

yet

1886

01:18:56,070 --> 01:18:53,920

it just seems almost unbelievable that

1887

01:18:58,310 --> 01:18:56,080

you wouldn't expect to get life there if

1888

01:19:00,310 --> 01:18:58,320

if anything we know about evolution and

1889

01:19:02,390 --> 01:19:00,320

basic biology seems to be true that's

1890

01:19:04,550 --> 01:19:02,400

right that's right and so and what is

1891

01:19:06,390 --> 01:19:04,560

fascinating with that

1892

01:19:08,470 --> 01:19:06,400

is is there

1893

01:19:10,149 --> 01:19:08,480

with a trillion-year

1894

01:19:13,990 --> 01:19:10,159

you know dwarf star

1895

01:19:15,990 --> 01:19:14,000

is there enough mass to keep a planet

1896

01:19:17,830 --> 01:19:16,000

there number one

1897

01:19:19,270 --> 01:19:17,840

and two because

1898

01:19:22,070 --> 01:19:19,280

through the evolution through its

1899

01:19:24,790 --> 01:19:22,080

changes they may eject the planets too

1900

01:19:27,350 --> 01:19:24,800

as well right okay so but let's say

1901

01:19:30,310 --> 01:19:27,360

trillion-year dwarf star

1902

01:19:32,550 --> 01:19:30,320

was still generating some heat and and

1903

01:19:35,350 --> 01:19:32,560

has enough mass to keep

1904

01:19:37,750 --> 01:19:35,360

uh a star system around it right and

1905

01:19:39,750 --> 01:19:37,760

it's got a planet is that enough to

1906

01:19:41,990 --> 01:19:39,760

support life

1907

01:19:44,550 --> 01:19:42,000

probably uh there's an interesting thing

1908

01:19:46,229 --> 01:19:44,560

about stars they vary in mass by a

1909

01:19:49,110 --> 01:19:46,239

factor of about a thousand you know they

1910

01:19:51,590 --> 01:19:49,120

can be a 20th or sun's mass to maybe 50

1911

01:19:53,270 --> 01:19:51,600

times more massive very very by about a

1912

01:19:55,750 --> 01:19:53,280

factor of a thousand in terms of mass

1913

01:19:58,229 --> 01:19:55,760

but they vary by a factor of about a

1914

01:20:00,070 --> 01:19:58,239

billion in brightness right right the

1915

01:20:02,229 --> 01:20:00,080

smallest stars are even a thousandth as

1916

01:20:04,630 --> 01:20:02,239

bright as our sun but they're 10 the

1917

01:20:06,070 --> 01:20:04,640

mass you know um they can definitely

1918

01:20:07,430 --> 01:20:06,080

hold a planet and certainly anything in

1919

01:20:09,990 --> 01:20:07,440

their habitable zone has to be pretty

1920

01:20:11,430 --> 01:20:10,000

close because you know they they have a

1921

01:20:13,910 --> 01:20:11,440

fraction of the gravity but they have

1922

01:20:15,430 --> 01:20:13,920

only a tiny sliver of the brightness of

1923

01:20:17,189 --> 01:20:15,440

the heat

1924

01:20:19,830 --> 01:20:17,199

so we would have to have like the orbit

1925

01:20:22,149 --> 01:20:19,840

of mercury right but but and none of

1926

01:20:23,110 --> 01:20:22,159

that would matter or much less some of

1927

01:20:25,270 --> 01:20:23,120

these things will be opening at a

1928

01:20:27,990 --> 01:20:25,280

distance that would be like a gas giant

1929

01:20:31,830 --> 01:20:28,000

and its moons like one week orbit right

1930

01:20:34,310 --> 01:20:31,840

right right right right um but

1931

01:20:36,390 --> 01:20:34,320

it would have the chance

1932

01:20:39,030 --> 01:20:36,400

if they didn't blow themselves up with a

1933

01:20:42,310 --> 01:20:39,040

nuclear war but you would have a chance

1934

01:20:44,709 --> 01:20:42,320

to evolve and survive as a planet

1935

01:20:47,510 --> 01:20:44,719

for essentially forever

1936

01:20:49,990 --> 01:20:47,520

right a trillion years where here we

1937

01:20:53,910 --> 01:20:50,000

know we've got a very limited lease

1938

01:20:55,830 --> 01:20:53,920

agreement oh yeah right but

1939

01:20:57,510 --> 01:20:55,840

and here's the bad part these stars

1940

01:20:59,270 --> 01:20:57,520

change in brightness too and these these

1941

01:21:01,910 --> 01:20:59,280

redwoods often tend to be very variable

1942

01:21:05,110 --> 01:21:01,920

in their brightness but more importantly

1943

01:21:06,629 --> 01:21:05,120

planets are not stable affairs you know

1944

01:21:08,229 --> 01:21:06,639

all solar systems say well how long the

1945

01:21:10,070 --> 01:21:08,239

planet's been here

1946

01:21:12,550 --> 01:21:10,080

there's a good chance that jupiter

1947

01:21:14,709 --> 01:21:12,560

migrated and kicked a lot of our planets

1948

01:21:16,070 --> 01:21:14,719

out of the solar system back in the day

1949

01:21:17,510 --> 01:21:16,080

uh one of the people who i know who

1950

01:21:19,030 --> 01:21:17,520

knows the most about exoplanets out

1951

01:21:20,550 --> 01:21:19,040

there dave kipping he'd been talking

1952

01:21:22,870 --> 01:21:20,560

about this actually when i was out in

1953

01:21:24,950 --> 01:21:22,880

california uh you know about this this

1954

01:21:27,030 --> 01:21:24,960

motion of the of jupiter migrating in

1955

01:21:29,110 --> 01:21:27,040

how there might be super earths around

1956

01:21:31,430 --> 01:21:29,120

most solar systems and our system is

1957

01:21:32,790 --> 01:21:31,440

weird because ours got ejected you know

1958

01:21:34,550 --> 01:21:32,800

things that we're more curious at that

1959

01:21:36,550 --> 01:21:34,560

or the size of neptune

1960

01:21:38,390 --> 01:21:36,560

and that might be the norm but solar

1961

01:21:40,629 --> 01:21:38,400

systems being stable

1962

01:21:42,390 --> 01:21:40,639

no it looks stable to us now because all

1963

01:21:43,750 --> 01:21:42,400

that's left over are those things that

1964

01:21:46,070 --> 01:21:43,760

have been there

1965

01:21:47,830 --> 01:21:46,080

stably for billions of years

1966

01:21:50,149 --> 01:21:47,840

but how many millions of times can you

1967

01:21:51,510 --> 01:21:50,159

orb the sun with a slight variation

1968

01:21:53,910 --> 01:21:51,520

before something happens and we're

1969

01:21:55,910 --> 01:21:53,920

constantly patrolling them you know our

1970

01:21:58,070 --> 01:21:55,920

all moon is not the same distance it was

1971

01:21:59,990 --> 01:21:58,080

for us when it formed our day is not the

1972

01:22:01,270 --> 01:22:00,000

same length it was our probability all

1973

01:22:02,149 --> 01:22:01,280

year is not quite the same as what it

1974

01:22:04,550 --> 01:22:02,159

was

1975

01:22:07,110 --> 01:22:04,560

if you have another couple billion years

1976

01:22:08,790 --> 01:22:07,120

the source will not look the same mars

1977

01:22:10,790 --> 01:22:08,800

probably had an atmosphere or venus

1978

01:22:13,110 --> 01:22:10,800

probably had less of an atmosphere in

1979

01:22:15,030 --> 01:22:13,120

the past in a billion years our sun will

1980

01:22:17,110 --> 01:22:15,040

have probably evaporated our atmosphere

1981

01:22:19,270 --> 01:22:17,120

away or gotten close to it

1982

01:22:21,350 --> 01:22:19,280

these other solar systems they have more

1983

01:22:22,790 --> 01:22:21,360

time but in many ways

1984

01:22:24,709 --> 01:22:22,800

that won't help their plants because

1985

01:22:25,990 --> 01:22:24,719

they are bit quicker they have to be

1986

01:22:27,590 --> 01:22:26,000

close to their sun to be warm so they

1987

01:22:28,790 --> 01:22:27,600

have to be closer and they're more

1988

01:22:29,990 --> 01:22:28,800

packed in

1989

01:22:32,870 --> 01:22:30,000

if you have multiple plants around them

1990

01:22:35,430 --> 01:22:32,880

it's more packed in more portubation so

1991

01:22:37,030 --> 01:22:35,440

it might be that these places have a

1992

01:22:39,669 --> 01:22:37,040

trillion years for life to evolve around

1993

01:22:41,189 --> 01:22:39,679

them or it might be that they don't

1994

01:22:43,430 --> 01:22:41,199

really have that stable environment for

1995

01:22:45,750 --> 01:22:43,440

too long it's one of those examples of i

1996

01:22:47,510 --> 01:22:45,760

could make a case for either way

1997

01:22:50,390 --> 01:22:47,520

and we just need so much more

1998

01:22:51,750 --> 01:22:50,400

information you know it did now i have

1999

01:22:53,110 --> 01:22:51,760

to stop making jokes about james but

2000

01:22:55,030 --> 01:22:53,120

telescope eventually getting launched

2001

01:22:56,709 --> 01:22:55,040

it's finally been launched but uh you

2002

01:22:58,950 --> 01:22:56,719

know as we get data in from that you

2003

01:23:01,189 --> 01:22:58,960

know that's going to tell us a lot but

2004

01:23:02,550 --> 01:23:01,199

we are going to have decades and decades

2005

01:23:04,229 --> 01:23:02,560

of staring at these things which are

2006

01:23:06,629 --> 01:23:04,239

hard to see around red dwarfs especially

2007

01:23:08,629 --> 01:23:06,639

because this you know they're so dim

2008

01:23:10,149 --> 01:23:08,639

um before we can really talk about what

2009

01:23:12,390 --> 01:23:10,159

exoplanets

2010

01:23:14,149 --> 01:23:12,400

you know what they really are like and i

2011

01:23:15,510 --> 01:23:14,159

know my nose when i was a kid i'd go

2012

01:23:17,270 --> 01:23:15,520

study in the astronomy section my

2013

01:23:18,870 --> 01:23:17,280

library and i didn't know to look at

2014

01:23:20,550 --> 01:23:18,880

copyrights on books so the science would

2015

01:23:22,950 --> 01:23:20,560

be different so in some of those books

2016

01:23:25,189 --> 01:23:22,960

within like 1950 they talk about this

2017

01:23:26,629 --> 01:23:25,199

paradise planet venus with clouds right

2018

01:23:27,910 --> 01:23:26,639

and then other ones in 1980 i was

2019

01:23:30,950 --> 01:23:27,920

talking about how you know it's it's

2020

01:23:32,629 --> 01:23:30,960

this place is a suburb of hell

2021

01:23:35,030 --> 01:23:32,639

very different in just 30 years it's the

2022

01:23:36,709 --> 01:23:35,040

same with our exoplanet knowledge we are

2023

01:23:38,149 --> 01:23:36,719

going to find more of these things and

2024

01:23:39,510 --> 01:23:38,159

we're going to learn more and i think

2025

01:23:41,110 --> 01:23:39,520

it's not going to help the trig equation

2026

01:23:43,030 --> 01:23:41,120

the least bit but there's going to be

2027

01:23:45,030 --> 01:23:43,040

things we think now they're just wrong

2028

01:23:46,149 --> 01:23:45,040

i'm sure of that now

2029

01:23:47,510 --> 01:23:46,159

okay

2030

01:23:49,270 --> 01:23:47,520

so

2031

01:23:52,709 --> 01:23:49,280

based on

2032

01:23:53,830 --> 01:23:52,719

uh what we know here right on our own

2033

01:23:56,229 --> 01:23:53,840

planet

2034

01:23:57,590 --> 01:23:56,239

we know that uh

2035

01:24:00,229 --> 01:23:57,600

our sun

2036

01:24:02,950 --> 01:24:00,239

and we keep the num the accepted numbers

2037

01:24:04,629 --> 01:24:02,960

are it's got a 10 billion year life span

2038

01:24:07,350 --> 01:24:04,639

we're halfway through it

2039

01:24:09,910 --> 01:24:07,360

the second half of this lifespan

2040

01:24:13,270 --> 01:24:09,920

is uh is eventually going to start to

2041

01:24:16,950 --> 01:24:13,280

get really really crazy and when it does

2042

01:24:18,629 --> 01:24:16,960

we can't be here on this planet so just

2043

01:24:20,470 --> 01:24:18,639

be i mean we got to go we've got to

2044

01:24:23,189 --> 01:24:20,480

figure it out we got to watch science

2045

01:24:26,790 --> 01:24:23,199

and futurism with isaac arthur and get

2046

01:24:27,750 --> 01:24:26,800

those uh uh colony spaceships built

2047

01:24:31,990 --> 01:24:27,760

right

2048

01:24:33,669 --> 01:24:32,000

that's it but here's the deal et

2049

01:24:35,990 --> 01:24:33,679

would have to be

2050

01:24:38,310 --> 01:24:36,000

in the same position

2051
01:24:41,189 --> 01:24:38,320
because their sun

2052
01:24:43,030 --> 01:24:41,199
is going to change as well

2053
01:24:45,350 --> 01:24:43,040
fusion is fusion

2054
01:24:48,709 --> 01:24:45,360
and that energy source is eventually

2055
01:24:50,070 --> 01:24:48,719
going to burn up and get unstable that's

2056
01:24:52,390 --> 01:24:50,080
it right

2057
01:24:54,709 --> 01:24:52,400
is there any other way to look at it

2058
01:24:56,709 --> 01:24:54,719
well yes you could there are things you

2059
01:24:57,669 --> 01:24:56,719
can do to protect a planet from its own

2060
01:24:58,870 --> 01:24:57,679
sun

2061
01:25:01,510 --> 01:24:58,880
and there are things you can do to

2062
01:25:03,350 --> 01:25:01,520
extend a lifespan of suns too

2063
01:25:05,750 --> 01:25:03,360

if you're willing to engage in some

2064

01:25:08,149 --> 01:25:05,760

extreme engineering what like move the

2065

01:25:09,320 --> 01:25:08,159

planet

2066

01:25:20,629 --> 01:25:09,330

so tomorrow morning actually

2067

01:25:28,950 --> 01:25:23,750

theoretically anyway too because our our

2068

01:25:31,189 --> 01:25:28,960

son is going to expand so big mercury's

2069

01:25:32,310 --> 01:25:31,199

gone that's that's done

2070

01:25:35,350 --> 01:25:32,320

venus

2071

01:25:36,629 --> 01:25:35,360

more than likely will get swallowed up

2072

01:25:38,950 --> 01:25:36,639

earth

2073

01:25:41,350 --> 01:25:38,960

may survive it but even if it doesn't

2074

01:25:43,110 --> 01:25:41,360

get touched by the expanding sun the

2075

01:25:45,350 --> 01:25:43,120

temperature is going to fry this out and

2076

01:25:46,550 --> 01:25:45,360

take care of the oceans and

2077

01:25:49,189 --> 01:25:46,560

and we're going to have a surface

2078

01:25:51,990 --> 01:25:49,199

temperature of 2000 degrees fahrenheit

2079

01:25:54,550 --> 01:25:52,000

and we won't want to be here even if we

2080

01:25:56,550 --> 01:25:54,560

do survive right and get out by pluto to

2081

01:25:58,950 --> 01:25:56,560

survive that one

2082

01:26:00,229 --> 01:25:58,960

yeah i would think so i mean

2083

01:26:02,629 --> 01:26:00,239

and so

2084

01:26:05,750 --> 01:26:02,639

uh back to my point

2085

01:26:07,750 --> 01:26:05,760

e.t would have to be facing the same

2086

01:26:10,790 --> 01:26:07,760

challenges that we know we're going to

2087

01:26:13,430 --> 01:26:12,550

but they might take steps like that you

2088

01:26:15,430 --> 01:26:13,440

know if we're assuming they're willing

2089

01:26:17,350 --> 01:26:15,440

to come visit us on those solar systems

2090

01:26:18,950 --> 01:26:17,360

maybe they will engage in star lifting

2091

01:26:21,189 --> 01:26:18,960

that technique that we've discussed for

2092

01:26:22,870 --> 01:26:21,199

like how you would magnetically pull

2093

01:26:24,070 --> 01:26:22,880

helium out of a stall and other metals

2094

01:26:25,910 --> 01:26:24,080

too it could be a very profitable

2095

01:26:27,910 --> 01:26:25,920

business there's more metal in the sun

2096

01:26:29,750 --> 01:26:27,920

lesser sources to combine

2097

01:26:31,669 --> 01:26:29,760

and that includes gold

2098

01:26:33,990 --> 01:26:31,679

and you you pull the old helium and

2099

01:26:35,830 --> 01:26:34,000

other metals out and you slowly insert

2100

01:26:37,830 --> 01:26:35,840

more hydrogen and you can keep a stall

2101
01:26:40,709 --> 01:26:37,840
going indefinitely like that it's just a

2102
01:26:42,709 --> 01:26:40,719
big fusion reactor okay no explain

2103
01:26:45,350 --> 01:26:42,719
okay good stuff i'm not gonna let you

2104
01:26:47,590 --> 01:26:45,360
get off that easy how would you

2105
01:26:48,830 --> 01:26:47,600
how would you stabilize our sun when

2106
01:26:50,390 --> 01:26:48,840
you're saying

2107
01:26:52,950 --> 01:26:50,400
okay

2108
01:26:54,149 --> 01:26:52,960
we have a hydrogen core

2109
01:26:56,550 --> 01:26:54,159
correct

2110
01:26:58,790 --> 01:26:56,560
and well we have hydrogen helium core

2111
01:26:59,750 --> 01:26:58,800
the helium is on the outside

2112
01:27:01,430 --> 01:26:59,760
and

2113
01:27:03,510 --> 01:27:01,440

the helium is in the middle

2114

01:27:06,950 --> 01:27:03,520

hydrogens on the outside

2115

01:27:09,669 --> 01:27:06,960

yep okay and so gravity is causing the

2116

01:27:11,270 --> 01:27:09,679

fusion and the temperature right

2117

01:27:13,910 --> 01:27:11,280

and then the

2118

01:27:15,990 --> 01:27:13,920

helium hydrogen fusion

2119

01:27:18,629 --> 01:27:16,000

what is happening with the helium on the

2120

01:27:21,350 --> 01:27:18,639

inside during the fusion process it's

2121

01:27:26,709 --> 01:27:21,360

turning into

2122

01:27:28,149 --> 01:27:26,719

helium

2123

01:27:29,669 --> 01:27:28,159

so the hydrogen is what the star is

2124

01:27:31,669 --> 01:27:29,679

usually made out of and there's more

2125

01:27:33,590 --> 01:27:31,679

helium in the core than anywhere else

2126
01:27:35,830 --> 01:27:33,600
but the helium does kind of percolate

2127
01:27:37,990 --> 01:27:35,840
out depends on the star right those

2128
01:27:39,030 --> 01:27:38,000
those red dwarfs the helium all spoke

2129
01:27:41,750 --> 01:27:39,040
lights out that's why i can use all its

2130
01:27:43,990 --> 01:27:41,760
hygiene our sun has the helium come off

2131
01:27:46,470 --> 01:27:44,000
the center to the outlet edges too and

2132
01:27:48,149 --> 01:27:46,480
we could suck that out how

2133
01:27:50,870 --> 01:27:48,159
how how how

2134
01:27:52,790 --> 01:27:50,880
what you do is you generate solo flairs

2135
01:27:54,149 --> 01:27:52,800
very very big solar flares one of the

2136
01:27:55,830 --> 01:27:54,159
methods for we have an episode on this

2137
01:27:57,590 --> 01:27:55,840
star lifting uh one of the methods

2138
01:27:58,629 --> 01:27:57,600

called the huff and puff method

2139

01:28:00,070 --> 01:27:58,639

it's

2140

01:28:02,629 --> 01:28:00,080

probably not the before one others

2141

01:28:04,550 --> 01:28:02,639

basically a giant uh plume of

2142

01:28:06,709 --> 01:28:04,560

solar flare really big chrono mass

2143

01:28:10,149 --> 01:28:06,719

ejections and you mine those

2144

01:28:13,750 --> 01:28:10,159

with giant magnets really big magnets

2145

01:28:14,709 --> 01:28:13,760

with really big magnet huff and puff how

2146

01:28:17,110 --> 01:28:14,719

is pretty straightforward on the

2147

01:28:19,030 --> 01:28:17,120

engineering side it's

2148

01:28:21,110 --> 01:28:19,040

difficult

2149

01:28:23,830 --> 01:28:21,120

huff and puff that was what we used to

2150

01:28:26,229 --> 01:28:23,840

do back in the 80s on the sunset strip

2151

01:28:30,470 --> 01:28:26,239

but that's a whole nother thing

2152

01:28:32,629 --> 01:28:30,480

those were fun days but what kind of uh

2153

01:28:34,229 --> 01:28:32,639

isaac has no idea what i'm talking about

2154

01:28:37,830 --> 01:28:34,239

when i just said that

2155

01:28:42,950 --> 01:28:38,870

is it

2156

01:28:45,030 --> 01:28:42,960

uh you would build a giant magnet and

2157

01:28:46,870 --> 01:28:45,040

obviously it wouldn't melt and you would

2158

01:28:48,870 --> 01:28:46,880

get that close enough to the sun and you

2159

01:28:50,310 --> 01:28:48,880

would get the extraction to point away

2160

01:28:52,629 --> 01:28:50,320

from earth you wouldn't want to have it

2161

01:28:55,030 --> 01:28:52,639

happen and the

2162

01:28:57,189 --> 01:28:55,040

magnet would then

2163

01:28:58,390 --> 01:28:57,199

accumulate what would you do with the

2164

01:29:00,390 --> 01:28:58,400

gas

2165

01:29:01,590 --> 01:29:00,400

well the the probably the way that i

2166

01:29:03,590 --> 01:29:01,600

usually use being there are three

2167

01:29:05,189 --> 01:29:03,600

methods you can use principally and the

2168

01:29:06,870 --> 01:29:05,199

one that i tend to favor is where you

2169

01:29:08,149 --> 01:29:06,880

build a bunch of magnetic rings around

2170

01:29:09,910 --> 01:29:08,159

the stall

2171

01:29:11,110 --> 01:29:09,920

and those normally are self-supporting

2172

01:29:13,510 --> 01:29:11,120

each other by

2173

01:29:14,950 --> 01:29:13,520

my magnetism you shut them off

2174

01:29:16,310 --> 01:29:14,960

you hit them far towards the sun as a

2175

01:29:18,709 --> 01:29:16,320

contracting ring

2176

01:29:19,830 --> 01:29:18,719

around the equator and and then you turn

2177

01:29:22,470 --> 01:29:19,840

them back on as they're getting pretty

2178

01:29:24,950 --> 01:29:22,480

close to dropping to the bottom and that

2179

01:29:26,790 --> 01:29:24,960

pushes on that area around the equator

2180

01:29:28,229 --> 01:29:26,800

you're heating up as we go too and then

2181

01:29:29,990 --> 01:29:28,239

there's another ring just north and just

2182

01:29:31,750 --> 01:29:30,000

south of that that fall in sequence beat

2183

01:29:33,430 --> 01:29:31,760

that and it kind of like like a big

2184

01:29:35,990 --> 01:29:33,440

bellows just pumps

2185

01:29:37,830 --> 01:29:36,000

superheated plasma off the poles

2186

01:29:40,070 --> 01:29:37,840

well how would okay but wouldn't you

2187

01:29:42,390 --> 01:29:40,080

need to get hydrogen

2188

01:29:44,550 --> 01:29:42,400

back into the star to keep it balanced

2189

01:29:46,950 --> 01:29:44,560

so you collected like two big vacuum

2190

01:29:48,629 --> 01:29:46,960

bags off the poles you sort out what you

2191

01:29:50,550 --> 01:29:48,639

want about one percent of the star's

2192

01:29:52,470 --> 01:29:50,560

mass is actually what we call metals

2193

01:29:55,830 --> 01:29:52,480

they'll be anything that's not hydrogen

2194

01:29:58,149 --> 01:29:55,840

helium mostly oxygen but iron gold

2195

01:29:59,189 --> 01:29:58,159

platinum 30 000 earth's worth of those

2196

01:30:01,669 --> 01:29:59,199

in the sun

2197

01:30:04,390 --> 01:30:01,679

and uh and then you you gather those up

2198

01:30:05,910 --> 01:30:04,400

and you take your helium oxide as well

2199

01:30:07,910 --> 01:30:05,920

and you dump the hydrogen back down in

2200

01:30:10,310 --> 01:30:07,920

there probably maybe not though because

2201
01:30:12,550 --> 01:30:10,320
stars live longer the more you more you

2202
01:30:14,470 --> 01:30:12,560
lighten the mass so you might just pull

2203
01:30:17,350 --> 01:30:14,480
mass off originally to let it burn

2204
01:30:19,750 --> 01:30:17,360
slower but then you bring hydrogen in

2205
01:30:21,510 --> 01:30:19,760
you know jupiter's got quite a lot it'll

2206
01:30:24,390 --> 01:30:21,520
keep the sun running for many many

2207
01:30:25,990 --> 01:30:24,400
millions or more years and uh you start

2208
01:30:27,910 --> 01:30:26,000
pumping gas in from everywhere you know

2209
01:30:30,470 --> 01:30:27,920
there's a lot of hydrogen out there okay

2210
01:30:33,830 --> 01:30:30,480
okay okay but how do you get uh i love

2211
01:30:35,750 --> 01:30:33,840
this concept it actually relaxes me

2212
01:30:38,310 --> 01:30:35,760
knowing that there's a possibility of

2213
01:30:40,310 --> 01:30:38,320

controlling the instability of our sun

2214

01:30:41,270 --> 01:30:40,320

but how could you use the existing mass

2215

01:30:43,189 --> 01:30:41,280

to keep that thing going for

2216

01:30:46,709 --> 01:30:43,199

quadrillions of years yeah that doesn't

2217

01:30:48,870 --> 01:30:46,719

work you replace some of the black hole

2218

01:30:51,910 --> 01:30:48,880

now how do you get the hydrogen in is it

2219

01:30:53,590 --> 01:30:51,920

a giant hypodermic needle oh no you just

2220

01:30:54,709 --> 01:30:53,600

dump it on the surface that's the easy

2221

01:30:56,629 --> 01:30:54,719

part

2222

01:30:58,870 --> 01:30:56,639

really though not too quickly because

2223

01:31:02,870 --> 01:30:58,880

that's cathay the results of novi you

2224

01:31:05,110 --> 01:31:02,880

you trickle it down now uh okay how long

2225

01:31:09,430 --> 01:31:05,120

does it take

2226

01:31:12,149 --> 01:31:09,440

helium to get to the surface of the sun

2227

01:31:14,070 --> 01:31:12,159

millions of years millions of years so

2228

01:31:16,550 --> 01:31:14,080

would it be the same thing in reverse

2229

01:31:18,390 --> 01:31:16,560

with hydrogen back to the core would it

2230

01:31:19,510 --> 01:31:18,400

take millions of years

2231

01:31:21,189 --> 01:31:19,520

well there'll be the hydrogen in the

2232

01:31:22,950 --> 01:31:21,199

medium shell that was sinking down you

2233

01:31:25,030 --> 01:31:22,960

know stuff in the top singing out it

2234

01:31:26,950 --> 01:31:25,040

bubbles slowly but yeah as you

2235

01:31:29,110 --> 01:31:26,960

introduced it would slowly sink down

2236

01:31:31,430 --> 01:31:29,120

well and if we're talking about a a

2237

01:31:33,910 --> 01:31:31,440

billion-year process

2238

01:31:36,790 --> 01:31:33,920

than a million years at the front of

2239

01:31:40,470 --> 01:31:36,800

this to get to the stability extension

2240

01:31:42,070 --> 01:31:40,480

then it's not that bad and you would do

2241

01:31:44,870 --> 01:31:42,080

this but you would do this before the

2242

01:31:46,310 --> 01:31:44,880

instability starts right so yeah no i'd

2243

01:31:48,070 --> 01:31:46,320

want to start as soon as possible

2244

01:31:51,030 --> 01:31:48,080

because that's there's so much material

2245

01:31:52,790 --> 01:31:51,040

there that we want for other projects so

2246

01:31:54,470 --> 01:31:52,800

i mean again you can just similarly plan

2247

01:31:57,110 --> 01:31:54,480

the solar system

2248

01:31:58,629 --> 01:31:57,120

or you can mine the sun and not need to

2249

01:32:00,310 --> 01:31:58,639

even touch them because it's like a you

2250

01:32:02,470 --> 01:32:00,320

know a bucket next to an ocean

2251

01:32:04,149 --> 01:32:02,480

practically all those asteroids and the

2252

01:32:05,990 --> 01:32:04,159

asteroid belt combined

2253

01:32:08,709 --> 01:32:06,000

don't eat away as much as our own moon

2254

01:32:10,790 --> 01:32:08,719

and all moon is not even what a 10 000

2255

01:32:12,470 --> 01:32:10,800

the mass of jupiter which is half the

2256

01:32:13,910 --> 01:32:12,480

solar system besides the sun

2257

01:32:15,510 --> 01:32:13,920

you know you want to

2258

01:32:17,750 --> 01:32:15,520

get that material out of there what's

2259

01:32:19,510 --> 01:32:17,760

nice it's hard to extract from the sun

2260

01:32:21,990 --> 01:32:19,520

in terms of all the energy to pull out

2261

01:32:23,430 --> 01:32:22,000

of it to pull the stuff out but the sun

2262

01:32:24,629 --> 01:32:23,440

supplies all that energy it's right

2263

01:32:26,709 --> 01:32:24,639

there

2264

01:32:29,110 --> 01:32:26,719

uh actually making it work is tricky but

2265

01:32:30,629 --> 01:32:29,120

it strikes me as all those things where

2266

01:32:33,350 --> 01:32:30,639

it would be a very high priority for

2267

01:32:34,870 --> 01:32:33,360

civilizations do that stably because one

2268

01:32:36,629 --> 01:32:34,880

that protects your your orbital

2269

01:32:38,229 --> 01:32:36,639

infrastructure your economies you expand

2270

01:32:39,910 --> 01:32:38,239

on that solar system from all those

2271

01:32:41,750 --> 01:32:39,920

unexpected flares you know you're in

2272

01:32:43,830 --> 01:32:41,760

control of the situation then so you can

2273

01:32:46,310 --> 01:32:43,840

more safely build that two

2274

01:32:47,990 --> 01:32:46,320

it gives you that vast supply of energy

2275

01:32:49,910 --> 01:32:48,000

you know this is part of that solar

2276

01:32:52,310 --> 01:32:49,920

extraction vectors that runs

2277

01:32:53,830 --> 01:32:52,320

giant kardashev civilizations three it

2278

01:32:55,590 --> 01:32:53,840

gives you more material than you'd mind

2279

01:32:57,189 --> 01:32:55,600

getting every planet within

2280

01:32:58,709 --> 01:32:57,199

you know 100 light years of us and just

2281

01:33:00,550 --> 01:32:58,719

to somebody every plan within 100 light

2282

01:33:01,590 --> 01:33:00,560

years or so and and that's

2283

01:33:03,270 --> 01:33:01,600

you know

2284

01:33:04,709 --> 01:33:03,280

better why is it good for your own son

2285

01:33:06,070 --> 01:33:04,719

or if you really need more mass get it

2286

01:33:07,669 --> 01:33:06,080

for those sons too

2287

01:33:09,750 --> 01:33:07,679

so there you go is it kind of like the

2288

01:33:11,350 --> 01:33:09,760

you're doing this because you want that

2289

01:33:13,350 --> 01:33:11,360

metal you're not really doing to survive

2290

01:33:15,350 --> 01:33:13,360

your sun longer that's just a really

2291

01:33:17,750 --> 01:33:15,360

nice bonus feature because that's the

2292

01:33:19,750 --> 01:33:17,760

focus on board save the sun

2293

01:33:21,669 --> 01:33:19,760

and make a profit save this time to make

2294

01:33:23,030 --> 01:33:21,679

a profit now i'm just going to let you

2295

01:33:26,149 --> 01:33:23,040

know uh

2296

01:33:28,629 --> 01:33:26,159

i've completely stolen all of this

2297

01:33:30,070 --> 01:33:28,639

that that is brilliant

2298

01:33:31,910 --> 01:33:30,080

this is fade to black i'm your stupid

2299

01:33:34,229 --> 01:33:31,920

church tonight isaac arthur is with us

2300

01:33:35,510 --> 01:33:34,239

tonight it's exoplanets

2301
01:33:37,270 --> 01:33:35,520
and

2302
01:33:44,460 --> 01:33:37,280
with a little et thrown in we'll be

2303
01:33:58,390 --> 01:33:55,270
[Music]

2304
01:34:00,570 --> 01:33:58,400
way out here we listen to jimmy church

2305
01:34:03,189 --> 01:34:00,580
you're listening to fade to black

2306
01:34:05,350 --> 01:34:03,199
[Applause]

2307
01:34:06,870 --> 01:34:05,360
you're listening to jimmy church and

2308
01:34:11,940 --> 01:34:06,880
fade to black

2309
01:34:11,950 --> 01:34:25,350
[Applause]

2310
01:34:31,669 --> 01:34:27,189
this is jimmy churchill fade to black

2311
01:34:34,390 --> 01:34:31,679
and this year june 18 2022

2312
01:34:37,030 --> 01:34:34,400
the disclosure fest foundation presents

2313
01:34:40,629 --> 01:34:37,040

the mass meditation initiative it's

2314

01:34:43,189 --> 01:34:40,639

saturday june 18th from 10 a.m to 10 p.m

2315

01:34:45,669 --> 01:34:43,199

one day only at the los angeles state

2316

01:34:48,790 --> 01:34:45,679

historic park in downtown los angeles

2317

01:34:51,189 --> 01:34:48,800

california right next to chinatown i'm

2318

01:34:54,470 --> 01:34:51,199

hosting the event again this year with

2319

01:34:57,910 --> 01:34:54,480

music performances by trevor hall the

2320

01:35:01,189 --> 01:34:57,920

desert dwellers poor on ghee and many

2321

01:35:05,109 --> 01:35:01,199

many more on four separate stages

2322

01:35:07,990 --> 01:35:05,119

there's 16 stages in total over 30 acres

2323

01:35:10,390 --> 01:35:08,000

in downtown los angeles with vendors and

2324

01:35:12,709 --> 01:35:10,400

tents and presentations and workshops

2325

01:35:15,030 --> 01:35:12,719

with billy carson adam apollo lori

2326

01:35:17,510 --> 01:35:15,040

spania laura eisenhower brattles and

2327

01:35:20,109 --> 01:35:17,520

david palmer and many many more it's all

2328

01:35:21,910 --> 01:35:20,119

simple to do just go to

2329

01:35:24,229 --> 01:35:21,920

disclosurefest.org for all of your

2330

01:35:29,810 --> 01:35:24,239

tickets information and a full schedule

2331

01:35:35,350 --> 01:35:33,270

[Music]

2332

01:35:38,070 --> 01:35:35,360

do you want to be an official fate or

2333

01:35:40,310 --> 01:35:38,080

not of course you do this is jimmy

2334

01:35:41,510 --> 01:35:40,320

churchill fade to black just go to our

2335

01:35:44,070 --> 01:35:41,520

membership section at

2336

01:35:45,990 --> 01:35:44,080

jimmychurchradio.com

2337

01:35:47,830 --> 01:35:46,000

vadernots when you think about the

2338

01:35:49,750 --> 01:35:47,840

future of our country and where we're

2339

01:35:52,790 --> 01:35:49,760

headed do you wonder about the food

2340

01:35:54,950 --> 01:35:52,800

supply i do disruptions in the food

2341

01:35:57,750 --> 01:35:54,960

supply chain could be disastrous and

2342

01:35:59,750 --> 01:35:57,760

they usually occur with little warning

2343

01:36:02,790 --> 01:35:59,760

that's why the smartest thing you can do

2344

01:36:05,750 --> 01:36:02,800

today is to stockpile emergency food

2345

01:36:08,550 --> 01:36:05,760

water and other essentials i personally

2346

01:36:10,870 --> 01:36:08,560

recommend my patriot supply they're the

2347

01:36:13,430 --> 01:36:10,880

nation's largest emergency preparedness

2348

01:36:15,910 --> 01:36:13,440

company serving millions of customers

2349

01:36:18,550 --> 01:36:15,920

for more than a decade in fact they're

2350

01:36:21,669 --> 01:36:18,560

the only source my family trusts for our

2351
01:36:25,030 --> 01:36:21,679
preparedness plan you should too right

2352
01:36:27,510 --> 01:36:25,040
now save 20 off a full four week supply

2353
01:36:30,629 --> 01:36:27,520
of delicious meals that provide 2 000

2354
01:36:33,590 --> 01:36:30,639
calories a day saving 20 helps too

2355
01:36:36,550 --> 01:36:33,600
doesn't it especially now so go to

2356
01:36:39,350 --> 01:36:36,560
prepare with jimmy.com and get ready

2357
01:36:41,189 --> 01:36:39,360
that's prepare with jimmy dot com

2358
01:36:43,669 --> 01:36:41,199
there's no time to lose

2359
01:36:46,790 --> 01:36:43,679
do it now

2360
01:36:48,950 --> 01:36:46,800
so you love talk radio then you'll love

2361
01:36:52,149 --> 01:36:48,960
talkstreamlive.com

2362
01:36:54,310 --> 01:36:52,159
talk stream live is always on 24 7 with

2363
01:36:56,229 --> 01:36:54,320

the best streaming talk shows find your

2364

01:36:59,109 --> 01:36:56,239

favorite talkers and discover some new

2365

01:37:01,270 --> 01:36:59,119

ones it's free readily available online

2366

01:37:03,350 --> 01:37:01,280

or on mobile with any smartphone or

2367

01:37:05,910 --> 01:37:03,360

tablet finding your favorite talk shows

2368

01:37:07,709 --> 01:37:05,920

all in one place has gotten a whole lot

2369

01:37:19,109 --> 01:37:07,719

easier just go to

2370

01:37:19,119 --> 01:37:20,150

the downl

2371

01:37:20,160 --> 01:37:24,310

[Music]

2372

01:37:31,109 --> 01:37:26,390

you are listening to fate to black with

2373

01:37:34,070 --> 01:37:31,910

hi

2374

01:37:37,590 --> 01:37:34,080

i'm lisa vance you're listening to jimmy

2375

01:37:40,629 --> 01:37:37,600

church this is revolution the revolution

2376

01:37:42,709 --> 01:37:40,639

will not be televised the revolution is

2377

01:37:47,370 --> 01:37:42,719

on radio

2378

01:38:25,830 --> 01:38:11,590

[Music]

2379

01:38:29,910 --> 01:38:27,910

welcome back fade to black i am your

2380

01:38:32,070 --> 01:38:29,920

host jimmy church tonight isaac arthur

2381

01:38:33,669 --> 01:38:32,080

is with us

2382

01:38:35,669 --> 01:38:33,679

save the sun

2383

01:38:38,550 --> 01:38:35,679

and make a profit

2384

01:38:40,790 --> 01:38:38,560

that's a t-shirt man

2385

01:38:44,310 --> 01:38:40,800

our guest is isaac arthur

2386

01:38:46,790 --> 01:38:44,320

and uh i want to talk about omua

2387

01:38:48,390 --> 01:38:46,800

and have you read let's just start here

2388

01:38:50,149 --> 01:38:48,400

have you read uh avi's book

2389

01:38:52,390 --> 01:38:50,159
extraterrestrial

2390

01:38:54,470 --> 01:38:52,400
no i haven't got to yet

2391

01:38:57,030 --> 01:38:54,480
do you have it

2392

01:38:58,229 --> 01:38:57,040
on audible yes

2393

01:39:00,950 --> 01:38:58,239
it's about my list of things that i

2394

01:39:04,070 --> 01:39:00,960
listen to for a bit it's it's uh it's an

2395

01:39:06,550 --> 01:39:04,080
incredible incredible book and uh it's a

2396

01:39:10,229 --> 01:39:06,560
great audiobook too as well it's uh it's

2397

01:39:11,590 --> 01:39:10,239
it's absolutely fantastic

2398

01:39:14,790 --> 01:39:11,600
um

2399

01:39:17,750 --> 01:39:14,800
artificial natural

2400

01:39:19,350 --> 01:39:17,760
probably natural

2401

01:39:20,390 --> 01:39:19,360

why is it

2402

01:39:23,590 --> 01:39:20,400

that

2403

01:39:26,390 --> 01:39:23,600

physicists like yourself

2404

01:39:27,750 --> 01:39:26,400

can't cross the rubicon

2405

01:39:29,109 --> 01:39:27,760

i think on this one is because i just

2406

01:39:31,830 --> 01:39:29,119

don't feel this i don't feel there's

2407

01:39:33,750 --> 01:39:31,840

enough quite there yet to me the the key

2408

01:39:35,430 --> 01:39:33,760

of anything being artificial that you

2409

01:39:36,229 --> 01:39:35,440

know with that natural artificial divide

2410

01:39:37,590 --> 01:39:36,239

right

2411

01:39:38,709 --> 01:39:37,600

very big difference between you got a

2412

01:39:40,390 --> 01:39:38,719

sighting you know you're looking up at a

2413

01:39:41,830 --> 01:39:40,400

little light moving through the sky it's

2414

01:39:43,910 --> 01:39:41,840

either a plane a satellite a weather

2415

01:39:46,149 --> 01:39:43,920

balloon or an alien ufo it's not natural

2416

01:39:47,270 --> 01:39:46,159

right there's no debate about that we're

2417

01:39:49,830 --> 01:39:47,280

looking at something that might be

2418

01:39:51,430 --> 01:39:49,840

natural or might be artificial i wanted

2419

01:39:53,270 --> 01:39:51,440

to have at least two

2420

01:39:54,390 --> 01:39:53,280

unrelated points that connect up to say

2421

01:39:55,750 --> 01:39:54,400

it's artificial

2422

01:39:57,430 --> 01:39:55,760

you know i'm trying to have new york

2423

01:39:59,750 --> 01:39:57,440

city off a car or something like that is

2424

01:40:01,830 --> 01:39:59,760

artificial i've got a lot of different

2425

01:40:03,910 --> 01:40:01,840

things to indicate not just one

2426

01:40:05,590 --> 01:40:03,920

i know this car is artificial because

2427

01:40:07,270 --> 01:40:05,600

it's built to a task i can see what that

2428

01:40:08,550 --> 01:40:07,280

task is because it has clearly

2429

01:40:10,390 --> 01:40:08,560

manufactured bits because of a whole

2430

01:40:12,709 --> 01:40:10,400

bunch of different stuff so when i want

2431

01:40:15,030 --> 01:40:12,719

to say something is artificial is an

2432

01:40:17,270 --> 01:40:15,040

alien manufacturer i want to be able to

2433

01:40:19,430 --> 01:40:17,280

see more than one thing that says

2434

01:40:21,270 --> 01:40:19,440

artificial in terms of its

2435

01:40:22,709 --> 01:40:21,280

why would not be a natural object like

2436

01:40:24,229 --> 01:40:22,719

what's its purpose

2437

01:40:25,669 --> 01:40:24,239

what was it built to do

2438

01:40:27,030 --> 01:40:25,679

you know if it comes in it's shaped like

2439

01:40:29,109 --> 01:40:27,040

you there could be one thing that's just

2440

01:40:30,629 --> 01:40:29,119

really extreme if it's a perfect cube

2441

01:40:31,990 --> 01:40:30,639

i'm gonna say that's probably artificial

2442

01:40:34,470 --> 01:40:32,000

but then you got things like the giant's

2443

01:40:37,189 --> 01:40:34,480

causeway that are perfect hexagons it

2444

01:40:39,350 --> 01:40:37,199

looks artificial too i need two points

2445

01:40:40,629 --> 01:40:39,360

you know not just one okay

2446

01:40:43,510 --> 01:40:40,639

um

2447

01:40:45,030 --> 01:40:43,520

avi gives you about 150 points in the

2448

01:40:48,629 --> 01:40:45,040

book by the way

2449

01:40:50,870 --> 01:40:48,639

and uh but two things

2450

01:40:52,790 --> 01:40:50,880

when when you go through it

2451
01:40:55,510 --> 01:40:52,800
he points out

2452
01:40:57,430 --> 01:40:55,520
with data by the way

2453
01:40:59,270 --> 01:40:57,440
uh two things

2454
01:41:00,870 --> 01:40:59,280
that

2455
01:41:02,709 --> 01:41:00,880
freaked me out

2456
01:41:05,109 --> 01:41:02,719
number one

2457
01:41:08,470 --> 01:41:05,119
metallic surface

2458
01:41:11,830 --> 01:41:08,480
okay and he gives the data for that

2459
01:41:13,430 --> 01:41:11,840
metallic surface number two

2460
01:41:16,870 --> 01:41:13,440
he says

2461
01:41:19,030 --> 01:41:16,880
it was not oblong

2462
01:41:21,510 --> 01:41:19,040
it was flat

2463
01:41:23,350 --> 01:41:21,520

like a pancake

2464

01:41:24,629 --> 01:41:23,360

and circular

2465

01:41:26,229 --> 01:41:24,639

now

2466

01:41:28,470 --> 01:41:26,239

hold on a minute

2467

01:41:31,030 --> 01:41:28,480

right yeah i mean just let's just stop

2468

01:41:32,470 --> 01:41:31,040

right there and contemplate those two

2469

01:41:34,950 --> 01:41:32,480

points

2470

01:41:39,109 --> 01:41:34,960

metallic surface not a rock not an

2471

01:41:40,390 --> 01:41:39,119

asteroid metallic reflective shining

2472

01:41:43,270 --> 01:41:40,400

surface

2473

01:41:46,790 --> 01:41:45,510

flat like a pancake and shape like a

2474

01:41:48,070 --> 01:41:46,800

pancake

2475

01:41:51,109 --> 01:41:48,080

now

2476

01:41:52,950 --> 01:41:51,119

what natural object

2477

01:41:56,310 --> 01:41:52,960

have have you seen

2478

01:42:00,229 --> 01:41:56,320

right we we photograph image and observe

2479

01:42:01,510 --> 01:42:00,239

asteroids all the time

2480

01:42:03,830 --> 01:42:01,520

they have a

2481

01:42:05,430 --> 01:42:03,840

very general shape to it

2482

01:42:06,310 --> 01:42:05,440

the size

2483

01:42:08,470 --> 01:42:06,320

uh

2484

01:42:11,750 --> 01:42:08,480

you know can vary

2485

01:42:15,590 --> 01:42:11,760

but uh metallic and flat like a pancake

2486

01:42:17,109 --> 01:42:15,600

are not known asteroid shapes

2487

01:42:18,149 --> 01:42:17,119

it depends on what would be making them

2488

01:42:20,550 --> 01:42:18,159

you know we have a pretty limited

2489

01:42:23,189 --> 01:42:20,560

quantity i don't agree with his analysis

2490

01:42:25,750 --> 01:42:23,199

of of them being a flat metallic disc

2491

01:42:28,310 --> 01:42:25,760

but just an example i have a planet

2492

01:42:29,990 --> 01:42:28,320

destroying collision it kicks out chunks

2493

01:42:32,550 --> 01:42:30,000

of material from the core of that planet

2494

01:42:35,270 --> 01:42:32,560

molten metal that big drop of molten

2495

01:42:36,870 --> 01:42:35,280

metal as it's cooling and spinning away

2496

01:42:39,030 --> 01:42:36,880

can flatten out

2497

01:42:40,229 --> 01:42:39,040

in fact it generally would is it going

2498

01:42:42,550 --> 01:42:40,239

to be able to do that at a rate that

2499

01:42:44,629 --> 01:42:42,560

allows it while it's cooling right

2500

01:42:45,830 --> 01:42:44,639

to turn to something kind of disc like

2501

01:42:47,669 --> 01:42:45,840

well yeah

2502

01:42:49,669 --> 01:42:47,679

how disc like how pancake like are we

2503

01:42:51,669 --> 01:42:49,679

talking we have some stallers that are

2504

01:42:53,189 --> 01:42:51,679

surprisingly you know squished up on

2505

01:42:55,350 --> 01:42:53,199

their pores and how quick they rotate

2506

01:42:57,510 --> 01:42:55,360

too there are things that can do that

2507

01:43:00,149 --> 01:42:57,520

they're all you know circles are not the

2508

01:43:02,629 --> 01:43:00,159

same as a square in terms of nature you

2509

01:43:04,709 --> 01:43:02,639

get circles in nature you get hexagons

2510

01:43:06,470 --> 01:43:04,719

in nature and we don't have the data to

2511

01:43:07,910 --> 01:43:06,480

say that it was in like a perfect circle

2512

01:43:10,709 --> 01:43:07,920

or things like that

2513

01:43:12,390 --> 01:43:10,719

metallic surface same concept what

2514

01:43:14,390 --> 01:43:12,400

caused it to get ejected from its solar

2515

01:43:16,950 --> 01:43:14,400

system in the first place probably

2516

01:43:19,990 --> 01:43:16,960

something energetic what survives an

2517

01:43:21,990 --> 01:43:20,000

energetic you know event well a piece of

2518

01:43:23,270 --> 01:43:22,000

molten metal can do that trick

2519

01:43:24,950 --> 01:43:23,280

but then on the way here it should have

2520

01:43:26,790 --> 01:43:24,960

gone oh scarred up with ice and other

2521

01:43:28,390 --> 01:43:26,800

things i don't dispute that it could

2522

01:43:30,229 --> 01:43:28,400

have had metal on surface you know

2523

01:43:32,390 --> 01:43:30,239

that's that is one of those things where

2524

01:43:33,830 --> 01:43:32,400

the data doesn't permit us to speak with

2525

01:43:35,350 --> 01:43:33,840

something we don't have a lot of data on

2526

01:43:37,270 --> 01:43:35,360

the thing we don't have

2527

01:43:38,709 --> 01:43:37,280

really good observations now i haven't

2528

01:43:40,149 --> 01:43:38,719

read his interpretations of them and

2529

01:43:42,229 --> 01:43:40,159

they're probably pretty good ones but

2530

01:43:43,590 --> 01:43:42,239

the same time i have seen the data on

2531

01:43:45,590 --> 01:43:43,600

this stuff and i don't think there's

2532

01:43:48,149 --> 01:43:45,600

anything that would really scream

2533

01:43:50,830 --> 01:43:48,159

this must absolutely be true right okay

2534

01:43:55,750 --> 01:43:50,840

so let's let's let's go to point number

2535

01:44:02,550 --> 01:43:59,350

i mean that changes uh changes to actual

2536

01:44:04,790 --> 01:44:02,560

expect it turned

2537

01:44:07,510 --> 01:44:04,800

okay on its own

2538

01:44:10,070 --> 01:44:07,520

and was not affected by the sun's

2539

01:44:12,229 --> 01:44:10,080

gravity and i'll get to point number

2540

01:44:13,510 --> 01:44:12,239

four in a second so now we've got

2541

01:44:15,430 --> 01:44:13,520

metallic

2542

01:44:20,709 --> 01:44:15,440

flat like a pancake

2543

01:44:22,550 --> 01:44:20,719

and then changes direction on its own

2544

01:44:24,070 --> 01:44:22,560

any pocket of gas inside it that had

2545

01:44:26,790 --> 01:44:24,080

been shielded from the sunlight as it

2546

01:44:28,550 --> 01:44:26,800

came in suddenly superheats and correct

2547

01:44:32,070 --> 01:44:28,560

except

2548

01:44:34,709 --> 01:44:32,080

no gas ejection from this object no

2549

01:44:36,870 --> 01:44:34,719

detected yes that's right right right

2550

01:44:38,709 --> 01:44:36,880

very small object very far away we

2551

01:44:40,470 --> 01:44:38,719

didn't get a good look at it i think

2552

01:44:42,310 --> 01:44:40,480

it's it's easy for folks to remember

2553

01:44:44,629 --> 01:44:42,320

hubble telescope

2554

01:44:47,669 --> 01:44:44,639

very very powerful telescope cannot even

2555

01:44:49,350 --> 01:44:47,679

see the moon landing on the moon

2556

01:44:50,790 --> 01:44:49,360

never got that close to us right and

2557

01:44:51,910 --> 01:44:50,800

it's not much bigger than that landing

2558

01:44:54,629 --> 01:44:51,920

sites

2559

01:44:59,750 --> 01:44:54,639

no no no tail

2560

01:45:03,030 --> 01:44:59,760

no gas ejection uh was no gas uh emitted

2561

01:45:05,030 --> 01:45:03,040

uh from the from the rear of it uh being

2562

01:45:06,709 --> 01:45:05,040

superheated by the sun

2563

01:45:10,229 --> 01:45:06,719

which would cause

2564

01:45:12,310 --> 01:45:10,239

all of this but it had none of that so

2565

01:45:15,109 --> 01:45:12,320

now we've got four things

2566

01:45:18,790 --> 01:45:15,119

no gas ejection wasn't a comet

2567

01:45:21,189 --> 01:45:18,800

uh metallic flat changing directions and

2568

01:45:23,669 --> 01:45:21,199

now we get up to number five

2569

01:45:26,470 --> 01:45:23,679

it increased speed

2570

01:45:28,870 --> 01:45:26,480

and not from gravity

2571

01:45:32,149 --> 01:45:28,880

now now see

2572

01:45:35,590 --> 01:45:32,159

answer that so now we've got five here

2573

01:45:37,910 --> 01:45:35,600

right we've got five very crazy things

2574

01:45:40,390 --> 01:45:37,920

how much of this needs to add up

2575

01:45:42,310 --> 01:45:40,400

before you go well okay there may be a

2576

01:45:44,390 --> 01:45:42,320

possibility here

2577

01:45:45,990 --> 01:45:44,400

oh i think there is a possibility

2578

01:45:47,590 --> 01:45:46,000

it could be and nearly and the thing is

2579

01:45:49,270 --> 01:45:47,600

the thing is i think that he's jumping

2580

01:45:51,590 --> 01:45:49,280

the gun to declare it to be an alien

2581

01:45:53,430 --> 01:45:51,600

artifact i don't think it is but it

2582

01:45:55,109 --> 01:45:53,440

could be i'm not saying it definitely

2583

01:45:57,350 --> 01:45:55,119

isn't thing is

2584

01:45:58,550 --> 01:45:57,360

let's say it's a big metallic disc this

2585

01:46:00,709 --> 01:45:58,560

we're talking about the anomalies of its

2586

01:46:02,550 --> 01:46:00,719

motion things like that okay so a pocket

2587

01:46:04,070 --> 01:46:02,560

of gas whoops on it very quickly and we

2588

01:46:04,950 --> 01:46:04,080

would never see that we would never have

2589

01:46:06,470 --> 01:46:04,960

seen

2590

01:46:09,189 --> 01:46:06,480

if a pocket of that thing would rotate

2591

01:46:10,470 --> 01:46:09,199

around and explode outward not a chance

2592

01:46:11,830 --> 01:46:10,480

that we detect that

2593

01:46:13,109 --> 01:46:11,840

unless we just had me stay at that

2594

01:46:15,270 --> 01:46:13,119

moment that's exactly how i can change

2595

01:46:17,430 --> 01:46:15,280

velocity very quickly but it was also a

2596

01:46:19,590 --> 01:46:17,440

big uncertainty value on its velocity we

2597

01:46:21,030 --> 01:46:19,600

don't know exactly how fast it's going

2598

01:46:23,270 --> 01:46:21,040

these things are always based on

2599

01:46:25,030 --> 01:46:23,280

estimates and those are got some pluses

2600

01:46:26,390 --> 01:46:25,040

and minuses it's not that big of a

2601
01:46:28,149 --> 01:46:26,400
velocity change if you're looking at the

2602
01:46:30,550 --> 01:46:28,159
top ball of uncertainty for the one

2603
01:46:32,629 --> 01:46:30,560
versus the bottom ball or the other

2604
01:46:33,830 --> 01:46:32,639
now then there's this question of all

2605
01:46:35,430 --> 01:46:33,840
right i have let's say it's a big

2606
01:46:36,790 --> 01:46:35,440
metallic pancake

2607
01:46:39,590 --> 01:46:36,800
why

2608
01:46:43,270 --> 01:46:39,600
what's the purpose of big metallic

2609
01:46:46,550 --> 01:46:43,280
pancake well you want to be like a 1950s

2610
01:46:47,350 --> 01:46:46,560
sci-fi film well yeah but i mean you got

2611
01:46:49,510 --> 01:46:47,360
it

2612
01:46:51,510 --> 01:46:49,520
you got to look useful

2613
01:46:52,790 --> 01:46:51,520

you got to have a cool looking spaceship

2614

01:46:55,750 --> 01:46:52,800

man i mean

2615

01:46:57,669 --> 01:46:55,760

you don't want anything boring but but

2616

01:46:59,350 --> 01:46:57,679

but business basic simple geometry

2617

01:47:00,390 --> 01:46:59,360

geometrical shape like a pancake kind of

2618

01:47:01,590 --> 01:47:00,400

void

2619

01:47:03,109 --> 01:47:01,600

i don't know

2620

01:47:05,669 --> 01:47:03,119

but but

2621

01:47:09,430 --> 01:47:05,679

the more uh

2622

01:47:11,590 --> 01:47:09,440

the more data with omumua

2623

01:47:13,270 --> 01:47:11,600

and and again i'm i'm just relying on

2624

01:47:15,910 --> 01:47:13,280

avi in the presentation and

2625

01:47:18,070 --> 01:47:15,920

extraterrestrial but he lays out a

2626

01:47:19,189 --> 01:47:18,080

fantastic case and i'm just touching

2627

01:47:23,750 --> 01:47:19,199

upon

2628

01:47:25,590 --> 01:47:23,760

uh the basics i could continue um uh

2629

01:47:29,430 --> 01:47:25,600

with uh some of

2630

01:47:31,350 --> 01:47:29,440

his points but i think it is it's sound

2631

01:47:34,950 --> 01:47:31,360

i think it's very logical i think it's

2632

01:47:37,270 --> 01:47:34,960

very pragmatic i i really do

2633

01:47:39,430 --> 01:47:37,280

i trust in his ability to put together a

2634

01:47:41,350 --> 01:47:39,440

good case you know the man is an expert

2635

01:47:43,590 --> 01:47:41,360

astronomer and he knows what he's

2636

01:47:45,350 --> 01:47:43,600

talking about but i know people who know

2637

01:47:47,189 --> 01:47:45,360

it as well as he does who don't agree

2638

01:47:49,189 --> 01:47:47,199

with his points on these things they

2639

01:47:51,990 --> 01:47:49,199

have looked at it and they disagree i

2640

01:47:54,149 --> 01:47:52,000

myself am not qualified you know to

2641

01:47:56,149 --> 01:47:54,159

to really i am not anything approaching

2642

01:47:58,149 --> 01:47:56,159

a skill in astronomy right

2643

01:47:59,430 --> 01:47:58,159

i can present things of what it would be

2644

01:48:01,430 --> 01:47:59,440

but in terms of why i behaved

2645

01:48:03,430 --> 01:48:01,440

anomalously to me that's a question of

2646

01:48:05,669 --> 01:48:03,440

well to me i still think the best answer

2647

01:48:07,270 --> 01:48:05,679

is to run the thing down and go to look

2648

01:48:08,870 --> 01:48:07,280

if we know where it was going we can

2649

01:48:10,709 --> 01:48:08,880

find the thing again

2650

01:48:13,030 --> 01:48:10,719

launch a satellite launch something get

2651
01:48:15,270 --> 01:48:13,040
out there it's worth the effort go take

2652
01:48:17,590 --> 01:48:15,280
a peek at this thing right at the same

2653
01:48:19,189 --> 01:48:17,600
time we also have to keep in mind that

2654
01:48:20,629 --> 01:48:19,199
while it is interstellar asteroid we

2655
01:48:22,870 --> 01:48:20,639
know very little about what kind of

2656
01:48:24,470 --> 01:48:22,880
things which go between solar systems we

2657
01:48:26,470 --> 01:48:24,480
were just assuming they look like walls

2658
01:48:27,590 --> 01:48:26,480
you only covered an ice in the trip we

2659
01:48:28,870 --> 01:48:27,600
didn't know that

2660
01:48:30,070 --> 01:48:28,880
what knocks things out of our solar

2661
01:48:32,709 --> 01:48:30,080
system

2662
01:48:33,990 --> 01:48:32,719
well a tiny sliver of something

2663
01:48:35,510 --> 01:48:34,000

i mean that could just be a random

2664

01:48:37,830 --> 01:48:35,520

perturbation but that could also be

2665

01:48:39,990 --> 01:48:37,840

giant collision right these are going to

2666

01:48:42,310 --> 01:48:40,000

produce atypical things we need to know

2667

01:48:43,430 --> 01:48:42,320

what this looks like and a key thing

2668

01:48:45,830 --> 01:48:43,440

that gets skipped sometimes this

2669

01:48:47,990 --> 01:48:45,840

conversation is this was our first time

2670

01:48:49,910 --> 01:48:48,000

we saw an interstellar asteroid but we'd

2671

01:48:51,189 --> 01:48:49,920

already estimated or spaceship we'd

2672

01:48:52,310 --> 01:48:51,199

already estimated that we probably had

2673

01:48:54,550 --> 01:48:52,320

thousands of going through our solar

2674

01:48:55,990 --> 01:48:54,560

system every year we need to know more

2675

01:48:57,910 --> 01:48:56,000

what these things look like and then we

2676

01:49:00,390 --> 01:48:57,920

know if it was anomalous or not

2677

01:49:03,189 --> 01:49:00,400

is this an alien ship if so it's a dead

2678

01:49:04,870 --> 01:49:03,199

one right or it's hibernating what is

2679

01:49:06,390 --> 01:49:04,880

this ceiling's purpose it's clearly not

2680

01:49:08,950 --> 01:49:06,400

meant to be seen

2681

01:49:11,109 --> 01:49:08,960

as what it is right you don't hide it

2682

01:49:12,870 --> 01:49:11,119

this way if you're aiming for subtle you

2683

01:49:15,589 --> 01:49:12,880

know spaceship

2684

01:49:17,430 --> 01:49:15,599

they clearly failed you know yeah i

2685

01:49:19,430 --> 01:49:17,440

don't agree with avi he's you know this

2686

01:49:20,310 --> 01:49:19,440

is definitely an anomalous asteroid

2687

01:49:22,149 --> 01:49:20,320

right

2688

01:49:24,149 --> 01:49:22,159

what he's like

2689

01:49:26,310 --> 01:49:24,159

there's there's one thing that he

2690

01:49:28,629 --> 01:49:26,320

mentions i've talked to him about this

2691

01:49:31,189 --> 01:49:28,639

and i'm still not

2692

01:49:32,070 --> 01:49:31,199

a hundred percent clear

2693

01:49:34,470 --> 01:49:32,080

in that

2694

01:49:36,629 --> 01:49:34,480

you know i've read the book ten times

2695

01:49:40,229 --> 01:49:36,639

right and i've listened to this over and

2696

01:49:42,550 --> 01:49:40,239

over again but i just can't digest it he

2697

01:49:44,870 --> 01:49:42,560

uses the word buoy

2698

01:49:48,790 --> 01:49:44,880

that you know that it was parked

2699

01:49:51,350 --> 01:49:50,070

to to

2700

01:49:56,070 --> 01:49:51,360

to

2701

01:49:58,550 --> 01:49:56,080

if you don't understand if you didn't

2702

01:50:00,310 --> 01:49:58,560

even know that it was here until it

2703

01:50:03,510 --> 01:50:00,320

popped out from behind the sun right

2704

01:50:06,550 --> 01:50:03,520

which is basically how it happened if if

2705

01:50:07,750 --> 01:50:06,560

uh hawaii wasn't looking at at that

2706

01:50:09,350 --> 01:50:07,760

moment

2707

01:50:12,390 --> 01:50:09,360

we lucked out to see it yeah we lucked

2708

01:50:14,629 --> 01:50:12,400

out um but how would he know

2709

01:50:16,790 --> 01:50:14,639

based on on that

2710

01:50:19,830 --> 01:50:16,800

uh you know backing up that it was a

2711

01:50:22,229 --> 01:50:19,840

buoy that was parked

2712

01:50:23,910 --> 01:50:22,239

i don't find that yeah well that's that

2713

01:50:25,270 --> 01:50:23,920

is an assumption it has to have been

2714

01:50:28,229 --> 01:50:25,280

accelerating i don't think we assuming

2715

01:50:29,910 --> 01:50:28,239

that it wasn't uh was a movie at all but

2716

01:50:31,750 --> 01:50:29,920

i'll give you an example again i don't

2717

01:50:33,669 --> 01:50:31,760

know what his particular case is there

2718

01:50:36,229 --> 01:50:33,679

was a popular concept back in the day

2719

01:50:37,990 --> 01:50:36,239

there might be a counter earth right a

2720

01:50:40,070 --> 01:50:38,000

planet on the exact top side of the sun

2721

01:50:42,229 --> 01:50:40,080

that we couldn't see at a lagrange three

2722

01:50:43,750 --> 01:50:42,239

point every system's got one it would

2723

01:50:44,790 --> 01:50:43,760

count orbit with us and we would never

2724

01:50:45,990 --> 01:50:44,800

see it

2725

01:50:48,790 --> 01:50:46,000

if you're looking for a good place to

2726

01:50:50,470 --> 01:50:48,800

leave you know a big lawn detector

2727

01:50:52,149 --> 01:50:50,480

that's the place you put your big dish

2728

01:50:53,350 --> 01:50:52,159

at you put all your small satellites

2729

01:50:55,430 --> 01:50:53,360

where people won't see them in the solar

2730

01:50:58,149 --> 01:50:55,440

system but if you spy on people put your

2731

01:50:59,669 --> 01:50:58,159

big dish and radar at their I3 point

2732

01:51:01,589 --> 01:50:59,679

because on your side of sun and they're

2733

01:51:03,510 --> 01:51:01,599

never gonna see it or see your waves

2734

01:51:05,430 --> 01:51:03,520

coming off it to you send out signals

2735

01:51:06,470 --> 01:51:05,440

right right that's the best interruption

2736

01:51:08,870 --> 01:51:06,480

you can get

2737

01:51:11,109 --> 01:51:08,880

um of course by now we'd have seen that

2738

01:51:12,950 --> 01:51:11,119

right what was it doing well why is it

2739

01:51:15,030 --> 01:51:12,960

suddenly why is it suddenly powering up

2740

01:51:16,709 --> 01:51:15,040

right why now why not earlier when it

2741

01:51:18,470 --> 01:51:16,719

first detected radio waves and could be

2742

01:51:20,470 --> 01:51:18,480

saying maybe i better get out of dodge

2743

01:51:21,990 --> 01:51:20,480

where they can see me well maybe it

2744

01:51:23,350 --> 01:51:22,000

maybe thought that was a good time

2745

01:51:25,669 --> 01:51:23,360

because it didn't think it was i could

2746

01:51:26,870 --> 01:51:25,679

be seen says there's less than 1 000

2747

01:51:28,709 --> 01:51:26,880

chance they're going to spot me on this

2748

01:51:32,229 --> 01:51:28,719

beautiful so it's good to do

2749

01:51:34,629 --> 01:51:32,239

but parking there as a buoy

2750

01:51:36,709 --> 01:51:34,639

has been thought of with saying well one

2751
01:51:38,629 --> 01:51:36,719
why is it that big why is it that size

2752
01:51:40,950 --> 01:51:38,639
what was its purpose where's the other

2753
01:51:43,589 --> 01:51:40,960
telltale's from it and

2754
01:51:45,510 --> 01:51:43,599
why that size low was it packing up

2755
01:51:48,310 --> 01:51:45,520
you say well if i'm going to be a solo

2756
01:51:49,990 --> 01:51:48,320
sales ship i have a huge sale and i sail

2757
01:51:51,669 --> 01:51:50,000
directly out from the sun because i'm

2758
01:51:53,589 --> 01:51:51,679
trying not to be seen

2759
01:51:54,790 --> 01:51:53,599
and then i wrap that sail back up around

2760
01:51:56,790 --> 01:51:54,800
me so it's not getting hit by the

2761
01:51:58,470 --> 01:51:56,800
collisions and dart on the way once i

2762
01:52:00,310 --> 01:51:58,480
fall from the sun but should have been

2763
01:52:02,629 --> 01:52:00,320

wrapping it up yet you know there's so

2764

01:52:03,990 --> 01:52:02,639

many things where you say well

2765

01:52:06,550 --> 01:52:04,000

if we start with the assumption that

2766

01:52:08,709 --> 01:52:06,560

it's x now let's follow x amount it says

2767

01:52:10,790 --> 01:52:08,719

well no that's not how i do it and of

2768

01:52:11,990 --> 01:52:10,800

course just because that's not how i do

2769

01:52:13,510 --> 01:52:12,000

it doesn't mean that's how aliens

2770

01:52:14,870 --> 01:52:13,520

wouldn't do it they might know a lot

2771

01:52:16,629 --> 01:52:14,880

better nursing what's more they can do

2772

01:52:18,149 --> 01:52:16,639

things the least best way to they can

2773

01:52:19,589 --> 01:52:18,159

make mistakes right

2774

01:52:21,510 --> 01:52:19,599

um but

2775

01:52:24,149 --> 01:52:21,520

if it's a solo ship it's solo sailor

2776

01:52:25,350 --> 01:52:24,159

ship it's all sunny reflective well

2777

01:52:27,270 --> 01:52:25,360

why

2778

01:52:28,870 --> 01:52:27,280

is it actually being

2779

01:52:31,109 --> 01:52:28,880

in that shape that's in right now wide

2780

01:52:32,709 --> 01:52:31,119

disk that's that size

2781

01:52:34,149 --> 01:52:32,719

you know it has to be really thin then

2782

01:52:35,910 --> 01:52:34,159

it's not a good sale it's not pointing

2783

01:52:37,430 --> 01:52:35,920

in the right direction to be a sale

2784

01:52:39,589 --> 01:52:37,440

maybe it's wrapping it up maybe it's a

2785

01:52:41,669 --> 01:52:39,599

damaged probe that makes more sense you

2786

01:52:43,910 --> 01:52:41,679

know he did because he does he does

2787

01:52:46,950 --> 01:52:43,920

suggest that actually that it could it

2788

01:52:48,470 --> 01:52:46,960

could be a piece a part yeah and that's

2789

01:52:50,470 --> 01:52:48,480

your best case for a lot of these things

2790

01:52:52,149 --> 01:52:50,480

is because then it doesn't have to match

2791

01:52:54,709 --> 01:52:52,159

all the criteria you'd expect for a

2792

01:52:56,870 --> 01:52:54,719

probe because it's damaged it's not

2793

01:52:59,750 --> 01:52:56,880

doing its job anymore if its job is to

2794

01:53:01,990 --> 01:52:59,760

spy on humans well it failed if the shop

2795

01:53:03,270 --> 01:53:02,000

was not to be seen right right and say

2796

01:53:04,790 --> 01:53:03,280

well maybe it was working on the

2797

01:53:06,709 --> 01:53:04,800

assumption we wouldn't be too likely to

2798

01:53:08,229 --> 01:53:06,719

see it but

2799

01:53:09,990 --> 01:53:08,239

the there are so many ways you can make

2800

01:53:11,669 --> 01:53:10,000

that ship a little bit less visible as

2801
01:53:12,629 --> 01:53:11,679
it were that it clearly doesn't build

2802
01:53:14,550 --> 01:53:12,639
around

2803
01:53:16,149 --> 01:53:14,560
uh so it doesn't meet the context of

2804
01:53:18,229 --> 01:53:16,159
intentionally you know intentionally

2805
01:53:19,589 --> 01:53:18,239
stealthy spaceship observer

2806
01:53:21,350 --> 01:53:19,599
uh on the other hand it doesn't care

2807
01:53:22,550 --> 01:53:21,360
about stealth then it doesn't really

2808
01:53:23,910 --> 01:53:22,560
meet the criteria anyway because the

2809
01:53:24,950 --> 01:53:23,920
best way to get a look at the planet be

2810
01:53:26,870 --> 01:53:24,960
just to

2811
01:53:29,030 --> 01:53:26,880
go look at the planet you get a lot

2812
01:53:30,950 --> 01:53:29,040
closer if it's a buoy designed to look

2813
01:53:31,750 --> 01:53:30,960

at us why isn't it coming over right by

2814

01:53:34,390 --> 01:53:31,760

us

2815

01:53:35,750 --> 01:53:34,400

would you if you were e.t

2816

01:53:37,910 --> 01:53:35,760

um and

2817

01:53:38,870 --> 01:53:37,920

speaking of this buoy concept if you

2818

01:53:41,430 --> 01:53:38,880

were

2819

01:53:43,669 --> 01:53:41,440

hanging out and observing

2820

01:53:45,589 --> 01:53:43,679

would you be out would you be in the

2821

01:53:48,390 --> 01:53:45,599

kuiper belt would you be in the oort

2822

01:53:50,390 --> 01:53:48,400

cloud and if you

2823

01:53:52,870 --> 01:53:50,400

the reason why i would suggest that is

2824

01:53:54,070 --> 01:53:52,880

that you wouldn't reflect sunlight you

2825

01:53:56,310 --> 01:53:54,080

know when you're out at that great

2826
01:53:57,910 --> 01:53:56,320
distance and so visually you wouldn't

2827
01:54:00,550 --> 01:53:57,920
necessarily be

2828
01:54:01,669 --> 01:54:00,560
detectable or observable from earth

2829
01:54:03,910 --> 01:54:01,679
right

2830
01:54:06,229 --> 01:54:03,920
yeah oh very much so and it depends on

2831
01:54:07,350 --> 01:54:06,239
what your power source is right uh we

2832
01:54:08,950 --> 01:54:07,360
shouldn't just assume they got some

2833
01:54:10,229 --> 01:54:08,960
really awesome you know like fusion

2834
01:54:11,350 --> 01:54:10,239
actually they can fit in the car you

2835
01:54:12,870 --> 01:54:11,360
know backseat their car or something

2836
01:54:14,070 --> 01:54:12,880
like that uh on the other hand they

2837
01:54:15,189 --> 01:54:14,080
might have a micro black hole in the

2838
01:54:17,350 --> 01:54:15,199

city it's tobacco thing that in which

2839

01:54:18,870 --> 01:54:17,360

case they got powerful trillion years

2840

01:54:20,550 --> 01:54:18,880

um

2841

01:54:21,750 --> 01:54:20,560

if they're running off of something like

2842

01:54:24,149 --> 01:54:21,760

solar power

2843

01:54:25,750 --> 01:54:24,159

which they might be then they do need to

2844

01:54:27,350 --> 01:54:25,760

be in closer and if they're not then

2845

01:54:29,510 --> 01:54:27,360

they need to spread out a big parabolic

2846

01:54:31,430 --> 01:54:29,520

dish which makes them just as visible

2847

01:54:33,270 --> 01:54:31,440

right so if they're solar powered that

2848

01:54:35,430 --> 01:54:33,280

helps being closer and if you are solar

2849

01:54:37,109 --> 01:54:35,440

powered that l3 point on the other side

2850

01:54:39,189 --> 01:54:37,119

of the sun is your best spot for your

2851
01:54:40,390 --> 01:54:39,199
main thing right you can actually beam

2852
01:54:42,470 --> 01:54:40,400
power to your other things if you have

2853
01:54:44,310 --> 01:54:42,480
to like be smaller but the thing is to

2854
01:54:46,629 --> 01:54:44,320
be able to send a big signal out to your

2855
01:54:47,589 --> 01:54:46,639
big computers you know to have your big

2856
01:54:49,270 --> 01:54:47,599
you know

2857
01:54:50,709 --> 01:54:49,280
factory that replaces your dead drones

2858
01:54:53,270 --> 01:54:50,719
so they can't repair themselves anymore

2859
01:54:54,870 --> 01:54:53,280
or whatever um that's on the other side

2860
01:54:56,550 --> 01:54:54,880
of the sun right because then you know

2861
01:54:57,589 --> 01:54:56,560
no one's going to see it until no one's

2862
01:54:58,870 --> 01:54:57,599
going to sneak up on you because you'll

2863
01:55:00,790 --> 01:54:58,880

be carrying their radio waves away

2864

01:55:02,790 --> 01:55:00,800

sooner and they're going to have to be

2865

01:55:04,390 --> 01:55:02,800

launching probes out to other planets

2866

01:55:06,070 --> 01:55:04,400

that are looking in your direction

2867

01:55:07,990 --> 01:55:06,080

before that isn't going to happen that's

2868

01:55:09,109 --> 01:55:08,000

you know at least 20 late 20th century

2869

01:55:12,149 --> 01:55:09,119

stuff right

2870

01:55:13,589 --> 01:55:12,159

um if your power plant is something else

2871

01:55:15,669 --> 01:55:13,599

though if it is

2872

01:55:18,470 --> 01:55:15,679

fission if it is fusion if it is black

2873

01:55:20,229 --> 01:55:18,480

or yeah kuiper belt absolutely and and

2874

01:55:22,310 --> 01:55:20,239

inside some irrelevant little asteroid

2875

01:55:24,870 --> 01:55:22,320

or cometary body you can just hide in

2876

01:55:26,070 --> 01:55:24,880

right right right

2877

01:55:28,790 --> 01:55:26,080

again

2878

01:55:30,390 --> 01:55:28,800

the sun wouldn't reflect off of it at

2879

01:55:32,149 --> 01:55:30,400

that distance i mean we don't even know

2880

01:55:35,750 --> 01:55:32,159

what the what's in the kuiper belt

2881

01:55:38,390 --> 01:55:35,760

actually we can't really see any of it

2882

01:55:41,109 --> 01:55:38,400

about probably five asteroid belts with

2883

01:55:43,030 --> 01:55:41,119

the icy rocks yeah that's right and

2884

01:55:45,669 --> 01:55:43,040

what i would do if i was a pub out there

2885

01:55:47,669 --> 01:55:45,679

is i would shoot uh fly by probes around

2886

01:55:49,750 --> 01:55:47,679

earth about once a century they look

2887

01:55:51,270 --> 01:55:49,760

like gold comets if they saw one at all

2888

01:55:53,350 --> 01:55:51,280

highly optical orbits they probably

2889

01:55:55,350 --> 01:55:53,360

about the size of a you know a

2890

01:55:57,430 --> 01:55:55,360

volkswagen

2891

01:56:00,070 --> 01:55:57,440

but took photos and then left background

2892

01:56:02,229 --> 01:56:00,080

you know a tic tac

2893

01:56:04,550 --> 01:56:02,239

why not yeah sure it could be

2894

01:56:06,390 --> 01:56:04,560

i mean these shapes go i i would want

2895

01:56:08,709 --> 01:56:06,400

something that looked like a meteor but

2896

01:56:10,950 --> 01:56:08,719

then a lot of things look like a meteor

2897

01:56:12,790 --> 01:56:10,960

you know it's a random piece of garbage

2898

01:56:14,390 --> 01:56:12,800

is basically what meteors are sure

2899

01:56:15,750 --> 01:56:14,400

anything you think it was a normal stone

2900

01:56:18,629 --> 01:56:15,760

shape they'll be in

2901

01:56:21,350 --> 01:56:18,639

now uh last night i had paul heineck on

2902

01:56:23,030 --> 01:56:21,360

the show uh jay allen heineck's son he's

2903

01:56:24,229 --> 01:56:23,040

brilliant and

2904

01:56:33,430 --> 01:56:24,239

uh

2905

01:56:35,030 --> 01:56:33,440

code really understands ai and and other

2906

01:56:37,910 --> 01:56:35,040

concepts and

2907

01:56:40,709 --> 01:56:37,920

and of course uh et loves to talk about

2908

01:56:44,070 --> 01:56:40,719

that one of the things he talked about

2909

01:56:47,350 --> 01:56:44,080

last night is how and you've discussed

2910

01:56:48,310 --> 01:56:47,360

this so while this is fresh in my mind

2911

01:56:49,750 --> 01:56:48,320

um

2912

01:56:52,790 --> 01:56:49,760

how

2913

01:56:57,350 --> 01:56:52,800

we would interpret

2914

01:56:58,709 --> 01:56:57,360

an incoming signal what would et send us

2915

01:56:59,750 --> 01:56:58,719

first

2916

01:57:02,470 --> 01:56:59,760

to

2917

01:57:05,189 --> 01:57:02,480

get the conversation going or

2918

01:57:07,589 --> 01:57:05,199

let's say we go first right what is it

2919

01:57:08,870 --> 01:57:07,599

that we would send to them and what i

2920

01:57:10,950 --> 01:57:08,880

suggested

2921

01:57:12,709 --> 01:57:10,960

is that e.t would send us like the

2922

01:57:19,350 --> 01:57:12,719

binary

2923

01:57:21,270 --> 01:57:19,360

and if we could figure that out right

2924

01:57:23,350 --> 01:57:21,280

and that's what we would send it because

2925

01:57:25,350 --> 01:57:23,360

hydrogen you know being so abundant in

2926

01:57:27,350 --> 01:57:25,360

the universe they know what hydrogen is

2927

01:57:30,629 --> 01:57:27,360

if we send that to them in binary we

2928

01:57:33,430 --> 01:57:30,639

could start they could figure out our

2929

01:57:35,750 --> 01:57:33,440

language slowly what would what would

2930

01:57:36,550 --> 01:57:35,760

you send it first and how would you do

2931

01:57:37,910 --> 01:57:36,560

it

2932

01:57:39,430 --> 01:57:37,920

well i mean the usual idea being that

2933

01:57:40,870 --> 01:57:39,440

you would post these these physical

2934

01:57:42,629 --> 01:57:40,880

consonants at them and things like that

2935

01:57:44,629 --> 01:57:42,639

and those work great but what i would

2936

01:57:47,189 --> 01:57:44,639

send because i want them to apply to me

2937

01:57:49,830 --> 01:57:47,199

as quickly as possible is i would send

2938

01:57:51,830 --> 01:57:49,840

them their day length and their year

2939

01:57:54,229 --> 01:57:51,840

length so they know i was sending a

2940

01:57:55,589 --> 01:57:54,239

message to their planet i want the

2941

01:57:57,109 --> 01:57:55,599

message to say

2942

01:57:59,510 --> 01:57:57,119

on the front end

2943

01:58:00,709 --> 01:57:59,520

i know where you live

2944

01:58:02,950 --> 01:58:00,719

because if you send them they're

2945

01:58:04,470 --> 01:58:02,960

basically in you're posting their their

2946

01:58:05,830 --> 01:58:04,480

day length and their year length at them

2947

01:58:09,350 --> 01:58:05,840

right right and what you can do it's

2948

01:58:11,270 --> 01:58:09,360

just time ratio you know 365 24

2949

01:58:13,510 --> 01:58:11,280

and uh i mean you know that's that's the

2950

01:58:15,990 --> 01:58:13,520

ratio there 365. just pumping that

2951

01:58:18,070 --> 01:58:16,000

number out there guess what it is 365.25

2952

01:58:21,030 --> 01:58:18,080

whatever it is and that says

2953

01:58:23,510 --> 01:58:21,040

we are looking at your planet oh we know

2954

01:58:24,629 --> 01:58:23,520

where you live you might as well apply

2955

01:58:26,470 --> 01:58:24,639

oh

2956

01:58:27,990 --> 01:58:26,480

smart

2957

01:58:29,750 --> 01:58:28,000

yeah right right

2958

01:58:33,589 --> 01:58:29,760

there would be no second guessing if we

2959

01:58:36,070 --> 01:58:33,599

got a if we got a 365 coming in

2960

01:58:37,669 --> 01:58:36,080

that's not a random number and you still

2961

01:58:39,430 --> 01:58:37,679

send your stuff like your pies or your

2962

01:58:42,149 --> 01:58:39,440

perfect squares or the other numbers but

2963

01:58:45,189 --> 01:58:42,159

you send that number because it says

2964

01:58:48,629 --> 01:58:45,199

i know where you live it's not a random

2965

01:58:50,310 --> 01:58:48,639

message out to nobody it's hello

2966

01:58:51,510 --> 01:58:50,320

this is what we can see about you and

2967

01:58:53,270 --> 01:58:51,520

they that's something you can pick up

2968

01:58:54,229 --> 01:58:53,280

from plant pretty easily too yeah so you

2969

01:58:55,510 --> 01:58:54,239

don't have to be all that advanced to

2970

01:58:57,030 --> 01:58:55,520

get there you'll be able to pick up day

2971

01:58:59,030 --> 01:58:57,040

length and year length off plants pretty

2972

01:59:01,109 --> 01:58:59,040

quickly you know exoplanet studies so

2973

01:59:02,790 --> 01:59:01,119

you send it out them and and there you

2974

01:59:04,870 --> 01:59:02,800

go because the biggest question they got

2975

01:59:06,550 --> 01:59:04,880

going isn't just is a signal on because

2976

01:59:08,470 --> 01:59:06,560

you start getting pi or you know

2977

01:59:10,229 --> 01:59:08,480

squaring up with you know set pipe

2978

01:59:12,149 --> 01:59:10,239

challenge to the radio you know that's

2979

01:59:13,750 --> 01:59:12,159

real the question is a hoax or not but

2980

01:59:16,550 --> 01:59:13,760

you know it's an artificial message

2981

01:59:18,550 --> 01:59:16,560

right and then it comes off it says oh

2982

01:59:21,109 --> 01:59:18,560

and by the way

2983

01:59:23,750 --> 01:59:21,119

this message is addressed to you we are

2984

01:59:24,790 --> 01:59:23,760

knocking on your literal door that means

2985

01:59:26,550 --> 01:59:24,800

they don't have to sit around be like

2986

01:59:29,109 --> 01:59:26,560

well should we reply or not because if

2987

01:59:31,270 --> 01:59:29,119

we do uh we might give away our presence

2988

01:59:33,669 --> 01:59:31,280

maybe it's designed to you know expose

2989

01:59:35,109 --> 01:59:33,679

us to a hostile universe well it's

2990

01:59:38,709 --> 01:59:35,119

already

2991

01:59:41,030 --> 01:59:38,719

and there wouldn't be any question about

2992

01:59:42,229 --> 01:59:41,040

it so you have to reply and it takes the

2993

01:59:43,910 --> 01:59:42,239

decision off them and that's you know

2994

01:59:45,750 --> 01:59:43,920

right you got to always think about what

2995

01:59:47,589 --> 01:59:45,760

you could do these folks you could cause

2996

01:59:48,950 --> 01:59:47,599

a war on someone's planet by sending

2997

01:59:51,589 --> 01:59:48,960

them a message and making them have to

2998

01:59:52,709 --> 01:59:51,599

decide they're going to apply to or not

2999

01:59:53,910 --> 01:59:52,719

because you could have people saying

3000

01:59:55,589 --> 01:59:53,920

we're going to blow up those towers

3001

01:59:57,030 --> 01:59:55,599

things like that you know you send a

3002

01:59:59,109 --> 01:59:57,040

probe by someone you say oh i'm sitting

3003

02:00:00,629 --> 01:59:59,119

a flyby probe well those things are

3004

02:00:02,310 --> 02:00:00,639

moving a fraction of the speed of light

3005

02:00:04,149 --> 02:00:02,320

have more you know power in them than a

3006

02:00:05,990 --> 02:00:04,159

whole bunch of nuclear bombs you have to

3007

02:00:07,589 --> 02:00:06,000

be careful with even those little things

3008

02:00:09,510 --> 02:00:07,599

everything you do calibrated towards

3009

02:00:10,629 --> 02:00:09,520

speaking to another civilization right

3010

02:00:13,270 --> 02:00:10,639

you have to think about how they're

3011

02:00:14,390 --> 02:00:13,280

going to respond to it and one of those

3012

02:00:16,550 --> 02:00:14,400

is to say

3013

02:00:18,229 --> 02:00:16,560

hey we want you to talk to us take the

3014

02:00:20,070 --> 02:00:18,239

decision away from them so the point is

3015

02:00:22,229 --> 02:00:20,080

to say we know where you are don't be

3016

02:00:24,229 --> 02:00:22,239

afraid to apply and you would have to

3017

02:00:25,589 --> 02:00:24,239

assume they have a language right that

3018

02:00:28,149 --> 02:00:25,599

they speak

3019

02:00:30,870 --> 02:00:28,159

um how would you

3020

02:00:32,070 --> 02:00:30,880

deal with that i mean is it like

3021

02:00:34,310 --> 02:00:32,080

teaching

3022

02:00:36,790 --> 02:00:34,320

uh you know like helen keller for the

3023

02:00:39,030 --> 02:00:36,800

first time that has no concept on of

3024

02:00:40,470 --> 02:00:39,040

anything at all zero

3025

02:00:42,229 --> 02:00:40,480

but you have to

3026
02:00:43,669 --> 02:00:42,239
you have to figure out the alphabet and

3027
02:00:45,750 --> 02:00:43,679
punctuation

3028
02:00:47,270 --> 02:00:45,760
how do you how do you

3029
02:00:49,189 --> 02:00:47,280
what's that i mean it's frequency

3030
02:00:51,430 --> 02:00:49,199
analysis you don't know what their words

3031
02:00:54,070 --> 02:00:51,440
are early on but you know that once

3032
02:00:56,870 --> 02:00:54,080
every seven planetary rotations this

3033
02:00:58,709 --> 02:00:56,880
word tuesday gets said more often than

3034
02:00:59,750 --> 02:00:58,719
on the other days and it's followed by

3035
02:01:02,070 --> 02:00:59,760
that same pattern for the world

3036
02:01:03,669 --> 02:01:02,080
wednesday and thursday and now you're

3037
02:01:05,669 --> 02:01:03,679
guessing that must be talking about day

3038
02:01:07,589 --> 02:01:05,679

somehow whatever that is is something

3039

02:01:09,589 --> 02:01:07,599

day length based you know those little

3040

02:01:11,510 --> 02:01:09,599

things like every time 24 hours these

3041

02:01:13,350 --> 02:01:11,520

cycles say morning everyone on radio the

3042

02:01:15,750 --> 02:01:13,360

first impostor head is good morning

3043

02:01:17,109 --> 02:01:15,760

happy tuesday everybody it's july blah

3044

02:01:18,950 --> 02:01:17,119

so you get those date and time things

3045

02:01:21,109 --> 02:01:18,960

will be the first thing you pull out we

3046

02:01:22,950 --> 02:01:21,119

have languages on earth made by humans

3047

02:01:24,870 --> 02:01:22,960

only 5 000 years old

3048

02:01:26,229 --> 02:01:24,880

that we do not understand but it's not

3049

02:01:29,350 --> 02:01:26,239

because they had a different mind than

3050

02:01:30,550 --> 02:01:29,360

us it's because we have uh a page worth

3051
02:01:31,750 --> 02:01:30,560
of data

3052
02:01:34,950 --> 02:01:31,760
well we don't have a page where the

3053
02:01:37,430 --> 02:01:34,960
radio signals are both we have a century

3054
02:01:39,510 --> 02:01:37,440
of them right of dozens of people

3055
02:01:41,109 --> 02:01:39,520
talking simultaneously

3056
02:01:43,189 --> 02:01:41,119
for

3057
02:01:44,310 --> 02:01:43,199
you know a century it's billions of

3058
02:01:46,709 --> 02:01:44,320
wards

3059
02:01:49,510 --> 02:01:46,719
so what you're suggesting is

3060
02:01:51,350 --> 02:01:49,520
if if i'm understanding you correctly

3061
02:01:54,870 --> 02:01:51,360
that if et is picking up on those

3062
02:01:56,870 --> 02:01:54,880
signals they already speak 50 languages

3063
02:01:58,390 --> 02:01:56,880

and they fully understand they probably

3064

02:02:00,149 --> 02:01:58,400

think humans have claws because we hear

3065

02:02:01,830 --> 02:02:00,159

about people sinking them into them they

3066

02:02:03,430 --> 02:02:01,840

probably think that we have four babies

3067

02:02:05,270 --> 02:02:03,440

called cats and dogs

3068

02:02:07,270 --> 02:02:05,280

uh and they think that we might eat them

3069

02:02:08,709 --> 02:02:07,280

too you know there's gonna be a lot of

3070

02:02:09,990 --> 02:02:08,719

things they're just gonna mess up on

3071

02:02:11,830 --> 02:02:10,000

they're going to take their species

3072

02:02:14,470 --> 02:02:11,840

called the flying squirrel that eats

3073

02:02:15,910 --> 02:02:14,480

nuts and they are going to think there's

3074

02:02:17,669 --> 02:02:15,920

gonna be so many things they mess up

3075

02:02:19,030 --> 02:02:17,679

homonyms especially

3076

02:02:20,390 --> 02:02:19,040

you know

3077

02:02:21,910 --> 02:02:20,400

they're going to assume the duck must be

3078

02:02:23,270 --> 02:02:21,920

some creature that sneaks under water

3079

02:02:24,950 --> 02:02:23,280

much like the ostrich that plants his

3080

02:02:25,990 --> 02:02:24,960

head on the ground right right those are

3081

02:02:28,149 --> 02:02:26,000

the little things they're going to mess

3082

02:02:29,990 --> 02:02:28,159

up anyway they will not have a perfect

3083

02:02:31,270 --> 02:02:30,000

understanding of our language but they

3084

02:02:33,270 --> 02:02:31,280

will be able to get applied to science

3085

02:02:34,870 --> 02:02:33,280

and technical stuff because that's all

3086

02:02:36,629 --> 02:02:34,880

built around those kind of core

3087

02:02:38,390 --> 02:02:36,639

universal concepts in the first place

3088

02:02:39,750 --> 02:02:38,400

sure they're gonna spot them you know

3089

02:02:40,790 --> 02:02:39,760

not necessarily right away but you don't

3090

02:02:42,310 --> 02:02:40,800

have a whole room with scientists

3091

02:02:43,830 --> 02:02:42,320

sitting together looking at a bunch of

3092

02:02:46,070 --> 02:02:43,840

you know shapes and images that look

3093

02:02:48,229 --> 02:02:46,080

like chemicals to us before one of them

3094

02:02:51,270 --> 02:02:48,239

you know either completely alien says

3095

02:02:53,030 --> 02:02:51,280

that's uranium-238

3096

02:02:55,430 --> 02:02:53,040

yeah yeah

3097

02:02:58,229 --> 02:02:55,440

stretch armstrong would really throw him

3098

02:02:59,270 --> 02:02:58,239

for a curve right yeah yeah i could i

3099

02:03:00,870 --> 02:02:59,280

could

3100

02:03:02,310 --> 02:03:00,880

let's take our break right here this is

3101
02:03:04,229 --> 02:03:02,320
fade to black our guest tonight the one

3102
02:03:06,870 --> 02:03:04,239
and only isaac arthur

3103
02:03:08,950 --> 02:03:06,880
the host of

3104
02:03:10,709 --> 02:03:08,960
science and futurism with isaac arthur

3105
02:03:12,390 --> 02:03:10,719
on youtube go and check it out this is

3106
02:03:14,860 --> 02:03:12,400
faded black i'm here with jimmy church

3107
02:03:16,950 --> 02:03:14,870
stay with us we'll be right back

3108
02:03:18,120 --> 02:03:16,960
[Music]

3109
02:03:20,709 --> 02:03:18,130
[Applause]

3110
02:03:22,470 --> 02:03:20,719
[Music]

3111
02:03:28,030 --> 02:03:22,480
hi everybody this is rob for the mental

3112
02:03:31,990 --> 02:03:29,510
[Music]

3113
02:03:35,430 --> 02:03:32,000

your 1 million gigawatt paranormal

3114

02:03:37,109 --> 02:03:35,440

powerhouse kumx db

3115

02:03:38,870 --> 02:03:37,119

the x

3116

02:03:41,430 --> 02:03:38,880

are you ready to read about true

3117

02:03:44,229 --> 02:03:41,440

paranormal events unex media publishes

3118

02:03:46,629 --> 02:03:44,239

non-fiction books about ufos ghosts and

3119

02:03:49,910 --> 02:03:46,639

haunted places time anomalies cryptid

3120

02:03:52,069 --> 02:03:49,920

creatures and more just like kunxdb

3121

02:03:56,149 --> 02:03:52,079

radio it's all about unexplained

3122

02:03:58,229 --> 02:03:56,159

phenomena visit www.unxmedia.com

3123

02:04:00,470 --> 02:03:58,239

to see our list of great book titles by

3124

02:04:02,950 --> 02:04:00,480

debbie zigglemeyer gene walker devin

3125

02:04:05,109 --> 02:04:02,960

listrom wayne lawrence bill spicer and

3126

02:04:08,229 --> 02:04:05,119

yours truly margie k that's an

3127

02:04:12,229 --> 02:04:10,069

why is it we're not very good with our

3128

02:04:13,990 --> 02:04:12,239

health regiment until it's too late we

3129

02:04:15,830 --> 02:04:14,000

don't put oil in the car until the

3130

02:04:18,629 --> 02:04:15,840

engine blows up when the body's out of

3131

02:04:20,870 --> 02:04:18,639

balance your health is not so good give

3132

02:04:23,830 --> 02:04:20,880

your body some love log on to get the

3133

02:04:25,830 --> 02:04:23,840

tea.com that's get the

3134

02:04:28,950 --> 02:04:25,840

try our life change tea which cleanses

3135

02:04:30,790 --> 02:04:28,960

you from harmful intruders a clean colon

3136

02:04:32,790 --> 02:04:30,800

is one of the ways to bring the body in

3137

02:04:34,790 --> 02:04:32,800

balance we also carry organic

3138

02:04:37,510 --> 02:04:34,800

supplements to help you get where you

3139

02:04:39,990 --> 02:04:37,520

need to go so do your body a favor log

3140

02:04:42,069 --> 02:04:40,000

on to get the tea dot com that's get the

3141

02:04:44,310 --> 02:04:42,079

ttea.com

3142

02:04:46,790 --> 02:04:44,320

you can even visit our sales page to

3143

02:04:48,950 --> 02:04:46,800

save some dough does anybody call money

3144

02:04:50,550 --> 02:04:48,960

dough anymore anyway log on to

3145

02:04:53,030 --> 02:04:50,560

getthet.com

3146

02:04:55,750 --> 02:04:53,040

shop get balanced then learn some cool

3147

02:04:59,109 --> 02:04:55,760

tips at health matters now you'll be

3148

02:05:00,870 --> 02:04:59,119

glad you did that's get the tea dot com

3149

02:05:04,310 --> 02:05:00,880

this is jimmy church of fade to black

3150

02:05:07,430 --> 02:05:04,320

and i only drink fade to black blend

3151
02:05:09,629 --> 02:05:07,440
coffee from river moon just click on the

3152
02:05:12,709 --> 02:05:09,639
river moon coffee banner at

3153
02:05:14,870 --> 02:05:12,719
jimmychurchradio.com promo code f2b

3154
02:05:17,510 --> 02:05:14,880
blend

3155
02:05:22,870 --> 02:05:17,520
this is the only way forward

3156
02:05:25,109 --> 02:05:22,880
this is made to black make contact

3157
02:05:26,709 --> 02:05:25,119
this is billy carson founder and ceo of

3158
02:05:28,870 --> 02:05:26,719
forbidden knowledge and we're heading to

3159
02:05:30,390 --> 02:05:28,880
egypt this october come join jimmy

3160
02:05:31,910 --> 02:05:30,400
church myself and the forbidden

3161
02:05:33,910 --> 02:05:31,920
knowledge team as we spend a week

3162
02:05:36,709 --> 02:05:33,920
exploring giza the great sphinx the

3163
02:05:38,550 --> 02:05:36,719

great pyramid zakara dashur aswan edfu

3164

02:05:40,790 --> 02:05:38,560

dindara karnak and will celebrate

3165

02:05:42,629 --> 02:05:40,800

jimmy's birthday in luxor the forbidden

3166

02:05:44,709 --> 02:05:42,639

tour of egypt is this october 5th

3167

02:05:46,709 --> 02:05:44,719

through the 12th and includes a four day

3168

02:05:48,709 --> 02:05:46,719

nile cruise expert egyptologist and a

3169

02:05:50,149 --> 02:05:48,719

chance to explore egypt with jimmy and i

3170

02:05:52,470 --> 02:05:50,159

as your host through your journey of a

3171

02:05:54,790 --> 02:05:52,480

lifetime space is limited so make your

3172

02:05:56,470 --> 02:05:54,800

reservations now please visit forbidden

3173

02:05:58,470 --> 02:05:56,480

knowledge.com for information and

3174

02:06:03,750 --> 02:05:58,480

complete itinerary that's forbidden

3175

02:06:10,069 --> 02:06:05,589

this is jimmy church of fade to black

3176

02:06:12,790 --> 02:06:10,079

and this year june 18 2022

3177

02:06:15,350 --> 02:06:12,800

the disclosure fest foundation presents

3178

02:06:18,950 --> 02:06:15,360

the mass meditation initiative it's

3179

02:06:21,589 --> 02:06:18,960

saturday june 18th from 10 a.m to 10 p.m

3180

02:06:23,990 --> 02:06:21,599

one day only at the los angeles state

3181

02:06:27,189 --> 02:06:24,000

historic park in downtown los angeles

3182

02:06:29,510 --> 02:06:27,199

california right next to chinatown i'm

3183

02:06:31,510 --> 02:06:29,520

hosting the event again this year with

3184

02:06:34,790 --> 02:06:31,520

music performances by

3185

02:06:38,709 --> 02:06:34,800

trevor hall the desert dwellers poor on

3186

02:06:42,229 --> 02:06:38,719

key and many many more on four separate

3187

02:06:45,430 --> 02:06:42,239

stages there's 16 stages in total over

3188

02:06:48,149 --> 02:06:45,440

30 acres in downtown los angeles with

3189

02:06:50,629 --> 02:06:48,159

vendors and tents and presentations and

3190

02:06:53,270 --> 02:06:50,639

workshops with billy carson adam apollo

3191

02:06:55,589 --> 02:06:53,280

lori spania laura eisenhower brattles

3192

02:06:58,510 --> 02:06:55,599

and david palmer and many many more it's

3193

02:07:00,310 --> 02:06:58,520

all simple to do just go to

3194

02:07:02,550 --> 02:07:00,320

disclosurefest.org for all of your

3195

02:07:04,149 --> 02:07:02,560

tickets information and a full schedule

3196

02:07:05,189 --> 02:07:04,159

of the day's events

3197

02:07:08,170 --> 02:07:05,199

again

3198

02:07:20,229 --> 02:07:08,180

disclosurefest.org

3199

02:07:25,910 --> 02:07:22,069

you wanna know a secret

3200

02:07:27,189 --> 02:07:25,920

i love ponies i really love ponies i'm

3201
02:07:29,109 --> 02:07:27,199
serious

3202
02:07:30,790 --> 02:07:29,119
i couldn't stay sane without pulling

3203
02:07:32,870 --> 02:07:30,800
instabrush

3204
02:07:39,350 --> 02:07:32,880
why fade to black

3205
02:07:45,370 --> 02:07:41,589
this is pony to black with jimmy church

3206
02:07:57,669 --> 02:07:45,380
on the game changer radio network

3207
02:07:59,910 --> 02:07:57,679
[Music]

3208
02:08:02,470 --> 02:07:59,920
all right welcome back fade to black i

3209
02:08:03,990 --> 02:08:02,480
am your host jimmy church

3210
02:08:08,629 --> 02:08:04,000
tonight

3211
02:08:12,390 --> 02:08:08,639
isaac arthur is with us

3212
02:08:15,030 --> 02:08:12,400
exoplanets omomua check check

3213
02:08:18,629 --> 02:08:15,040

e.t we haven't gotten there yet um and

3214

02:08:21,589 --> 02:08:18,639

i'm gonna go uh into another zone uh

3215

02:08:23,589 --> 02:08:21,599

uh uh do a little segue

3216

02:08:27,990 --> 02:08:23,599

um which is

3217

02:08:29,589 --> 02:08:28,000

the department of defense right now um

3218

02:08:35,830 --> 02:08:29,599

the

3219

02:08:38,550 --> 02:08:35,840

in et and and and things that are being

3220

02:08:41,350 --> 02:08:38,560

witnessed by different branches of the

3221

02:08:43,669 --> 02:08:41,360

military has now got the attention as we

3222

02:08:45,189 --> 02:08:43,679

all know of uh the senate intelligence

3223

02:08:47,430 --> 02:08:45,199

committee we've got the gillibrand

3224

02:08:50,709 --> 02:08:47,440

amendment in the new budget

3225

02:08:53,270 --> 02:08:50,719

uh that is now legislation going into uh

3226

02:08:58,229 --> 02:08:53,280

2022 we've got a new

3227

02:09:00,950 --> 02:08:58,239

uh task force uh established uh based at

3228

02:09:03,109 --> 02:09:00,960

wright patterson i might add

3229

02:09:05,270 --> 02:09:03,119

um i'm sure you're part of

3230

02:09:07,750 --> 02:09:05,280

your your chairman of the committee over

3231

02:09:08,950 --> 02:09:07,760

there but but here's the deal

3232

02:09:11,350 --> 02:09:08,960

um

3233

02:09:13,510 --> 02:09:11,360

the department of defense

3234

02:09:16,069 --> 02:09:13,520

the opposite of neil degrasse tyson by

3235

02:09:18,950 --> 02:09:16,079

the way the department of defense

3236

02:09:20,470 --> 02:09:18,960

has said it's not foreign adversaries

3237

02:09:24,310 --> 02:09:20,480

it's not us

3238

02:09:26,790 --> 02:09:24,320

and we have the other bin those are

3239

02:09:27,669 --> 02:09:26,800

their words not mine right

3240

02:09:29,830 --> 02:09:27,679

um

3241

02:09:32,790 --> 02:09:29,840

now they're saying everything but we're

3242

02:09:35,430 --> 02:09:32,800

being visited by e.t

3243

02:09:37,189 --> 02:09:35,440

but they've checked everything off uh

3244

02:09:38,310 --> 02:09:37,199

they've scratched everything else off of

3245

02:09:40,470 --> 02:09:38,320

the list

3246

02:09:42,310 --> 02:09:40,480

uh what do you what do you as you as you

3247

02:09:44,790 --> 02:09:42,320

hear all of this isaac what do you think

3248

02:09:46,870 --> 02:09:44,800

is actually going on

3249

02:09:48,310 --> 02:09:46,880

that's a hard one because i i've long

3250

02:09:50,470 --> 02:09:48,320

been on the opinion that they wore

3251

02:09:52,310 --> 02:09:50,480

terrestrial vehicles that the people

3252

02:09:54,470 --> 02:09:52,320

they most likely belong to was another

3253

02:09:56,149 --> 02:09:54,480

branch of the military or even the same

3254

02:09:58,390 --> 02:09:56,159

branch different department

3255

02:09:59,510 --> 02:09:58,400

um because you know who's got the most

3256

02:10:01,669 --> 02:09:59,520

advanced stuff that would also be

3257

02:10:03,910 --> 02:10:01,679

hanging around fleets to check that will

3258

02:10:05,589 --> 02:10:03,920

be all stuff right and on submarines

3259

02:10:06,870 --> 02:10:05,599

regularly go up by own carrier fleets to

3260

02:10:08,870 --> 02:10:06,880

see if they get detected or stuff like

3261

02:10:11,189 --> 02:10:08,880

that if it's terrestrial i think it's

3262

02:10:12,629 --> 02:10:11,199

ours and you know i don't really accept

3263

02:10:13,669 --> 02:10:12,639

those answers from them anyway because

3264

02:10:15,270 --> 02:10:13,679

one

3265

02:10:18,629 --> 02:10:15,280

if they're on secret missions they are

3266

02:10:21,109 --> 02:10:19,990

i mean we can check them off to some

3267

02:10:22,310 --> 02:10:21,119

degree but

3268

02:10:23,910 --> 02:10:22,320

you know it's like they're necessarily

3269

02:10:25,510 --> 02:10:23,920

recording those very well they feel any

3270

02:10:27,910 --> 02:10:25,520

obligation to say report those unless

3271

02:10:28,709 --> 02:10:27,920

they were under extreme orders to do so

3272

02:10:30,550 --> 02:10:28,719

uh

3273

02:10:32,709 --> 02:10:30,560

if it's somebody else's if it's like

3274

02:10:34,470 --> 02:10:32,719

russia's or china's or india's or

3275

02:10:35,510 --> 02:10:34,480

whoever's that doesn't mean that we

3276

02:10:36,870 --> 02:10:35,520

would know you know i don't think

3277

02:10:38,149 --> 02:10:36,880

they're gonna brag to us they get some

3278

02:10:41,030 --> 02:10:38,159

stealthy system

3279

02:10:42,709 --> 02:10:41,040

uh if it is an alien system i still and

3280

02:10:44,229 --> 02:10:42,719

this is the big one i want to know what

3281

02:10:45,990 --> 02:10:44,239

they're doing

3282

02:10:49,910 --> 02:10:46,000

you know why would you go and

3283

02:10:51,109 --> 02:10:49,920

essentially taunt or kill your fleet

3284

02:10:53,030 --> 02:10:51,119

well

3285

02:10:54,390 --> 02:10:53,040

those are that particular one right

3286

02:10:56,069 --> 02:10:54,400

right right

3287

02:10:57,430 --> 02:10:56,079

dies down on the sea you know i'm not

3288

02:10:59,510 --> 02:10:57,440

sure what's down in the bottom should

3289

02:11:00,790 --> 02:10:59,520

they be interested either but you know

3290

02:11:02,069 --> 02:11:00,800

that's the question to me is i don't

3291

02:11:03,750 --> 02:11:02,079

know what they want they could easily be

3292

02:11:06,310 --> 02:11:03,760

aliens you know i i don't want to rule

3293

02:11:08,310 --> 02:11:06,320

that out to me that's one in ten you

3294

02:11:11,350 --> 02:11:08,320

know but it's a real number that's a

3295

02:11:13,669 --> 02:11:11,360

real number okay one in ten here's let

3296

02:11:16,790 --> 02:11:13,679

me go back to your point and i have

3297

02:11:19,910 --> 02:11:16,800

discussed this at length with uh crew

3298

02:11:20,790 --> 02:11:19,920

members that were there with the nimitz

3299

02:11:23,510 --> 02:11:20,800

uh

3300

02:11:24,629 --> 02:11:23,520

specifically you know radar operators

3301

02:11:32,870 --> 02:11:24,639

and

3302

02:11:36,069 --> 02:11:32,880

look at these targets

3303

02:11:38,709 --> 02:11:36,079

uh kevin day who ordered that was a

3304

02:11:40,149 --> 02:11:38,719

guest on this show too as well so

3305

02:11:42,229 --> 02:11:40,159

here's the deal

3306

02:11:43,510 --> 02:11:42,239

if it was hours

3307

02:11:44,390 --> 02:11:43,520

and

3308

02:11:49,350 --> 02:11:44,400

uh

3309

02:11:50,709 --> 02:11:49,360

programs and and so forth okay

3310

02:11:53,030 --> 02:11:50,719

but that would

3311

02:11:54,310 --> 02:11:53,040

have to have been done outside the

3312

02:11:56,870 --> 02:11:54,320

purview

3313

02:12:00,709 --> 02:11:56,880

of congress and the senate and

3314

02:12:04,310 --> 02:12:00,719

apparently the pentagon as well

3315

02:12:07,270 --> 02:12:04,320

where an entire carrier battle group

3316

02:12:11,270 --> 02:12:07,280

was unaware of testing

3317

02:12:14,870 --> 02:12:11,280

uh of their radar spy one system

3318

02:12:16,390 --> 02:12:14,880

and could have really caused a lot of

3319

02:12:18,629 --> 02:12:16,400

problems

3320

02:12:22,149 --> 02:12:18,639

with uh activating flight crews and

3321

02:12:24,310 --> 02:12:22,159

f-18s and and things that you're putting

3322

02:12:27,910 --> 02:12:24,320

uh lives in jeopardy

3323

02:12:29,669 --> 02:12:27,920

and outside of any regulation at all and

3324

02:12:31,589 --> 02:12:29,679

and not known by

3325

02:12:35,510 --> 02:12:31,599

by congress or the senate intelligence

3326

02:12:36,790 --> 02:12:35,520

committee who are now asking questions

3327

02:12:38,390 --> 02:12:36,800

who should have been asking questions

3328

02:12:40,390 --> 02:12:38,400

for a lot longer and to be fair didn't

3329

02:12:42,790 --> 02:12:40,400

like the 70s for instance too but you

3330

02:12:43,990 --> 02:12:42,800

know i i generally tend to be on the

3331

02:12:45,430 --> 02:12:44,000

trusting side where government's

3332

02:12:46,550 --> 02:12:45,440

concerned and even i don't really trust

3333

02:12:47,510 --> 02:12:46,560

them that much

3334

02:12:51,350 --> 02:12:47,520

um

3335

02:12:52,870 --> 02:12:51,360

they're running a test on something

3336

02:12:54,470 --> 02:12:52,880

it didn't go well because they got the

3337

02:12:56,390 --> 02:12:54,480

whole big scramble up on it of things

3338

02:12:57,510 --> 02:12:56,400

going on and they did not want it

3339

02:12:59,430 --> 02:12:57,520

knowing that that happened so they

3340

02:13:01,510 --> 02:12:59,440

delete that that entire drill took place

3341

02:13:02,709 --> 02:13:01,520

secretly anyway in the first place and

3342

02:13:04,229 --> 02:13:02,719

just happened to be in a slightly

3343

02:13:06,550 --> 02:13:04,239

different place in time when they

3344

02:13:07,990 --> 02:13:06,560

acquainted that well so yeah i know we

3345

02:13:09,430 --> 02:13:08,000

weren't over there at that time we were

3346

02:13:11,910 --> 02:13:09,440

flying over there with our stealth

3347

02:13:14,310 --> 02:13:11,920

prototype that kind of thing is not that

3348

02:13:16,149 --> 02:13:14,320

unbelievable to me uh i don't like to

3349

02:13:17,669 --> 02:13:16,159

accuse anyone of anything and say it was

3350

02:13:19,189 --> 02:13:17,679

not confusing the pilots have not seen

3351

02:13:20,709 --> 02:13:19,199

what they saw things like that right

3352

02:13:23,990 --> 02:13:20,719

right there's the same question that

3353

02:13:25,990 --> 02:13:24,000

comes up is if it's an alien ship well

3354

02:13:27,030 --> 02:13:26,000

okay maybe we do know about that already

3355

02:13:28,870 --> 02:13:27,040

what they think it was and they thought

3356

02:13:30,310 --> 02:13:28,880

it was aliens now they'd say

3357

02:13:31,669 --> 02:13:30,320

now we don't want anyone to know that's

3358

02:13:34,069 --> 02:13:31,679

the case so why not just say it was a

3359

02:13:35,350 --> 02:13:34,079

drill right or the same sequence events

3360

02:13:37,109 --> 02:13:35,360

would go on a lot of these seconds we

3361

02:13:38,790 --> 02:13:37,119

don't know what it was

3362

02:13:40,629 --> 02:13:38,800

uh but we shouldn't take assumption

3363

02:13:42,629 --> 02:13:40,639

about what it is because of that

3364

02:13:45,109 --> 02:13:42,639

it could be exactly what we tend to

3365

02:13:46,950 --> 02:13:45,119

think it is and that is either you know

3366

02:13:48,310 --> 02:13:46,960

another country screw with us or one of

3367

02:13:50,950 --> 02:13:48,320

our own departments that's not admitting

3368

02:13:52,709 --> 02:13:50,960

to it alien the ufo is actually running

3369

02:13:54,470 --> 02:13:52,719

buzzes on our fleet

3370

02:13:56,790 --> 02:13:54,480

i don't know right

3371

02:14:00,550 --> 02:13:56,800

now as a physicist

3372

02:14:04,069 --> 02:14:00,560

um and we if we look at the data and we

3373

02:14:06,550 --> 02:14:04,079

listen to the eyewitness testimony from

3374

02:14:09,750 --> 02:14:06,560

the crew members on the ships number one

3375

02:14:11,910 --> 02:14:09,760

and number two the pilots themselves

3376

02:14:14,550 --> 02:14:11,920

okay so we have radar operators we have

3377

02:14:15,990 --> 02:14:14,560

the western weapon systems we have

3378

02:14:17,669 --> 02:14:16,000

you know the crew

3379

02:14:19,669 --> 02:14:17,679

also uh

3380

02:14:22,870 --> 02:14:19,679

uh sean cahill

3381

02:14:24,470 --> 02:14:22,880

who was uh you know i i guess the best

3382

02:14:27,030 --> 02:14:24,480

way to uh

3383

02:14:29,189 --> 02:14:27,040

uh he's uh

3384

02:14:32,709 --> 02:14:29,199

uh he's like the sheriff

3385

02:14:35,589 --> 02:14:32,719

okay he's the sheriff of

3386

02:14:37,270 --> 02:14:35,599

the navy he's a commander he was also on

3387

02:14:41,830 --> 02:14:37,280

the show too as well when all of this

3388

02:14:44,629 --> 02:14:41,840

went down okay so uh if we understand

3389

02:14:46,709 --> 02:14:44,639

correctly and this is from multiple

3390

02:14:49,830 --> 02:14:46,719

sources not just one

3391

02:14:51,669 --> 02:14:49,840

that as a physicist when you hear

3392

02:14:57,109 --> 02:14:51,679

that this object

3393

02:15:01,510 --> 02:14:57,119

40 feet long right went from 80 000 feet

3394

02:15:03,990 --> 02:15:01,520

to sea level well it parked at 28 000

3395

02:15:09,030 --> 02:15:04,000

feet so 80 000 feet to 28 000 feet then

3396

02:15:11,910 --> 02:15:09,040

down the sea level in less than a second

3397

02:15:13,830 --> 02:15:11,920

how is that possible what do we now now

3398

02:15:15,669 --> 02:15:13,840

what are we talking about here from a

3399

02:15:17,589 --> 02:15:15,679

physics perspective

3400

02:15:21,350 --> 02:15:17,599

anti-gravity

3401

02:15:23,510 --> 02:15:21,360

we're not seeing uh there was no uh uh

3402

02:15:25,669 --> 02:15:23,520

sonic booms you would think that there

3403

02:15:27,350 --> 02:15:25,679

would be a tremendous energy release at

3404

02:15:30,229 --> 02:15:27,360

the surface of the ocean that would be

3405

02:15:33,990 --> 02:15:30,239

visible right if you hit the brakes

3406

02:15:35,750 --> 02:15:34,000

at that type of velocity as a physicist

3407

02:15:38,550 --> 02:15:35,760

what are you thinking

3408

02:15:40,550 --> 02:15:38,560

it's dropping 80 000 to 20 000 feet or

3409

02:15:43,109 --> 02:15:40,560

what would that be uh

3410

02:15:43,910 --> 02:15:43,119

60 12 miles per second or something like

3411

02:15:47,270 --> 02:15:43,920

that

3412

02:15:48,550 --> 02:15:47,280

faster than the actual orbital velocity

3413

02:15:49,910 --> 02:15:48,560

around this planet but this kind of

3414

02:15:51,270 --> 02:15:49,920

speed that things come into our

3415

02:15:52,709 --> 02:15:51,280

atmosphere at

3416

02:15:54,870 --> 02:15:52,719

there are a lot of things coming that

3417

02:15:56,709 --> 02:15:54,880

fast it's just that they are usually not

3418

02:15:58,950 --> 02:15:56,719

going away afterwards

3419

02:16:01,430 --> 02:15:58,960

what would cause it to drop that height

3420

02:16:03,270 --> 02:16:01,440

and you know anything coming from space

3421

02:16:04,629 --> 02:16:03,280

would be going that fast it's not the

3422

02:16:06,709 --> 02:16:04,639

speed you'd expect a shift to be going

3423

02:16:08,950 --> 02:16:06,719

at from a physics standpoint pulling out

3424

02:16:11,109 --> 02:16:08,960

that velocity is no big deal right it's

3425

02:16:13,350 --> 02:16:11,119

just a matter of letting yourself fall

3426

02:16:15,270 --> 02:16:13,360

and being skinny enough that you're not

3427

02:16:17,589 --> 02:16:15,280

getting a whole ton of drag skinny and

3428

02:16:19,189 --> 02:16:17,599

thick you take your rods for god they

3429

02:16:21,270 --> 02:16:19,199

say the order bombardment techniques

3430

02:16:23,510 --> 02:16:21,280

right take a big tungsten rod and drop

3431

02:16:24,950 --> 02:16:23,520

it that's what that looks like

3432

02:16:26,790 --> 02:16:24,960

that would be something i wouldn't mind

3433

02:16:29,669 --> 02:16:26,800

experimenting with one day that would be

3434

02:16:31,189 --> 02:16:29,679

a great weapon system i would never ever

3435

02:16:33,990 --> 02:16:31,199

ever tell you what he had in prototype

3436

02:16:37,990 --> 02:16:35,110

what does that look like when it

3437

02:16:40,070 --> 02:16:38,000

detonates well if i detonate say 20 000

3438

02:16:42,309 --> 02:16:40,080

feet up in the air to break into a whole

3439

02:16:43,830 --> 02:16:42,319

bunch of smaller possibly self-directed

3440

02:16:44,790 --> 02:16:43,840

little bullets they're gonna go to land

3441

02:16:46,790 --> 02:16:44,800

places

3442

02:16:48,950 --> 02:16:46,800

like an anti-personnel cluster mutation

3443

02:16:50,389 --> 02:16:48,960

well that might look like that

3444

02:16:52,230 --> 02:16:50,399

i don't think that's what it was mind

3445

02:16:53,429 --> 02:16:52,240

you but that's on the table right right

3446

02:16:55,270 --> 02:16:53,439

that's right a lot of things it could be

3447

02:16:57,910 --> 02:16:55,280

i can put together scenarios that this

3448

02:16:59,429 --> 02:16:57,920

might be the case for um

3449

02:17:02,070 --> 02:16:59,439

it's a spaceship it's coming in really

3450

02:17:04,150 --> 02:17:02,080

fast it's a drop pod how would you drop

3451

02:17:06,150 --> 02:17:04,160

infantry onto another planet well you

3452

02:17:07,990 --> 02:17:06,160

drop them as fast as you possibly can

3453

02:17:09,669 --> 02:17:08,000

right you might even push the envelope

3454

02:17:10,709 --> 02:17:09,679

and make you go faster they need to slow

3455

02:17:11,990 --> 02:17:10,719

them down real quick so they don't get

3456

02:17:13,990 --> 02:17:12,000

shot up on the way down but then they

3457

02:17:16,150 --> 02:17:14,000

slow start to hit that surface at uh you

3458

02:17:18,150 --> 02:17:16,160

know 10 miles a second so you deploy a

3459

02:17:19,669 --> 02:17:18,160

big graphene parachute graphene's a

3460

02:17:21,910 --> 02:17:19,679

super material and one of its properties

3461

02:17:23,190 --> 02:17:21,920

is it would make a great parachute what

3462

02:17:25,270 --> 02:17:23,200

would that look like when you suddenly

3463

02:17:27,589 --> 02:17:25,280

deploy it 10 miles up and it yanks you

3464

02:17:29,349 --> 02:17:27,599

to a rapid dust you hold

3465

02:17:31,750 --> 02:17:29,359

these are things that can have really

3466

02:17:33,429 --> 02:17:31,760

weird effects if you see them on a scope

3467

02:17:35,190 --> 02:17:33,439

another thing to keep in mind i don't

3468

02:17:37,349 --> 02:17:35,200

like to ever you know knock someone as

3469

02:17:39,190 --> 02:17:37,359

an observer but you know

3470

02:17:41,270 --> 02:17:39,200

as recently as two weeks ago i'm up

3471

02:17:43,349 --> 02:17:41,280

flying with my wife right and our flight

3472

02:17:44,790 --> 02:17:43,359

instructor who flies

3473

02:17:46,709 --> 02:17:44,800

constantly a bunch of different things

3474

02:17:48,150 --> 02:17:46,719

has been doing it for decades he has at

3475

02:17:50,709 --> 02:17:48,160

least as experienced and he knows who's

3476

02:17:52,709 --> 02:17:50,719

been a navy or air force pilots right

3477

02:17:54,549 --> 02:17:52,719

uh he and i are trying to figure out

3478

02:17:56,389 --> 02:17:54,559

what is something during the daytime

3479

02:17:58,469 --> 02:17:56,399

what a craft is a helicopter or a plane

3480

02:18:00,230 --> 02:17:58,479

of what kind that can't be more than a

3481

02:18:03,429 --> 02:18:00,240

mile or two away from us

3482

02:18:04,469 --> 02:18:03,439

in the open sky on a nice day my wife's

3483

02:18:06,950 --> 02:18:04,479

able to pick the thing out because she

3484

02:18:09,190 --> 02:18:06,960

got eagle-eyes right but he's the

3485

02:18:10,469 --> 02:18:09,200

trained absorber for that and so am i

3486

02:18:12,950 --> 02:18:10,479

just out of that particular type of

3487

02:18:15,429 --> 02:18:12,960

device and we couldn't tell

3488

02:18:17,110 --> 02:18:15,439

so now i'm flying a fighter craft in the

3489

02:18:19,349 --> 02:18:17,120

middle of the night in the ocean dire

3490

02:18:21,509 --> 02:18:19,359

drill trying to find something that is

3491

02:18:23,750 --> 02:18:21,519

not acting normally and not by an

3492

02:18:25,270 --> 02:18:23,760

airport it's hard to pull things off

3493

02:18:27,270 --> 02:18:25,280

like how long it is or what kind of

3494

02:18:29,270 --> 02:18:27,280

angle think it turned at these are not

3495

02:18:30,709 --> 02:18:29,280

easy observations i think

3496

02:18:31,990 --> 02:18:30,719

people tend to forget sometimes that

3497

02:18:33,830 --> 02:18:32,000

just because someone's a fighter pilot

3498

02:18:35,830 --> 02:18:33,840

or a radar operator you know i've been

3499

02:18:38,070 --> 02:18:35,840

in the military we had ford absorbers

3500

02:18:39,589 --> 02:18:38,080

they made bad cars all the time it's

3501

02:18:41,589 --> 02:18:39,599

easy to make a mistake out though so we

3502

02:18:43,509 --> 02:18:41,599

don't want to take these as ironclad at

3503

02:18:45,190 --> 02:18:43,519

the same time you know never even a

3504

02:18:46,309 --> 02:18:45,200

discussion dishonesty that shouldn't be

3505

02:18:47,589 --> 02:18:46,319

there

3506

02:18:49,110 --> 02:18:47,599

technically it should because you always

3507

02:18:50,870 --> 02:18:49,120

want to consider the possibility but

3508

02:18:53,509 --> 02:18:50,880

these are people who are experts at

3509

02:18:55,589 --> 02:18:53,519

their field making calls but they're

3510

02:18:57,309 --> 02:18:55,599

just like avi loeb or me we can be wrong

3511

02:18:59,509 --> 02:18:57,319

about [h__h] all that

3512

02:19:02,230 --> 02:18:59,519

success all the time

3513

02:19:04,150 --> 02:19:02,240

you know and we all right i don't know

3514

02:19:05,429 --> 02:19:04,160

if i'm wrong about this i probably am i

3515

02:19:07,509 --> 02:19:05,439

don't have a pet theory for what these

3516

02:19:09,750 --> 02:19:07,519

things actually works i don't know

3517

02:19:11,110 --> 02:19:09,760

but we have to keep mine in these

3518

02:19:13,030 --> 02:19:11,120

observations

3519

02:19:14,709 --> 02:19:13,040

that we are saying you know this could

3520

02:19:17,190 --> 02:19:14,719

be or couldn't be have to be taking the

3521

02:19:19,110 --> 02:19:17,200

context that we probably have errors in

3522

02:19:21,910 --> 02:19:19,120

what we have reported to us

3523

02:19:23,830 --> 02:19:21,920

at best we have a hazy view

3524

02:19:25,990 --> 02:19:23,840

and that might be a hazy view of ufos it

3525

02:19:27,830 --> 02:19:26,000

really could be but we can't i can't

3526

02:19:30,549 --> 02:19:27,840

tell you what this could be if it was a

3527

02:19:32,230 --> 02:19:30,559

ufo beyond certain basic things because

3528

02:19:34,629 --> 02:19:32,240

i don't know what the real details are

3529

02:19:36,070 --> 02:19:34,639

at war right it drops that fast and we

3530

02:19:37,910 --> 02:19:36,080

say that's an object re-entry or

3531

02:19:40,870 --> 02:19:37,920

entering surprises re-entering the

3532

02:19:42,469 --> 02:19:40,880

atmosphere at normal speed for meteorite

3533

02:19:44,469 --> 02:19:42,479

and if nothing slowing down that might

3534

02:19:45,830 --> 02:19:44,479

be what that looked like what could look

3535

02:19:47,429 --> 02:19:45,840

like that i don't know was an

3536

02:19:49,429 --> 02:19:47,439

anti-satellite getting blown up well we

3537

02:19:51,270 --> 02:19:49,439

can't admit to that now because we blew

3538

02:19:54,309 --> 02:19:51,280

up somebody else's satellite right right

3539

02:19:57,990 --> 02:19:54,319

how's it coming now now when we uh we

3540

02:20:00,630 --> 02:19:58,000

add the other for me i'm still

3541

02:20:03,670 --> 02:20:00,640

trying to figure this out i i

3542

02:20:06,550 --> 02:20:03,680

just don't know but this is

3543

02:20:08,389 --> 02:20:06,560

the next stage of and as a physicist i

3544

02:20:11,429 --> 02:20:08,399

want you to uh

3545

02:20:13,910 --> 02:20:11,439

contemplate this so the object 80 000

3546

02:20:16,630 --> 02:20:13,920

feet down to sea level they they

3547

02:20:17,990 --> 02:20:16,640

launched some planes off of the nimitz

3548

02:20:21,510 --> 02:20:18,000

and uh

3549

02:20:24,550 --> 02:20:21,520

and david fravor and his wing person

3550

02:20:28,070 --> 02:20:24,560

wing lady uh alex dietrich

3551
02:20:30,950 --> 02:20:28,080
um so they head out they observe they

3552
02:20:33,030 --> 02:20:30,960
get to the the cap point they see the

3553
02:20:35,670 --> 02:20:33,040
tic tac uh

3554
02:20:38,309 --> 02:20:35,680
bubbling water above the ocean floor

3555
02:20:39,750 --> 02:20:38,319
they're circling now right and they're

3556
02:20:43,429 --> 02:20:39,760
looking at it

3557
02:20:46,150 --> 02:20:43,439
as he's circling and he goes to

3558
02:20:49,030 --> 02:20:46,160
drop down in altitude and take a closer

3559
02:20:51,030 --> 02:20:49,040
look it comes out of park mode

3560
02:20:54,389 --> 02:20:51,040
comes up and is

3561
02:20:57,270 --> 02:20:54,399
following him in this corkscrew it's not

3562
02:21:00,150 --> 02:20:57,280
sitting anymore it's not a meteorite

3563
02:21:01,510 --> 02:21:00,160

that's fallen out of the sky or whatever

3564

02:21:02,790 --> 02:21:01,520

it is now

3565

02:21:05,910 --> 02:21:02,800

flying

3566

02:21:07,590 --> 02:21:05,920

and he describes it as uh you know the

3567

02:21:11,030 --> 02:21:07,600

40-foot tic-tac

3568

02:21:11,950 --> 02:21:11,040

no wings no gas no propulsion

3569

02:21:15,110 --> 02:21:11,960

no

3570

02:21:16,389 --> 02:21:15,120

protrusions basically a tic tac

3571

02:21:18,950 --> 02:21:16,399

um

3572

02:21:21,270 --> 02:21:18,960

smooth and white it's following him he

3573

02:21:24,630 --> 02:21:21,280

then attempts to cut it off right the

3574

02:21:27,030 --> 02:21:24,640

corkscrew uh cut it off it stops he's

3575

02:21:29,190 --> 02:21:27,040

looking at it he's flying and then he

3576

02:21:32,950 --> 02:21:29,200

says

3577

02:21:35,750 --> 02:21:32,960

it flies away and in a split second it's

3578

02:21:39,190 --> 02:21:35,760

gone and disappears in a straight line

3579

02:21:41,590 --> 02:21:39,200

off now as a physicist

3580

02:21:43,750 --> 02:21:41,600

how how do you start to digest something

3581

02:21:46,230 --> 02:21:43,760

like that this is combined with the

3582

02:21:46,950 --> 02:21:46,240

radar data and the other observations

3583

02:21:51,270 --> 02:21:46,960

and

3584

02:21:55,429 --> 02:21:51,280

looking at what do they call them the

3585

02:21:57,910 --> 02:21:55,439

eyes you know the big eyes um so it was

3586

02:21:59,910 --> 02:21:57,920

electronically observed it was visually

3587

02:22:01,750 --> 02:21:59,920

observed and also

3588

02:22:04,870 --> 02:22:01,760

uh the two pilots out there alex

3589

02:22:09,670 --> 02:22:04,880

dietrich his wing person

3590

02:22:11,429 --> 02:22:09,680

recounts the same uh the same testimony

3591

02:22:12,870 --> 02:22:11,439

well if we're assuming that it was

3592

02:22:15,270 --> 02:22:12,880

actually an object doing these real

3593

02:22:16,710 --> 02:22:15,280

maneuvers that it wasn't any kind of you

3594

02:22:18,150 --> 02:22:16,720

know there are a lot of options that are

3595

02:22:19,910 --> 02:22:18,160

still on the table we'll skip those for

3596

02:22:21,590 --> 02:22:19,920

now right we all know how that could

3597

02:22:24,070 --> 02:22:21,600

have been a weather balloon or a wheeled

3598

02:22:26,309 --> 02:22:24,080

signal or aor data right let's say it's

3599

02:22:28,230 --> 02:22:26,319

the real object and it did this it was

3600

02:22:30,710 --> 02:22:28,240

able to come to a halt from coming in at

3601
02:22:32,950 --> 02:22:30,720
inter planetary speeds it was able to

3602
02:22:34,309 --> 02:22:32,960
come to halt very quickly right we don't

3603
02:22:35,349 --> 02:22:34,319
know exactly what rate that deceleration

3604
02:22:37,190 --> 02:22:35,359
would have been at because we basically

3605
02:22:38,070 --> 02:22:37,200
just know at this point that it slowed

3606
02:22:40,150 --> 02:22:38,080
down

3607
02:22:41,349 --> 02:22:40,160
to stop that quickly but not what the

3608
02:22:43,910 --> 02:22:41,359
rate of acceleration would be but it'd

3609
02:22:45,990 --> 02:22:43,920
be very fast nothing organic is alive in

3610
02:22:48,070 --> 02:22:46,000
that thing right nothing classically

3611
02:22:50,389 --> 02:22:48,080
organic anyway but it could be a robot

3612
02:22:52,230 --> 02:22:50,399
obviously enough right right right on

3613
02:22:54,309 --> 02:22:52,240

that right so the the fact that it's

3614

02:22:56,230 --> 02:22:54,319

making these weird maneuvers all that

3615

02:22:57,750 --> 02:22:56,240

requires is the kind of power system

3616

02:22:59,830 --> 02:22:57,760

that we'd actually expecting a spaceship

3617

02:23:02,230 --> 02:22:59,840

to have anyway to get to interstellar

3618

02:23:04,469 --> 02:23:02,240

cruising velocity means you need a lot

3619

02:23:05,830 --> 02:23:04,479

of energy the ability to actually power

3620

02:23:07,429 --> 02:23:05,840

up that quickly that's a little bit

3621

02:23:09,030 --> 02:23:07,439

different of a story because it means a

3622

02:23:11,910 --> 02:23:09,040

lot of energy and a lot of good

3623

02:23:13,750 --> 02:23:11,920

engineering right but doable right at

3624

02:23:15,910 --> 02:23:13,760

that point the rest of it that's that's

3625

02:23:17,910 --> 02:23:15,920

minimal that's chasing after him why is

3626
02:23:19,190 --> 02:23:17,920
it doing that i have no idea that seems

3627
02:23:21,510 --> 02:23:19,200
really stupid

3628
02:23:22,790 --> 02:23:21,520
it could be someone's homing missile we

3629
02:23:25,349 --> 02:23:22,800
could probably build something that

3630
02:23:26,469 --> 02:23:25,359
could act like that for a few seconds

3631
02:23:28,950 --> 02:23:26,479
you know we

3632
02:23:30,550 --> 02:23:28,960
all rockets have a burn time that's

3633
02:23:34,309 --> 02:23:30,560
basically how long they can levitate in

3634
02:23:36,309 --> 02:23:34,319
the air at 1g uh you know it's usually a

3635
02:23:38,309 --> 02:23:36,319
couple minutes you know three or four

3636
02:23:41,030 --> 02:23:38,319
minutes good rocket fuel those are good

3637
02:23:42,550 --> 02:23:41,040
rockets right um it could potentially do

3638
02:23:44,389 --> 02:23:42,560

a maneuver like that we could maybe

3639

02:23:45,910 --> 02:23:44,399

build something that could do that

3640

02:23:48,150 --> 02:23:45,920

i'd have to run the numbers but a

3641

02:23:49,670 --> 02:23:48,160

spaceship from little style civilization

3642

02:23:50,790 --> 02:23:49,680

anybody who's just not using regular

3643

02:23:52,630 --> 02:23:50,800

chemistry they've got a good power

3644

02:23:54,070 --> 02:23:52,640

supply yeah they could do it potentially

3645

02:23:55,910 --> 02:23:54,080

something with bean power could do it

3646

02:23:57,910 --> 02:23:55,920

right right what about the rest of the

3647

02:24:00,150 --> 02:23:57,920

menu at that point then the question

3648

02:24:02,870 --> 02:24:00,160

becomes what was it doing when they

3649

02:24:04,150 --> 02:24:02,880

interrupted it and why was it chasing

3650

02:24:06,630 --> 02:24:04,160

him around

3651

02:24:08,550 --> 02:24:06,640

yes yes all of these are just

3652

02:24:10,389 --> 02:24:08,560

fascinating questions

3653

02:24:12,230 --> 02:24:10,399

each one of them i mean i you know

3654

02:24:13,670 --> 02:24:12,240

granted to you to get there you have to

3655

02:24:15,750 --> 02:24:13,680

first assume that it's an official

3656

02:24:17,270 --> 02:24:15,760

object an alien not necessarily the area

3657

02:24:19,510 --> 02:24:17,280

it could be some other countries but

3658

02:24:20,710 --> 02:24:19,520

you're now saying what was it doing and

3659

02:24:22,950 --> 02:24:20,720

that's an interesting question all by

3660

02:24:25,110 --> 02:24:22,960

itself because now we have to figure out

3661

02:24:27,190 --> 02:24:25,120

why why is it staring at the ocean was

3662

02:24:30,389 --> 02:24:27,200

it steering a submarine

3663

02:24:32,230 --> 02:24:30,399

or was it sucking water out of the ocean

3664

02:24:33,830 --> 02:24:32,240

nobody wants water from ocean i mean

3665

02:24:35,750 --> 02:24:33,840

maybe that's a great way to sample for

3666

02:24:37,830 --> 02:24:35,760

dna but water's

3667

02:24:39,990 --> 02:24:37,840

so plentiful it's it's not even the best

3668

02:24:42,630 --> 02:24:40,000

place in the solar system to get water

3669

02:24:45,190 --> 02:24:42,640

you know i know i know um i was just

3670

02:24:48,070 --> 02:24:45,200

thinking it was a hydrogen uh fueled

3671

02:24:51,910 --> 02:24:48,080

vehicle you know from uh general motors

3672

02:24:53,990 --> 02:24:51,920

but here okay so um i'm glad you you

3673

02:24:57,590 --> 02:24:54,000

laugh at my science jokes

3674

02:24:59,110 --> 02:24:57,600

um but are we talking about now

3675

02:25:01,349 --> 02:24:59,120

um

3676
02:25:03,510 --> 02:25:01,359
from a physics standpoint are we talking

3677
02:25:06,389 --> 02:25:03,520
about gravity

3678
02:25:08,070 --> 02:25:06,399
uh some type of anti-gravity propulsion

3679
02:25:11,349 --> 02:25:08,080
system that we just don't understand yet

3680
02:25:13,349 --> 02:25:11,359
that is not in our world of physics

3681
02:25:15,349 --> 02:25:13,359
yeah i mean you can say that it could be

3682
02:25:17,429 --> 02:25:15,359
but that doesn't it's not required from

3683
02:25:19,030 --> 02:25:17,439
what's being described and mind you i'd

3684
02:25:20,870 --> 02:25:19,040
have to really dig into what the the

3685
02:25:22,150 --> 02:25:20,880
flighted trajectory was to be able to

3686
02:25:24,230 --> 02:25:22,160
calculate out with the torrens on it

3687
02:25:26,070 --> 02:25:24,240
wall and things like that but you know

3688
02:25:28,710 --> 02:25:26,080

right now we know that it's doing an

3689

02:25:31,190 --> 02:25:28,720

acceleration rate that would

3690

02:25:32,309 --> 02:25:31,200

probably kill a pilot right even though

3691

02:25:33,990 --> 02:25:32,319

i won't be you know it was it was

3692

02:25:35,510 --> 02:25:34,000

organic it could be an alien race that

3693

02:25:36,950 --> 02:25:35,520

just handles g's better than us though

3694

02:25:38,550 --> 02:25:36,960

too it could be that just hannah twice

3695

02:25:41,110 --> 02:25:38,560

me jesus you know it's not that big a

3696

02:25:42,710 --> 02:25:41,120

job is that it could be post biological

3697

02:25:45,429 --> 02:25:42,720

or could just be a remote drone probe

3698

02:25:47,190 --> 02:25:45,439

like we have yes certainly certainly um

3699

02:25:50,469 --> 02:25:47,200

now that doesn't require a gravity drive

3700

02:25:52,389 --> 02:25:50,479

but it will sure help and yeah

3701

02:25:54,630 --> 02:25:52,399

okay this is let your

3702

02:25:56,389 --> 02:25:54,640

let your mind go for a second is it

3703

02:25:59,670 --> 02:25:56,399

possible

3704

02:26:00,469 --> 02:25:59,680

to have some type of gravity i don't

3705

02:26:02,389 --> 02:26:00,479

know

3706

02:26:04,550 --> 02:26:02,399

i may be choosing the wrong words a

3707

02:26:07,830 --> 02:26:04,560

bubble around the craft

3708

02:26:09,910 --> 02:26:07,840

where g-forces on the inside

3709

02:26:13,429 --> 02:26:09,920

simply don't matter you could take a

3710

02:26:16,630 --> 02:26:13,439

right turn at 80 000 miles per hour and

3711

02:26:19,270 --> 02:26:16,640

and you and i could survive is that is

3712

02:26:20,550 --> 02:26:19,280

that a possible namesake isaac asimov

3713

02:26:22,070 --> 02:26:20,560

when he finally got around to writing

3714

02:26:24,389 --> 02:26:22,080

the fourth book of the foundation

3715

02:26:26,389 --> 02:26:24,399

trilogy gave him a gravitic engine for

3716

02:26:28,870 --> 02:26:26,399

ship because it lets them do inertialis

3717

02:26:31,349 --> 02:26:28,880

so you know a nurseless acceleration too

3718

02:26:33,670 --> 02:26:31,359

right if you have a gravity drive it's

3719

02:26:35,510 --> 02:26:33,680

very likely that you would ask me to

3720

02:26:37,429 --> 02:26:35,520

have the kind of inertial damping as you

3721

02:26:38,950 --> 02:26:37,439

see in the star trek ships for why they

3722

02:26:40,550 --> 02:26:38,960

don't give them so smeared across the

3723

02:26:42,070 --> 02:26:40,560

front of the ship every time they turn

3724

02:26:44,150 --> 02:26:42,080

their engines on even to do basic

3725

02:26:45,590 --> 02:26:44,160

maneuvers um

3726

02:26:47,030 --> 02:26:45,600

if it got if it's got that kind of

3727

02:26:48,389 --> 02:26:47,040

driving yeah they could do with a with

3728

02:26:49,910 --> 02:26:48,399

organic pilot

3729

02:26:52,230 --> 02:26:49,920

i i don't think that's you know again we

3730

02:26:54,070 --> 02:26:52,240

don't know what the alien organic makeup

3731

02:26:55,670 --> 02:26:54,080

would be if it's organic so it doesn't

3732

02:26:58,230 --> 02:26:55,680

really matter because it could be a

3733

02:26:59,670 --> 02:26:58,240

robot but uh yeah if you've got a

3734

02:27:00,950 --> 02:26:59,680

gravity drive there's a good chance you

3735

02:27:02,630 --> 02:27:00,960

can do some tricks with the nordstrom

3736

02:27:04,150 --> 02:27:02,640

acceleration that would

3737

02:27:07,670 --> 02:27:04,160

let you survive some impressive

3738

02:27:08,550 --> 02:27:07,680

maneuvers now let's suppose

3739

02:27:09,990 --> 02:27:08,560

uh

3740

02:27:11,830 --> 02:27:10,000

a couple of things a good way to save

3741

02:27:14,309 --> 02:27:11,840

fuel too if you can change your natural

3742

02:27:15,830 --> 02:27:14,319

mass during an acceleration sky switch

3743

02:27:16,870 --> 02:27:15,840

it back and forth

3744

02:27:19,349 --> 02:27:16,880

absolutely

3745

02:27:21,670 --> 02:27:19,359

slow down right and and and fake out

3746

02:27:22,870 --> 02:27:21,680

known physics fake out new tony in

3747

02:27:24,790 --> 02:27:22,880

physics

3748

02:27:26,550 --> 02:27:24,800

well yeah yeah if you can play and again

3749

02:27:28,469 --> 02:27:26,560

quantum gravity might give options for

3750

02:27:31,190 --> 02:27:28,479

things like this i would not be

3751
02:27:32,550 --> 02:27:31,200
you know to me a anti-gravity drive or

3752
02:27:35,030 --> 02:27:32,560
you know artificial gravity is not in

3753
02:27:36,550 --> 02:27:35,040
that realm of fast night travel or

3754
02:27:38,550 --> 02:27:36,560
perpetual motion machine where it breaks

3755
02:27:40,070 --> 02:27:38,560
any rules there's no rules that are

3756
02:27:41,990 --> 02:27:40,080
being broken by that we don't have a

3757
02:27:44,070 --> 02:27:42,000
clear pathway to getting that

3758
02:27:45,670 --> 02:27:44,080
uh but there's nothing to me that

3759
02:27:48,070 --> 02:27:45,680
violates who it was about artificially

3760
02:27:49,190 --> 02:27:48,080
produce gravity and nor is there

3761
02:27:50,469 --> 02:27:49,200
anything that would say that you

3762
02:27:51,990 --> 02:27:50,479
couldn't play around with the higgs

3763
02:27:54,550 --> 02:27:52,000

bosons to

3764

02:27:56,950 --> 02:27:54,560

change an object's inertial mass which

3765

02:27:59,110 --> 02:27:56,960

would let you very quickly change speed

3766

02:28:01,990 --> 02:27:59,120

without having to change energy

3767

02:28:04,150 --> 02:28:02,000

because momentum is mass times velocity

3768

02:28:05,670 --> 02:28:04,160

if you say drop your inertia mass by to

3769

02:28:07,910 --> 02:28:05,680

a tenth of what normally is your

3770

02:28:09,190 --> 02:28:07,920

velocity should kick up to ten times as

3771

02:28:09,910 --> 02:28:09,200

much

3772

02:28:15,110 --> 02:28:09,920

uh

3773

02:28:18,710 --> 02:28:15,120

now we have three reports

3774

02:28:21,030 --> 02:28:18,720

on uaps and ufos that

3775

02:28:23,110 --> 02:28:21,040

are to be presented to the senate

3776

02:28:25,990 --> 02:28:23,120

intelligence committee this year

3777

02:28:28,469 --> 02:28:26,000

two that will be public every six months

3778

02:28:31,070 --> 02:28:28,479

right so one in june and one

3779

02:28:33,510 --> 02:28:31,080

um at the end of december and then one

3780

02:28:35,110 --> 02:28:33,520

classified version of the report in

3781

02:28:36,790 --> 02:28:35,120

december and that only

3782

02:28:38,550 --> 02:28:36,800

uh goes to the senate intelligence

3783

02:28:41,190 --> 02:28:38,560

committee

3784

02:28:44,309 --> 02:28:41,200

would it surprise you

3785

02:28:45,070 --> 02:28:44,319

to have mention of

3786

02:28:47,590 --> 02:28:45,080

an

3787

02:28:49,270 --> 02:28:47,600

extraterrestrial possibility in one of

3788

02:28:51,270 --> 02:28:49,280

these reports

3789

02:28:53,270 --> 02:28:51,280

uh no i would i would take for given

3790

02:28:54,710 --> 02:28:53,280

they would include that possibility no

3791

02:28:56,469 --> 02:28:54,720

one's going to take the report seriously

3792

02:28:58,070 --> 02:28:56,479

if it doesn't include that the the

3793

02:28:59,910 --> 02:28:58,080

people are willing to hear them talk

3794

02:29:00,790 --> 02:28:59,920

about the ufo option if it skips that

3795

02:29:02,710 --> 02:29:00,800

they're going to say oh they just

3796

02:29:04,550 --> 02:29:02,720

skipped it again and you can be a

3797

02:29:06,790 --> 02:29:04,560

hardcore skeptic like myself or a

3798

02:29:08,469 --> 02:29:06,800

complete believer and be still not going

3799

02:29:10,550 --> 02:29:08,479

to take a government report discussing

3800

02:29:12,790 --> 02:29:10,560

these anomalies seriously if it doesn't

3801

02:29:15,590 --> 02:29:12,800

have a chapter that discusses

3802

02:29:17,270 --> 02:29:15,600

this might be aliens why or why not they

3803

02:29:19,270 --> 02:29:17,280

can't just skip that that has to be

3804

02:29:21,110 --> 02:29:19,280

discussed they might discuss it the way

3805

02:29:23,590 --> 02:29:21,120

i would discuss it as probably not for

3806

02:29:25,349 --> 02:29:23,600

these reasons or they might say we think

3807

02:29:27,910 --> 02:29:25,359

it is i don't know that one's hard to

3808

02:29:29,590 --> 02:29:27,920

predict but um you know i would guess

3809

02:29:31,349 --> 02:29:29,600

they're probably gonna leave it as

3810

02:29:33,590 --> 02:29:31,359

question mark

3811

02:29:35,190 --> 02:29:33,600

do you okay and and one last question

3812

02:29:37,590 --> 02:29:35,200

you're gonna stay for overtime by the

3813

02:29:42,469 --> 02:29:37,600

way because i saw you go and get another

3814

02:29:43,990 --> 02:29:42,479

cup of coffee i saw you do that um so uh

3815

02:29:46,070 --> 02:29:44,000

we'll have some fun in overtime but i

3816

02:29:49,990 --> 02:29:46,080

wanted to ask you this is

3817

02:29:51,990 --> 02:29:50,000

you have uh done many shows and discuss

3818

02:29:55,349 --> 02:29:52,000

von neumann probes

3819

02:29:58,070 --> 02:29:55,359

is this is that could this be an example

3820

02:30:01,110 --> 02:29:58,080

of that it's been speculated it's been

3821

02:30:02,469 --> 02:30:01,120

talked about you've absolutely discussed

3822

02:30:05,590 --> 02:30:02,479

this uh

3823

02:30:08,150 --> 02:30:05,600

so much could this be

3824

02:30:11,190 --> 02:30:08,160

that actually coming to life and

3825

02:30:15,120 --> 02:30:11,200

becoming reality for us

3826

02:30:20,630 --> 02:30:19,030

[Laughter]

3827

02:30:22,309 --> 02:30:20,640

okay i would say that this this comes

3828

02:30:24,790 --> 02:30:22,319

down the idea that that the key thing

3829

02:30:26,389 --> 02:30:24,800

about a proper von neuen probe is it

3830

02:30:28,230 --> 02:30:26,399

should be dumb

3831

02:30:30,309 --> 02:30:28,240

you want your von neumann poe to be as

3832

02:30:31,670 --> 02:30:30,319

dumb as you can if you're not sending if

3833

02:30:33,510 --> 02:30:31,680

you're sending out a full ai then it's

3834

02:30:35,429 --> 02:30:33,520

not an unmanned von neumann just has to

3835

02:30:37,670 --> 02:30:35,439

be an artificial intelligence that's a

3836

02:30:39,670 --> 02:30:37,680

person buy a different deal uh makeup

3837

02:30:41,030 --> 02:30:39,680

right right your vinyl in probe should

3838

02:30:42,790 --> 02:30:41,040

be dumb

3839

02:30:44,870 --> 02:30:42,800

and that is that is exactly kind of

3840

02:30:46,389 --> 02:30:44,880

behavior you would expect of a probe

3841

02:30:47,990 --> 02:30:46,399

that doesn't really know what it's doing

3842

02:30:49,830 --> 02:30:48,000

very well and says oh look there's

3843

02:30:51,190 --> 02:30:49,840

something interesting i have really

3844

02:30:53,110 --> 02:30:51,200

powerful engines i'm going to take a

3845

02:30:55,990 --> 02:30:53,120

look at that fleet hey someone's chasing

3846

02:30:57,670 --> 02:30:56,000

after me i'll chase after it

3847

02:31:02,389 --> 02:30:57,680

yes that is exactly the sort of behavior

3848

02:31:06,950 --> 02:31:05,670

and uh i've just got 60 seconds

3849

02:31:09,270 --> 02:31:06,960

um

3850

02:31:10,630 --> 02:31:09,280

wouldn't we expect

3851
02:31:13,590 --> 02:31:10,640
many more

3852
02:31:16,469 --> 02:31:13,600
it wouldn't just be one

3853
02:31:19,190 --> 02:31:16,479
right i mean we would expect

3854
02:31:21,110 --> 02:31:19,200
i don't want to say thousands but

3855
02:31:23,030 --> 02:31:21,120
but that's what the numbers are the

3856
02:31:25,030 --> 02:31:23,040
position requires yeah that's that's the

3857
02:31:26,870 --> 02:31:25,040
key i don't have one knowing pope it's a

3858
02:31:28,309 --> 02:31:26,880
self-replicating probe it's main purpose

3859
02:31:30,230 --> 02:31:28,319
to making the next probe to send out to

3860
02:31:31,990 --> 02:31:30,240
the next solar systems too right but

3861
02:31:33,510 --> 02:31:32,000
once it's there it's making more probes

3862
02:31:35,590 --> 02:31:33,520
and not just one of itself too it's

3863
02:31:37,030 --> 02:31:35,600

gonna be a whole spectrum it is gonna

3864

02:31:38,870 --> 02:31:37,040

factory produce

3865

02:31:40,630 --> 02:31:38,880

all the fun tools it needs to achieve

3866

02:31:42,469 --> 02:31:40,640

whatever its mission is

3867

02:31:44,389 --> 02:31:42,479

and that might be a billion posts well

3868

02:31:45,910 --> 02:31:44,399

we know or it might be one right right

3869

02:31:48,469 --> 02:31:45,920

right right let's take our break right

3870

02:31:50,230 --> 02:31:48,479

here such a fascinating subject this is

3871

02:31:52,150 --> 02:31:50,240

fade to black our guest tonight isaac

3872

02:31:54,469 --> 02:31:52,160

arthur when we come back

3873

02:31:56,950 --> 02:31:54,479

i want to talk e.t

3874

02:31:59,349 --> 02:31:56,960

yeah we're going to talk e.t but i want

3875

02:32:01,830 --> 02:31:59,359

to talk alien races and we will do that

3876
02:32:04,469 --> 02:32:01,840
we'll have some fun with this it's isaac

3877
02:32:06,830 --> 02:32:04,479
arthur science and futurism with isaac

3878
02:32:10,469 --> 02:32:06,840
arthur on youtube is his channel

3879
02:32:12,710 --> 02:32:10,479
684 000 subscribers after tonight is

3880
02:32:14,469 --> 02:32:12,720
going to be at 6 85. you're welcome

3881
02:32:17,150 --> 02:32:14,479
isaac we'll be right back after this

3882
02:32:32,070 --> 02:32:17,160
short break stay with us

3883
02:32:35,670 --> 02:32:34,150
you're listening to jimmy church and

3884
02:32:40,710 --> 02:32:35,680
made to black

3885
02:32:45,910 --> 02:32:43,030
hey what up y'all biblical fox here and

3886
02:32:50,309 --> 02:32:45,920
you are listening to my boy jimmy church

3887
02:32:59,580 --> 02:32:52,870
despite popular opinion

3888
02:33:03,030 --> 02:33:00,870

[Applause]

3889

02:33:05,190 --> 02:33:03,040

this is billy carson founder and ceo of

3890

02:33:07,030 --> 02:33:05,200

forbidden knowledge.tv forbidden

3891

02:33:08,790 --> 02:33:07,040

knowledge dot tv is the fastest growing

3892

02:33:10,630 --> 02:33:08,800

and one of the most watched networks in

3893

02:33:12,230 --> 02:33:10,640

the world i would like to personally

3894

02:33:15,030 --> 02:33:12,240

invite you to check out our expanding

3895

02:33:17,110 --> 02:33:15,040

library of tv film lectures and special

3896

02:33:19,190 --> 02:33:17,120

presentations forbidden knowledge dot tv

3897

02:33:22,469 --> 02:33:19,200

has over 6 000 videos covering lost

3898

02:33:24,389 --> 02:33:22,479

history health ufos spirituality and our

3899

02:33:26,790 --> 02:33:24,399

future we are committed to our community

3900

02:33:28,870 --> 02:33:26,800

and with my personal invitation you can

3901

02:33:31,190 --> 02:33:28,880

right now get your free 30-day

3902

02:33:33,190 --> 02:33:31,200

membership at forbidden knowledge dot tv

3903

02:33:37,429 --> 02:33:33,200

your own library of information starts

3904

02:33:39,110 --> 02:33:37,439

today at forbidden knowledge dot tv

3905

02:33:41,990 --> 02:33:39,120

this is jimmy church of fade to black

3906

02:33:45,510 --> 02:33:42,000

and i take life change t supplements

3907

02:33:49,110 --> 02:33:45,520

every single day it's what i do click on

3908

02:33:50,870 --> 02:33:49,120

their banner at jimmychurchradio

3909

02:33:53,429 --> 02:33:50,880

are you ready to read about true

3910

02:33:56,230 --> 02:33:53,439

paranormal events onex media publishes

3911

02:33:58,630 --> 02:33:56,240

nonfiction books about ufos ghosts and

3912

02:34:01,910 --> 02:33:58,640

haunted places time anomalies cryptid

3913

02:34:04,070 --> 02:34:01,920

creatures and more just like kunx db

3914

02:34:07,070 --> 02:34:04,080

radio it's all about unexplained

3915

02:34:09,110 --> 02:34:07,080

phenomena visit

3916

02:34:11,270 --> 02:34:09,120

www.unxmedia.com to see our list of

3917

02:34:13,910 --> 02:34:11,280

great book titles by debbie zigglemeyer

3918

02:34:16,469 --> 02:34:13,920

gene walker devin listrom wayne lawrence

3919

02:34:21,510 --> 02:34:16,479

bill spicer and yours truly margie k

3920

02:34:26,309 --> 02:34:23,670

when you take the beans from central

3921

02:34:28,710 --> 02:34:26,319

america with dashes of indonesian and

3922

02:34:31,910 --> 02:34:28,720

african mixed in and then roasted to the

3923

02:34:34,389 --> 02:34:31,920

dark side of fade to black you create

3924

02:34:37,349 --> 02:34:34,399

the ultimate brew of fringe

3925

02:34:40,630 --> 02:34:37,359

introducing the fade to black blend from

3926

02:34:43,429 --> 02:34:40,640

river moon coffee yes river moon's

3927

02:34:46,230 --> 02:34:43,439

darkest customized roast was created for

3928

02:34:48,790 --> 02:34:46,240

the love of fade to black

3929

02:34:51,429 --> 02:34:48,800

the alchemy of masterful roasting and

3930

02:34:54,950 --> 02:34:51,439

smoking the beans is in every sip of

3931

02:34:56,389 --> 02:34:54,960

this full-bodied dark java i need my

3932

02:34:58,950 --> 02:34:56,399

coffee doc

3933

02:35:01,990 --> 02:34:58,960

deep with distinct bittersweet chocolate

3934

02:35:04,469 --> 02:35:02,000

highlights just like the bunker leaning

3935

02:35:07,110 --> 02:35:04,479

further into the darkness of the roast

3936

02:35:09,790 --> 02:35:07,120

is fade to black blend from river moon

3937

02:35:11,750 --> 02:35:09,800

coffee just click on the banner at

3938

02:35:15,510 --> 02:35:11,760

jimmychurchradio.com and use the promo

3939

02:35:18,469 --> 02:35:15,520

code f2b blend for 15 off of your order

3940

02:35:23,670 --> 02:35:20,389

this is billy carson with forbidden

3941

02:35:25,590 --> 02:35:23,680

knowledge dot tv forbidden knowledge tv

3942

02:35:26,389 --> 02:35:25,600

has just reached its one year

3943

02:35:29,190 --> 02:35:26,399

anniversary

3944

02:35:31,270 --> 02:35:29,200

that's right one year and as a show of

3945

02:35:33,830 --> 02:35:31,280

appreciation we are giving all new

3946

02:35:36,950 --> 02:35:33,840

subscribers a free 30-day trial of

3947

02:35:40,070 --> 02:35:36,960

forbidden knowledge dot tv that's 30

3948

02:35:42,630 --> 02:35:40,080

days to binge watch thousands of movies

3949

02:35:45,590 --> 02:35:42,640

documentaries conferences workshops

3950

02:35:48,230 --> 02:35:45,600

lectures yoga classes meditation courses

3951
02:35:50,550 --> 02:35:48,240
and so much more so log on to forbidden

3952
02:35:52,710 --> 02:35:50,560
knowledge dot tv from your computer or

3953
02:35:57,349 --> 02:35:52,720
mobile device or get the forbidden

3954
02:36:00,389 --> 02:35:57,359
knowledge tv app on apple tv roku amazon

3955
02:36:03,990 --> 02:36:00,399
itunes or google play today and use

3956
02:36:06,469 --> 02:36:04,000
coupon code 30 days free that's coupon

3957
02:36:09,710 --> 02:36:06,479
code 30 days free on forbidden knowledge

3958
02:36:12,790 --> 02:36:09,720
dot tv today

3959
02:36:14,950 --> 02:36:12,800
[Music]

3960
02:36:17,830 --> 02:36:14,960
are you intrigued by paranormal talk

3961
02:36:20,550 --> 02:36:17,840
radio you love the new paranormal radio

3962
02:36:22,309 --> 02:36:20,560
app from talk stream live

3963
02:36:25,110 --> 02:36:22,319

you'll find a great selection of talk

3964

02:36:27,750 --> 02:36:25,120

shows covering ufos ghosts strange

3965

02:36:29,990 --> 02:36:27,760

phenomena and much more download the

3966

02:36:32,070 --> 02:36:30,000

paranormal radio app now and start

3967

02:36:34,309 --> 02:36:32,080

listening to the very best in paranormal

3968

02:36:36,070 --> 02:36:34,319

talk entertainment including the network

3969

02:36:39,270 --> 02:36:36,080

you're listening to right now the

3970

02:36:48,830 --> 02:36:39,280

paranormal radio app free in google play

3971

02:36:56,710 --> 02:36:52,630

store it's not a lifestyle we chose we

3972

02:37:00,540 --> 02:36:56,720

were born this way this is kjccr

3973

02:37:00,550 --> 02:37:11,750

[Music]

3974

02:37:15,830 --> 02:37:13,510

all right welcome back fade to black i'm

3975

02:37:18,710 --> 02:37:15,840

yours jimmy church

3976

02:37:20,070 --> 02:37:18,720

science and futurism with isaac arthur

3977

02:37:21,429 --> 02:37:20,080

on youtube you've got to go and check

3978

02:37:24,389 --> 02:37:21,439

that out

3979

02:37:25,990 --> 02:37:24,399

we're heading into overtime and we've

3980

02:37:29,270 --> 02:37:26,000

got everything checked off the list

3981

02:37:32,469 --> 02:37:29,280

tonight except for et isaac now i'm

3982

02:37:33,510 --> 02:37:32,479

gonna i want to discuss dna

3983

02:37:36,230 --> 02:37:33,520

uh

3984

02:37:38,230 --> 02:37:36,240

chemistry is chemistry the

3985

02:37:39,830 --> 02:37:38,240

right it's got to be the same chemistry

3986

02:37:41,910 --> 02:37:39,840

in all parts of the universe maybe

3987

02:37:44,150 --> 02:37:41,920

there's elements out there we haven't

3988

02:37:47,190 --> 02:37:44,160

discovered yet but nonetheless

3989

02:37:49,990 --> 02:37:47,200

uh the basics are the basics

3990

02:37:52,950 --> 02:37:50,000

which would suggest to me

3991

02:37:54,469 --> 02:37:52,960

that life is universal and

3992

02:37:58,870 --> 02:37:54,479

dna

3993

02:38:02,630 --> 02:38:01,830

is is is that what we should consider

3994

02:38:05,030 --> 02:38:02,640

here

3995

02:38:06,790 --> 02:38:05,040

is dna this is is dna the same

3996

02:38:09,190 --> 02:38:06,800

everywhere

3997

02:38:10,550 --> 02:38:09,200

well probably not in terms of like what

3998

02:38:12,469 --> 02:38:10,560

we think of it as being the code that

3999

02:38:14,790 --> 02:38:12,479

things keep their life on you know we've

4000

02:38:16,150 --> 02:38:14,800

got rna here and we've we've just it

4001

02:38:18,469 --> 02:38:16,160

might be una

4002

02:38:19,990 --> 02:38:18,479

you've got four amino acids out of the

4003

02:38:21,670 --> 02:38:20,000

20 that we use in our body we use what

4004

02:38:23,270 --> 02:38:21,680

20 in our body four of them are the ones

4005

02:38:25,670 --> 02:38:23,280

we use for dna

4006

02:38:27,030 --> 02:38:25,680

um now and you know another fifth is the

4007

02:38:29,510 --> 02:38:27,040

one for rna

4008

02:38:31,830 --> 02:38:29,520

uh even assuming that life was being

4009

02:38:34,070 --> 02:38:31,840

built on amino acids there are another

4010

02:38:36,630 --> 02:38:34,080

five six hundred identified amino acids

4011

02:38:38,230 --> 02:38:36,640

last i checked and probably some of

4012

02:38:41,110 --> 02:38:38,240

those could be used as part of that core

4013

02:38:42,870 --> 02:38:41,120

20 that life uses and probably some of

4014

02:38:45,270 --> 02:38:42,880

them could be used in the same for the

4015

02:38:48,309 --> 02:38:45,280

dna is so we don't want to be assuming

4016

02:38:50,710 --> 02:38:48,319

those are are the ones everything uses

4017

02:38:51,910 --> 02:38:50,720

even inside the life idea of amino acid

4018

02:38:53,990 --> 02:38:51,920

based life

4019

02:38:55,349 --> 02:38:54,000

um and

4020

02:38:57,349 --> 02:38:55,359

i would say it's probably gonna be a lot

4021

02:38:59,830 --> 02:38:57,359

like the humanoid shape the forms four

4022

02:39:01,590 --> 02:38:59,840

legs it's not gonna be that surprising

4023

02:39:03,110 --> 02:39:01,600

to find things built on amino acids but

4024

02:39:04,309 --> 02:39:03,120

it's probably not gonna be the exclusive

4025

02:39:06,710 --> 02:39:04,319

realm of that

4026

02:39:09,429 --> 02:39:06,720

i i would be surprised if we found that

4027

02:39:11,910 --> 02:39:09,439

dna was the norm i would not be

4028

02:39:14,469 --> 02:39:11,920

surprised we found that it was common

4029

02:39:16,309 --> 02:39:14,479

so the construction of dna the double

4030

02:39:19,349 --> 02:39:16,319

helix yeah

4031

02:39:22,790 --> 02:39:19,359

would be similar

4032

02:39:25,990 --> 02:39:22,800

the amino acids the four that we use

4033

02:39:27,190 --> 02:39:26,000

may not be the same four amino acids

4034

02:39:28,870 --> 02:39:27,200

elsewhere

4035

02:39:30,389 --> 02:39:28,880

yeah okay

4036

02:39:32,150 --> 02:39:30,399

there might be different amino acids it

4037

02:39:34,230 --> 02:39:32,160

might be some overlapping ones you know

4038

02:39:36,389 --> 02:39:34,240

it's really two pairs of two when it

4039

02:39:37,750 --> 02:39:36,399

comes those those four there there's

4040

02:39:39,910 --> 02:39:37,760

there are pairs that work together and

4041

02:39:43,190 --> 02:39:39,920

you got two pairs

4042

02:39:46,630 --> 02:39:43,200

and here on planet earth

4043

02:39:49,910 --> 02:39:46,640

and again i'm not a scientist but those

4044

02:39:52,630 --> 02:39:49,920

same four amino acids and dna

4045

02:39:54,710 --> 02:39:52,640

are the same for all life on earth right

4046

02:39:57,510 --> 02:39:54,720

bananas humans

4047

02:39:59,429 --> 02:39:57,520

yep right everything use them and you

4048

02:40:01,030 --> 02:39:59,439

get that basic system you stick with it

4049

02:40:02,550 --> 02:40:01,040

uh and you know everything being

4050

02:40:05,030 --> 02:40:02,560

descended from that same source but we

4051

02:40:06,870 --> 02:40:05,040

have to remember again there's rna rna i

4052

02:40:08,950 --> 02:40:06,880

can't remember why i cannot think of the

4053

02:40:11,190 --> 02:40:08,960

other one that uses right now but uh

4054

02:40:12,950 --> 02:40:11,200

toulouse

4055

02:40:14,550 --> 02:40:12,960

i'm very bad at pronouncing names all

4056

02:40:16,309 --> 02:40:14,560

things chemical but there's that fifth

4057

02:40:18,389 --> 02:40:16,319

amino acid that's used in rna in the

4058

02:40:21,110 --> 02:40:18,399

place of the t and the u interchangeable

4059

02:40:22,150 --> 02:40:21,120

there that's right right there's a u for

4060

02:40:23,030 --> 02:40:22,160

rna

4061

02:40:24,950 --> 02:40:23,040

um

4062

02:40:26,790 --> 02:40:24,960

and so maybe there's some different ones

4063

02:40:28,630 --> 02:40:26,800

that they'll pair up again i wouldn't

4064

02:40:30,230 --> 02:40:28,640

expect to be uncommon but here on we

4065

02:40:31,349 --> 02:40:30,240

can't even be sure that on earth we

4066

02:40:34,710 --> 02:40:31,359

haven't seen something inside so if

4067

02:40:37,190 --> 02:40:34,720

you've got rna and dna maybe there was a

4068

02:40:38,630 --> 02:40:37,200

a gna at some point in time too you know

4069

02:40:40,790 --> 02:40:38,640

there might have been something that was

4070

02:40:42,469 --> 02:40:40,800

kicking around for billions of years

4071

02:40:44,070 --> 02:40:42,479

even on this planet but probably you

4072

02:40:45,510 --> 02:40:44,080

know just a short period of time that

4073

02:40:46,950 --> 02:40:45,520

that just died and doesn't show up in

4074

02:40:49,990 --> 02:40:46,960

the fossil record because it never

4075

02:40:51,910 --> 02:40:50,000

really expanded yeah rna fascinates me

4076

02:40:54,870 --> 02:40:51,920

just as much as dna

4077

02:40:56,950 --> 02:40:54,880

in that rna and how nature has worked

4078

02:40:57,830 --> 02:40:56,960

this out that's why i keep thinking that

4079

02:41:00,469 --> 02:40:57,840

there's

4080

02:41:03,030 --> 02:41:00,479

something other intelligence uh involved

4081

02:41:05,269 --> 02:41:03,040

in this process because rna is used for

4082

02:41:07,190 --> 02:41:05,279

the transfer of information

4083

02:41:10,150 --> 02:41:07,200

that's crazy to me how nature has

4084

02:41:11,590 --> 02:41:10,160

figured that out all on its own

4085

02:41:13,670 --> 02:41:11,600

it's you know and again i always see the

4086

02:41:15,110 --> 02:41:13,680

big check mark on that one too because

4087

02:41:16,389 --> 02:41:15,120

when you approach this from the science

4088

02:41:17,750 --> 02:41:16,399

angle you're supposed to begin by

4089

02:41:20,550 --> 02:41:17,760

assumption you're studying natural

4090

02:41:22,309 --> 02:41:20,560

phenomena so your answer one should be

4091

02:41:24,309 --> 02:41:22,319

that it doesn't necessarily have to be

4092

02:41:26,070 --> 02:41:24,319

natural but we'll aiming to get that

4093

02:41:27,349 --> 02:41:26,080

that's our assumption as we go through

4094

02:41:29,110 --> 02:41:27,359

we're gonna be living in a simulation

4095

02:41:30,630 --> 02:41:29,120

this world could be seeded by alien life

4096

02:41:32,070 --> 02:41:30,640

forms this could be a different

4097

02:41:33,429 --> 02:41:32,080

iteration of a plan there's a lot of

4098

02:41:35,590 --> 02:41:33,439

these options

4099

02:41:37,190 --> 02:41:35,600

dismissed right but from the science

4100

02:41:38,870 --> 02:41:37,200

standpoint you have to

4101
02:41:41,110 --> 02:41:38,880
work under the basic assumption that

4102
02:41:43,269 --> 02:41:41,120
either the mediocrity principle is true

4103
02:41:45,110 --> 02:41:43,279
or the anthropic principle is true and

4104
02:41:47,110 --> 02:41:45,120
that being the case you're looking at

4105
02:41:48,309 --> 02:41:47,120
and say these natural events are

4106
02:41:49,750 --> 02:41:48,319
probably natural if i don't know what

4107
02:41:51,830 --> 02:41:49,760
they are if they're natural until i

4108
02:41:54,070 --> 02:41:51,840
prove otherwise so no we don't know for

4109
02:41:56,070 --> 02:41:54,080
sure that there wasn't other types of

4110
02:41:57,830 --> 02:41:56,080
you know that that dna worked entirely

4111
02:41:59,429 --> 02:41:57,840
on its own is a purely natural process

4112
02:42:02,230 --> 02:41:59,439
so that's what's used on other planets

4113
02:42:05,910 --> 02:42:02,240

or there's still so many question marks

4114

02:42:07,590 --> 02:42:05,920

on things like that now uh tardigrades

4115

02:42:09,429 --> 02:42:07,600

same dna as us

4116

02:42:12,309 --> 02:42:09,439

yeah they're freaks too are they yeah

4117

02:42:15,190 --> 02:42:12,319

total total freaks that survive in the

4118

02:42:19,030 --> 02:42:15,200

vacuum of space and and apparently they

4119

02:42:20,790 --> 02:42:19,040

love radiation too as well right

4120

02:42:24,389 --> 02:42:20,800

i mean

4121

02:42:25,910 --> 02:42:24,399

mind-blowing oh so many freaky

4122

02:42:27,670 --> 02:42:25,920

unbelievable life forms that we

4123

02:42:29,910 --> 02:42:27,680

discovered you know i was saying earlier

4124

02:42:31,510 --> 02:42:29,920

that like reading astronomy books that

4125

02:42:33,990 --> 02:42:31,520

were on the library show for the kids

4126
02:42:35,190 --> 02:42:34,000
section between like the 1950s and 80s

4127
02:42:37,830 --> 02:42:35,200
all mixed together and they're just the

4128
02:42:40,150 --> 02:42:37,840
sheer change in that 30-year window and

4129
02:42:41,990 --> 02:42:40,160
it's it's just as bad with extreme files

4130
02:42:43,750 --> 02:42:42,000
and life forms on earth there's stuff

4131
02:42:45,990 --> 02:42:43,760
that you would read from very

4132
02:42:47,830 --> 02:42:46,000
proper exports who were sincere and

4133
02:42:49,910 --> 02:42:47,840
genuine and hard-working scientists who

4134
02:42:51,429 --> 02:42:49,920
would say something like that is just

4135
02:42:53,110 --> 02:42:51,439
impossible

4136
02:42:55,349 --> 02:42:53,120
and then it just comes right by and

4137
02:42:57,030 --> 02:42:55,359
there you go right there it was all

4138
02:42:58,230 --> 02:42:57,040

freaky little thing living in lava or

4139

02:43:00,070 --> 02:42:58,240

something

4140

02:43:02,469 --> 02:43:00,080

right right right and tardigrades are

4141

02:43:06,630 --> 02:43:02,479

cute too in a weird way

4142

02:43:09,590 --> 02:43:06,640

right those are the real as crazy as the

4143

02:43:10,710 --> 02:43:09,600

the most uh insane thing that you could

4144

02:43:12,630 --> 02:43:10,720

think up

4145

02:43:16,790 --> 02:43:12,640

would be the tardigrade

4146

02:43:18,309 --> 02:43:16,800

right and they're real now okay

4147

02:43:21,429 --> 02:43:18,319

panspermia

4148

02:43:25,349 --> 02:43:21,439

and this concept

4149

02:43:28,389 --> 02:43:25,359

as as far-fetched as it probably sounded

4150

02:43:29,750 --> 02:43:28,399

when it was first suggested in the 70s

4151
02:43:31,590 --> 02:43:29,760
um

4152
02:43:33,030 --> 02:43:31,600
meteorites

4153
02:43:35,349 --> 02:43:33,040
have

4154
02:43:37,269 --> 02:43:35,359
crashed to earth

4155
02:43:38,870 --> 02:43:37,279
with

4156
02:43:41,910 --> 02:43:38,880
basic sugars

4157
02:43:42,710 --> 02:43:41,920
that make up rna

4158
02:43:44,469 --> 02:43:42,720
now

4159
02:43:46,630 --> 02:43:44,479
nebula's made out of those basic sugars

4160
02:43:47,590 --> 02:43:46,640
too right right right

4161
02:43:50,389 --> 02:43:47,600
so

4162
02:43:53,590 --> 02:43:50,399
this doesn't really get to be as

4163
02:43:55,590 --> 02:43:53,600

far-fetched and as crazy as as it sounds

4164

02:43:57,030 --> 02:43:55,600

does it it's it's my preferred number

4165

02:43:59,110 --> 02:43:57,040

three although i guess it has to be my

4166

02:44:00,870 --> 02:43:59,120

number four now is it does lifestyle

4167

02:44:02,150 --> 02:44:00,880

around thermal events in deep sea or did

4168

02:44:04,150 --> 02:44:02,160

it start in the title pause or did it

4169

02:44:05,349 --> 02:44:04,160

start in panspermia i guess now what

4170

02:44:07,830 --> 02:44:05,359

they're looking at is to start

4171

02:44:08,790 --> 02:44:07,840

underground in the sofa soil instead and

4172

02:44:11,190 --> 02:44:08,800

that's supposed to be another big

4173

02:44:13,670 --> 02:44:11,200

contender but panspermia is my

4174

02:44:16,389 --> 02:44:13,680

outside chance dark horse but very valid

4175

02:44:19,429 --> 02:44:16,399

canada yeah adult absolutely possible

4176

02:44:22,710 --> 02:44:19,439

and so now if you

4177

02:44:24,950 --> 02:44:22,720

uh staying on this is so funny uh during

4178

02:44:28,230 --> 02:44:24,960

the break i hit isaac i said it's going

4179

02:44:29,269 --> 02:44:28,240

to be dna man we're going alien dna

4180

02:44:30,630 --> 02:44:29,279

um

4181

02:44:33,830 --> 02:44:30,640

uh

4182

02:44:36,230 --> 02:44:33,840

i i read so much about this and i study

4183

02:44:37,750 --> 02:44:36,240

so much about human dna

4184

02:44:38,710 --> 02:44:37,760

uh but uh

4185

02:44:44,710 --> 02:44:38,720

the

4186

02:44:47,510 --> 02:44:44,720

only combine so many different ways it's

4187

02:44:49,510 --> 02:44:47,520

not an infinite amount of combinations

4188

02:44:50,790 --> 02:44:49,520

and but it's a very big number it's a

4189

02:44:52,870 --> 02:44:50,800

big number

4190

02:44:55,670 --> 02:44:52,880

but it's a big universe

4191

02:44:58,230 --> 02:44:55,680

and so the possibility the random

4192

02:45:01,590 --> 02:44:58,240

combinations of things

4193

02:45:03,510 --> 02:45:01,600

has to eventually just repeat almost to

4194

02:45:06,550 --> 02:45:03,520

an infinite amount

4195

02:45:07,910 --> 02:45:06,560

so if we take a look at that if you were

4196

02:45:11,590 --> 02:45:07,920

going to

4197

02:45:13,269 --> 02:45:11,600

uh have a concept of what an alien race

4198

02:45:15,349 --> 02:45:13,279

basically

4199

02:45:18,230 --> 02:45:15,359

would look like

4200

02:45:19,830 --> 02:45:18,240

what do you suggest eight legs

4201

02:45:21,910 --> 02:45:19,840

mushrooms

4202

02:45:24,230 --> 02:45:21,920

flying dinosaurs

4203

02:45:27,990 --> 02:45:24,240

humans you know what what what what is

4204

02:45:31,429 --> 02:45:28,000

an alien to isaac arthur

4205

02:45:33,830 --> 02:45:31,439

a wonderful topic for an episode

4206

02:45:36,389 --> 02:45:33,840

right you know i i i grew up on star

4207

02:45:38,790 --> 02:45:36,399

trek and flash gordon and doctor who to

4208

02:45:40,710 --> 02:45:38,800

me when i mostly picture a typical alien

4209

02:45:43,429 --> 02:45:40,720

i picture either human with some very

4210

02:45:44,469 --> 02:45:43,439

nice prosthetic makeup on or some silly

4211

02:45:46,230 --> 02:45:44,479

creature that looks like something out

4212

02:45:48,389 --> 02:45:46,240

of turn foil and garbage that they threw

4213

02:45:50,309 --> 02:45:48,399

together on the sound set behind on a

4214

02:45:51,590 --> 02:45:50,319

cheap budget you know when it comes to

4215

02:45:53,830 --> 02:45:51,600

what's going to work for an alien

4216

02:45:55,349 --> 02:45:53,840

mechanically anything we see on earth

4217

02:45:56,389 --> 02:45:55,359

has to be considered realistic and we

4218

02:45:58,950 --> 02:45:56,399

got stuff with

4219

02:46:00,070 --> 02:45:58,960

eight legs six legs you know four legs

4220

02:46:01,590 --> 02:46:00,080

and wings

4221

02:46:04,790 --> 02:46:01,600

i don't know how many legs a centipede

4222

02:46:06,070 --> 02:46:04,800

actually has but many uh

4223

02:46:08,710 --> 02:46:06,080

you've got things that don't have

4224

02:46:10,630 --> 02:46:08,720

bilateral symmetry like starfishes you

4225

02:46:12,630 --> 02:46:10,640

know you want an example of alien life

4226
02:46:14,309 --> 02:46:12,640
just look at how deep seas and that's

4227
02:46:17,510 --> 02:46:14,319
keep your mind that those things are

4228
02:46:18,870 --> 02:46:17,520
still probably related to us you know

4229
02:46:21,030 --> 02:46:18,880
jellyfish

4230
02:46:22,710 --> 02:46:21,040
are as alien as you're gonna find on

4231
02:46:25,670 --> 02:46:22,720
this planet so a starfish at the

4232
02:46:27,269 --> 02:46:25,680
macroscopic scale and they are alien you

4233
02:46:29,190 --> 02:46:27,279
got creatures that have donut shaped

4234
02:46:31,030 --> 02:46:29,200
brains that have their brains extended

4235
02:46:32,790 --> 02:46:31,040
out throughout their entire body you

4236
02:46:34,389 --> 02:46:32,800
know that don't have a mouth that don't

4237
02:46:35,830 --> 02:46:34,399
you know bees insects they don't even

4238
02:46:38,550 --> 02:46:35,840

have blood they have hemoglobin

4239

02:46:40,870 --> 02:46:38,560

equivalents instead no lungs

4240

02:46:42,309 --> 02:46:40,880

there are so many weird combinations

4241

02:46:44,150 --> 02:46:42,319

that we get for life

4242

02:46:45,429 --> 02:46:44,160

just on this planet

4243

02:46:47,750 --> 02:46:45,439

that when it comes to what that could be

4244

02:46:50,230 --> 02:46:47,760

put together under an alien sun

4245

02:46:51,990 --> 02:46:50,240

who knows you know

4246

02:46:53,670 --> 02:46:52,000

what differences are there in a planet

4247

02:46:55,429 --> 02:46:53,680

where the gravity is just low enough but

4248

02:46:57,269 --> 02:46:55,439

the atmosphere is thick enough that they

4249

02:46:59,349 --> 02:46:57,279

can get away with sucking in helium from

4250

02:47:01,510 --> 02:46:59,359

the native atmosphere to float around

4251
02:47:03,190 --> 02:47:01,520
now the big gray black you know gas

4252
02:47:05,349 --> 02:47:03,200
blimp creatures that float around the

4253
02:47:07,030 --> 02:47:05,359
surface you could have all sorts of

4254
02:47:08,150 --> 02:47:07,040
weird stuff that goes on those things

4255
02:47:09,750 --> 02:47:08,160
and

4256
02:47:10,870 --> 02:47:09,760
like

4257
02:47:12,309 --> 02:47:10,880
just

4258
02:47:14,630 --> 02:47:12,319
amazing to contemplate some of the

4259
02:47:17,349 --> 02:47:14,640
weirder options but it's it's almost

4260
02:47:19,269 --> 02:47:17,359
exercise and futility because i am

4261
02:47:20,790 --> 02:47:19,279
certain that we do find alien life and i

4262
02:47:22,550 --> 02:47:20,800
i'm not a big fan of the idea that

4263
02:47:24,230 --> 02:47:22,560

they've come to reach us but i do tend

4264

02:47:26,150 --> 02:47:24,240

to think we're going to find it all over

4265

02:47:27,429 --> 02:47:26,160

the place in the galaxy and i think that

4266

02:47:29,590 --> 02:47:27,439

if we find it

4267

02:47:31,269 --> 02:47:29,600

if it's not just basic microorganisms if

4268

02:47:33,510 --> 02:47:31,279

we actually define animal life and

4269

02:47:35,190 --> 02:47:33,520

equivalent it's going to be so much

4270

02:47:37,429 --> 02:47:35,200

weirder than we'd expect it's you know

4271

02:47:40,230 --> 02:47:37,439

reality is always stranger than fiction

4272

02:47:46,070 --> 02:47:42,230

and you can stop me at any point and

4273

02:47:49,750 --> 02:47:46,080

just call me crazy but an octopus

4274

02:47:50,550 --> 02:47:49,760

or a jellyfish right that that's life no

4275

02:47:53,190 --> 02:47:50,560

doubt

4276
02:47:57,830 --> 02:47:53,200
but they're not going to they don't have

4277
02:48:00,630 --> 02:47:57,840
fire they live in water so without fire

4278
02:48:03,910 --> 02:48:00,640
you're not going to progress into an

4279
02:48:05,349 --> 02:48:03,920
industrial age i could be wrong in that

4280
02:48:07,670 --> 02:48:05,359
thought process

4281
02:48:11,269 --> 02:48:07,680
but i don't see

4282
02:48:12,550 --> 02:48:11,279
uh octopuses uh developing interstellar

4283
02:48:14,550 --> 02:48:12,560
craft

4284
02:48:16,870 --> 02:48:14,560
so i mean i have a whole episode just on

4285
02:48:18,389 --> 02:48:16,880
how very nearly impossible that would be

4286
02:48:20,710 --> 02:48:18,399
right okay

4287
02:48:22,150 --> 02:48:20,720
the answer is very nearly impossible you

4288
02:48:24,389 --> 02:48:22,160

can put together some pathways where

4289

02:48:26,309 --> 02:48:24,399

they might be able to do it but it's so

4290

02:48:29,190 --> 02:48:26,319

iffy you gotta remember we had fire for

4291

02:48:30,550 --> 02:48:29,200

a million years before we got around to

4292

02:48:33,030 --> 02:48:30,560

actually inventing pottery or metal

4293

02:48:34,550 --> 02:48:33,040

walking right so you know you're using

4294

02:48:37,429 --> 02:48:34,560

this for this basic purpose of food

4295

02:48:39,510 --> 02:48:37,439

cooking and uh you know warming yourself

4296

02:48:41,190 --> 02:48:39,520

right right uh and you're already in the

4297

02:48:42,550 --> 02:48:41,200

adverse environment people

4298

02:48:44,710 --> 02:48:42,560

generation after generation after

4299

02:48:46,870 --> 02:48:44,720

generation was sitting around the fire

4300

02:48:48,309 --> 02:48:46,880

which you couldn't do in an ocean before

4301

02:48:49,990 --> 02:48:48,319

someone said hey

4302

02:48:51,670 --> 02:48:50,000

maybe we could melt murder with this and

4303

02:48:52,870 --> 02:48:51,680

then make some pottery

4304

02:48:55,190 --> 02:48:52,880

and

4305

02:48:57,349 --> 02:48:55,200

that's a big jump i know how they just

4306

02:48:59,590 --> 02:48:57,359

keep being smarter and smarter as you

4307

02:49:01,830 --> 02:48:59,600

know evolution if if intelligence is

4308

02:49:03,190 --> 02:49:01,840

something that evolution aims for um if

4309

02:49:04,950 --> 02:49:03,200

they just keep being smaller and smaller

4310

02:49:07,110 --> 02:49:04,960

to the point that their their average

4311

02:49:09,670 --> 02:49:07,120

citizen is smaller than einstein they

4312

02:49:11,110 --> 02:49:09,680

might one day go from oh you know we've

4313

02:49:13,110 --> 02:49:11,120

been a civilization for millions of

4314

02:49:15,110 --> 02:49:13,120

years now and it just occurred to us we

4315

02:49:16,389 --> 02:49:15,120

can do technology

4316

02:49:17,990 --> 02:49:16,399

and now we've invented it like that

4317

02:49:19,830 --> 02:49:18,000

because we're all geniuses our bridges

4318

02:49:22,230 --> 02:49:19,840

kept getting bigger and bigger so our

4319

02:49:24,710 --> 02:49:22,240

giant you know squid brains that wander

4320

02:49:26,710 --> 02:49:24,720

out and we go from we've never used fire

4321

02:49:28,790 --> 02:49:26,720

before too how to make an atomic pile or

4322

02:49:31,110 --> 02:49:28,800

that quickly

4323

02:49:33,429 --> 02:49:31,120

it's hard to say but without fire really

4324

02:49:35,429 --> 02:49:33,439

hard to do yeah really hard to do not

4325

02:49:37,349 --> 02:49:35,439

popular wars because think about it if

4326

02:49:39,190 --> 02:49:37,359

the ward's a little less massive

4327

02:49:41,110 --> 02:49:39,200

it's hard to keep an atmosphere if it's

4328

02:49:43,510 --> 02:49:41,120

a little bit more massive it's hard to

4329

02:49:45,830 --> 02:49:43,520

keep land you know because you could you

4330

02:49:48,309 --> 02:49:45,840

retain your hydrogen better that's

4331

02:49:50,389 --> 02:49:48,319

what's what we lose and hydrogen water

4332

02:49:52,469 --> 02:49:50,399

add up to oceans right there's plenty of

4333

02:49:54,070 --> 02:49:52,479

hydrogen you got plenty of water your

4334

02:49:55,429 --> 02:49:54,080

oceans get deeper they're on three

4335

02:49:57,429 --> 02:49:55,439

kilometers deep on average on this

4336

02:50:00,630 --> 02:49:57,439

planet it doesn't take that much more

4337

02:50:02,950 --> 02:50:00,640

water to make the whole planet submerged

4338

02:50:04,309 --> 02:50:02,960

more water more erosion bigger planet

4339

02:50:06,150 --> 02:50:04,319

more spin

4340

02:50:07,510 --> 02:50:06,160

it just wears the land out and there's

4341

02:50:08,790 --> 02:50:07,520

no place to start a file because there's

4342

02:50:10,630 --> 02:50:08,800

no land

4343

02:50:13,590 --> 02:50:10,640

and so

4344

02:50:15,269 --> 02:50:13,600

you would have to have land get out of

4345

02:50:17,269 --> 02:50:15,279

the water

4346

02:50:20,389 --> 02:50:17,279

to develop into

4347

02:50:22,790 --> 02:50:20,399

an industrial situation right okay so

4348

02:50:25,110 --> 02:50:22,800

yeah in that case

4349

02:50:27,510 --> 02:50:25,120

is the best design what do you picture

4350

02:50:30,550 --> 02:50:27,520

bipedal does it have to have two arms

4351
02:50:33,269 --> 02:50:30,560
and two legs and an opposing thumbs

4352
02:50:35,750 --> 02:50:33,279
cheapest design i mean there's some very

4353
02:50:37,429 --> 02:50:35,760
clear advantages to having extra legs

4354
02:50:38,790 --> 02:50:37,439
but those already exist like the insects

4355
02:50:41,110 --> 02:50:38,800
that got all those those are older than

4356
02:50:42,950 --> 02:50:41,120
us so you know the shorter design on

4357
02:50:45,190 --> 02:50:42,960
that cheaper if you want to put big

4358
02:50:46,630 --> 02:50:45,200
muscles and skeletons on

4359
02:50:48,630 --> 02:50:46,640
easier do that you know from an

4360
02:50:51,510 --> 02:50:48,640
evolutionary standpoint you want to live

4361
02:50:53,429 --> 02:50:51,520
on on land you need great big strong

4362
02:50:55,590 --> 02:50:53,439
hips and shoulders you got to have that

4363
02:50:57,110 --> 02:50:55,600

powerful skeleton inside you that's not

4364

02:50:59,269 --> 02:50:57,120

going to get crushed by your own weight

4365

02:51:01,590 --> 02:50:59,279

that's a lot easier to develop

4366

02:51:03,110 --> 02:51:01,600

uh if one thing insects don't have that

4367

02:51:05,190 --> 02:51:03,120

to begin with but you know that bigger

4368

02:51:08,469 --> 02:51:05,200

one easier if you only got four limbs so

4369

02:51:10,469 --> 02:51:08,479

yes i think that the four limb approach

4370

02:51:12,790 --> 02:51:10,479

is probably more common don't know about

4371

02:51:14,550 --> 02:51:12,800

bipedal that was a little iffy but i

4372

02:51:15,910 --> 02:51:14,560

don't say that's gonna be so dominant

4373

02:51:17,590 --> 02:51:15,920

that you wouldn't expect uh right across

4374

02:51:20,150 --> 02:51:17,600

a centaur on some planet you know it's

4375

02:51:21,990 --> 02:51:20,160

got four legs and two homes

4376

02:51:23,590 --> 02:51:22,000

right right right right right right

4377

02:51:26,790 --> 02:51:23,600

right okay

4378

02:51:28,389 --> 02:51:26,800

so now let's take it to the next step

4379

02:51:31,429 --> 02:51:28,399

gravity

4380

02:51:33,510 --> 02:51:31,439

because i and again

4381

02:51:35,190 --> 02:51:33,520

i always have to interject i'm not a

4382

02:51:37,030 --> 02:51:35,200

scientist all right i'm not an

4383

02:51:38,070 --> 02:51:37,040

anthropologist

4384

02:51:40,070 --> 02:51:38,080

but

4385

02:51:41,830 --> 02:51:40,080

more gravity

4386

02:51:45,110 --> 02:51:41,840

shorter

4387

02:51:47,670 --> 02:51:45,120

right less gravity taller

4388

02:51:50,150 --> 02:51:47,680

is that a concept that would

4389

02:51:52,309 --> 02:51:50,160

right and we are six feet tall because

4390

02:51:54,630 --> 02:51:52,319

of our gravity if we had less gravity

4391

02:51:56,950 --> 02:51:54,640

would we be ten feet tall

4392

02:51:59,030 --> 02:51:56,960

dinosaurs were a lot taller than us so a

4393

02:52:00,469 --> 02:51:59,040

mammoth so you need thicker bones to be

4394

02:52:01,349 --> 02:52:00,479

taller you know or they need to get

4395

02:52:03,590 --> 02:52:01,359

hollow

4396

02:52:05,429 --> 02:52:03,600

uh the bigger you want to be the the

4397

02:52:07,030 --> 02:52:05,439

more bone you have to pay for and that

4398

02:52:09,030 --> 02:52:07,040

bone gets expensive to drag around

4399

02:52:11,190 --> 02:52:09,040

everywhere right which means more muscle

4400

02:52:13,590 --> 02:52:11,200

more food to do it the more high the

4401
02:52:16,309 --> 02:52:13,600
gravity is on the planet the more like

4402
02:52:18,469 --> 02:52:16,319
you know more mobile land life animal

4403
02:52:19,510 --> 02:52:18,479
life has to pay extra costs to move

4404
02:52:21,190 --> 02:52:19,520
around

4405
02:52:23,750 --> 02:52:21,200
but it might not really make that much

4406
02:52:25,429 --> 02:52:23,760
of a difference you know i don't think

4407
02:52:27,349 --> 02:52:25,439
because there's a really narrow range of

4408
02:52:28,630 --> 02:52:27,359
actual surface gravity anyway i think

4409
02:52:30,389 --> 02:52:28,640
folks think we come across some kind of

4410
02:52:32,950 --> 02:52:30,399
terrestrial planet where the gravity was

4411
02:52:34,309 --> 02:52:32,960
twice as high now you know to get to

4412
02:52:35,830 --> 02:52:34,319
that with again they have a kind of

4413
02:52:38,070 --> 02:52:35,840

composition like our planet means it's

4414

02:52:40,070 --> 02:52:38,080

eight times as massive as our planet is

4415

02:52:41,910 --> 02:52:40,080

twice as wide right it's hard to get

4416

02:52:44,309 --> 02:52:41,920

that higher surface area you usually be

4417

02:52:46,469 --> 02:52:44,319

talking 25 percent higher would be like

4418

02:52:48,070 --> 02:52:46,479

the high end at which point i i'd be

4419

02:52:49,590 --> 02:52:48,080

very shocked that any land to come out

4420

02:52:50,550 --> 02:52:49,600

on top of required the big bone

4421

02:52:53,429 --> 02:52:50,560

structure

4422

02:52:54,630 --> 02:52:53,439

and 25 higher gravity is that gonna make

4423

02:52:57,830 --> 02:52:54,640

shorter people

4424

02:53:00,230 --> 02:52:57,840

i mean they'll make more muscular ones

4425

02:53:01,990 --> 02:53:00,240

they're gonna be more slabby you know

4426

02:53:03,590 --> 02:53:02,000

they gotta be beefed up

4427

02:53:04,870 --> 02:53:03,600

but uh i don't know that they're

4428

02:53:06,550 --> 02:53:04,880

necessarily be

4429

02:53:08,870 --> 02:53:06,560

skinnier or unfrailer on other plants

4430

02:53:10,710 --> 02:53:08,880

than lighter gravity either but yeah and

4431

02:53:12,710 --> 02:53:10,720

the basic trope from sci-fi about you

4432

02:53:15,190 --> 02:53:12,720

know higher gravity shorter more

4433

02:53:17,670 --> 02:53:15,200

muscular lower gravity tall and skinny

4434

02:53:19,190 --> 02:53:17,680

that's decently plausible but i think

4435

02:53:20,389 --> 02:53:19,200

it's exaggerated what the effect would

4436

02:53:21,670 --> 02:53:20,399

really be

4437

02:53:24,550 --> 02:53:21,680

so

4438

02:53:27,590 --> 02:53:24,560

if uh et shows up

4439

02:53:30,070 --> 02:53:27,600

and you and i uh

4440

02:53:32,150 --> 02:53:30,080

get beamed up in a blue beam

4441

02:53:35,269 --> 02:53:32,160

right and we go and visit them

4442

02:53:38,790 --> 02:53:35,279

it you would expect

4443

02:53:41,910 --> 02:53:38,800

six foot tall average build right there

4444

02:53:43,429 --> 02:53:41,920

wouldn't be extremes is what i'm saying

4445

02:53:45,429 --> 02:53:43,439

i don't think we'd expect to see an

4446

02:53:47,830 --> 02:53:45,439

intelligent life form that was

4447

02:53:50,230 --> 02:53:47,840

biological and origin i mean like all

4448

02:53:52,710 --> 02:53:50,240

biology all chemistry that was

4449

02:53:54,150 --> 02:53:52,720

significantly smaller than a human

4450

02:53:55,990 --> 02:53:54,160

they might be half a height mind you

4451
02:53:57,110 --> 02:53:56,000
just you know significantly smaller you

4452
02:53:59,269 --> 02:53:57,120
start talking about an intelligent

4453
02:54:00,710 --> 02:53:59,279
creature that's the size of a mouse

4454
02:54:02,230 --> 02:54:00,720
they're using something else for their

4455
02:54:03,670 --> 02:54:02,240
brain at that point in time which is

4456
02:54:04,870 --> 02:54:03,680
possible we don't necessarily know that

4457
02:54:06,630 --> 02:54:04,880
they might you know

4458
02:54:08,150 --> 02:54:06,640
they don't have to have neurons but

4459
02:54:09,990 --> 02:54:08,160
don't be surprised about being up a ship

4460
02:54:11,830 --> 02:54:10,000
and you're looking like high giant

4461
02:54:14,550 --> 02:54:11,840
mammoth creature with

4462
02:54:16,710 --> 02:54:14,560
tentacles on your face wow that must be

4463
02:54:19,429 --> 02:54:16,720

really terrifying

4464

02:54:22,230 --> 02:54:19,439

now okay they might be a 50 foot tall

4465

02:54:24,070 --> 02:54:22,240

creature with tentacles that's that's

4466

02:54:26,230 --> 02:54:24,080

is it possible you know honestly

4467

02:54:28,389 --> 02:54:26,240

forbidden by it by evolution

4468

02:54:30,710 --> 02:54:28,399

is it possible

4469

02:54:34,630 --> 02:54:30,720

that there could be

4470

02:54:37,429 --> 02:54:34,640

one inch tall human-like aliens like

4471

02:54:39,110 --> 02:54:37,439

gulliver's travels um only and i keep

4472

02:54:40,150 --> 02:54:39,120

wanting to do an episode on that too

4473

02:54:42,389 --> 02:54:40,160

only

4474

02:54:45,190 --> 02:54:42,399

if they are not using

4475

02:54:47,429 --> 02:54:45,200

the same type of brain setup as we all

4476
02:54:49,269 --> 02:54:47,439
like they are naturally evolved to use

4477
02:54:51,510 --> 02:54:49,279
semiconductors as their brain supply as

4478
02:54:52,950 --> 02:54:51,520
opposed to our style of neurons because

4479
02:54:54,550 --> 02:54:52,960
you that that problem you start trying

4480
02:54:57,269 --> 02:54:54,560
to get that thing micro sized you're not

4481
02:54:59,030 --> 02:54:57,279
going to get there but again we don't

4482
02:55:00,870 --> 02:54:59,040
know i mean the brain is as best we can

4483
02:55:02,950 --> 02:55:00,880
tell just group of neurons that happens

4484
02:55:04,150 --> 02:55:02,960
to evolve into a thinking pattern we

4485
02:55:05,670 --> 02:55:04,160
have no particular reason to think that

4486
02:55:07,510 --> 02:55:05,680
there's not a complete different basis

4487
02:55:09,190 --> 02:55:07,520
for nerve systems that might be

4488
02:55:10,790 --> 02:55:09,200

naturally occurring semiconductors or

4489

02:55:11,990 --> 02:55:10,800

superconductors

4490

02:55:14,389 --> 02:55:12,000

they might come from a planet that's

4491

02:55:17,349 --> 02:55:14,399

covered in frozen helium and it's a

4492

02:55:18,389 --> 02:55:17,359

brisk five degrees kelvin out and uh all

4493

02:55:20,070 --> 02:55:18,399

the time

4494

02:55:21,590 --> 02:55:20,080

and uh they just naturally have

4495

02:55:23,510 --> 02:55:21,600

superconductors and that's what they are

4496

02:55:25,990 --> 02:55:23,520

they are a

4497

02:55:27,429 --> 02:55:26,000

bunch of natural wiring and they in that

4498

02:55:29,429 --> 02:55:27,439

case might actually be

4499

02:55:30,950 --> 02:55:29,439

an icy rock 10 kilometers of rock

4500

02:55:33,349 --> 02:55:30,960

floating through space the size of a

4501
02:55:34,950 --> 02:55:33,359
mountain that is a brain

4502
02:55:40,150 --> 02:55:34,960
so

4503
02:55:42,309 --> 02:55:40,160
cells are cells atoms or atoms

4504
02:55:44,870 --> 02:55:42,319
and now you're talking about a brain

4505
02:55:46,790 --> 02:55:44,880
that would be you know super super tiny

4506
02:55:49,429 --> 02:55:46,800
and there's just not enough room there

4507
02:55:51,590 --> 02:55:49,439
to have the cell capacity for the amount

4508
02:55:53,670 --> 02:55:51,600
of neurons that we have

4509
02:55:55,190 --> 02:55:53,680
here on earth we have this concept

4510
02:55:57,670 --> 02:55:55,200
called academ when we talk about

4511
02:56:00,230 --> 02:55:57,680
claytronics and it's it's the academy a

4512
02:56:01,670 --> 02:56:00,240
clay atom you know the human cell is

4513
02:56:03,670 --> 02:56:01,680

basically the cannon of the human or the

4514

02:56:05,830 --> 02:56:03,680

biological cell was first and you get

4515

02:56:07,269 --> 02:56:05,840

that minimum size building block their

4516

02:56:08,870 --> 02:56:07,279

cattle might be something much smaller

4517

02:56:10,389 --> 02:56:08,880

and much bigger their baseline thing you

4518

02:56:12,790 --> 02:56:10,399

know the lego blocks that they're built

4519

02:56:14,309 --> 02:56:12,800

out of effectively um and people tend to

4520

02:56:16,550 --> 02:56:14,319

forget how complex those are people

4521

02:56:18,389 --> 02:56:16,560

think well you know cells they probably

4522

02:56:19,670 --> 02:56:18,399

got a bunch of atoms how many atoms want

4523

02:56:22,150 --> 02:56:19,680

to sell and say oh

4524

02:56:25,269 --> 02:56:22,160

thousands maybe say well think more like

4525

02:56:27,590 --> 02:56:25,279

trillions you know a atom is to a

4526
02:56:28,870 --> 02:56:27,600
biological cell what a regular masonry

4527
02:56:31,190 --> 02:56:28,880
brick is to

4528
02:56:33,429 --> 02:56:31,200
a metropolis you know cells are

4529
02:56:35,190 --> 02:56:33,439
immensely complicated things

4530
02:56:37,429 --> 02:56:35,200
and they they have to be that big and

4531
02:56:38,950 --> 02:56:37,439
they could be small they would be right

4532
02:56:40,469 --> 02:56:38,960
based on the architecture the design

4533
02:56:42,150 --> 02:56:40,479
amount they might be able to be a lot

4534
02:56:43,990 --> 02:56:42,160
smaller and you know even if you're just

4535
02:56:45,190 --> 02:56:44,000
shaving 10 15 off the size of these

4536
02:56:47,349 --> 02:56:45,200
things you have some serious

4537
02:56:48,389 --> 02:56:47,359
ramifications on that creature but they

4538
02:56:50,070 --> 02:56:48,399

might just use something different for

4539

02:56:51,910 --> 02:56:50,080

their nerves that was faster say yes

4540

02:56:54,230 --> 02:56:51,920

they don't need as much brain because

4541

02:56:55,830 --> 02:56:54,240

the signals move between it faster right

4542

02:56:57,429 --> 02:56:55,840

then you got cooling issues there's so

4543

02:56:59,670 --> 02:56:57,439

many sweet spots these things can hit

4544

02:57:01,670 --> 02:56:59,680

well you know i can talk as much about

4545

02:57:04,150 --> 02:57:01,680

these concepts and you know as i want

4546

02:57:05,510 --> 02:57:04,160

but the answer is i don't know there are

4547

02:57:09,030 --> 02:57:05,520

so many question marks and i think

4548

02:57:14,790 --> 02:57:11,830

episode yeah right right right with the

4549

02:57:15,590 --> 02:57:14,800

little time that we have left um

4550

02:57:17,910 --> 02:57:15,600

uh

4551
02:57:19,269 --> 02:57:17,920
when we talk about the fermi paradox

4552
02:57:21,030 --> 02:57:19,279
there must be

4553
02:57:23,269 --> 02:57:21,040
all this life out there but where is

4554
02:57:24,950 --> 02:57:23,279
everybody and

4555
02:57:27,830 --> 02:57:24,960
one of the things you've talked about

4556
02:57:30,469 --> 02:57:27,840
this a lot is that we have not observed

4557
02:57:33,269 --> 02:57:30,479
any interstellar travel we haven't seen

4558
02:57:35,990 --> 02:57:33,279
any evidence of a galactic trading

4559
02:57:37,510 --> 02:57:36,000
system right we haven't seen anything

4560
02:57:39,830 --> 02:57:37,520
like that out there and if they would

4561
02:57:40,870 --> 02:57:39,840
they would have taken over the milky way

4562
02:57:43,830 --> 02:57:40,880
by now

4563
02:57:45,990 --> 02:57:43,840

and we would see evidence of that

4564

02:57:46,790 --> 02:57:46,000

but could it be

4565

02:57:49,750 --> 02:57:46,800

that

4566

02:57:51,910 --> 02:57:49,760

we haven't seen it because we can't or

4567

02:57:53,429 --> 02:57:51,920

that they are traveling in a way that

4568

02:57:56,070 --> 02:57:53,439

wouldn't

4569

02:57:57,269 --> 02:57:56,080

give us a visual uh

4570

02:57:59,590 --> 02:57:57,279

uh

4571

02:58:00,710 --> 02:57:59,600

evidence between planets

4572

02:58:03,349 --> 02:58:00,720

right that

4573

02:58:04,870 --> 02:58:03,359

because we're thinking too 2d

4574

02:58:08,630 --> 02:58:04,880

and we're thinking

4575

02:58:10,469 --> 02:58:08,640

chemicals and and and rocket engines and

4576

02:58:13,030 --> 02:58:10,479

we don't see that kind of trace evidence

4577

02:58:14,309 --> 02:58:13,040

because they're not using it yeah we you

4578

02:58:15,910 --> 02:58:14,319

know you're talking about quantity on

4579

02:58:17,429 --> 02:58:15,920

things like that be like well would we

4580

02:58:19,590 --> 02:58:17,439

see decentral coming out the back hole

4581

02:58:21,030 --> 02:58:19,600

or black or drive they were doing hockey

4582

02:58:22,710 --> 02:58:21,040

radiation or force feeling of the

4583

02:58:23,910 --> 02:58:22,720

pendulus process you know those are

4584

02:58:25,830 --> 02:58:23,920

things that might be harder to spot or

4585

02:58:28,150 --> 02:58:25,840

easier spot but the other thing they say

4586

02:58:30,870 --> 02:58:28,160

on this one is we must never

4587

02:58:33,750 --> 02:58:30,880

oversimplify another civilization

4588

02:58:36,150 --> 02:58:33,760

um when i remember the old video uh tv

4589

02:58:39,510 --> 02:58:36,160

kill the radio of video kill the t radio

4590

02:58:40,630 --> 02:58:39,520

star yes by the way by the runners the

4591

02:58:43,190 --> 02:58:40,640

ruddles

4592

02:58:45,590 --> 02:58:43,200

yeah and did it kill books no did

4593

02:58:47,830 --> 02:58:45,600

audiobooks kill books no did movies kill

4594

02:58:50,710 --> 02:58:47,840

books no we still have books put on

4595

02:58:52,950 --> 02:58:50,720

paper we still have you know regular

4596

02:58:54,710 --> 02:58:52,960

paintings not just digital art we still

4597

02:58:57,110 --> 02:58:54,720

have regular board games not just

4598

02:58:59,269 --> 02:58:57,120

computer games radio is still around and

4599

02:59:00,790 --> 02:58:59,279

strong even though we have tv still

4600

02:59:03,590 --> 02:59:00,800

around even though youtube's coming out

4601
02:59:05,429 --> 02:59:03,600
there they're not going away so if they

4602
02:59:08,150 --> 02:59:05,439
use one given method for communication

4603
02:59:09,750 --> 02:59:08,160
or one given method for moving around

4604
02:59:11,990 --> 02:59:09,760
this does not mean they don't use the

4605
02:59:13,590 --> 02:59:12,000
other ones too obviously if one is just

4606
02:59:15,269 --> 02:59:13,600
way better across the board at one thing

4607
02:59:17,030 --> 02:59:15,279
it's going to dominate that that

4608
02:59:19,670 --> 02:59:17,040
landscape but when we talk about these

4609
02:59:21,349 --> 02:59:19,680
kind of galactic-sized empires whale is

4610
02:59:22,950 --> 02:59:21,359
the example of one of them just sailing

4611
02:59:24,630 --> 02:59:22,960
a ship how many people these days have

4612
02:59:28,389 --> 02:59:24,640
sailboats

4613
02:59:29,590 --> 02:59:28,399

combustion engines everywhere i'd be

4614

02:59:31,830 --> 02:59:29,600

willing to bet you there are actually

4615

02:59:34,389 --> 02:59:31,840

more sailboats around nowadays than

4616

02:59:36,230 --> 02:59:34,399

there were a couple centuries ago

4617

02:59:37,990 --> 02:59:36,240

and in terms of raw numbers if not

4618

02:59:40,389 --> 02:59:38,000

there's probably not that much less they

4619

02:59:42,309 --> 02:59:40,399

are still here so i i really don't see

4620

02:59:43,910 --> 02:59:42,319

that yes maybe they've got the the

4621

02:59:45,269 --> 02:59:43,920

system that lets them communicate faster

4622

02:59:46,389 --> 02:59:45,279

and light and of course that's all

4623

02:59:47,990 --> 02:59:46,399

they're going to use to talk back and

4624

02:59:49,190 --> 02:59:48,000

forth to install systems but doesn't

4625

02:59:51,269 --> 02:59:49,200

mean that's all they use inside their

4626
02:59:52,550 --> 02:59:51,279
own system might use radio yes they

4627
02:59:53,910 --> 02:59:52,560
might have a ship that can move them

4628
02:59:56,070 --> 02:59:53,920
from point a to point b almost

4629
02:59:57,590 --> 02:59:56,080
instantaneously but does it let them do

4630
03:00:00,630 --> 02:59:57,600
you know planetary travel just you know

4631
03:00:02,870 --> 03:00:00,640
stellar do they use solar sail ships

4632
03:00:05,670 --> 03:00:02,880
we should assume that what we see with

4633
03:00:07,590 --> 03:00:05,680
big civilizations is a vast array of

4634
03:00:09,349 --> 03:00:07,600
options and that's what we're looking

4635
03:00:11,030 --> 03:00:09,359
for there it's not about whether or not

4636
03:00:12,389 --> 03:00:11,040
we could see the ca we can't we can't

4637
03:00:15,030 --> 03:00:12,399
see the subways in new york because we

4638
03:00:16,389 --> 03:00:15,040

go flying ahead they're invisible to us

4639

03:00:18,550 --> 03:00:16,399

but subway's not the only way people

4640

03:00:20,790 --> 03:00:18,560

travel in new york right right we will

4641

03:00:23,429 --> 03:00:20,800

never see those subways flying overhead

4642

03:00:25,910 --> 03:00:23,439

but we will still see travel

4643

03:00:28,389 --> 03:00:25,920

now with the james webb

4644

03:00:30,950 --> 03:00:28,399

telescope and that uh you know today the

4645

03:00:32,950 --> 03:00:30,960

cooling setup for the infrared

4646

03:00:36,150 --> 03:00:32,960

uh portion of it which is how it

4647

03:00:38,150 --> 03:00:36,160

operates is is now good to go

4648

03:00:40,870 --> 03:00:38,160

it is seeing in the infrared i think

4649

03:00:42,550 --> 03:00:40,880

most people are assuming that they just

4650

03:00:44,309 --> 03:00:42,560

naturally think that this is going to be

4651
03:00:46,230 --> 03:00:44,319
full spectrum and that's what they're no

4652
03:00:47,670 --> 03:00:46,240
it this is a telescope that sees an

4653
03:00:48,710 --> 03:00:47,680
infrared

4654
03:00:52,070 --> 03:00:48,720
um

4655
03:00:54,070 --> 03:00:52,080
what if it picks up a telltale sign of

4656
03:00:55,990 --> 03:00:54,080
interstellar travel in the infrared

4657
03:00:57,269 --> 03:00:56,000
spectrum which is entirely in the

4658
03:00:59,590 --> 03:00:57,279
possibility

4659
03:01:00,710 --> 03:00:59,600
especially if it's occurring it could be

4660
03:01:03,910 --> 03:01:00,720
seen

4661
03:01:08,710 --> 03:01:03,920
would they tell us

4662
03:01:11,110 --> 03:01:08,720
mean i'm not i'd have to check with the

4663
03:01:12,950 --> 03:01:11,120

actual pathway for the information going

4664

03:01:14,469 --> 03:01:12,960

if you know from the scope to where it

4665

03:01:16,469 --> 03:01:14,479

is because i don't know

4666

03:01:18,550 --> 03:01:16,479

uh i assume that they would that's the

4667

03:01:20,150 --> 03:01:18,560

official policy and i just know too many

4668

03:01:21,429 --> 03:01:20,160

people astronomy to think that the i

4669

03:01:23,269 --> 03:01:21,439

feel like i would know if there was an

4670

03:01:25,349 --> 03:01:23,279

official clampdown rule in place that

4671

03:01:27,429 --> 03:01:25,359

that people had that uh but i don't know

4672

03:01:29,429 --> 03:01:27,439

you know i think they would tell us i

4673

03:01:31,990 --> 03:01:29,439

don't expect that we see a spaceship in

4674

03:01:34,150 --> 03:01:32,000

infrared though because infrared is cool

4675

03:01:35,510 --> 03:01:34,160

right infrared it's a very wide range

4676

03:01:37,349 --> 03:01:35,520

most of the sun's light is actually

4677

03:01:39,110 --> 03:01:37,359

infrared but in terms of photons coming

4678

03:01:40,389 --> 03:01:39,120

off it um

4679

03:01:41,670 --> 03:01:40,399

and it goes all the way down to about

4680

03:01:43,590 --> 03:01:41,680

the temperature of pluto and you know

4681

03:01:45,750 --> 03:01:43,600

the cosmic microwave background you know

4682

03:01:47,830 --> 03:01:45,760

radiation is the other end of that uh so

4683

03:01:50,630 --> 03:01:47,840

that's a huge range there but you'd

4684

03:01:51,590 --> 03:01:50,640

expect spaceship engines to be really

4685

03:01:52,950 --> 03:01:51,600

hot

4686

03:01:54,710 --> 03:01:52,960

you know you expect them to be plugging

4687

03:01:56,309 --> 03:01:54,720

away probably visible light or high-end

4688

03:01:57,830 --> 03:01:56,319

infrared and that's not really what the

4689

03:02:00,950 --> 03:01:57,840

james webb is looking for it's more

4690

03:02:03,670 --> 03:02:00,960

looking for your kulo bodies you know

4691

03:02:05,990 --> 03:02:03,680

and uh it i mean you could see a space

4692

03:02:07,990 --> 03:02:06,000

station probably you wouldn't see

4693

03:02:09,830 --> 03:02:08,000

habitats a lot of stuff that people are

4694

03:02:11,349 --> 03:02:09,840

calibrated around you know it's like i

4695

03:02:13,830 --> 03:02:11,359

want to build all these big structures

4696

03:02:15,990 --> 03:02:13,840

to live on instead of just planets those

4697

03:02:17,590 --> 03:02:16,000

would be visible they'd be really dim if

4698

03:02:19,590 --> 03:02:17,600

they are of a certain size because it's

4699

03:02:21,110 --> 03:02:19,600

not that big it's not that bright but

4700

03:02:22,550 --> 03:02:21,120

they'd be something you could pick up if

4701
03:02:25,590 --> 03:02:22,560
it was looking at it

4702
03:02:27,269 --> 03:02:25,600
isaac thank you what another great show

4703
03:02:28,790 --> 03:02:27,279
and another great conversation i've got

4704
03:02:30,389 --> 03:02:28,800
10 seconds

4705
03:02:32,150 --> 03:02:30,399
what's your next episode

4706
03:02:34,070 --> 03:02:32,160
and when does it air

4707
03:02:35,750 --> 03:02:34,080
what if earth became a rogue planet

4708
03:02:37,670 --> 03:02:35,760
about the earth being kicked away from

4709
03:02:39,110 --> 03:02:37,680
the sun the sun dying and it comes out

4710
03:02:41,510 --> 03:02:39,120
thursday morning

4711
03:02:44,950 --> 03:02:41,520
my man isaac arthur thank you so much

4712
03:02:47,750 --> 03:02:44,960
isaac behave and be well my friend

4713
03:02:50,070 --> 03:02:47,760

absolutely fantastic conversation

4714

03:02:51,990 --> 03:02:50,080

isaac arthur now it's all simple science

4715

03:02:54,469 --> 03:02:52,000

and futurism with isaac arthur right

4716

03:02:56,830 --> 03:02:54,479

there search for it on youtube i've got

4717

03:02:59,030 --> 03:02:56,840

the links up for

4718

03:03:01,670 --> 03:02:59,040

isaacarthur.net you can click there all

4719

03:03:03,590 --> 03:03:01,680

of the information is right there what a

4720

03:03:06,150 --> 03:03:03,600

great show tonight tomorrow night linda

4721

03:03:08,150 --> 03:03:06,160

moulton howe is with us fade to black is

4722

03:03:10,230 --> 03:03:08,160

produced by hill j palm renee dennis and

4723

03:03:12,790 --> 03:03:10,240

kevin announcers are steve harter gene

4724

03:03:15,110 --> 03:03:12,800

vettel and mark d kovar webmaster is

4725

03:03:16,830 --> 03:03:15,120

drew the geek music doug aldrich intro

4726

03:03:20,550 --> 03:03:16,840

spaceboy

4727

03:03:23,110 --> 03:03:20,560

produced by kjcr for the game changer

4728

03:03:25,190 --> 03:03:23,120

network this broadcast only copyrighted

4729

03:03:27,110 --> 03:03:25,200

2022 by fade to black and the game

4730

03:03:29,429 --> 03:03:27,120

changer network inc it cannot be

4731

03:03:31,670 --> 03:03:29,439

re-broadcast downloaded copied or used

4732

03:03:33,190 --> 03:03:31,680

anywhere in the known universe without

4733

03:03:34,469 --> 03:03:33,200

written permission from fade to black or

4734

03:03:36,389 --> 03:03:34,479

the game changer network i'm your host

4735

03:03:39,510 --> 03:03:36,399

jimmy church until tomorrow night with

4736

03:03:41,190 --> 03:03:39,520

lmh linda molten howe i want everybody

4737

03:03:49,710 --> 03:03:41,200

to be safe

4738

03:03:52,620 --> 03:03:49,930

[Music]

4739

03:04:12,309 --> 03:03:52,630

[Applause]

4740

03:04:12,319 --> 03:04:21,930

so