



**LIFE IS GROOVY:  
ASTROBIOLOGY IN THE SIXTIES  
GIDEON MARCUS**



1  
00:00:07,190 --> 00:00:02,550  
folks

2  
00:00:13,749 --> 00:00:10,950  
oh please please no no that's too much

3  
00:00:14,910 --> 00:00:13,759  
so i'm gideon marcus and i am

4  
00:00:16,710 --> 00:00:14,920  
a time

5  
00:00:19,510 --> 00:00:16,720  
traveler

6  
00:00:22,310 --> 00:00:19,520  
so all the people in this room you are

7  
00:00:24,470 --> 00:00:22,320  
master's degrees or phds you spent the

8  
00:00:26,790 --> 00:00:24,480  
better part of a decade going to school

9  
00:00:29,349 --> 00:00:26,800  
you may still be in school

10  
00:00:32,870 --> 00:00:29,359  
and all i had to do to be up here

11  
00:00:36,069 --> 00:00:34,229  
so this is it

12  
00:00:37,910 --> 00:00:36,079  
in fact if you have those little pocket

13  
00:00:39,910 --> 00:00:37,920

computers those little

14

00:00:41,670 --> 00:00:39,920

phone evacs that are in your pockets you

15

00:00:43,270 --> 00:00:41,680

can go pull them out

16

00:00:44,630 --> 00:00:43,280

pull them out everybody pull them out i

17

00:00:46,950 --> 00:00:44,640

know you all have you're addicted to

18

00:00:48,709 --> 00:00:46,960

these things good god

19

00:00:51,270 --> 00:00:48,719

in the 60s we just have black and white

20

00:00:52,990 --> 00:00:51,280

television

21

00:00:55,029 --> 00:00:53,000

if you go to

22

00:00:56,389 --> 00:00:55,039

galacticjourney.org is this too loud is

23

00:00:57,670 --> 00:00:56,399

this the right level

24

00:00:58,670 --> 00:00:57,680

good level okay

25

00:01:01,750 --> 00:00:58,680

if you go to

26

00:01:03,750 --> 00:01:01,760

galacticjourney.org you will see

27

00:01:07,109 --> 00:01:03,760

the presence that we maintain what it is

28

00:01:09,590 --> 00:01:07,119

it is a time portal to exactly 55 years

29

00:01:12,830 --> 00:01:09,600

ago what does that mean it moves so

30

00:01:16,149 --> 00:01:12,840

right now it is may 17

31

00:01:19,109 --> 00:01:16,159

1967. jimi hendrix has just come out

32

00:01:21,350 --> 00:01:19,119

with an album which is amazing

33

00:01:23,429 --> 00:01:21,360

hemlines are up to here star trek just

34

00:01:26,550 --> 00:01:23,439

finished its first season

35

00:01:29,350 --> 00:01:26,560

and as it's in its summer reruns not

36

00:01:32,310 --> 00:01:29,360

everything is great in as many months

37

00:01:34,230 --> 00:01:32,320

we've lost four space men on both sides

38

00:01:36,789 --> 00:01:34,240

of the iron curtain in the apollo 1 and

39

00:01:38,789 --> 00:01:36,799

the soyuz one catastrophes

40

00:01:41,030 --> 00:01:38,799

right now there are half a million

41

00:01:42,870 --> 00:01:41,040

american soldiers in south vietnamese

42

00:01:44,870 --> 00:01:42,880

and countless hundreds of thousands of

43

00:01:46,950 --> 00:01:44,880

south vietnamese fighting hundreds of

44

00:01:48,630 --> 00:01:46,960

thousands of north vietnamese

45

00:01:50,550 --> 00:01:48,640

for some nameless hills somewhere in the

46

00:01:53,109 --> 00:01:50,560

center of their country

47

00:01:55,350 --> 00:01:53,119

we have racial injustice we have people

48

00:01:56,950 --> 00:01:55,360

marching for their rights

49

00:02:00,389 --> 00:01:56,960

and i'm sure things will be completely

50

00:02:02,230 --> 00:02:00,399

different in 55 years

51  
00:02:03,830 --> 00:02:02,240  
warfare will be a thing of the past we

52  
00:02:04,870 --> 00:02:03,840  
will have complete racial harmony and

53  
00:02:06,469 --> 00:02:04,880  
justice

54  
00:02:08,150 --> 00:02:06,479  
oh and if you're wondering why i'm

55  
00:02:09,830 --> 00:02:08,160  
wearing a mask and i see you're all

56  
00:02:12,229 --> 00:02:09,840  
wearing masks so i assume the smog

57  
00:02:15,190 --> 00:02:12,239  
problem has not been solved in 55 years

58  
00:02:17,990 --> 00:02:16,390  
so

59  
00:02:19,830 --> 00:02:18,000  
that's what i do and if you're wondering

60  
00:02:21,589 --> 00:02:19,840  
how i do it if you go to my house i live

61  
00:02:25,030 --> 00:02:21,599  
in vista california which is a lovely

62  
00:02:26,309 --> 00:02:25,040  
suburb of san diego it is a bubble back

63  
00:02:28,390 --> 00:02:26,319

in time

64

00:02:29,589 --> 00:02:28,400

if you tune into the radio station near

65

00:02:30,790 --> 00:02:29,599

my house i won't give you the frequency

66

00:02:32,070 --> 00:02:30,800

because i don't want the fcc coming

67

00:02:33,910 --> 00:02:32,080

after me

68

00:02:35,509 --> 00:02:33,920

it actually plays that wonderful music

69

00:02:37,430 --> 00:02:35,519

you heard and by the way everyone can

70

00:02:39,670 --> 00:02:37,440

tune in if you go to the website

71

00:02:41,350 --> 00:02:39,680

we have a tv station that plays exactly

72

00:02:43,190 --> 00:02:41,360

what happened 55 years ago which is a

73

00:02:45,030 --> 00:02:43,200

mixed blessing because on one hand you

74

00:02:46,949 --> 00:02:45,040

know we get mission impossible and star

75

00:02:48,949 --> 00:02:46,959

trek and i spy and

76

00:02:51,589 --> 00:02:48,959

on the other hand we get gilligan's

77

00:02:54,150 --> 00:02:51,599

island

78

00:02:56,309 --> 00:02:54,160

the vast wasteland as fcc chair nelson

79

00:02:57,670 --> 00:02:56,319

minnow said a few years ago and we've

80

00:02:59,110 --> 00:02:57,680

got people coming in this is why i'm

81

00:03:01,750 --> 00:02:59,120

vamping by the way so everyone can come

82

00:03:04,630 --> 00:03:01,760

in and get the meat of this performance

83

00:03:06,869 --> 00:03:04,640

so the times are very similar the times

84

00:03:09,030 --> 00:03:06,879

are very different in some ways but

85

00:03:12,470 --> 00:03:09,040

they're very similar and if there's one

86

00:03:14,710 --> 00:03:12,480

thing that unites the era of 1967 and

87

00:03:16,710 --> 00:03:14,720

2022 it's that we are both

88

00:03:19,830 --> 00:03:16,720

seeking the answer to the eternal

89

00:03:22,710 --> 00:03:19,840

question is there intelligent life

90

00:03:24,630 --> 00:03:22,720

on planet earth

91

00:03:26,869 --> 00:03:24,640

i imagine the jury is still out from the

92

00:03:29,270 --> 00:03:26,879

laughter

93

00:03:31,430 --> 00:03:29,280

but we're also hoping that somewhere out

94

00:03:33,030 --> 00:03:31,440

there there may be smart aliens that

95

00:03:35,509 --> 00:03:33,040

have figured things out a bit better

96

00:03:36,710 --> 00:03:35,519

than we have and so that is what this

97

00:03:39,110 --> 00:03:36,720

talk is going to be about because

98

00:03:41,509 --> 00:03:39,120

everyone here is an astrobiologist an

99

00:03:43,190 --> 00:03:41,519

extrobiologist some kind of out of this

100

00:03:44,949 --> 00:03:43,200

solar system or maybe planetary

101  
00:03:46,630 --> 00:03:44,959  
biologist

102  
00:03:48,710 --> 00:03:46,640  
but you may not be completely familiar

103  
00:03:51,270 --> 00:03:48,720  
with the context of what your field was

104  
00:03:53,429 --> 00:03:51,280  
like in the 60s particularly the public

105  
00:03:57,030 --> 00:03:53,439  
perception thereof

106  
00:03:58,789 --> 00:03:57,040  
so so begins our tour and we will begin

107  
00:04:02,869 --> 00:03:58,799  
with a journey through

108  
00:04:06,229 --> 00:04:04,229  
this is

109  
00:04:07,830 --> 00:04:06,239  
for those of you who do not look up

110  
00:04:10,949 --> 00:04:07,840  
the moon

111  
00:04:12,830 --> 00:04:10,959  
and even as of 1960 we had a pretty good

112  
00:04:15,509 --> 00:04:12,840  
idea what the moon was like even in the

113  
00:04:17,990 --> 00:04:15,519

1800s we knew that there was likely no

114

00:04:19,909 --> 00:04:18,000

atmosphere around this moon we figured

115

00:04:23,350 --> 00:04:19,919

there probably were not any beings

116

00:04:25,030 --> 00:04:23,360

living on this on this planet but at the

117

00:04:26,629 --> 00:04:25,040

same time it was close and it was

118

00:04:28,790 --> 00:04:26,639

compelling and so

119

00:04:30,710 --> 00:04:28,800

science fiction authors at the even at

120

00:04:34,150 --> 00:04:30,720

the dawn of our genre we're writing

121

00:04:38,870 --> 00:04:36,310

this is the first one that i know that

122

00:04:40,390 --> 00:04:38,880

is a truly science fiction deserving the

123

00:04:42,870 --> 00:04:40,400

label of

124

00:04:44,870 --> 00:04:42,880

aliens on the moon and the interesting

125

00:04:46,550 --> 00:04:44,880

the way they they justify there being an

126  
00:04:47,350 --> 00:04:46,560  
alien presence on the moon was the idea

127  
00:04:49,749 --> 00:04:47,360  
that

128  
00:04:52,469 --> 00:04:49,759  
there are times when the sun is just

129  
00:04:54,070 --> 00:04:52,479  
right on the moon and the uh the

130  
00:04:55,510 --> 00:04:54,080  
volatiles evaporate and for a little

131  
00:04:58,469 --> 00:04:55,520  
while you have a breathable atmosphere

132  
00:04:59,510 --> 00:04:58,479  
so h.g wells wrote about life on the

133  
00:05:00,790 --> 00:04:59,520  
moon

134  
00:05:03,749 --> 00:05:00,800  
alien life

135  
00:05:08,710 --> 00:05:06,150  
edgar rice burroughs who gallivanted

136  
00:05:10,230 --> 00:05:08,720  
about our solar system in pros also

137  
00:05:11,749 --> 00:05:10,240  
posited that there were people on the

138  
00:05:13,110 --> 00:05:11,759

moon but

139

00:05:15,189 --> 00:05:13,120

he understood that the moon was a

140

00:05:16,390 --> 00:05:15,199

lifeless husk on the surface and so he

141

00:05:19,029 --> 00:05:16,400

assumed

142

00:05:20,790 --> 00:05:19,039

that there was in fact an empty space

143

00:05:22,710 --> 00:05:20,800

within the moon and people lived on the

144

00:05:24,230 --> 00:05:22,720

underside which is interesting are there

145

00:05:25,830 --> 00:05:24,240

any edgar rice burroughs fans in this

146

00:05:27,189 --> 00:05:25,840

room

147

00:05:29,749 --> 00:05:27,199

we have a few

148

00:05:31,990 --> 00:05:29,759

um edgar rice burroughs also posited

149

00:05:33,350 --> 00:05:32,000

that there was a hollow earth and people

150

00:05:35,110 --> 00:05:33,360

living inside that it was called

151

00:05:37,110 --> 00:05:35,120

pelusidar and those are some of my

152

00:05:40,070 --> 00:05:37,120

favorite stories so there's a whole i

153

00:05:41,830 --> 00:05:40,080

think it's four books set on the moon um

154

00:05:45,189 --> 00:05:41,840

that deal with this internal surface of

155

00:05:50,870 --> 00:05:46,870

movies

156

00:05:52,710 --> 00:05:50,880

the science so we have missile to the

157

00:05:54,230 --> 00:05:52,720

moon which uh

158

00:05:55,990 --> 00:05:54,240

you know it takes place on an airless

159

00:05:57,830 --> 00:05:56,000

moon and yet look at all the scattering

160

00:05:59,029 --> 00:05:57,840

of the light and the shadows but you

161

00:06:01,670 --> 00:05:59,039

know

162

00:06:03,990 --> 00:06:01,680

this movie was not really made so much

163

00:06:06,870 --> 00:06:04,000

for the scientific accuracy but as an

164

00:06:11,670 --> 00:06:06,880

opportunity to showcase

165

00:06:13,110 --> 00:06:11,680

the miss america pageant contestants

166

00:06:13,990 --> 00:06:13,120

but there are little fun little aliens

167

00:06:16,230 --> 00:06:14,000

on it

168

00:06:17,990 --> 00:06:16,240

and if you ever watch amazon women on

169

00:06:19,909 --> 00:06:18,000

the moon which is a wonderful send up in

170

00:06:21,749 --> 00:06:19,919

the 80s by the people who made kentucky

171

00:06:23,510 --> 00:06:21,759

fried movie in the 70s they've got a

172

00:06:25,270 --> 00:06:23,520

wonderful send-up of this movie starring

173

00:06:27,990 --> 00:06:25,280

steve forrest called amazon women on the

174

00:06:29,110 --> 00:06:28,000

moon absolutely worth your time

175

00:06:30,710 --> 00:06:29,120

it's worth coming just for that

176

00:06:35,909 --> 00:06:30,720

recommendation

177

00:06:39,670 --> 00:06:36,790

so

178

00:06:42,070 --> 00:06:39,680

before it became legal to display

179

00:06:44,150 --> 00:06:42,080

pornography in any theater

180

00:06:47,670 --> 00:06:44,160

you could only film

181

00:06:50,230 --> 00:06:47,680

nude films at a nudist colony so why not

182

00:06:53,029 --> 00:06:50,240

combine this burgeoning sci-fi field of

183

00:06:57,670 --> 00:06:55,189

with nude colonies and this thus was

184

00:07:00,550 --> 00:06:57,680

born the nudie cutie features

185

00:07:03,270 --> 00:07:00,560

very scientifically accurate

186

00:07:05,670 --> 00:07:03,280

this is what we presume

187

00:07:08,469 --> 00:07:05,680

aliens would look like on the moon if in

188

00:07:12,469 --> 00:07:08,479

fact they had nudist colonies

189

00:07:13,990 --> 00:07:12,479

all right so by 1967

190

00:07:15,990 --> 00:07:14,000

we had a pretty good idea what the moon

191

00:07:18,469 --> 00:07:16,000

was like we'd sent several lunar orbiter

192

00:07:20,070 --> 00:07:18,479

craft right now as we speak in 1967

193

00:07:21,510 --> 00:07:20,080

there are four

194

00:07:23,110 --> 00:07:21,520

um although i believe one has already

195

00:07:25,670 --> 00:07:23,120

crashed into the moon

196

00:07:27,029 --> 00:07:25,680

we've crashed rangers into the moon

197

00:07:29,110 --> 00:07:27,039

several of them

198

00:07:31,110 --> 00:07:29,120

and we've landed a couple of these guys

199

00:07:33,029 --> 00:07:31,120

these are surveyors

200

00:07:35,110 --> 00:07:33,039

and you can see surveyor returning a

201  
00:07:36,950 --> 00:07:35,120  
self-portrait of its foot

202  
00:07:39,189 --> 00:07:36,960  
which is sort of reminiscent of how my

203  
00:07:40,629 --> 00:07:39,199  
daughter used to take pictures

204  
00:07:42,309 --> 00:07:40,639  
and from this we gathered that the

205  
00:07:44,469 --> 00:07:42,319  
surface of the moon was something that

206  
00:07:46,790 --> 00:07:44,479  
apollo astronauts could land on and we

207  
00:07:48,790 --> 00:07:46,800  
are predicting in 1967 even with the

208  
00:07:51,350 --> 00:07:48,800  
catastrophe that took the lives of three

209  
00:07:54,629 --> 00:07:51,360  
astronauts that we will be on the moon

210  
00:07:56,390 --> 00:07:54,639  
before this decade is out

211  
00:07:58,869 --> 00:07:56,400  
so of course

212  
00:08:00,710 --> 00:07:58,879  
of course once you have the moon this

213  
00:08:02,309 --> 00:08:00,720

mapped and this understood

214

00:08:04,550 --> 00:08:02,319

there's not going to be any ridiculous

215

00:08:06,309 --> 00:08:04,560

movies like in say 2022 to get the

216

00:08:08,309 --> 00:08:06,319

science all wrong

217

00:08:10,469 --> 00:08:08,319

i'm assured on that right

218

00:08:12,469 --> 00:08:10,479

i can be optimistic about the future

219

00:08:15,270 --> 00:08:12,479

right okay

220

00:08:17,430 --> 00:08:15,280

all right so having exhausted the moon

221

00:08:19,749 --> 00:08:17,440

as an abode for life let's go to the

222

00:08:21,589 --> 00:08:19,759

planets

223

00:08:23,510 --> 00:08:21,599

so this is mercury first from the sun

224

00:08:25,350 --> 00:08:23,520

and i imagine there's not a lot of

225

00:08:27,350 --> 00:08:25,360

people here who's who have seen mercury

226

00:08:28,710 --> 00:08:27,360

raise your hand if you've actually seen

227

00:08:30,869 --> 00:08:28,720

mercury

228

00:08:32,630 --> 00:08:30,879

got a few good for you

229

00:08:34,230 --> 00:08:32,640

it's uh it's hard to see mercury because

230

00:08:36,790 --> 00:08:34,240

it's closest to the sun which means it

231

00:08:39,029 --> 00:08:36,800

never gets much uh elongation from it

232

00:08:41,269 --> 00:08:39,039

unlike venus which goes up to i think 45

233

00:08:44,149 --> 00:08:41,279

degrees or so mercury is always within i

234

00:08:47,590 --> 00:08:44,159

think 12. so you can see it at sunset

235

00:08:49,269 --> 00:08:47,600

and sunrise if you're looking for it

236

00:08:50,870 --> 00:08:49,279

because of this because a lot of people

237

00:08:52,389 --> 00:08:50,880

couldn't see mercury and when they could

238

00:08:53,590 --> 00:08:52,399

it was often in glare and it was far

239

00:08:55,509 --> 00:08:53,600

away

240

00:08:57,269 --> 00:08:55,519

it was sort of wishful thinking when

241

00:08:58,790 --> 00:08:57,279

they came up with maps for the moon and

242

00:09:01,509 --> 00:08:58,800

they really didn't know how fast it

243

00:09:03,670 --> 00:09:01,519

rotated in 1963

244

00:09:05,509 --> 00:09:03,680

people still believed assumed because

245

00:09:08,150 --> 00:09:05,519

they kept seeing the same markings on

246

00:09:09,990 --> 00:09:08,160

mercury that either it had a 24-hour

247

00:09:11,670 --> 00:09:10,000

rotation which was awfully coincidental

248

00:09:12,710 --> 00:09:11,680

although mars does too

249

00:09:15,190 --> 00:09:12,720

or

250

00:09:16,630 --> 00:09:15,200

it presented one face to the sun which

251  
00:09:18,790 --> 00:09:16,640  
makes sense something that close to the

252  
00:09:20,829 --> 00:09:18,800  
sun should be tidally locked

253  
00:09:23,829 --> 00:09:20,839  
um and as late as

254  
00:09:25,750 --> 00:09:23,839  
1964 a certain famous science fiction

255  
00:09:28,230 --> 00:09:25,760  
author released his first story called

256  
00:09:30,470 --> 00:09:28,240  
the coldest place

257  
00:09:31,829 --> 00:09:30,480  
which posited that mercury would in fact

258  
00:09:33,430 --> 00:09:31,839  
not only be the hottest place in the

259  
00:09:35,190 --> 00:09:33,440  
solar system but also the coldest

260  
00:09:36,710 --> 00:09:35,200  
because its backside was always

261  
00:09:38,310 --> 00:09:36,720  
presented to the sun which was unique

262  
00:09:40,310 --> 00:09:38,320  
amongst all the planets

263  
00:09:43,190 --> 00:09:40,320

and this author posited that there would

264

00:09:47,030 --> 00:09:43,200

be life based on helium-2 superfluid

265

00:09:48,949 --> 00:09:47,040

liquid it was a pretty neat story

266

00:09:51,430 --> 00:09:48,959

raise your hand if you happen to be this

267

00:09:53,030 --> 00:09:51,440

author who wrote this story

268

00:09:53,790 --> 00:09:53,040

larry niven ladies and gentlemen round

269

00:09:57,750 --> 00:09:53,800

of applause

270

00:09:59,750 --> 00:09:57,760

[Applause]

271

00:10:02,150 --> 00:09:59,760

i could not have asked for a better prop

272

00:10:04,550 --> 00:10:02,160

for this talk i did not know larry niven

273

00:10:06,470 --> 00:10:04,560

would be in the audience right now so so

274

00:10:07,509 --> 00:10:06,480

thank you for being accommodating

275

00:10:10,550 --> 00:10:07,519

um

276

00:10:12,069 --> 00:10:10,560

so mercury is very so at that before

277

00:10:14,790 --> 00:10:12,079

before we understood mercury's rotation

278

00:10:16,069 --> 00:10:14,800

when we thought it was a one-faced world

279

00:10:19,590 --> 00:10:16,079

this is what we thought it was like we

280

00:10:23,190 --> 00:10:22,069

we thought there might be a twilight

281

00:10:25,190 --> 00:10:23,200

region

282

00:10:27,030 --> 00:10:25,200

where the temperature might be

283

00:10:28,630 --> 00:10:27,040

inhabitable and maybe there was

284

00:10:30,550 --> 00:10:28,640

something you could do with that if not

285

00:10:32,949 --> 00:10:30,560

natively maybe it'd be a good place to

286

00:10:35,990 --> 00:10:32,959

live we found out right around the time

287

00:10:38,550 --> 00:10:36,000

larry nevin wrote this story using radar

288

00:10:41,350 --> 00:10:38,560

that the moon actually rotates three

289

00:10:43,350 --> 00:10:41,360

times for every two orbits it does not

290

00:10:45,350 --> 00:10:43,360

present one face of the sun and this

291

00:10:46,630 --> 00:10:45,360

conception of mercury does not exist

292

00:10:50,470 --> 00:10:46,640

cannot exist

293

00:10:52,630 --> 00:10:50,480

and in fact mercury must be lifeless

294

00:10:54,230 --> 00:10:52,640

let's go to the next planet this is like

295

00:10:56,310 --> 00:10:54,240

vacation slides and then i went to the

296

00:10:58,870 --> 00:10:56,320

eiffel tower

297

00:11:00,790 --> 00:10:58,880

so this is venus and this is about as

298

00:11:02,910 --> 00:11:00,800

good as venus looks from terrestrial

299

00:11:04,470 --> 00:11:02,920

telescopes this is as of

300

00:11:07,110 --> 00:11:04,480

1962

301  
00:11:08,790 --> 00:11:07,120  
the best look we had of what we called

302  
00:11:11,829 --> 00:11:08,800  
earth's twin and we called it that

303  
00:11:13,590 --> 00:11:11,839  
because of course similar gravity um

304  
00:11:15,269 --> 00:11:13,600  
it had thick clouds we didn't know what

305  
00:11:18,870 --> 00:11:15,279  
those clouds were made of

306  
00:11:20,949 --> 00:11:18,880  
and so there were two competing theories

307  
00:11:21,750 --> 00:11:20,959  
as to what the surface of venus looked

308  
00:11:23,190 --> 00:11:21,760  
like

309  
00:11:25,430 --> 00:11:23,200  
one was that

310  
00:11:27,190 --> 00:11:25,440  
venus was a hot

311  
00:11:29,110 --> 00:11:27,200  
desolate desert

312  
00:11:31,030 --> 00:11:29,120  
a bit like el centro where i grew up in

313  
00:11:32,870 --> 00:11:31,040

southern california

314

00:11:36,550 --> 00:11:32,880

perhaps more culture

315

00:11:38,470 --> 00:11:36,560

and on the right uh a steaming ocean

316

00:11:40,389 --> 00:11:38,480

now steaming oceans are a bit more

317

00:11:42,150 --> 00:11:40,399

appealing to science fiction authors and

318

00:11:44,389 --> 00:11:42,160

so that's the one that tended to get

319

00:11:46,470 --> 00:11:44,399

used the most

320

00:11:47,910 --> 00:11:46,480

so you've probably read ray bradbury's

321

00:11:50,150 --> 00:11:47,920

all summer in a day i think that was

322

00:11:51,110 --> 00:11:50,160

mandatory reading when we were kids

323

00:11:52,870 --> 00:11:51,120

um

324

00:11:54,470 --> 00:11:52,880

and edgar rice burroughs of course made

325

00:11:57,829 --> 00:11:54,480

it amtor

326

00:12:00,150 --> 00:11:57,839

um also set on an oceanic venus

327

00:12:03,030 --> 00:12:00,160

so venus was a fairly popular setting

328

00:12:05,430 --> 00:12:03,040

for a while until

329

00:12:08,629 --> 00:12:05,440

mariner 2 the first interplanetary probe

330

00:12:10,710 --> 00:12:08,639

went in 1962 and the end of 1962

331

00:12:13,110 --> 00:12:10,720

returned data

332

00:12:15,269 --> 00:12:13,120

and found that venus seared at a good

333

00:12:17,350 --> 00:12:15,279

800 degrees and it was impossible that

334

00:12:20,150 --> 00:12:17,360

there could be any liquid water on the

335

00:12:21,590 --> 00:12:20,160

planet now this didn't stop carl sagan

336

00:12:23,509 --> 00:12:21,600

from positing that there are ways to

337

00:12:24,710 --> 00:12:23,519

terraform the the planet

338

00:12:26,790 --> 00:12:24,720

and this was right about the time that

339

00:12:29,509 --> 00:12:26,800

carl sagan was starting to make his

340

00:12:32,550 --> 00:12:29,519

transition from astrophysicist to

341

00:12:35,110 --> 00:12:32,560

science popularizer

342

00:12:37,269 --> 00:12:35,120

but nevertheless the venus that we knew

343

00:12:39,110 --> 00:12:37,279

was gone

344

00:12:40,949 --> 00:12:39,120

or was it

345

00:12:43,590 --> 00:12:40,959

interestingly enough the idea of an

346

00:12:45,590 --> 00:12:43,600

oceanic inhabitable venus was so

347

00:12:47,509 --> 00:12:45,600

compelling that many big authors

348

00:12:49,829 --> 00:12:47,519

continued to write about it as if it

349

00:12:52,389 --> 00:12:49,839

existed so robert silverberg said some

350

00:12:54,230 --> 00:12:52,399

stories there in the blue fire series

351

00:12:56,069 --> 00:12:54,240

roger zelazny has this one it's sort of

352

00:12:57,350 --> 00:12:56,079

a hemingway-esque story but it takes

353

00:13:00,790 --> 00:12:57,360

place on venus

354

00:13:02,949 --> 00:13:00,800

it's big fish hunting on venus

355

00:13:05,750 --> 00:13:02,959

this is 1966 people should know better

356

00:13:06,949 --> 00:13:05,760

but zolasney was a big author and

357

00:13:08,230 --> 00:13:06,959

made more money than me so what do i

358

00:13:11,030 --> 00:13:08,240

know um

359

00:13:13,509 --> 00:13:11,040

i will say the first person to put a

360

00:13:16,629 --> 00:13:13,519

story in a realistic marine or two-based

361

00:13:18,470 --> 00:13:16,639

venus was again larry niven with homed

362

00:13:20,069 --> 00:13:18,480

in hell which actually appeared in

363

00:13:22,790 --> 00:13:20,079

fantasy and science fiction i think the

364

00:13:24,069 --> 00:13:22,800

same year maybe the year before

365

00:13:25,030 --> 00:13:24,079

and i always say

366

00:13:30,949 --> 00:13:25,040

writing

367

00:13:32,310 --> 00:13:30,959

ignoring science but what do i know

368

00:13:34,629 --> 00:13:32,320

next planet

369

00:13:36,949 --> 00:13:34,639

this is mars

370

00:13:39,590 --> 00:13:36,959

looking about as good as it ever does

371

00:13:41,829 --> 00:13:39,600

from terrestrial telescopes

372

00:13:44,069 --> 00:13:41,839

it's an enigmatic compelling planet

373

00:13:46,870 --> 00:13:44,079

isn't it it's kind of green

374

00:13:49,030 --> 00:13:46,880

it changes with the seasons it's very

375

00:13:50,629 --> 00:13:49,040

earth-like in terms of its rotation and

376

00:13:51,430 --> 00:13:50,639

its axial tilt

377

00:13:53,430 --> 00:13:51,440

so

378

00:13:55,670 --> 00:13:53,440

clearly mars if we're going to look for

379

00:13:57,990 --> 00:13:55,680

life anywhere it's going to be mars and

380

00:14:01,509 --> 00:13:58,000

i have to ask how many folks here are

381

00:14:04,069 --> 00:14:01,519

mars astro exobiologists

382

00:14:05,670 --> 00:14:04,079

we have a few

383

00:14:07,350 --> 00:14:05,680

after the show i want to know what got

384

00:14:08,790 --> 00:14:07,360

you into looking for life on mars

385

00:14:10,790 --> 00:14:08,800

because i can tell you what got the

386

00:14:14,150 --> 00:14:10,800

first generation

387

00:14:16,389 --> 00:14:14,160

was this guy chaparrali an italian

388

00:14:19,110 --> 00:14:16,399

astronomer who made the first real maps

389

00:14:21,350 --> 00:14:19,120

of mars and you'll notice he's got those

390

00:14:24,870 --> 00:14:21,360

really interesting straight lines on

391

00:14:28,150 --> 00:14:24,880

there which he called in italian canali

392

00:14:31,030 --> 00:14:28,160

which means channels

393

00:14:33,030 --> 00:14:31,040

but percival lowell who we know from his

394

00:14:34,389 --> 00:14:33,040

search for planet x which eventually

395

00:14:37,350 --> 00:14:34,399

became pluto

396

00:14:40,550 --> 00:14:37,360

translated it as canals and the

397

00:14:43,269 --> 00:14:40,560

difference between channel and canal is

398

00:14:48,389 --> 00:14:43,279

natural versus artificial

399

00:14:53,189 --> 00:14:51,110

there must be intelligent life on mars

400

00:14:54,949 --> 00:14:53,199

mars is further from the sun than venus

401  
00:14:57,269 --> 00:14:54,959  
venus earth earth is further from the

402  
00:14:59,189 --> 00:14:57,279  
sun than venus clearly we are seeing the

403  
00:15:01,430 --> 00:14:59,199  
evolution of the solar system in the

404  
00:15:03,670 --> 00:15:01,440  
distance of the planets from the stars

405  
00:15:05,750 --> 00:15:03,680  
so mercury is the youngest planet it

406  
00:15:07,750 --> 00:15:05,760  
hasn't cooled down yet venus is still a

407  
00:15:10,710 --> 00:15:07,760  
primeval swamp

408  
00:15:13,509 --> 00:15:10,720  
the dinosaurs lived in earth is earth

409  
00:15:16,069 --> 00:15:13,519  
and mars is an ancient planet with an

410  
00:15:18,550 --> 00:15:16,079  
old advanced civilization on it the kind

411  
00:15:21,990 --> 00:15:18,560  
that might send aliens to earth to

412  
00:15:25,430 --> 00:15:22,000  
declare war only to be felled by a bug

413  
00:15:27,189 --> 00:15:25,440

presumably covid 18. um

414

00:15:29,670 --> 00:15:27,199

i guess that would be coveted negative

415

00:15:32,230 --> 00:15:29,680

50 or something um so we have a lot of

416

00:15:34,230 --> 00:15:32,240

stories set on mars some of them are

417

00:15:36,790 --> 00:15:34,240

rather romantic so for instance we have

418

00:15:38,069 --> 00:15:36,800

lee brackett who uh is a very famous

419

00:15:40,629 --> 00:15:38,079

screenwriter everyone know who lee

420

00:15:42,629 --> 00:15:40,639

brackett is if you don't look her up

421

00:15:44,150 --> 00:15:42,639

because she's super important not just

422

00:15:45,509 --> 00:15:44,160

in the 40s but beyond she actually wrote

423

00:15:47,430 --> 00:15:45,519

the first draft of the script to the

424

00:15:48,790 --> 00:15:47,440

empire strikes back

425

00:15:52,069 --> 00:15:48,800

she also wrote the treasure of sierra

426

00:15:55,110 --> 00:15:52,079

madre which i believe won an oscar

427

00:15:56,710 --> 00:15:55,120

but in her seekings of mars her heroes

428

00:15:58,150 --> 00:15:56,720

are transported back in time a few

429

00:16:00,230 --> 00:15:58,160

million years to when mars was an

430

00:16:03,030 --> 00:16:00,240

inhabitable wet planet

431

00:16:05,030 --> 00:16:03,040

mars child by cyril judd that's actually

432

00:16:08,069 --> 00:16:05,040

judith merrill and cyril kornbluth who

433

00:16:10,310 --> 00:16:08,079

were big authors in the early 50s

434

00:16:12,230 --> 00:16:10,320

this is a story about colonists on a

435

00:16:13,030 --> 00:16:12,240

more earth-like mars

436

00:16:19,189 --> 00:16:13,040

or

437

00:16:19,990 --> 00:16:19,199

about

438

00:16:28,310 --> 00:16:20,000

the

439

00:16:30,310 --> 00:16:28,320  
on an unusual planet look like

440

00:16:33,110 --> 00:16:30,320  
the mars they write about is not the

441

00:16:35,030 --> 00:16:33,120  
mars that we know today but it is an

442

00:16:36,230 --> 00:16:35,040  
interesting scientifically based world

443

00:16:37,990 --> 00:16:36,240  
and i think it's a story that's still

444

00:16:40,710 --> 00:16:38,000  
worth reading it's called mars child

445

00:16:46,069 --> 00:16:40,720  
there but uh lisa what was it called in

446

00:16:46,079 --> 00:16:52,790  
sin in space

447

00:16:58,870 --> 00:16:54,790  
woman taking her sweater off guy very

448

00:17:03,030 --> 00:17:00,710  
um edgar rice burroughs of course made

449

00:17:05,270 --> 00:17:03,040  
mars very popular and i believe in the

450

00:17:07,270 --> 00:17:05,280  
2010s or so you're going to have a set

451  
00:17:09,829 --> 00:17:07,280  
of movies based on john carter of mars

452  
00:17:12,870 --> 00:17:09,839  
or has he called it barsoom so mars

453  
00:17:15,270 --> 00:17:12,880  
figures huge in science fiction all the

454  
00:17:17,029 --> 00:17:15,280  
way up through the 50s and even into the

455  
00:17:18,789 --> 00:17:17,039  
60s

456  
00:17:22,069 --> 00:17:18,799  
but of course

457  
00:17:26,069 --> 00:17:22,079  
illusions are made to be broken and in

458  
00:17:29,029 --> 00:17:26,079  
1964 mariner 4 was the first probe to

459  
00:17:31,029 --> 00:17:29,039  
successfully pass by mars uh the soviet

460  
00:17:32,470 --> 00:17:31,039  
union sent some that didn't make it or

461  
00:17:34,630 --> 00:17:32,480  
it didn't have their cameras on anyway

462  
00:17:37,350 --> 00:17:34,640  
which doesn't do any good

463  
00:17:38,150 --> 00:17:37,360

mariner 4 determined in its 22 pictures

464

00:17:39,909 --> 00:17:38,160

that

465

00:17:41,750 --> 00:17:39,919

mars looked like the surface of the moon

466

00:17:44,950 --> 00:17:41,760

and everyone came to the conclusion that

467

00:17:48,150 --> 00:17:44,960

mars was an airless worthless hulk

468

00:17:50,070 --> 00:17:48,160

which is interesting because

469

00:17:52,230 --> 00:17:50,080

yes it's true that mars had less than

470

00:17:53,750 --> 00:17:52,240

one percent of earth's atmospheric

471

00:17:55,830 --> 00:17:53,760

density but you know what earth has

472

00:17:56,950 --> 00:17:55,840

about one percent the density of venus's

473

00:17:58,230 --> 00:17:56,960

atmosphere and if there were any

474

00:18:00,950 --> 00:17:58,240

venusians they would be looking at earth

475

00:18:04,070 --> 00:18:00,960

going god what a terrible airless vacuum

476

00:18:05,590 --> 00:18:04,080

place so it wasn't until after the 60s

477

00:18:08,870 --> 00:18:05,600

that we started to say ah well maybe

478

00:18:11,190 --> 00:18:08,880

mars isn't so bad but this is in 1967

479

00:18:12,630 --> 00:18:11,200

pretty much the nader of interest in

480

00:18:14,150 --> 00:18:12,640

mart mars

481

00:18:15,669 --> 00:18:14,160

even though it's interesting i read an

482

00:18:17,270 --> 00:18:15,679

article just a couple of years ago from

483

00:18:19,110 --> 00:18:17,280

my perspective

484

00:18:21,350 --> 00:18:19,120

that talked about how they expected mars

485

00:18:23,270 --> 00:18:21,360

to be heavily cratered um so the fact

486

00:18:25,669 --> 00:18:23,280

that it has craters and not so much

487

00:18:28,070 --> 00:18:25,679

weathering is not that surprising but in

488

00:18:29,669 --> 00:18:28,080

1964 it seemed like or 65 it seemed like

489

00:18:32,150 --> 00:18:29,679

everyone breathed a sigh of relief thank

490

00:18:33,590 --> 00:18:32,160

god there isn't anything on mars

491

00:18:35,750 --> 00:18:33,600

maybe they knew tom cruise was going to

492

00:18:39,350 --> 00:18:35,760

star in a movie

493

00:18:43,190 --> 00:18:41,510

is there life on jupiter could there be

494

00:18:45,750 --> 00:18:43,200

did people think that there was life on

495

00:18:47,190 --> 00:18:45,760

jupiter so jupiter is a hostile

496

00:18:48,630 --> 00:18:47,200

environment and we did know a bit about

497

00:18:50,310 --> 00:18:48,640

it we certainly knew its density we knew

498

00:18:51,190 --> 00:18:50,320

its temperature

499

00:18:53,110 --> 00:18:51,200

um

500

00:18:55,270 --> 00:18:53,120

but there was the possibility that

501  
00:18:57,110 --> 00:18:55,280  
beneath the cloud tops it could be warm

502  
00:18:59,190 --> 00:18:57,120  
enough or

503  
00:19:01,669 --> 00:18:59,200  
or congenial enough to support some kind

504  
00:19:06,390 --> 00:19:01,679  
of alien life

505  
00:19:09,990 --> 00:19:08,630  
why is everyone laughing

506  
00:19:11,909 --> 00:19:10,000  
edgar riceboroughs wrote this is

507  
00:19:13,190 --> 00:19:11,919  
actually late edgar riceborough stories

508  
00:19:14,549 --> 00:19:13,200  
which means it's not one of his better

509  
00:19:17,990 --> 00:19:14,559  
ones um

510  
00:19:20,789 --> 00:19:18,000  
so he made jupiter inhabitable by having

511  
00:19:22,390 --> 00:19:20,799  
hot volcanoes keep everything warm like

512  
00:19:25,590 --> 00:19:22,400  
indonesia i guess

513  
00:19:28,549 --> 00:19:25,600

and uh and the speed of jupiter's

514

00:19:31,190 --> 00:19:28,559

rotation mitigating the gravity with

515

00:19:32,310 --> 00:19:31,200

centrifugal force

516

00:19:34,310 --> 00:19:32,320

you have to give them credit for

517

00:19:37,190 --> 00:19:34,320

originality

518

00:19:38,950 --> 00:19:37,200

um in a more realistic vein we have paul

519

00:19:41,510 --> 00:19:38,960

anderson someone i'm sure larry nevin

520

00:19:43,270 --> 00:19:41,520

knew very well um paul anderson was a

521

00:19:45,510 --> 00:19:43,280

science fiction author whose work was

522

00:19:48,070 --> 00:19:45,520

far more rooted in science very hard

523

00:19:49,990 --> 00:19:48,080

science and he wrote a story under the

524

00:19:52,310 --> 00:19:50,000

name of winston sanders a couple of

525

00:19:54,630 --> 00:19:52,320

years ago from my perspective called

526

00:19:57,110 --> 00:19:54,640

three worlds to conquer um and it

527

00:19:59,590 --> 00:19:57,120

posited that there was life on jupiter

528

00:20:02,149 --> 00:19:59,600

on some sort of cold rocky core under

529

00:20:03,990 --> 00:20:02,159

the thick atmosphere um

530

00:20:07,590 --> 00:20:04,000

the only problem with this book is it's

531

00:20:09,510 --> 00:20:07,600

not very good but the but the aliens are

532

00:20:11,830 --> 00:20:09,520

interesting all right

533

00:20:13,510 --> 00:20:11,840

saturn pretty planet but there's not

534

00:20:15,669 --> 00:20:13,520

much you can do with saturn that you

535

00:20:17,669 --> 00:20:15,679

can't do with jupiter and beca and

536

00:20:19,510 --> 00:20:17,679

because saturn is clearly more hostile

537

00:20:21,190 --> 00:20:19,520

than jupiter not a lot of people wrote

538

00:20:23,590 --> 00:20:21,200

stories about saturn

539

00:20:27,190 --> 00:20:23,600

even less hospitable and no i will not

540

00:20:31,669 --> 00:20:29,590

the seventh planet

541

00:20:32,950 --> 00:20:31,679

you can you can pronounce it yourself

542

00:20:34,870 --> 00:20:32,960

grow up

543

00:20:36,310 --> 00:20:34,880

um

544

00:20:38,070 --> 00:20:36,320

you would think that this planet would

545

00:20:39,110 --> 00:20:38,080

not be the subject of science fiction

546

00:20:40,950 --> 00:20:39,120

and yet

547

00:20:42,390 --> 00:20:40,960

a few years ago there was this one i

548

00:20:43,510 --> 00:20:42,400

believe it was translated from the

549

00:20:45,029 --> 00:20:43,520

danish

550

00:20:46,230 --> 00:20:45,039

journey to the seventh planet and they

551  
00:20:48,870 --> 00:20:46,240  
go to the planet and they find a

552  
00:20:50,470 --> 00:20:48,880  
completely earth-like environment

553  
00:20:52,070 --> 00:20:50,480  
turns out it's actually an artificial

554  
00:20:53,990 --> 00:20:52,080  
creation and that little monster in the

555  
00:20:56,310 --> 00:20:54,000  
bottom left is sending out mine waves to

556  
00:20:59,510 --> 00:20:56,320  
ensnare people with with beautiful women

557  
00:21:01,510 --> 00:20:59,520  
to uh to trap the uh the stalwart

558  
00:21:03,270 --> 00:21:01,520  
spacemen it's actually not a bad movie

559  
00:21:05,830 --> 00:21:03,280  
but it is the only one i know that takes

560  
00:21:07,190 --> 00:21:05,840  
place on uranus

561  
00:21:09,830 --> 00:21:07,200  
and then finally we get to the edge of

562  
00:21:11,669 --> 00:21:09,840  
the solar system neptune and pluto

563  
00:21:13,909 --> 00:21:11,679

neptune on the left pluto on the right

564

00:21:16,870 --> 00:21:13,919

and obviously those are so far out we do

565

00:21:20,310 --> 00:21:16,880

not expect to see any kind of life there

566

00:21:23,029 --> 00:21:20,320

so as of 1967 we've exhausted the solar

567

00:21:24,470 --> 00:21:23,039

system as an abode for life

568

00:21:28,549 --> 00:21:24,480

is there any other place in the solar

569

00:21:28,559 --> 00:21:32,549

let's not always see the same hands

570

00:21:35,750 --> 00:21:34,470

the moons

571

00:21:37,909 --> 00:21:35,760

so

572

00:21:40,149 --> 00:21:37,919

at the time we knew that jupiter had a

573

00:21:41,190 --> 00:21:40,159

bunch of big moons and so we have doc

574

00:21:42,950 --> 00:21:41,200

smith

575

00:21:46,230 --> 00:21:42,960

one of the deans of science fiction

576  
00:21:48,090 --> 00:21:46,240  
writing a pulpy story about aliens from

577  
00:21:49,190 --> 00:21:48,100  
ganymede

578  
00:21:51,190 --> 00:21:49,200  
[Music]

579  
00:21:52,870 --> 00:21:51,200  
and then we have titan titan we knew had

580  
00:21:54,390 --> 00:21:52,880  
an atmosphere and a significant

581  
00:21:56,390 --> 00:21:54,400  
atmosphere

582  
00:21:59,270 --> 00:21:56,400  
and alan norse wrote an interesting

583  
00:22:01,510 --> 00:21:59,280  
story set under the clouds of titan

584  
00:22:03,029 --> 00:22:01,520  
the life was incidental to the story it

585  
00:22:05,350 --> 00:22:03,039  
was mostly a hard science fiction about

586  
00:22:06,950 --> 00:22:05,360  
colonization and mining but the aliens

587  
00:22:09,990 --> 00:22:06,960  
were there

588  
00:22:11,270 --> 00:22:10,000

and titan over the next few decades is

589

00:22:13,590 --> 00:22:11,280

going to figure more and more

590

00:22:15,909 --> 00:22:13,600

prominently in science fiction because

591

00:22:17,029 --> 00:22:15,919

it is such a fascinating world and we'll

592

00:22:19,350 --> 00:22:17,039

get back to that are there any people

593

00:22:21,190 --> 00:22:19,360

who are studying life possibility

594

00:22:23,029 --> 00:22:21,200

she got very excited

595

00:22:24,710 --> 00:22:23,039

we're going to exchange cards because

596

00:22:28,310 --> 00:22:24,720

titan is amazing

597

00:22:30,870 --> 00:22:28,320

all right nevertheless

598

00:22:32,390 --> 00:22:30,880

speculation these these these meager

599

00:22:34,870 --> 00:22:32,400

speculations aside it certainly looks

600

00:22:36,789 --> 00:22:34,880

like the solar system is not going to be

601  
00:22:39,590 --> 00:22:36,799  
a great place to find life which is you

602  
00:22:41,430 --> 00:22:39,600  
know a bumper

603  
00:22:45,270 --> 00:22:41,440  
so the question is are the planets

604  
00:22:47,590 --> 00:22:45,280  
around other solar systems and in 1967

605  
00:22:51,029 --> 00:22:47,600  
this was still something of an open

606  
00:22:52,789 --> 00:22:51,039  
question we had not settled on an origin

607  
00:22:55,029 --> 00:22:52,799  
of the solar system theory i know that

608  
00:22:57,270 --> 00:22:55,039  
sounds crazy it was only 55 years ago

609  
00:22:59,590 --> 00:22:57,280  
heck it was only 55 years ago that that

610  
00:23:02,149 --> 00:22:59,600  
plate tectonics became an established

611  
00:23:05,909 --> 00:23:02,159  
theory it was only this year the

612  
00:23:07,510 --> 00:23:05,919  
tennessee repealed its scopes monkey law

613  
00:23:10,390 --> 00:23:07,520

restriction on teaching evolution in

614

00:23:12,470 --> 00:23:10,400

public schools so just 55 years whenever

615

00:23:14,710 --> 00:23:12,480

you're feeling like oh my gosh 2022 is

616

00:23:17,350 --> 00:23:14,720

the worst year ever it has never been as

617

00:23:20,710 --> 00:23:17,360

bad as today let me tell you folks

618

00:23:21,590 --> 00:23:20,720

55 years ago was worse in every single

619

00:23:24,950 --> 00:23:21,600

way

620

00:23:27,830 --> 00:23:26,470

all right so the question is were there

621

00:23:30,470 --> 00:23:27,840

other solar systems because it really

622

00:23:32,310 --> 00:23:30,480

relies on two things is our solar system

623

00:23:34,310 --> 00:23:32,320

a unique phenomenon

624

00:23:36,149 --> 00:23:34,320

or is it one of many

625

00:23:37,430 --> 00:23:36,159

and at the time one of the competing

626  
00:23:39,029 --> 00:23:37,440  
theories was

627  
00:23:41,029 --> 00:23:39,039  
earth is rare

628  
00:23:43,430 --> 00:23:41,039  
and what happened was a star passed

629  
00:23:45,990 --> 00:23:43,440  
another star and ripped some of the

630  
00:23:47,590 --> 00:23:46,000  
matter from it and that congealed into a

631  
00:23:49,190 --> 00:23:47,600  
disk that turned into planets and if

632  
00:23:50,950 --> 00:23:49,200  
that's the case stellar collisions are

633  
00:23:53,269 --> 00:23:50,960  
very rare and there would be very few

634  
00:23:57,029 --> 00:23:53,279  
planets in the solar system but even as

635  
00:23:59,750 --> 00:23:57,039  
early as the 1700s laplace theorized

636  
00:24:01,350 --> 00:23:59,760  
that no every star has a disc

637  
00:24:02,870 --> 00:24:01,360  
and it collapses into planets and the

638  
00:24:04,390 --> 00:24:02,880

only reason laplace didn't really take

639

00:24:06,470 --> 00:24:04,400

off is because they hadn't solved some

640

00:24:08,789 --> 00:24:06,480

momentum issues which they won't solve

641

00:24:10,630 --> 00:24:08,799

for another couple of decades

642

00:24:13,750 --> 00:24:10,640

obviously in 2022

643

00:24:16,710 --> 00:24:13,760

protoplanetary disks are accepted fact

644

00:24:18,390 --> 00:24:16,720

so the question is in 1967 did we have

645

00:24:20,950 --> 00:24:18,400

evidence of any other planets around

646

00:24:22,710 --> 00:24:20,960

other stars

647

00:24:25,190 --> 00:24:22,720

yes

648

00:24:28,710 --> 00:24:25,200

this is peter vandecamp

649

00:24:29,830 --> 00:24:28,720

and he had by 1967 discovered three

650

00:24:33,590 --> 00:24:29,840

planets

651  
00:24:36,310 --> 00:24:33,600  
around three nearby stars the land 21185

652  
00:24:38,230 --> 00:24:36,320  
61 cygni and bird star those just trip

653  
00:24:40,630 --> 00:24:38,240  
off the tongue

654  
00:24:42,950 --> 00:24:40,640  
the land 21185 is a household name today

655  
00:24:44,789 --> 00:24:42,960  
because of peter vanderkamp

656  
00:24:46,789 --> 00:24:44,799  
um and the way he discovered these

657  
00:24:48,390 --> 00:24:46,799  
planets was the science of astrometry

658  
00:24:50,149 --> 00:24:48,400  
which is you measure the star and see

659  
00:24:52,630 --> 00:24:50,159  
the wiggle this isn't the radial

660  
00:24:56,310 --> 00:24:52,640  
velocity method this is actual watching

661  
00:24:58,630 --> 00:24:56,320  
the star move around in your telescope

662  
00:25:00,710 --> 00:24:58,640  
and so we knew in the 60s there were

663  
00:25:02,230 --> 00:25:00,720

another stars so there was only one

664

00:25:03,909 --> 00:25:02,240

problem with peter van der kamp's

665

00:25:05,110 --> 00:25:03,919

discoveries and that was they were all

666

00:25:09,190 --> 00:25:05,120

wrong

667

00:25:11,029 --> 00:25:09,200

this telescope not with so there were no

668

00:25:13,909 --> 00:25:11,039

planets these planets do not exist but

669

00:25:16,310 --> 00:25:13,919

we didn't know that in 1967 and we took

670

00:25:19,190 --> 00:25:16,320

that as this is license to let our

671

00:25:21,029 --> 00:25:19,200

imaginations run wild

672

00:25:23,590 --> 00:25:21,039

now here's the cool thing you don't have

673

00:25:26,830 --> 00:25:23,600

to just look for stars

674

00:25:29,269 --> 00:25:26,840

look at stars for planets invisible

675

00:25:31,669 --> 00:25:29,279

light now that we know that there are

676

00:25:33,110 --> 00:25:31,679

other solar systems we can start to make

677

00:25:34,870 --> 00:25:33,120

predictions about the probability of

678

00:25:36,390 --> 00:25:34,880

life and every everybody's seen this

679

00:25:37,990 --> 00:25:36,400

equate

680

00:25:39,750 --> 00:25:38,000

meaningless equation in the history of

681

00:25:41,669 --> 00:25:39,760

humanity because we've got seven

682

00:25:43,669 --> 00:25:41,679

variables only three of which we can

683

00:25:46,390 --> 00:25:43,679

really nail down so the other four are

684

00:25:49,190 --> 00:25:46,400

whatever you want them to be um

685

00:25:51,830 --> 00:25:49,200

you can probably with tessa and kepler

686

00:25:55,430 --> 00:25:51,840

and so and now that jim webb is up we

687

00:25:56,630 --> 00:25:55,440

can maybe start to narrow down on f of p

688

00:25:59,190 --> 00:25:56,640

but anyway

689

00:26:01,350 --> 00:25:59,200

so frank drake decided you know what we

690

00:26:04,149 --> 00:26:01,360

don't need just visible light

691

00:26:07,590 --> 00:26:04,159

let's listen to the stars with this very

692

00:26:09,190 --> 00:26:07,600

new technology radio astronomy

693

00:26:11,029 --> 00:26:09,200

so if any of you have read the third

694

00:26:13,669 --> 00:26:11,039

book in the oz series you know who osma

695

00:26:15,510 --> 00:26:13,679

is the queen of oz

696

00:26:17,190 --> 00:26:15,520

one of the first transgender heroes

697

00:26:18,470 --> 00:26:17,200

actually because she was a he in the

698

00:26:19,590 --> 00:26:18,480

second book

699

00:26:21,190 --> 00:26:19,600

um

700

00:26:22,789 --> 00:26:21,200

and what he did was he set up a

701  
00:26:24,470 --> 00:26:22,799  
telescope in west virginia he didn't set

702  
00:26:26,870 --> 00:26:24,480  
it up he contracted a telescope in west

703  
00:26:28,070 --> 00:26:26,880  
virginia and listened for two months to

704  
00:26:31,029 --> 00:26:28,080  
tau seti

705  
00:26:32,390 --> 00:26:31,039  
and epsilon iridony

706  
00:26:34,789 --> 00:26:32,400  
and his thinking was if they are

707  
00:26:36,390 --> 00:26:34,799  
broadcasting anything we will hear it

708  
00:26:38,230 --> 00:26:36,400  
well two months went by he didn't hear

709  
00:26:39,990 --> 00:26:38,240  
anything but he said well you know what

710  
00:26:42,149 --> 00:26:40,000  
really this is going to take a good 30

711  
00:26:45,190 --> 00:26:42,159  
years before we can make any conclusions

712  
00:26:48,710 --> 00:26:45,200  
but this was the first attempt to listen

713  
00:26:52,630 --> 00:26:50,310

of course we don't have to stay on our

714

00:26:54,390 --> 00:26:52,640

planet we can leave and in the late 60s

715

00:26:57,510 --> 00:26:54,400

we were talking about using the saturn v

716

00:26:59,669 --> 00:26:57,520

moon rocket to send really giant probes

717

00:27:01,750 --> 00:26:59,679

to mars and that was the original

718

00:27:04,149 --> 00:27:01,760

voyager this eventually will get

719

00:27:06,149 --> 00:27:04,159

cancelled and replaced by viking

720

00:27:08,950 --> 00:27:06,159

so it will have to wait until 1976

721

00:27:11,190 --> 00:27:08,960

before we get some surveyor class on the

722

00:27:12,710 --> 00:27:11,200

ground science from mars

723

00:27:13,990 --> 00:27:12,720

but we were ambitious we were planning

724

00:27:15,909 --> 00:27:14,000

on going there

725

00:27:19,669 --> 00:27:15,919

all right so this is the state of

726

00:27:20,950 --> 00:27:19,679

knowledge as of 1967. this is what we

727

00:27:24,389 --> 00:27:20,960

knew

728

00:27:28,070 --> 00:27:24,399

let's talk about what we dreamed

729

00:27:30,870 --> 00:27:28,080

oh sorry i got ahead of myself

730

00:27:33,909 --> 00:27:30,880

this is us going we went

731

00:27:35,830 --> 00:27:33,919

we had plans to go out to the planets

732

00:27:39,110 --> 00:27:35,840

but what if the aliens had already come

733

00:27:42,950 --> 00:27:40,870

for instance there's this meteorite that

734

00:27:46,310 --> 00:27:42,960

fell that we found in the 1800s called

735

00:27:48,710 --> 00:27:46,320

the orguel meteorite and we believed

736

00:27:50,870 --> 00:27:48,720

that there was evidence of life

737

00:27:52,789 --> 00:27:50,880

on this meteorite you see the thing on

738

00:27:55,750 --> 00:27:52,799

the right that actually made big

739

00:27:59,029 --> 00:27:55,760

headlines about 30 years from the 1960s

740

00:28:01,430 --> 00:27:59,039

we were certain that this was the proof

741

00:28:03,909 --> 00:28:01,440

that there was life outside of earth so

742

00:28:05,269 --> 00:28:03,919

common that even asteroids could have

743

00:28:07,590 --> 00:28:05,279

pieces of it

744

00:28:09,430 --> 00:28:07,600

turned out this was a fraud

745

00:28:10,950 --> 00:28:09,440

like pilt down man

746

00:28:12,230 --> 00:28:10,960

but we didn't know that at the time and

747

00:28:14,070 --> 00:28:12,240

again this is one of those things where

748

00:28:17,029 --> 00:28:14,080

we get put on the right course even for

749

00:28:18,789 --> 00:28:17,039

the wrong reasons all right well what if

750

00:28:20,909 --> 00:28:18,799

the aliens visiting us are a bit more

751  
00:28:23,590 --> 00:28:20,919  
flashy about it

752  
00:28:27,110 --> 00:28:23,600  
1947 all of a sudden

753  
00:28:29,830 --> 00:28:27,120  
ufos are everywhere

754  
00:28:33,990 --> 00:28:29,840  
now i'm not saying that ufos don't exist

755  
00:28:38,070 --> 00:28:36,870  
reports of demonic visitation

756  
00:28:39,510 --> 00:28:38,080  
plummeted

757  
00:28:41,430 --> 00:28:39,520  
tremendously

758  
00:28:44,310 --> 00:28:41,440  
right around the time that reports of

759  
00:28:46,070 --> 00:28:44,320  
ufo visitation and abduction became

760  
00:28:47,510 --> 00:28:46,080  
popular

761  
00:28:49,110 --> 00:28:47,520  
coincidence

762  
00:28:51,669 --> 00:28:49,120  
you be the judge

763  
00:28:53,350 --> 00:28:51,679

ufos became very popular in the late 40s

764

00:28:55,430 --> 00:28:53,360

probably because that was around the

765

00:28:57,510 --> 00:28:55,440

time that the air force was lofting

766

00:28:59,350 --> 00:28:57,520

things so high up that you could see

767

00:29:01,029 --> 00:28:59,360

them at night time

768

00:29:02,950 --> 00:29:01,039

but lit up very brightly because they

769

00:29:06,230 --> 00:29:02,960

were still catching the sunlight so what

770

00:29:08,149 --> 00:29:06,240

could these things be um

771

00:29:10,389 --> 00:29:08,159

the air force nasa so forth they get

772

00:29:11,990 --> 00:29:10,399

reports every day when someone looks at

773

00:29:13,590 --> 00:29:12,000

venus and goes oh my god that must be a

774

00:29:15,669 --> 00:29:13,600

ufo anytime you see something bright in

775

00:29:17,510 --> 00:29:15,679

the sky people are going to assume it

776

00:29:18,870 --> 00:29:17,520

shouldn't be there

777

00:29:20,630 --> 00:29:18,880

what's going to happen when elon musk

778

00:29:22,630 --> 00:29:20,640

sends up all those starling satellites

779

00:29:24,630 --> 00:29:22,640

are we just going to get 10 billion

780

00:29:28,070 --> 00:29:24,640

calls

781

00:29:32,389 --> 00:29:28,080

we okay am i dying no you're not uh

782

00:29:32,399 --> 00:29:35,350

so in the

783

00:29:39,190 --> 00:29:37,669

so don't don't kiss this thing so can

784

00:29:41,909 --> 00:29:39,200

you still hear me

785

00:29:44,470 --> 00:29:41,919

all right i just have to be closer

786

00:29:46,710 --> 00:29:44,480

in the 50s flying saucers were

787

00:29:49,750 --> 00:29:46,720

legitimate science fiction by the late

788

00:29:52,230 --> 00:29:49,760

50s they no longer were they had moved

789

00:29:54,710 --> 00:29:52,240

over into crack pottery

790

00:29:56,630 --> 00:29:54,720

by 1961 we have betty and barney smith

791

00:29:59,029 --> 00:29:56,640

talking about in lurid detail about

792

00:30:00,789 --> 00:29:59,039

their abduction by ufos and they made a

793

00:30:03,990 --> 00:30:00,799

living on that for the next many decades

794

00:30:06,149 --> 00:30:04,000

of their lives um but even by 1966 we've

795

00:30:09,110 --> 00:30:06,159

got walter cronkite talking about how

796

00:30:11,269 --> 00:30:09,120

there are no unidentified objects in

797

00:30:13,110 --> 00:30:11,279

space

798

00:30:15,350 --> 00:30:13,120

we knew it was was nothing and yet you

799

00:30:17,110 --> 00:30:15,360

know even 55 years from now i'm i assume

800

00:30:18,950 --> 00:30:17,120

people will still be assuming that they

801

00:30:21,990 --> 00:30:18,960

uh they want to believe

802

00:30:23,029 --> 00:30:22,000

so flying saucers probably not real

803

00:30:24,710 --> 00:30:23,039

sorry

804

00:30:26,149 --> 00:30:24,720

okay so now we go back to what i was

805

00:30:28,070 --> 00:30:26,159

gonna say

806

00:30:29,590 --> 00:30:28,080

let's talk about what we dreamed we

807

00:30:31,750 --> 00:30:29,600

personally thought aliens were gonna be

808

00:30:33,430 --> 00:30:31,760

like

809

00:30:35,909 --> 00:30:33,440

well we had blobs

810

00:30:38,549 --> 00:30:35,919

blobs are easy they're they're big and

811

00:30:40,870 --> 00:30:38,559

symmetrical and scary this is the movie

812

00:30:43,110 --> 00:30:40,880

the blob um but they were also featured

813

00:30:46,149 --> 00:30:43,120

in science fiction um

814

00:30:50,870 --> 00:30:48,149

m schwiller keller um carol m schwiller

815

00:30:53,830 --> 00:30:50,880

wrote a lovely story about from the

816

00:30:56,310 --> 00:30:53,840

perspective of the blob um so blobs make

817

00:30:58,470 --> 00:30:56,320

sense we've got puppet masters and this

818

00:30:59,990 --> 00:30:58,480

is a concept that will resurface time

819

00:31:01,750 --> 00:31:00,000

and time again the aliens that show up

820

00:31:05,830 --> 00:31:01,760

and ride our backs and make us do their

821

00:31:11,029 --> 00:31:08,230

this is one of my favorites so blobs and

822

00:31:12,710 --> 00:31:11,039

puppet masters are the things of schlock

823

00:31:14,870 --> 00:31:12,720

b movies

824

00:31:17,669 --> 00:31:14,880

but inside the pages of magazine like

825

00:31:19,669 --> 00:31:17,679

astounding you had more nuanced more

826

00:31:21,990 --> 00:31:19,679

interesting suppositions have any of you

827

00:31:24,070 --> 00:31:22,000

read this story omnilingual

828

00:31:25,669 --> 00:31:24,080

famous story um

829

00:31:27,350 --> 00:31:25,679

it's important for a lot of reasons one

830

00:31:29,149 --> 00:31:27,360

it's one of the very first stories to

831

00:31:32,230 --> 00:31:29,159

star a woman scientist in a

832

00:31:34,470 --> 00:31:32,240

non-sexualized role she's just a woman

833

00:31:36,549 --> 00:31:34,480

doing her job

834

00:31:38,230 --> 00:31:36,559

and this story is really neat if you get

835

00:31:40,310 --> 00:31:38,240

a chance to read it it's actually you

836

00:31:43,110 --> 00:31:40,320

can find it on gutenber for free

837

00:31:44,870 --> 00:31:43,120

um it is about a martian civilization

838

00:31:46,870 --> 00:31:44,880

there's mars again

839

00:31:48,230 --> 00:31:46,880

we do not understand their language we

840

00:31:50,470 --> 00:31:48,240

can't understand their culture they've

841

00:31:53,750 --> 00:31:50,480

been dead for tens of thousands of years

842

00:31:57,190 --> 00:31:53,760

and yet there is a rosetta stone

843

00:31:59,509 --> 00:31:57,200

that allows us to crack the martian code

844

00:32:00,470 --> 00:31:59,519

do you want me to spoil it for you

845

00:32:02,389 --> 00:32:00,480

okay

846

00:32:04,230 --> 00:32:02,399

i won't but if you read it it's really

847

00:32:06,070 --> 00:32:04,240

interesting i strongly recommend this it

848

00:32:08,389 --> 00:32:06,080

is a hard science fiction story and well

849

00:32:11,509 --> 00:32:08,399

worth your time

850

00:32:15,509 --> 00:32:11,519

it says it right there hb piper

851  
00:32:20,710 --> 00:32:17,909  
we have paul anderson again this is an

852  
00:32:22,710 --> 00:32:20,720  
alien from uh a planet with a red sun

853  
00:32:24,470 --> 00:32:22,720  
very dim and so their eyes are very big

854  
00:32:26,230 --> 00:32:24,480  
to catch the light and their ears big

855  
00:32:29,269 --> 00:32:26,240  
because you depend more on hearing when

856  
00:32:31,029 --> 00:32:29,279  
you can't see so well

857  
00:32:35,750 --> 00:32:31,039  
this is a really interesting story this

858  
00:32:38,950 --> 00:32:35,760  
is unhuman sacrifice by catherine mclean

859  
00:32:41,110 --> 00:32:38,960  
this came out in 1958 also in analog and

860  
00:32:42,950 --> 00:32:41,120  
this has an extra

861  
00:32:44,950 --> 00:32:42,960  
terrestrial team going to a planet and

862  
00:32:47,269 --> 00:32:44,960  
finding these aliens with the strange

863  
00:32:48,710 --> 00:32:47,279

life cycle they live as bipedal

864

00:32:50,149 --> 00:32:48,720

creatures most

865

00:32:51,750 --> 00:32:50,159

and then there just comes a point in

866

00:32:54,549 --> 00:32:51,760

their life when they take the old

867

00:32:56,789 --> 00:32:54,559

members of this tribe and hang them by

868

00:32:58,789 --> 00:32:56,799

their feet from trees

869

00:33:00,230 --> 00:32:58,799

leaving them somewhat hobbled for the

870

00:33:02,470 --> 00:33:00,240

rest of their life

871

00:33:03,909 --> 00:33:02,480

what terrible cruel people why would

872

00:33:05,750 --> 00:33:03,919

they do this

873

00:33:08,070 --> 00:33:05,760

and the answer is a very interesting

874

00:33:09,990 --> 00:33:08,080

biological puzzle and i strongly

875

00:33:12,070 --> 00:33:10,000

recommend that all of you get a chance

876

00:33:13,830 --> 00:33:12,080

to read unhuman sacrifice by katherine

877

00:33:15,430 --> 00:33:13,840

mclean and if you're wondering where you

878

00:33:17,509 --> 00:33:15,440

can read that you can find it in the

879

00:33:19,350 --> 00:33:17,519

first volume of rediscovery science

880

00:33:21,990 --> 00:33:19,360

fiction by women

881

00:33:23,430 --> 00:33:22,000

put out by journey press

882

00:33:25,350 --> 00:33:23,440

this is not a plug for that this is just

883

00:33:26,950 --> 00:33:25,360

a particularly interesting story with

884

00:33:30,070 --> 00:33:26,960

well thought out biology i think you'll

885

00:33:33,669 --> 00:33:31,909

have any of you read this story critical

886

00:33:35,269 --> 00:33:33,679

point by hal clement

887

00:33:37,669 --> 00:33:35,279

how clement was another one of those

888

00:33:39,509 --> 00:33:37,679

extremely hard science fiction authors

889

00:33:42,230 --> 00:33:39,519

and what i love about this story this is

890

00:33:45,190 --> 00:33:42,240

also worth your time it posits a planet

891

00:33:46,789 --> 00:33:45,200

where you've got an atmospheric density

892

00:33:48,630 --> 00:33:46,799

it's three times the size of the earth

893

00:33:50,549 --> 00:33:48,640

so the atmospheric density is hundreds

894

00:33:53,029 --> 00:33:50,559

that of earth and we're near the

895

00:33:55,430 --> 00:33:53,039

critical point of water so as the sun

896

00:33:57,990 --> 00:33:55,440

sets the water coalesces from the

897

00:34:00,149 --> 00:33:58,000

atmosphere and the oceans rise by

898

00:34:01,830 --> 00:34:00,159

several meters every night and it's all

899

00:34:03,269 --> 00:34:01,840

about these aliens that live essentially

900

00:34:05,669 --> 00:34:03,279

like at the bottom of the ocean except

901  
00:34:07,509 --> 00:34:05,679  
the ocean is their atmosphere really

902  
00:34:09,349 --> 00:34:07,519  
interesting story

903  
00:34:10,230 --> 00:34:09,359  
so even in the 50s we were writing

904  
00:34:12,310 --> 00:34:10,240  
really

905  
00:34:14,470 --> 00:34:12,320  
nuanced compelling scientifically

906  
00:34:18,470 --> 00:34:14,480  
motivated stories that i suspect to some

907  
00:34:23,109 --> 00:34:20,550  
let's go to television

908  
00:34:24,869 --> 00:34:23,119  
not quite as sophisticated does anyone

909  
00:34:28,230 --> 00:34:24,879  
know what this is

910  
00:34:30,950 --> 00:34:28,240  
this is doctor who the second serial the

911  
00:34:34,230 --> 00:34:30,960  
person these are falls

912  
00:34:36,389 --> 00:34:34,240  
very alien looking creatures these are

913  
00:34:38,550 --> 00:34:36,399

here's some more aliens that's the

914

00:34:41,589 --> 00:34:38,560

doctor and his granddaughter they're

915

00:34:43,589 --> 00:34:41,599

aliens can't you tell

916

00:34:45,190 --> 00:34:43,599

of course we do have the daleks which we

917

00:34:47,190 --> 00:34:45,200

actually don't know what they look like

918

00:34:48,550 --> 00:34:47,200

in 1964 they could be people in there in

919

00:34:51,510 --> 00:34:48,560

fact they're supposed to be mutated

920

00:34:51,520 --> 00:34:55,030

in fact

921

00:34:57,990 --> 00:34:56,389

when you've got humans doing the acting

922

00:35:01,349 --> 00:34:58,000

why not have two in a box you're going

923

00:35:05,589 --> 00:35:01,359

to find this very often in 60 science

924

00:35:08,470 --> 00:35:05,599

fiction your aliens look like people

925

00:35:10,710 --> 00:35:08,480

or they're people in a suit

926  
00:35:12,470 --> 00:35:10,720  
for instance the first monster we see in

927  
00:35:14,829 --> 00:35:12,480  
star trek this is the man trap the first

928  
00:35:17,430 --> 00:35:14,839  
aired episode this was a woman in a

929  
00:35:19,430 --> 00:35:17,440  
suit here's a man in a lizard suit this

930  
00:35:21,510 --> 00:35:19,440  
is the gorn from the episode arena also

931  
00:35:24,390 --> 00:35:21,520  
first season of star trek

932  
00:35:26,310 --> 00:35:24,400  
this idea this theme of the man in a

933  
00:35:27,910 --> 00:35:26,320  
suit is so prevalent there's even an

934  
00:35:29,190 --> 00:35:27,920  
outer limits episode which is an

935  
00:35:30,630 --> 00:35:29,200  
anthology show that happened around the

936  
00:35:33,510 --> 00:35:30,640  
same time as twilight zone starring

937  
00:35:41,910 --> 00:35:33,520  
martin landau as a man in a suit who

938  
00:35:46,870 --> 00:35:44,230

and that's if we're lucky usually what

939

00:35:50,470 --> 00:35:46,880

we get these are all aliens aliens from

940

00:35:52,630 --> 00:35:50,480

star trek these are all non-humans

941

00:35:55,109 --> 00:35:52,640

and yet they look just like you and me

942

00:35:56,790 --> 00:35:55,119

maybe with little makeup on

943

00:35:58,230 --> 00:35:56,800

why is that

944

00:35:59,990 --> 00:35:58,240

and this is something we don't just see

945

00:36:02,470 --> 00:36:00,000

in television you actually see this all

946

00:36:05,750 --> 00:36:02,480

the time in the science fiction in print

947

00:36:06,630 --> 00:36:05,760

of the day well there's two reasons

948

00:36:09,589 --> 00:36:06,640

one

949

00:36:11,990 --> 00:36:09,599

it's cheaper to put a person in makeup

950

00:36:13,510 --> 00:36:12,000

than it is to make a truly alien thing

951  
00:36:16,069 --> 00:36:13,520  
and also there's a matter of writing

952  
00:36:17,510 --> 00:36:16,079  
what you know right that's why we get

953  
00:36:19,349 --> 00:36:17,520  
people on other planets that's why we

954  
00:36:21,510 --> 00:36:19,359  
get cat people on other planets that's

955  
00:36:24,230 --> 00:36:21,520  
why we get fish on other planets birds

956  
00:36:25,910 --> 00:36:24,240  
on other planets the idea that life will

957  
00:36:28,310 --> 00:36:25,920  
evolve on other worlds in the same order

958  
00:36:32,069 --> 00:36:28,320  
they did here from fish to amphibians to

959  
00:36:33,670 --> 00:36:32,079  
reptiles to birds to humans

960  
00:36:37,270 --> 00:36:33,680  
there's also something a little more

961  
00:36:39,430 --> 00:36:37,280  
sinister going on here there's a bit of

962  
00:36:42,230 --> 00:36:39,440  
translated racism

963  
00:36:44,550 --> 00:36:42,240

it's a sort of terran chauvinism human

964

00:36:45,829 --> 00:36:44,560

chauvinism this idea that

965

00:36:47,829 --> 00:36:45,839

humanity

966

00:36:52,150 --> 00:36:47,839

is not only

967

00:36:54,550 --> 00:36:52,160

the best form it's an inevitable form

968

00:36:56,470 --> 00:36:54,560

because it's the best and so we can go

969

00:36:59,829 --> 00:36:56,480

out to other planets and we will find

970

00:37:01,510 --> 00:36:59,839

people who look exactly like us

971

00:37:03,589 --> 00:37:01,520

sound familiar there's there's a there's

972

00:37:06,230 --> 00:37:03,599

an element of colonialism in there and

973

00:37:08,230 --> 00:37:06,240

certainly chauvinism um and no more was

974

00:37:10,790 --> 00:37:08,240

this espou espouse that in the pages of

975

00:37:12,230 --> 00:37:10,800

astounding by john campbell um

976  
00:37:14,069 --> 00:37:12,240  
a lot of great science fiction in his

977  
00:37:15,510 --> 00:37:14,079  
magazines a lot of great discoveries in

978  
00:37:18,550 --> 00:37:15,520  
his magazines

979  
00:37:19,750 --> 00:37:18,560  
a lot of regressive attitudes in his

980  
00:37:21,109 --> 00:37:19,760  
magazine

981  
00:37:22,790 --> 00:37:21,119  
all right

982  
00:37:24,790 --> 00:37:22,800  
now this is star trek i'm making fun of

983  
00:37:27,349 --> 00:37:24,800  
it but the fact is star trek does give

984  
00:37:29,109 --> 00:37:27,359  
us some interesting aliens

985  
00:37:30,630 --> 00:37:29,119  
for instance we have

986  
00:37:33,270 --> 00:37:30,640  
in the first season episode the devil of

987  
00:37:36,150 --> 00:37:33,280  
the devil in the dark this is the horta

988  
00:37:38,390 --> 00:37:36,160

a silicon based life form now even at

989

00:37:41,270 --> 00:37:38,400

the time we were aware that

990

00:37:42,790 --> 00:37:41,280

silicon-based life was unlikely um

991

00:37:44,470 --> 00:37:42,800

certainly compared to carbon-based life

992

00:37:47,430 --> 00:37:44,480

and if it existed it would probably need

993

00:37:50,230 --> 00:37:47,440

extremely high temperatures

994

00:37:52,390 --> 00:37:50,240

to to do its thing and what solvent

995

00:37:53,990 --> 00:37:52,400

exists at those high temperatures what's

996

00:37:55,670 --> 00:37:54,000

really exciting especially i imagine for

997

00:37:57,430 --> 00:37:55,680

you the titan person is now we're

998

00:37:58,710 --> 00:37:57,440

discovering that maybe silicon-based

999

00:38:01,349 --> 00:37:58,720

life

1000

00:38:04,150 --> 00:38:01,359

thrives at very cold temperatures in

1001  
00:38:06,069 --> 00:38:04,160  
nitrogen or methane-based solvents but

1002  
00:38:07,589 --> 00:38:06,079  
at the time we didn't know that

1003  
00:38:09,109 --> 00:38:07,599  
still the idea that we were coming up

1004  
00:38:11,270 --> 00:38:09,119  
with a truly alien life based on

1005  
00:38:13,589 --> 00:38:11,280  
completely different biochemistry was

1006  
00:38:16,069 --> 00:38:13,599  
exciting and new and straight science

1007  
00:38:18,310 --> 00:38:16,079  
fiction which was admirable for a tv

1008  
00:38:20,710 --> 00:38:18,320  
show in fact if there's anything star

1009  
00:38:22,470 --> 00:38:20,720  
trek did was it brought science fiction

1010  
00:38:24,790 --> 00:38:22,480  
to the masses because before then there

1011  
00:38:26,950 --> 00:38:24,800  
were a few thousand hardcore science

1012  
00:38:28,790 --> 00:38:26,960  
fiction fans who wore propeller head

1013  
00:38:30,470 --> 00:38:28,800

beanies

1014

00:38:32,950 --> 00:38:30,480

and got to conventions that numbered

1015

00:38:34,710 --> 00:38:32,960

around a thousand once you have star

1016

00:38:36,950 --> 00:38:34,720

trek you start getting conventions in

1017

00:38:38,870 --> 00:38:36,960

the tens of thousands of attendance and

1018

00:38:40,470 --> 00:38:38,880

the millions of people watching and in

1019

00:38:42,230 --> 00:38:40,480

some ways more important you get women

1020

00:38:44,790 --> 00:38:42,240

really participating in science fiction

1021

00:38:47,990 --> 00:38:44,800

in a big way

1022

00:38:53,270 --> 00:38:50,870

another thing we see a lot in star trek

1023

00:38:55,829 --> 00:38:53,280

is the god-like aliens whether it's

1024

00:38:58,790 --> 00:38:55,839

charlie x's father on the left or

1025

00:39:01,990 --> 00:38:58,800

trelane's parents in the middle or

1026  
00:39:04,470 --> 00:39:02,000  
the uh the metron on the right these are

1027  
00:39:06,870 --> 00:39:04,480  
aliens that are so far beyond us that

1028  
00:39:08,710 --> 00:39:06,880  
they have no corporeal form unless they

1029  
00:39:11,430 --> 00:39:08,720  
want one

1030  
00:39:14,150 --> 00:39:11,440  
and this to my mind is actually the most

1031  
00:39:16,950 --> 00:39:14,160  
plausible kind of alien we will discover

1032  
00:39:19,910 --> 00:39:16,960  
because let's face it if you take the

1033  
00:39:21,670 --> 00:39:19,920  
entire history of humanity

1034  
00:39:24,069 --> 00:39:21,680  
the entire history all the way to when

1035  
00:39:25,670 --> 00:39:24,079  
we were definably human say a hundred

1036  
00:39:27,109 --> 00:39:25,680  
thousand years say a million years and

1037  
00:39:29,270 --> 00:39:27,119  
compare it to the age of the earth we

1038  
00:39:31,670 --> 00:39:29,280

are talking about something the width of

1039

00:39:33,349 --> 00:39:31,680

a dime on top of the empire state

1040

00:39:35,670 --> 00:39:33,359

building

1041

00:39:37,670 --> 00:39:35,680

any aliens we find are going to be far

1042

00:39:43,190 --> 00:39:37,680

less advanced than us or far more

1043

00:39:46,950 --> 00:39:45,109

now we see a lot of aliens in star trek

1044

00:39:48,390 --> 00:39:46,960

we see so many aliens in star trek the

1045

00:39:50,790 --> 00:39:48,400

next season they're going to find it

1046

00:39:53,430 --> 00:39:50,800

necessary to actually designate someone

1047

00:39:55,829 --> 00:39:53,440

their astrobiologist and so that name

1048

00:39:58,550 --> 00:39:55,839

will come into the popular lexicon it

1049

00:40:00,790 --> 00:39:58,560

existed in 1952 the soviets had a book

1050

00:40:03,430 --> 00:40:00,800

called astrobiology but in the 60s

1051

00:40:05,589 --> 00:40:03,440

generally it was called exobiology

1052

00:40:08,230 --> 00:40:05,599

i think this character played by diana

1053

00:40:10,069 --> 00:40:08,240

moldoward named anne mulhall was what

1054

00:40:11,829 --> 00:40:10,079

made astrobiology something everybody

1055

00:40:14,309 --> 00:40:11,839

knew all right

1056

00:40:16,470 --> 00:40:14,319

so this is what we dreamed as of the 60s

1057

00:40:19,030 --> 00:40:16,480

and what we knew as of the 60s this was

1058

00:40:25,349 --> 00:40:19,040

55 years ago

1059

00:40:27,349 --> 00:40:25,359

had zero evidence

1060

00:40:29,270 --> 00:40:27,359

of aliens or even any kind of life

1061

00:40:31,190 --> 00:40:29,280

outside the earth clearly 55 years from

1062

00:40:32,950 --> 00:40:31,200

now there's going to be some kind of

1063

00:40:35,670 --> 00:40:32,960

evidence in 2022 everybody's gonna have

1064

00:40:38,630 --> 00:40:35,680

tons of evidence of life on other

1065

00:40:40,470 --> 00:40:38,640

planets

1066

00:40:42,550 --> 00:40:40,480

but we don't

1067

00:40:44,150 --> 00:40:42,560

we have none

1068

00:40:46,069 --> 00:40:44,160

we have better models

1069

00:40:48,550 --> 00:40:46,079

we have better instruments we have

1070

00:40:51,030 --> 00:40:48,560

better computers we have more people in

1071

00:40:54,710 --> 00:40:51,040

the field than ever before

1072

00:40:58,630 --> 00:40:54,720

but not one piece of evidence

1073

00:41:03,670 --> 00:41:00,790

sorry to be a downer but you guys know

1074

00:41:06,870 --> 00:41:03,680

that you're in this room

1075

00:41:08,150 --> 00:41:06,880

there's been some false alarms

1076

00:41:11,030 --> 00:41:08,160

the search for extraterrestrial

1077

00:41:12,390 --> 00:41:11,040

intelligence went on and at one point we

1078

00:41:13,589 --> 00:41:12,400

thought we'd gotten a signal from the

1079

00:41:16,150 --> 00:41:13,599

stars turns out it was probably a

1080

00:41:19,510 --> 00:41:16,160

reflection off a satellite

1081

00:41:22,870 --> 00:41:21,190

but nothing

1082

00:41:26,309 --> 00:41:22,880

and this is the state of the best radio

1083

00:41:31,030 --> 00:41:29,030

kind of depressing should we give up

1084

00:41:33,829 --> 00:41:31,040

are we done

1085

00:41:35,270 --> 00:41:33,839

is there nothing to be

1086

00:41:37,750 --> 00:41:35,280

i don't think so and i don't think

1087

00:41:38,870 --> 00:41:37,760

anyone in this room thinks so either

1088

00:41:43,589 --> 00:41:38,880

because we are

1089

00:41:46,230 --> 00:41:43,599

just beginning to explore the universe

1090

00:41:48,550 --> 00:41:46,240

55 years ago there were three planets

1091

00:41:52,150 --> 00:41:48,560

and they weren't even real when i was an

1092

00:41:54,230 --> 00:41:52,160

astronomer student in 1994

1093

00:41:56,710 --> 00:41:54,240

i got into exoplanets and everyone

1094

00:41:58,390 --> 00:41:56,720

laughed at me because it was the bottom

1095

00:42:01,589 --> 00:41:58,400

of the totem pole everyone was

1096

00:42:04,150 --> 00:42:01,599

interested in in huge structures galaxy

1097

00:42:05,750 --> 00:42:04,160

clusters the cosmos who's interested in

1098

00:42:07,349 --> 00:42:05,760

planets there's nothing there and the

1099

00:42:09,510 --> 00:42:07,359

next year what happened we discovered

1100

00:42:12,150 --> 00:42:09,520

the first exoplanets and now there are a

1101  
00:42:14,870 --> 00:42:12,160  
10 000 discovered exoplanets and more

1102  
00:42:17,990 --> 00:42:14,880  
every day and we've got tessa and we've

1103  
00:42:20,550 --> 00:42:18,000  
got jim webb just went up

1104  
00:42:21,990 --> 00:42:20,560  
and there's every reason to believe that

1105  
00:42:24,710 --> 00:42:22,000  
our knowledge of the universe is going

1106  
00:42:27,030 --> 00:42:24,720  
to expand tremendously

1107  
00:42:29,270 --> 00:42:27,040  
and even if we don't find alien life an

1108  
00:42:31,430 --> 00:42:29,280  
alien sentient life and i don't think we

1109  
00:42:33,030 --> 00:42:31,440  
will for the reasons i said before i

1110  
00:42:34,870 --> 00:42:33,040  
don't think they're out there listening

1111  
00:42:36,710 --> 00:42:34,880  
to us either they can't hear us because

1112  
00:42:38,550 --> 00:42:36,720  
they haven't developed radio yet or even

1113  
00:42:41,430 --> 00:42:38,560

brains yet

1114

00:42:42,710 --> 00:42:41,440

or they're far beyond us

1115

00:42:45,030 --> 00:42:42,720

i don't think we're going to find them

1116

00:42:47,030 --> 00:42:45,040

conventionally but i think everyone in

1117

00:42:49,510 --> 00:42:47,040

this room would be perfectly happy if we

1118

00:42:50,870 --> 00:42:49,520

found a microbe

1119

00:42:52,950 --> 00:42:50,880

if we found

1120

00:42:55,910 --> 00:42:52,960

some kind of biochemistry that arose

1121

00:42:57,430 --> 00:42:55,920

differently from ours to tell us so much

1122

00:43:00,069 --> 00:42:57,440

about how

1123

00:43:01,829 --> 00:43:00,079

chemistry and physics and biology work

1124

00:43:03,430 --> 00:43:01,839

that's what we're waiting for

1125

00:43:05,510 --> 00:43:03,440

and we keep refining our techniques and

1126  
00:43:07,510 --> 00:43:05,520  
our instruments and i think one day we

1127  
00:43:10,230 --> 00:43:07,520  
will find it and even if we don't find

1128  
00:43:12,470 --> 00:43:10,240  
it even if we never find it

1129  
00:43:14,950 --> 00:43:12,480  
that's knowledge too

1130  
00:43:18,710 --> 00:43:14,960  
and in the process we will make a map of

1131  
00:43:19,990 --> 00:43:18,720  
the universe so comprehensive

1132  
00:43:22,630 --> 00:43:20,000  
that we'll know

1133  
00:43:24,309 --> 00:43:22,640  
as much as we possibly can

1134  
00:43:26,950 --> 00:43:24,319  
and let's face it

1135  
00:43:28,870 --> 00:43:26,960  
the one thing that gets the populace

1136  
00:43:31,109 --> 00:43:28,880  
interested in what we do

1137  
00:43:33,030 --> 00:43:31,119  
is the search for life

1138  
00:43:34,710 --> 00:43:33,040

people want to find other people out

1139

00:43:35,990 --> 00:43:34,720

there maybe it's that terran chauvinism

1140

00:43:37,910 --> 00:43:36,000

i was talking about maybe it's

1141

00:43:39,190 --> 00:43:37,920

loneliness maybe it's hope that someone

1142

00:43:41,270 --> 00:43:39,200

can fix our problems that maybe

1143

00:43:43,270 --> 00:43:41,280

someone's already fixed problems maybe

1144

00:43:44,950 --> 00:43:43,280

it's just extroversion we really want

1145

00:43:46,550 --> 00:43:44,960

someone to talk to

1146

00:43:49,270 --> 00:43:46,560

or maybe for some of us it's just the

1147

00:43:50,870 --> 00:43:49,280

interesting physical problem

1148

00:43:52,790 --> 00:43:50,880

but i think it's worth continuing for

1149

00:43:54,950 --> 00:43:52,800

all those reasons

1150

00:43:56,870 --> 00:43:54,960

and i hope this talk has given you a

1151

00:43:58,230 --> 00:43:56,880

little bit of insight a little bit of

1152

00:44:00,069 --> 00:43:58,240

excitement

1153

00:44:00,950 --> 00:44:00,079

showing you how far we've come in 55

1154

00:44:03,190 --> 00:44:00,960

years

1155

00:44:07,270 --> 00:44:03,200

and also just how groovy a time it was

1156

00:44:11,270 --> 00:44:09,510

so if you enjoyed this talk

1157

00:44:14,950 --> 00:44:11,280

i uh i do this kind of thing at

1158

00:44:17,750 --> 00:44:14,960

universities libraries planetarium

1159

00:44:19,349 --> 00:44:17,760

weddings bar mitzvahs

1160

00:44:20,630 --> 00:44:19,359

so after this feel free to get a card we

1161

00:44:23,109 --> 00:44:20,640

still have some time and one of my

1162

00:44:26,150 --> 00:44:23,119

favorite things is q a so you have any

1163

00:44:28,630 --> 00:44:26,160

questions about the 60s the science of

1164

00:44:30,390 --> 00:44:28,640

the time the zeitgeist of the time the

1165

00:44:32,630 --> 00:44:30,400

science fiction of the time i'm here to

1166

00:44:34,069 --> 00:44:32,640

answer any of your questions until you

1167

00:44:36,230 --> 00:44:34,079

get tired and want to go join me at the

1168

00:44:38,190 --> 00:44:36,240

tiki bar

1169

00:44:45,270 --> 00:44:38,200

and now you can applaud if you want

1170

00:44:45,280 --> 00:44:49,430

any questions

1171

00:44:49,440 --> 00:44:55,190

mom

1172

00:44:59,829 --> 00:44:58,309

people didn't know in the 60s uh hello

1173

00:45:01,910 --> 00:44:59,839

i'm surprised that people didn't know in

1174

00:45:04,950 --> 00:45:01,920

the 60s that

1175

00:45:07,430 --> 00:45:04,960

venus was uninhabitable i mean couldn't

1176  
00:45:08,950 --> 00:45:07,440  
you see what the composition of the

1177  
00:45:10,470 --> 00:45:08,960  
atmosphere was at that time with

1178  
00:45:12,069 --> 00:45:10,480  
spectroscopy

1179  
00:45:14,230 --> 00:45:12,079  
you could tell that there was carbon

1180  
00:45:16,309 --> 00:45:14,240  
dioxide in the atmosphere you could not

1181  
00:45:17,750 --> 00:45:16,319  
tell the density

1182  
00:45:19,589 --> 00:45:17,760  
and there was also

1183  
00:45:22,069 --> 00:45:19,599  
there were models that

1184  
00:45:23,990 --> 00:45:22,079  
suggested that you could have this thick

1185  
00:45:25,990 --> 00:45:24,000  
atmosphere and still if it operated

1186  
00:45:28,710 --> 00:45:26,000  
certain ways was not too hot on the

1187  
00:45:30,309 --> 00:45:28,720  
surface um it was not until we actually

1188  
00:45:33,750 --> 00:45:30,319

went there mariner 2 didn't even have a

1189

00:45:35,750 --> 00:45:33,760

camera all it had was a magnetometer um

1190

00:45:36,870 --> 00:45:35,760

and a and a radiometer to see the

1191

00:45:37,750 --> 00:45:36,880

temperature

1192

00:45:39,750 --> 00:45:37,760

um

1193

00:45:41,109 --> 00:45:39,760

it wasn't until then that we knew which

1194

00:45:42,950 --> 00:45:41,119

model was accurate and it was the one

1195

00:45:44,470 --> 00:45:42,960

that said this is a really hot planet

1196

00:45:46,150 --> 00:45:44,480

all right

1197

00:45:47,750 --> 00:45:46,160

sorry

1198

00:45:49,430 --> 00:45:47,760

although um we actually were already

1199

00:45:51,430 --> 00:45:49,440

getting radar data at that time that

1200

00:45:52,870 --> 00:45:51,440

suggested it was hot we have another

1201  
00:45:55,109 --> 00:45:52,880  
question and thank you to the person

1202  
00:45:58,390 --> 00:45:55,119  
running delivering the microphone

1203  
00:46:00,150 --> 00:45:58,400  
it's like uber microphone so um for uh

1204  
00:46:02,150 --> 00:46:00,160  
given that this was like uh

1205  
00:46:05,109 --> 00:46:02,160  
during the cold war were there any

1206  
00:46:06,710 --> 00:46:05,119  
sci-fi stories where the aliens are sort

1207  
00:46:09,349 --> 00:46:06,720  
of preferentially siding with the

1208  
00:46:10,790 --> 00:46:09,359  
russians or the americans

1209  
00:46:12,069 --> 00:46:10,800  
no

1210  
00:46:14,390 --> 00:46:12,079  
actually

1211  
00:46:16,550 --> 00:46:14,400  
um no that's a good question right do

1212  
00:46:20,550 --> 00:46:16,560  
the aliens come and work through people

1213  
00:46:22,230 --> 00:46:20,560

almost invariably the aliens are the

1214

00:46:25,109 --> 00:46:22,240

external threat

1215

00:46:27,829 --> 00:46:25,119

that either unites us against them

1216

00:46:32,630 --> 00:46:27,839

or takes advantage of our internal

1217

00:46:38,630 --> 00:46:35,910

sometimes the aliens are stand-ins for

1218

00:46:40,069 --> 00:46:38,640

the enemy so for instance the klingons

1219

00:46:44,870 --> 00:46:40,079

are the

1220

00:46:46,710 --> 00:46:44,880

they're probably the chinese

1221

00:46:48,550 --> 00:46:46,720

um but in terms of the aliens coming

1222

00:46:50,550 --> 00:46:48,560

down and saying we choose

1223

00:46:53,109 --> 00:46:50,560

union to be our representative on this

1224

00:46:57,270 --> 00:46:53,119

earth sorry yankees um

1225

00:46:58,870 --> 00:46:57,280

no that actually does not happen

1226

00:47:00,870 --> 00:46:58,880

yeah here

1227

00:47:02,550 --> 00:47:00,880

hi um

1228

00:47:05,430 --> 00:47:02,560

yeah actually it was scar sagan the

1229

00:47:06,790 --> 00:47:05,440

first one that uh got closer to the

1230

00:47:09,190 --> 00:47:06,800

surface of the

1231

00:47:11,349 --> 00:47:09,200

of the temperature of the surface venus

1232

00:47:16,150 --> 00:47:11,359

venus um

1233

00:47:18,470 --> 00:47:16,160

right in 1960 using the radio uh

1234

00:47:20,309 --> 00:47:18,480

because basically the idea was it is

1235

00:47:22,390 --> 00:47:20,319

there is clouds we cannot see anything

1236

00:47:23,589 --> 00:47:22,400

then there should be the dinosaurs or

1237

00:47:24,390 --> 00:47:23,599

something like that

1238

00:47:26,790 --> 00:47:24,400

um

1239

00:47:28,630 --> 00:47:26,800

but i was i was going to ask you about

1240

00:47:31,829 --> 00:47:28,640

the this uh

1241

00:47:33,589 --> 00:47:31,839

the meteorite uh because i i think that

1242

00:47:36,790 --> 00:47:33,599

the picture there

1243

00:47:38,549 --> 00:47:36,800

that was the l a l h

1244

00:47:43,829 --> 00:47:38,559

84 0

1245

00:47:49,270 --> 00:47:46,950

for yes yeah so so the the one you

1246

00:47:52,390 --> 00:47:49,280

mentioned you said it was in the 60s

1247

00:47:53,190 --> 00:47:52,400

there was another meteorite

1248

00:47:55,670 --> 00:47:53,200

where

1249

00:47:58,150 --> 00:47:55,680

there were claims about life and did

1250

00:48:00,790 --> 00:47:58,160

that meteorite that is correct so in the

1251

00:48:02,230 --> 00:48:00,800

19th century i believe in the 1860s

1252

00:48:04,230 --> 00:48:02,240

there was a meteorite that fell near

1253

00:48:06,870 --> 00:48:04,240

orgoel france and became known as the

1254

00:48:07,829 --> 00:48:06,880

orgoel meteorite and even from an early

1255

00:48:10,309 --> 00:48:07,839

time

1256

00:48:12,549 --> 00:48:10,319

there were reports that there were

1257

00:48:15,910 --> 00:48:12,559

that chemical analysis suggested there

1258

00:48:18,549 --> 00:48:15,920

was life on this thing and then in 1965

1259

00:48:20,230 --> 00:48:18,559

someone found little microbes like that

1260

00:48:24,710 --> 00:48:20,240

uh it turns out it was conta it was

1261

00:48:25,589 --> 00:48:24,720

artificially inserted contamination

1262

00:48:27,910 --> 00:48:25,599

okay

1263

00:48:31,510 --> 00:48:27,920

thank you and you should see the santo

1264

00:48:33,829 --> 00:48:31,520

movies in mexico against the martians

1265

00:48:38,069 --> 00:48:33,839

those are fantastic so she mentions the

1266

00:48:39,990 --> 00:48:38,079

santo movies el santo el santo is a hero

1267

00:48:42,230 --> 00:48:40,000

in mexican science fiction he's an actor

1268

00:48:43,270 --> 00:48:42,240

actually a luchador

1269

00:48:44,950 --> 00:48:43,280

and

1270

00:48:46,549 --> 00:48:44,960

so we actually i told you about galactic

1271

00:48:48,710 --> 00:48:46,559

journey we actually we started with just

1272

00:48:50,309 --> 00:48:48,720

me now there's 20 authors from around

1273

00:48:51,910 --> 00:48:50,319

the world writing for this thing

1274

00:48:53,990 --> 00:48:51,920

including we had a correspondent from

1275

00:48:56,150 --> 00:48:54,000

behind the iron curtain and we had a

1276

00:48:57,910 --> 00:48:56,160

mexican writer who wrote an article

1277

00:49:00,069 --> 00:48:57,920

about the el santo movie so if you go to

1278

00:49:01,510 --> 00:49:00,079

galactic journey and look up el santo

1279

00:49:02,710 --> 00:49:01,520

you will actually see the character that

1280

00:49:04,390 --> 00:49:02,720

she is talking about thank you for

1281

00:49:06,309 --> 00:49:04,400

bringing that up

1282

00:49:08,230 --> 00:49:06,319

um you didn't talk at all about ray

1283

00:49:10,710 --> 00:49:08,240

bradbury's martian chronicles which was

1284

00:49:12,630 --> 00:49:10,720

one of the most influential for me

1285

00:49:14,230 --> 00:49:12,640

um could you set that within a context

1286

00:49:15,670 --> 00:49:14,240

of the time what was known about mars

1287

00:49:17,589 --> 00:49:15,680

when he wrote it

1288

00:49:19,990 --> 00:49:17,599

so martian chronicles came out in the

1289

00:49:21,829 --> 00:49:20,000

early 50s you're right there was um for

1290

00:49:23,349 --> 00:49:21,839

time constraints i realized

1291

00:49:24,710 --> 00:49:23,359

almost all science fiction i had to

1292

00:49:27,030 --> 00:49:24,720

leave out if this was going to be done

1293

00:49:29,510 --> 00:49:27,040

in less than 20 years

1294

00:49:31,030 --> 00:49:29,520

um but yeah ray brad i did mention all

1295

00:49:32,230 --> 00:49:31,040

summer and a day for venus so ray

1296

00:49:35,109 --> 00:49:32,240

bradbury does talk about the

1297

00:49:37,270 --> 00:49:35,119

colonization of mars although

1298

00:49:39,030 --> 00:49:37,280

that was not particularly hard science

1299

00:49:40,710 --> 00:49:39,040

fiction ray bradbury doesn't write

1300

00:49:42,150 --> 00:49:40,720

particularly hard science fiction he

1301

00:49:43,670 --> 00:49:42,160

wrote in the early 50s what we knew

1302

00:49:45,430 --> 00:49:43,680

about mars was that it had a thin

1303

00:49:48,309 --> 00:49:45,440

atmosphere we assumed it was probably

1304

00:49:50,230 --> 00:49:48,319

about 10 percent that of earth

1305

00:49:52,150 --> 00:49:50,240

so it was like the highest mountains on

1306

00:49:55,670 --> 00:49:52,160

earth we believed that some kind of

1307

00:49:59,030 --> 00:49:55,680

andean or denver type civilization could

1308

00:50:02,150 --> 00:49:59,040

exist um the martian chronicles

1309

00:50:05,589 --> 00:50:02,160

mars is similar to the mars child mars

1310

00:50:08,549 --> 00:50:05,599

of cyril judd it was it was a popular

1311

00:50:12,710 --> 00:50:08,559

difficult but not unrealizable

1312

00:50:14,549 --> 00:50:12,720

landscape for science fiction

1313

00:50:17,109 --> 00:50:14,559

i have a question thank you

1314

00:50:19,430 --> 00:50:17,119

thank you for the talk here uh

1315

00:50:20,309 --> 00:50:19,440

just maybe correct me if i'm if i'm

1316

00:50:23,430 --> 00:50:20,319

wrong

1317

00:50:24,950 --> 00:50:23,440

uh i i understand that in many science

1318

00:50:27,190 --> 00:50:24,960

fiction book where there's other

1319

00:50:29,349 --> 00:50:27,200

civilization they depict them as

1320

00:50:31,510 --> 00:50:29,359

invasive dangerous

1321

00:50:33,510 --> 00:50:31,520

that can they don't want they are not

1322

00:50:36,710 --> 00:50:33,520

nice basically

1323

00:50:38,069 --> 00:50:36,720

and how if this is

1324

00:50:40,549 --> 00:50:38,079

almost correct

1325

00:50:43,109 --> 00:50:40,559

uh how do you would you explain the

1326

00:50:45,990 --> 00:50:43,119

apparent contradiction of

1327

00:50:48,309 --> 00:50:46,000

we want to meet other civilization and

1328

00:50:50,309 --> 00:50:48,319

whenever we depict those civilization

1329

00:50:53,589 --> 00:50:50,319

they are dangerous to us

1330

00:50:55,190 --> 00:50:53,599

and whether this can be something due to

1331

00:50:58,790 --> 00:50:55,200

the

1332

00:51:01,270 --> 00:50:58,800

tend to

1333

00:51:02,790 --> 00:51:01,280

be devastative uh

1334

00:51:04,150 --> 00:51:02,800

yeah i just would like your thoughts

1335

00:51:04,870 --> 00:51:04,160

about that

1336

00:51:07,109 --> 00:51:04,880

so

1337

00:51:09,990 --> 00:51:07,119

it is true that science fiction

1338

00:51:13,349 --> 00:51:11,910

scary boogeyman science fiction that we

1339

00:51:15,510 --> 00:51:13,359

see in on

1340

00:51:18,230 --> 00:51:15,520

in the movie theaters or science fiction

1341

00:51:19,510 --> 00:51:18,240

that's designed to evoke the terror that

1342

00:51:20,630 --> 00:51:19,520

existed at the time we have to

1343

00:51:22,870 --> 00:51:20,640

understand

1344

00:51:25,270 --> 00:51:22,880

it was a scary time to live in the 60s

1345

00:51:26,870 --> 00:51:25,280

we think it's scary now but back then we

1346

00:51:28,230 --> 00:51:26,880

went to sleep thinking you know tomorrow

1347

00:51:29,829 --> 00:51:28,240

could be the end all it takes is someone

1348

00:51:31,990 --> 00:51:29,839

to push the button it had only been five

1349

00:51:33,430 --> 00:51:32,000

years since the cuban missile crisis

1350

00:51:34,790 --> 00:51:33,440

that said

1351  
00:51:36,470 --> 00:51:34,800  
don't get a skewed view of science

1352  
00:51:38,150 --> 00:51:36,480  
fiction there are plenty

1353  
00:51:39,430 --> 00:51:38,160  
plenty of stories where the aliens are

1354  
00:51:41,670 --> 00:51:39,440  
benign

1355  
00:51:42,950 --> 00:51:41,680  
friendly we work with them sometimes

1356  
00:51:44,309 --> 00:51:42,960  
they're more advanced than they put us

1357  
00:51:44,950 --> 00:51:44,319  
on our course star trek is filled with

1358  
00:51:47,109 --> 00:51:44,960  
them

1359  
00:51:50,309 --> 00:51:47,119  
larry niven's known space universe has

1360  
00:51:52,470 --> 00:51:50,319  
several aliens uh the kazinti are bad

1361  
00:51:53,910 --> 00:51:52,480  
guys until we beat them enough times and

1362  
00:51:56,470 --> 00:51:53,920  
then they're our friends uh the

1363  
00:51:58,069 --> 00:51:56,480

puppeteers are never bad guys except of

1364

00:52:00,870 --> 00:51:58,079

course they're manipulating all politics

1365

00:52:04,069 --> 00:52:00,880

behind the scenes uh the cadet lino the

1366

00:52:06,309 --> 00:52:04,079

purin they're good guys um so there are

1367

00:52:08,950 --> 00:52:06,319

there are plenty of examples of science

1368

00:52:10,950 --> 00:52:08,960

fiction of good aliens

1369

00:52:13,589 --> 00:52:10,960

or even completely neutral aliens

1370

00:52:14,870 --> 00:52:13,599

completely detached aliens the aliens in

1371

00:52:16,790 --> 00:52:14,880

critical point didn't even know we

1372

00:52:18,870 --> 00:52:16,800

existed and had no reason to believe we

1373

00:52:20,309 --> 00:52:18,880

existed because their environment was so

1374

00:52:21,910 --> 00:52:20,319

different from ours they never even saw

1375

00:52:24,710 --> 00:52:21,920

the sky

1376

00:52:27,829 --> 00:52:24,720

so yes it's true that we often see

1377

00:52:30,150 --> 00:52:27,839

aliens as other and bad

1378

00:52:31,750 --> 00:52:30,160

and i and i think that's a bad i hate to

1379

00:52:34,390 --> 00:52:31,760

use the word but i think that's a bad

1380

00:52:36,230 --> 00:52:34,400

trope i think it's a bad cliché

1381

00:52:38,630 --> 00:52:36,240

i think science fiction and horror

1382

00:52:42,069 --> 00:52:38,640

particularly in cinema have gotten so

1383

00:52:44,390 --> 00:52:42,079

closely intertwined

1384

00:52:45,670 --> 00:52:44,400

in space nobody can hear you scream

1385

00:52:48,870 --> 00:52:45,680

right

1386

00:52:50,710 --> 00:52:48,880

it's always scary space is scary enough

1387

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

we don't need aliens to make it worse

1388

00:52:55,109 --> 00:52:52,640

how about the alien that comes up and

1389

00:52:56,950 --> 00:52:55,119

saves the person who gets separated from

1390

00:52:59,670 --> 00:52:56,960

the space shuttle that's what i want to

1391

00:53:03,430 --> 00:53:00,870

hi

1392

00:53:05,190 --> 00:53:03,440

great talk um i really enjoyed that so i

1393

00:53:06,630 --> 00:53:05,200

don't think i would be an astrobiologist

1394

00:53:08,790 --> 00:53:06,640

if i didn't grow up in the 90s

1395

00:53:10,870 --> 00:53:08,800

surrounded by the heyday of star trek um

1396

00:53:12,950 --> 00:53:10,880

you know tng deep deep six nine and

1397

00:53:14,710 --> 00:53:12,960

voyager and so i really feel this

1398

00:53:17,030 --> 00:53:14,720

feedback between science and science

1399

00:53:18,870 --> 00:53:17,040

fiction in my own life i was wondering

1400

00:53:22,470 --> 00:53:18,880

you know in the early 60s when it was

1401

00:53:24,069 --> 00:53:22,480

just these like um you know stories

1402

00:53:26,790 --> 00:53:24,079

that that not that many people were

1403

00:53:28,309 --> 00:53:26,800

reading was there still a feedback

1404

00:53:29,990 --> 00:53:28,319

between science and science fiction i

1405

00:53:31,030 --> 00:53:30,000

mean we know that there were science

1406

00:53:32,390 --> 00:53:31,040

that was inspiring the science fiction

1407

00:53:35,109 --> 00:53:32,400

but was there science fiction that was

1408

00:53:36,230 --> 00:53:35,119

also inspiring scientists at the time

1409

00:53:37,190 --> 00:53:36,240

yes

1410

00:53:39,750 --> 00:53:37,200

um

1411

00:53:41,829 --> 00:53:39,760

so yeah it is a it is a positive

1412

00:53:44,309 --> 00:53:41,839

feedback loop

1413

00:53:46,470 --> 00:53:44,319

in the 50s

1414

00:53:48,710 --> 00:53:46,480

and the 40s science fiction is mostly

1415

00:53:51,910 --> 00:53:48,720

based in the solar system

1416

00:53:55,030 --> 00:53:51,920

1957 sputnik goes up and science fiction

1417

00:53:57,030 --> 00:53:55,040

changes overnight isaac asimov leaves

1418

00:53:59,270 --> 00:53:57,040

the field he had been one of science

1419

00:54:01,109 --> 00:53:59,280

fiction's brightest lights

1420

00:54:02,230 --> 00:54:01,119

and he goes to do science writing

1421

00:54:04,870 --> 00:54:02,240

because what's happening in the

1422

00:54:07,190 --> 00:54:04,880

newspapers is is exciting and all of a

1423

00:54:09,750 --> 00:54:07,200

sudden science fiction transitions from

1424

00:54:11,030 --> 00:54:09,760

a planetary

1425

00:54:17,030 --> 00:54:11,040

literature

1426

00:54:19,430 --> 00:54:17,040

born of that tradition and then star

1427

00:54:20,150 --> 00:54:19,440

trek in turn feeds everybody else like

1428

00:54:22,230 --> 00:54:20,160

you

1429

00:54:23,510 --> 00:54:22,240

back into it absolutely back and forth

1430

00:54:25,510 --> 00:54:23,520

in science fiction the whole point of

1431

00:54:26,870 --> 00:54:25,520

science fiction is you're always on the

1432

00:54:28,870 --> 00:54:26,880

next step

1433

00:54:31,030 --> 00:54:28,880

going to that cutting edge and then

1434

00:54:32,710 --> 00:54:31,040

inspiring the scientists to follow suit

1435

00:54:34,790 --> 00:54:32,720

absolutely

1436

00:54:36,630 --> 00:54:34,800

i have a question so you focused a lot

1437

00:54:39,109 --> 00:54:36,640

of your examples on english speaking

1438

00:54:41,829 --> 00:54:39,119

examples and maybe a little touch on

1439

00:54:43,990 --> 00:54:41,839

mexico but what were other cultures

1440

00:54:46,470 --> 00:54:44,000

uh what would with the chinese writing

1441

00:54:48,390 --> 00:54:46,480

about in the science fiction and um

1442

00:54:51,430 --> 00:54:48,400

maybe in the middle east what were their

1443

00:54:53,670 --> 00:54:51,440

scientific uh science fiction themes and

1444

00:54:54,789 --> 00:54:53,680

how did that did it parallel what was

1445

00:54:55,910 --> 00:54:54,799

going on

1446

00:54:58,710 --> 00:54:55,920

with

1447

00:55:00,549 --> 00:54:58,720

the discoveries that nasa was doing or

1448

00:55:03,349 --> 00:55:00,559

did they go off in their own direction

1449

00:55:05,349 --> 00:55:03,359

it was a fascinating question

1450

00:55:09,670 --> 00:55:05,359

and the answer is

1451

00:55:15,990 --> 00:55:13,349

in the 1950s and 60s we have

1452

00:55:17,670 --> 00:55:16,000

we have plenty of stories that could be

1453

00:55:19,910 --> 00:55:17,680

classified today as science fiction

1454

00:55:21,430 --> 00:55:19,920

nigeria was writing stories as early as

1455

00:55:23,109 --> 00:55:21,440

1920 that we might say is science

1456

00:55:25,270 --> 00:55:23,119

fiction but they were science fiction

1457

00:55:27,430 --> 00:55:25,280

the way frankenstein was science fiction

1458

00:55:29,430 --> 00:55:27,440

they were not in

1459

00:55:30,870 --> 00:55:29,440

the central branch the lineage of

1460

00:55:32,549 --> 00:55:30,880

science fiction that has led to star

1461

00:55:35,589 --> 00:55:32,559

trek and everything else today in the

1462

00:55:37,430 --> 00:55:35,599

1950s and 1960s the only two countries

1463

00:55:39,589 --> 00:55:37,440

only the only

1464

00:55:40,710 --> 00:55:39,599

two languages i should say that were

1465

00:55:43,510 --> 00:55:40,720

producing

1466

00:55:46,470 --> 00:55:43,520

new innovative science fiction were

1467

00:55:49,510 --> 00:55:46,480

english and russian in the mid 60s you

1468

00:55:51,670 --> 00:55:49,520

start to get japanese science fiction

1469

00:55:52,470 --> 00:55:51,680

literary science fiction happening

1470

00:55:53,510 --> 00:55:52,480

um

1471

00:55:55,030 --> 00:55:53,520

europa

1472

00:55:57,589 --> 00:55:55,040

uh science fiction is on the client

1473

00:55:59,670 --> 00:55:57,599

obviously jules verne is not

1474

00:56:01,030 --> 00:55:59,680

is not english speaking um and he was

1475

00:56:03,430 --> 00:56:01,040

hard science fiction before we had a

1476

00:56:04,630 --> 00:56:03,440

name for the term but in 1960s french

1477

00:56:06,470 --> 00:56:04,640

science fiction is actually on the

1478

00:56:08,150 --> 00:56:06,480

decline

1479

00:56:10,150 --> 00:56:08,160

the magazine of fantasy and science

1480

00:56:13,030 --> 00:56:10,160

fiction is translated into tons of

1481

00:56:15,510 --> 00:56:13,040

languages and is the main outlet for for

1482

00:56:16,870 --> 00:56:15,520

science fiction in europe at this time

1483

00:56:19,510 --> 00:56:16,880

so if you want science fiction it's

1484

00:56:21,910 --> 00:56:19,520

really england the united states and the

1485

00:56:24,390 --> 00:56:21,920

soviet union now that is why we had a

1486

00:56:25,349 --> 00:56:24,400

soviet correspondent um to cover the

1487

00:56:27,190 --> 00:56:25,359

stories that were coming out of the

1488

00:56:29,670 --> 00:56:27,200

soviet union and those do come from an

1489

00:56:32,789 --> 00:56:29,680

interesting different tradition because

1490

00:56:35,430 --> 00:56:32,799

soviet science fiction has to assume

1491

00:56:38,470 --> 00:56:35,440

that sometime in the future

1492

00:56:40,230 --> 00:56:38,480

communism has reached

1493

00:56:42,230 --> 00:56:40,240

its ideal right right now they're stuck

1494

00:56:43,750 --> 00:56:42,240

in socialism but eventually communism is

1495

00:56:45,270 --> 00:56:43,760

going to succeed

1496

00:56:47,510 --> 00:56:45,280

and this is the world we're going to

1497

00:56:49,190 --> 00:56:47,520

have after communism exists and

1498

00:56:50,549 --> 00:56:49,200

sometimes the stories are as boring as

1499

00:56:52,870 --> 00:56:50,559

you would imagine they would be in that

1500

00:56:55,109 --> 00:56:52,880

kind of universe sometimes people manage

1501  
00:56:57,030 --> 00:56:55,119  
to write interesting stories despite

1502  
00:56:59,030 --> 00:56:57,040  
that requirement of soviet science

1503  
00:57:00,789 --> 00:56:59,040  
fiction

1504  
00:57:02,390 --> 00:57:00,799  
but in the 50s and 60s we're talking

1505  
00:57:05,670 --> 00:57:02,400  
about a time when most countries were

1506  
00:57:07,430 --> 00:57:05,680  
still trying to figure out how to exist

1507  
00:57:09,430 --> 00:57:07,440  
israeli science fiction for instance

1508  
00:57:11,990 --> 00:57:09,440  
doesn't really come into existence until

1509  
00:57:14,549 --> 00:57:12,000  
the 90s partly because the idea was look

1510  
00:57:17,030 --> 00:57:14,559  
we are too busy making a country we

1511  
00:57:19,670 --> 00:57:17,040  
don't have time to dream about this

1512  
00:57:21,190 --> 00:57:19,680  
frivolous stuff

1513  
00:57:24,069 --> 00:57:21,200

um um

1514

00:57:27,190 --> 00:57:24,079

i have a friend organized who's uh who's

1515

00:57:29,750 --> 00:57:27,200

the first nigerian to be a hugo finalist

1516

00:57:31,750 --> 00:57:29,760

really great guy um and i talked to him

1517

00:57:32,950 --> 00:57:31,760

about this very topic when did these

1518

00:57:34,870 --> 00:57:32,960

other countries develop a science

1519

00:57:36,549 --> 00:57:34,880

fiction tradition and the answer is

1520

00:57:39,109 --> 00:57:36,559

a long time ago if you include like

1521

00:57:41,270 --> 00:57:39,119

folklore or allegory type stories but if

1522

00:57:43,030 --> 00:57:41,280

you're talking direct lineage from the

1523

00:57:44,789 --> 00:57:43,040

magazine of fantasy and science fiction

1524

00:57:46,470 --> 00:57:44,799

and galaxy and analog

1525

00:57:47,990 --> 00:57:46,480

and then now they have their own science

1526

00:57:50,549 --> 00:57:48,000

fiction periodicals and they're writing

1527

00:57:53,030 --> 00:57:50,559

conventional science fiction that's a

1528

00:57:54,950 --> 00:57:53,040

very recent phenomenon in nigeria and in

1529

00:57:58,870 --> 00:57:54,960

a lot of other places

1530

00:58:03,589 --> 00:58:01,030

the question that i had was exactly

1531

00:58:06,230 --> 00:58:03,599

along these lines and that

1532

00:58:07,190 --> 00:58:06,240

we had our rivals and i was going to ask

1533

00:58:09,750 --> 00:58:07,200

what was

1534

00:58:11,589 --> 00:58:09,760

soviet science fiction like

1535

00:58:13,750 --> 00:58:11,599

and you've answered that

1536

00:58:15,030 --> 00:58:13,760

and that it was very much like socialist

1537

00:58:19,670 --> 00:58:15,040

realism

1538

00:58:22,230 --> 00:58:19,680

which uh could be as as as boring as uh

1539

00:58:23,829 --> 00:58:22,240

as one can possibly imagine novels like

1540

00:58:25,349 --> 00:58:23,839

cement

1541

00:58:27,270 --> 00:58:25,359

being really

1542

00:58:30,390 --> 00:58:27,280

the best of the genre

1543

00:58:32,549 --> 00:58:30,400

however it is also true that by

1544

00:58:35,349 --> 00:58:32,559

the early 70s

1545

00:58:37,270 --> 00:58:35,359

you had people you know real geniuses

1546

00:58:38,630 --> 00:58:37,280

like tarkovsky

1547

00:58:40,390 --> 00:58:38,640

uh making

1548

00:58:42,309 --> 00:58:40,400

um

1549

00:58:44,390 --> 00:58:42,319

science fiction that was at least as

1550

00:58:45,990 --> 00:58:44,400

serious as the most serious science

1551  
00:58:48,309 --> 00:58:46,000  
fiction films

1552  
00:58:50,630 --> 00:58:48,319  
uh made here in the west

1553  
00:58:53,990 --> 00:58:50,640  
and so he couldn't have just come out of

1554  
00:58:57,670 --> 00:58:54,000  
nowhere so what was maybe happening in

1555  
00:58:58,789 --> 00:58:57,680  
the 60s in in soviet science fiction

1556  
00:59:01,349 --> 00:58:58,799  
literature

1557  
00:59:02,309 --> 00:59:01,359  
was there um

1558  
00:59:05,270 --> 00:59:02,319  
uh

1559  
00:59:08,470 --> 00:59:05,280  
could it be predicted that movies of the

1560  
00:59:10,710 --> 00:59:08,480  
quality that tarkovsky made in the 70s

1561  
00:59:12,309 --> 00:59:10,720  
um were going to come out of that

1562  
00:59:16,470 --> 00:59:12,319  
country absolutely you've got the

1563  
00:59:20,309 --> 00:59:18,549

you if you if you go to galactic journey

1564

00:59:22,710 --> 00:59:20,319

and you look up the soviet union if you

1565

00:59:24,710 --> 00:59:22,720

do just do a search for soviet union um

1566

00:59:26,470 --> 00:59:24,720

not only do we have a couple of

1567

00:59:27,829 --> 00:59:26,480

collections of stories that came out of

1568

00:59:29,829 --> 00:59:27,839

the soviet which is what they assumed

1569

00:59:31,190 --> 00:59:29,839

would be the most sellable here they

1570

00:59:33,190 --> 00:59:31,200

they figured it was their best and maybe

1571

00:59:36,150 --> 00:59:33,200

the most appealing to a western audience

1572

00:59:38,549 --> 00:59:36,160

but a lot of soviet movies came out in

1573

00:59:40,069 --> 00:59:38,559

the late 50s early 60s and got dubbed

1574

00:59:43,030 --> 00:59:40,079

into english

1575

00:59:44,470 --> 00:59:43,040

and a lot of those have more interesting

1576

00:59:46,230 --> 00:59:44,480

stories

1577

00:59:49,109 --> 00:59:46,240

than then they're contemporaries in the

1578

00:59:51,349 --> 00:59:49,119

west they were big budget uh they were

1579

00:59:54,069 --> 00:59:51,359

big science friendly they often posited

1580

00:59:55,750 --> 00:59:54,079

a united united earth um sometimes they

1581

00:59:57,430 --> 00:59:55,760

didn't sometimes they they would have a

1582

00:59:59,589 --> 00:59:57,440

northern hemisphere versus the southern

1583

01:00:01,750 --> 00:59:59,599

hemisphere which would be analogs to to

1584

01:00:03,750 --> 01:00:01,760

capitalism versus communism but

1585

01:00:05,910 --> 01:00:03,760

absolutely in the 60s

1586

01:00:08,710 --> 01:00:05,920

soviet science fiction is a going

1587

01:00:11,190 --> 01:00:08,720

concern and we knew that i mean in 66

1588

01:00:13,349 --> 01:00:11,200

sagan does uh co-writes a book sort of

1589

01:00:15,109 --> 01:00:13,359

with um i cannot remember the name i

1590

01:00:17,510 --> 01:00:15,119

just read about it um but they write a

1591

01:00:19,270 --> 01:00:17,520

book in 66 talking about life

1592

01:00:20,710 --> 01:00:19,280

beyond the solar system and it's an

1593

01:00:22,789 --> 01:00:20,720

interesting collaboration because what

1594

01:00:24,069 --> 01:00:22,799

it really is is they both wrote books

1595

01:00:25,990 --> 01:00:24,079

and then they sort of put them together

1596

01:00:27,510 --> 01:00:26,000

and did commentary on each other um i

1597

01:00:33,670 --> 01:00:27,520

cannot remember the name of the book but

1598

01:00:39,030 --> 01:00:35,789

i grew in the

1599

01:00:40,470 --> 01:00:39,040

1970s reading a lot of spanish stories

1600

01:00:43,270 --> 01:00:40,480

from spain

1601

01:00:46,230 --> 01:00:43,280

and i was amazed of all so many alters

1602

01:00:49,510 --> 01:00:46,240

usually they use a a

1603

01:00:52,470 --> 01:00:49,520

english dynamo i remember one series of

1604

01:00:54,230 --> 01:00:52,480

stories the galaxy 2000 where there were

1605

01:00:56,789 --> 01:00:54,240

stories about planets

1606

01:00:57,829 --> 01:00:56,799

and in visiting astronauts and other

1607

01:00:59,430 --> 01:00:57,839

planets

1608

01:01:02,549 --> 01:00:59,440

and and and

1609

01:01:03,430 --> 01:01:02,559

my question is is this something that is

1610

01:01:05,829 --> 01:01:03,440

now

1611

01:01:08,230 --> 01:01:05,839

ignored or or their people are

1612

01:01:11,109 --> 01:01:08,240

translating it was not that popular so

1613

01:01:13,990 --> 01:01:11,119

the stories was in 1960s and

1614

01:01:15,670 --> 01:01:14,000

you're are you asking if in 2022 there

1615

01:01:17,109 --> 01:01:15,680

are people translating these older

1616

01:01:19,670 --> 01:01:17,119

stories

1617

01:01:21,750 --> 01:01:19,680

well you just you said that the language

1618

01:01:24,470 --> 01:01:21,760

that for this science fiction was one

1619

01:01:27,430 --> 01:01:24,480

less popular for english and russian

1620

01:01:29,589 --> 01:01:27,440

but for me i got impression that

1621

01:01:31,109 --> 01:01:29,599

they were in spanish very popular at

1622

01:01:34,230 --> 01:01:31,119

least from spain

1623

01:01:35,750 --> 01:01:34,240

so is this something that is uh unknown

1624

01:01:38,309 --> 01:01:35,760

or or

1625

01:01:40,789 --> 01:01:38,319

or also people are keeping a track of

1626  
01:01:43,030 --> 01:01:40,799  
these stories and translating them

1627  
01:01:43,750 --> 01:01:43,040  
not in the 60s

1628  
01:01:47,750 --> 01:01:43,760  
so

1629  
01:01:49,990 --> 01:01:47,760  
science fiction in the 70s and 80s and

1630  
01:01:51,910 --> 01:01:50,000  
90s is more limited than my knowledge of

1631  
01:01:55,270 --> 01:01:51,920  
science fiction from the early 50s to

1632  
01:01:57,990 --> 01:01:55,280  
the 60s and that's by design part of the

1633  
01:01:59,910 --> 01:01:58,000  
charm and the import of galactic journey

1634  
01:02:02,069 --> 01:01:59,920  
is we review the stories

1635  
01:02:03,589 --> 01:02:02,079  
in context now obviously we know we're

1636  
01:02:04,789 --> 01:02:03,599  
writing for a modern audience so we make

1637  
01:02:06,390 --> 01:02:04,799  
sure that you're interested and

1638  
01:02:08,870 --> 01:02:06,400

occasionally we have little winks but

1639

01:02:10,309 --> 01:02:08,880

for the most part we try to understand

1640

01:02:11,990 --> 01:02:10,319

why people were writing these stories

1641

01:02:13,750 --> 01:02:12,000

back then and as a result i don't even

1642

01:02:15,990 --> 01:02:13,760

know who's going to win the hugos in

1643

01:02:17,190 --> 01:02:16,000

1967 and if anyone spoils me i will be

1644

01:02:19,349 --> 01:02:17,200

very upset

1645

01:02:21,349 --> 01:02:19,359

so i can't tell you what we thought of

1646

01:02:23,270 --> 01:02:21,359

spanish science fiction in the 70s

1647

01:02:24,870 --> 01:02:23,280

because i'm not there yet i would guess

1648

01:02:26,870 --> 01:02:24,880

that the 70s would be about the time

1649

01:02:29,270 --> 01:02:26,880

that european science fiction italian

1650

01:02:30,390 --> 01:02:29,280

spanish french german

1651

01:02:32,230 --> 01:02:30,400

um

1652

01:02:34,390 --> 01:02:32,240

all right so i've given the german short

1653

01:02:35,589 --> 01:02:34,400

shrift we have a german correspondent i

1654

01:02:37,750 --> 01:02:35,599

should say we have a west german

1655

01:02:39,510 --> 01:02:37,760

correspondent and that's cora bullard

1656

01:02:41,750 --> 01:02:39,520

she's also been on the ballot for the

1657

01:02:43,589 --> 01:02:41,760

hugo fan writer many times so i've been

1658

01:02:45,990 --> 01:02:43,599

utterly remiss there is german science

1659

01:02:47,910 --> 01:02:46,000

fiction in fact there is a german show

1660

01:02:50,390 --> 01:02:47,920

you could call it the german answer to

1661

01:02:51,829 --> 01:02:50,400

star trek except that it came out

1662

01:02:54,309 --> 01:02:51,839

completely independently and that was

1663

01:02:56,950 --> 01:02:54,319

called space patrol orion there were

1664

01:02:59,190 --> 01:02:56,960

only seven episodes only one season but

1665

01:03:00,630 --> 01:02:59,200

it was brilliant and i believe you can

1666

01:03:02,870 --> 01:03:00,640

get your hands on it through some

1667

01:03:06,309 --> 01:03:02,880

streaming networks so look for space

1668

01:03:14,390 --> 01:03:09,349

the germans absolutely had a science

1669

01:03:19,670 --> 01:03:17,430

oh here me again um

1670

01:03:22,630 --> 01:03:19,680

latin america has a long history of

1671

01:03:25,910 --> 01:03:22,640

science fiction too um since the 19th

1672

01:03:27,510 --> 01:03:25,920

century so it's uh um

1673

01:03:29,349 --> 01:03:27,520

i think it's

1674

01:03:30,470 --> 01:03:29,359

i mean i know we have a lot of problems

1675

01:03:33,029 --> 01:03:30,480

and we have to think about those

1676

01:03:34,870 --> 01:03:33,039

problems but one one way of thinking

1677

01:03:36,789 --> 01:03:34,880

about those problems is writing about

1678

01:03:39,589 --> 01:03:36,799

the future

1679

01:03:40,870 --> 01:03:39,599

so we do have so maybe i wouldn't say

1680

01:03:43,430 --> 01:03:40,880

that

1681

01:03:45,109 --> 01:03:43,440

china or i don't know other countries in

1682

01:03:47,829 --> 01:03:45,119

asia or

1683

01:03:50,549 --> 01:03:47,839

um africa don't have science fiction

1684

01:03:53,750 --> 01:03:50,559

because it's just like

1685

01:03:57,270 --> 01:03:53,760

we have been colonized and our histories

1686

01:03:58,470 --> 01:03:57,280

have been deleted purposely by

1687

01:04:01,190 --> 01:03:58,480

white people

1688

01:04:02,309 --> 01:04:01,200

so i would be careful saying those kind

1689

01:04:03,349 --> 01:04:02,319

of things

1690

01:04:05,029 --> 01:04:03,359

and

1691

01:04:06,710 --> 01:04:05,039

i don't want to

1692

01:04:08,630 --> 01:04:06,720

and and i

1693

01:04:10,470 --> 01:04:08,640

let me let me say this better thank you

1694

01:04:13,270 --> 01:04:10,480

for that

1695

01:04:15,990 --> 01:04:13,280

there are plenty of

1696

01:04:18,309 --> 01:04:16,000

genres that are native to many countries

1697

01:04:21,510 --> 01:04:18,319

to every every country has its literary

1698

01:04:27,829 --> 01:04:24,630

are necessarily different from

1699

01:04:29,990 --> 01:04:27,839

an english science fiction tradition so

1700

01:04:31,589 --> 01:04:30,000

when i say that there is not science

1701

01:04:33,349 --> 01:04:31,599

fiction in these other languages i'm not

1702

01:04:34,789 --> 01:04:33,359

saying there is not a literary tradition

1703

01:04:37,029 --> 01:04:34,799

and that there's not

1704

01:04:38,549 --> 01:04:37,039

speculative elements in these writings

1705

01:04:41,109 --> 01:04:38,559

all i'm saying is that there's a very

1706

01:04:43,589 --> 01:04:41,119

specific genre that is the western

1707

01:04:46,230 --> 01:04:43,599

science fiction story

1708

01:04:47,910 --> 01:04:46,240

and that genre is worldwide now and is

1709

01:04:50,230 --> 01:04:47,920

being contributed specifically by

1710

01:04:53,029 --> 01:04:50,240

countries all over the world

1711

01:04:54,470 --> 01:04:53,039

that particular genre was not being

1712

01:04:56,870 --> 01:04:54,480

participated in

1713

01:04:59,190 --> 01:04:56,880

by other languages at that time other

1714

01:05:00,950 --> 01:04:59,200

countries at that time that particular

1715

01:05:05,990 --> 01:05:00,960

threat of it

1716

01:05:06,000 --> 01:05:15,270

not trying to move the goal post

1717

01:05:18,710 --> 01:05:16,870

so i know you've been

1718

01:05:20,549 --> 01:05:18,720

sorry i know you've been concentrating

1719

01:05:31,029 --> 01:05:20,559

on

1720

01:05:31,990 --> 01:05:31,039

would actually very much love if you

1721

01:05:35,349 --> 01:05:32,000

have

1722

01:05:37,510 --> 01:05:35,359

some names i would love to be educated

1723

01:05:38,549 --> 01:05:37,520

as to the authors that you are referring

1724

01:05:41,829 --> 01:05:38,559

to because i would love to know more

1725

01:05:46,950 --> 01:05:43,349

so you've been concentrating on the

1726

01:05:50,950 --> 01:05:46,960

1950s and 60s

1727

01:05:52,390 --> 01:05:50,960

how do you see lovecraft as a

1728

01:05:53,510 --> 01:05:52,400

influencer

1729

01:05:55,829 --> 01:05:53,520

of

1730

01:05:58,470 --> 01:05:55,839

modern science fiction

1731

01:06:01,510 --> 01:05:58,480

well lovecraft is 20s and 30s i've

1732

01:06:03,349 --> 01:06:01,520

actually as it turns out i i'm not

1733

01:06:05,910 --> 01:06:03,359

my knowledge of science fiction before

1734

01:06:07,589 --> 01:06:05,920

1950 is fairly thin

1735

01:06:09,430 --> 01:06:07,599

with the exception of edgar

1736

01:06:11,349 --> 01:06:09,440

riceborough's and h.p lovecraft i've

1737

01:06:13,990 --> 01:06:11,359

actually read every single thing that

1738

01:06:16,470 --> 01:06:14,000

guy ever wrote including like letters to

1739

01:06:17,670 --> 01:06:16,480

editors i was a masochist for a couple

1740

01:06:19,670 --> 01:06:17,680

of years

1741

01:06:22,309 --> 01:06:19,680

h.p lovecraft

1742

01:06:23,910 --> 01:06:22,319

wrote three excellent stories

1743

01:06:25,750 --> 01:06:23,920

and a bunch of rough drafts for those

1744

01:06:27,670 --> 01:06:25,760

stories he kept publishing over and over

1745

01:06:29,349 --> 01:06:27,680

in magazines

1746

01:06:31,670 --> 01:06:29,359

h.p lovecraft was huge but he didn't

1747

01:06:33,990 --> 01:06:31,680

write science fiction he wrote weird

1748

01:06:36,069 --> 01:06:34,000

tales specifically for the magazine

1749

01:06:37,910 --> 01:06:36,079

weird tales

1750

01:06:39,510 --> 01:06:37,920

the closest he comes to science fiction

1751

01:06:42,309 --> 01:06:39,520

i would say is the mountains of madness

1752

01:06:44,150 --> 01:06:42,319

which features aliens in antarctica

1753

01:06:46,069 --> 01:06:44,160

and i think that's influenced some

1754

01:06:47,190 --> 01:06:46,079

things you could argue that maybe that

1755

01:06:48,710 --> 01:06:47,200

influenced

1756

01:06:51,190 --> 01:06:48,720

john campbell's who goes there which

1757

01:06:53,109 --> 01:06:51,200

ultimately influenced the 1982 john

1758

01:06:56,309 --> 01:06:53,119

carpenter the thing movie

1759

01:06:58,390 --> 01:06:56,319

h.p lovecraft's influence on the genre

1760

01:07:01,589 --> 01:06:58,400

was profound

1761

01:07:03,029 --> 01:07:01,599

but again just as i was saying that

1762

01:07:05,029 --> 01:07:03,039

these other countries were not producing

1763

01:07:07,589 --> 01:07:05,039

science fiction hp lovecraft was not

1764

01:07:09,190 --> 01:07:07,599

producing what we call this science

1765

01:07:11,829 --> 01:07:09,200

fiction genre

1766

01:07:14,069 --> 01:07:11,839

um which honestly hardly existed at the

1767

01:07:16,470 --> 01:07:14,079

time we mostly found it in places like

1768

01:07:26,069 --> 01:07:16,480

amazing in the late 20s it was a very

1769

01:07:29,109 --> 01:07:27,029

hi so

1770

01:07:31,190 --> 01:07:29,119

just so just so happens that i was

1771

01:07:33,910 --> 01:07:31,200

speaking to another scholar of science

1772

01:07:36,069 --> 01:07:33,920

fiction recently who posited the theory

1773

01:07:38,309 --> 01:07:36,079

that uh science fiction is basically

1774

01:07:39,430 --> 01:07:38,319

humanity's way of trying to express and

1775

01:07:41,750 --> 01:07:39,440

explore

1776

01:07:43,910 --> 01:07:41,760

an inherent contradiction in our

1777

01:07:45,670 --> 01:07:43,920

progress in technology and our progress

1778

01:07:49,270 --> 01:07:45,680

in science so technology gives us these

1779

01:07:51,750 --> 01:07:49,280

amazing tools to manipulate the world to

1780

01:07:54,549 --> 01:07:51,760

our whims whereas scientific discoveries

1781

01:07:56,390 --> 01:07:54,559

such as you know other exoplanets and

1782

01:07:57,510 --> 01:07:56,400

and uh the laws of thermodynamics that

1783

01:07:59,829 --> 01:07:57,520

say everything's decaying towards

1784

01:08:02,150 --> 01:07:59,839

entropy make us feel small and actually

1785

01:08:04,630 --> 01:08:02,160

powerless and and very insignificant in

1786

01:08:06,789 --> 01:08:04,640

this grand universe so science fiction

1787

01:08:10,069 --> 01:08:06,799

was this exploration essentially emerged

1788

01:08:12,309 --> 01:08:10,079

as this exploration of these contrasting

1789

01:08:14,710 --> 01:08:12,319

uh results of our increasing

1790

01:08:15,670 --> 01:08:14,720

technological prowess and are increasing

1791

01:08:17,110 --> 01:08:15,680

like

1792

01:08:18,070 --> 01:08:17,120

smallness in the universe i was

1793

01:08:19,110 --> 01:08:18,080

wondering what you thought about this

1794

01:08:20,950 --> 01:08:19,120

theory

1795

01:08:23,189 --> 01:08:20,960

it's interesting um the idea that

1796

01:08:24,709 --> 01:08:23,199

science fiction is the pretty face we

1797

01:08:26,229 --> 01:08:24,719

draw on the universe because the

1798

01:08:29,189 --> 01:08:26,239

universe is too complicated to

1799

01:08:30,870 --> 01:08:29,199

understand and scary in its complexity

1800

01:08:32,390 --> 01:08:30,880

that's certainly one of the motivations

1801

01:08:34,229 --> 01:08:32,400

i mean we have to remember the primary

1802

01:08:35,189 --> 01:08:34,239

motivation for the existence of science

1803

01:08:36,829 --> 01:08:35,199

fiction

1804

01:08:39,349 --> 01:08:36,839

is to make

1805

01:08:40,709 --> 01:08:39,359

money larry niven when he was selling

1806

01:08:42,550 --> 01:08:40,719

his story well maybe not you because you

1807

01:08:44,149 --> 01:08:42,560

were rich to begin with but

1808

01:08:46,309 --> 01:08:44,159

you probably did it for the fanish love

1809

01:08:48,149 --> 01:08:46,319

of it all um there's a lot of reasons to

1810

01:08:50,149 --> 01:08:48,159

write science fiction one

1811

01:08:53,510 --> 01:08:50,159

but but ultimately the point is to tell

1812

01:08:55,990 --> 01:08:53,520

a story and we're science is the core of

1813

01:08:57,349 --> 01:08:56,000

science fiction we love extrapolating

1814

01:09:00,470 --> 01:08:57,359

sometimes we like making social

1815

01:09:02,390 --> 01:09:00,480

commentary sometimes we express analogs

1816

01:09:04,550 --> 01:09:02,400

in science fiction that aren't safe to

1817

01:09:06,070 --> 01:09:04,560

do in our regular fiction

1818

01:09:08,070 --> 01:09:06,080

so we talk about the green people

1819

01:09:11,110 --> 01:09:08,080

instead of the brown people

1820

01:09:15,990 --> 01:09:13,749

and sometimes we are making cautionary

1821

01:09:17,829 --> 01:09:16,000

stories so i did a talk at georgia tech

1822

01:09:20,550 --> 01:09:17,839

in october which is kind of the reason

1823

01:09:23,510 --> 01:09:20,560

i'm here today called uh doomsday

1824

01:09:25,030 --> 01:09:23,520

predictions of the past and how we make

1825

01:09:27,749 --> 01:09:25,040

and and why they didn't come true and

1826

01:09:30,870 --> 01:09:27,759

how we make the future um and in the 60s

1827

01:09:32,950 --> 01:09:30,880

we believed that overpopulation

1828

01:09:34,390 --> 01:09:32,960

pollution nuclear annihilation these

1829

01:09:37,349 --> 01:09:34,400

were things that were going to destroy

1830

01:09:39,749 --> 01:09:37,359

us if they went on now no science

1831

01:09:41,110 --> 01:09:39,759

fiction person is a soothsayer we don't

1832

01:09:42,709 --> 01:09:41,120

know the future because again we're

1833

01:09:44,709 --> 01:09:42,719

mostly writing to make a buck maybe to

1834

01:09:46,070 --> 01:09:44,719

make a statement

1835

01:09:48,070 --> 01:09:46,080

but

1836

01:09:49,829 --> 01:09:48,080

what we can do is say you know what this

1837

01:09:52,149 --> 01:09:49,839

thing looks like a bad

1838

01:09:54,070 --> 01:09:52,159

idea let's write stories about what the

1839

01:09:55,910 --> 01:09:54,080

world looks like if this goes on and

1840

01:09:58,550 --> 01:09:55,920

then the world can look at these stories

1841

01:10:00,149 --> 01:09:58,560

read them and go huh well i didn't

1842

01:10:01,750 --> 01:10:00,159

really understand the problem until it

1843

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

was conveyed to me in this easily

1844

01:10:07,189 --> 01:10:04,640

digestible form of a story or a movie

1845

01:10:08,630 --> 01:10:07,199

now that i've seen soylent green

1846

01:10:24,950 --> 01:10:08,640

maybe i am going to be an advocate for

1847

01:10:28,830 --> 01:10:26,709

uh

1848

01:10:41,189 --> 01:10:28,840

all right this is the last

1849

01:10:44,390 --> 01:10:43,110

can you hear me are there any examples

1850

01:10:46,390 --> 01:10:44,400

um

1851  
01:10:47,510 --> 01:10:46,400  
fiction writers

1852  
01:10:48,870 --> 01:10:47,520  
um

1853  
01:10:50,870 --> 01:10:48,880  
addicting

1854  
01:10:51,750 --> 01:10:50,880  
uh is their writer just

1855  
01:10:54,070 --> 01:10:51,760  
it's

1856  
01:10:56,149 --> 01:10:54,080  
uh uh science these are not scientists

1857  
01:10:57,350 --> 01:10:56,159  
but writers making predictions about the

1858  
01:10:59,110 --> 01:10:57,360  
future

1859  
01:11:01,270 --> 01:10:59,120  
and then that actually becoming

1860  
01:11:02,950 --> 01:11:01,280  
technologically true but they were

1861  
01:11:06,870 --> 01:11:02,960  
artists making the interpretation not

1862  
01:11:10,790 --> 01:11:08,950  
star trek of course is a stellar example

1863  
01:11:12,870 --> 01:11:10,800

although in some cases it's a matter of

1864

01:11:15,110 --> 01:11:12,880

the people inspired by star trek then

1865

01:11:17,830 --> 01:11:15,120

created the technologies they saw in the

1866

01:11:24,229 --> 01:11:22,310

do you ever watch the show green hornet

1867

01:11:29,110 --> 01:11:24,239

green hornet

1868

01:11:30,149 --> 01:11:29,120

the batman 66

1869

01:11:32,070 --> 01:11:30,159

that one

1870

01:11:33,750 --> 01:11:32,080

by the same people william dozier and it

1871

01:11:36,390 --> 01:11:33,760

was designed it was supposed to be the

1872

01:11:38,470 --> 01:11:36,400

serious alternative to batman and it's a

1873

01:11:40,070 --> 01:11:38,480

great show and it's really kind of

1874

01:11:41,990 --> 01:11:40,080

criminal that it's not better remembered

1875

01:11:44,950 --> 01:11:42,000

it only lasted one season there's even a

1876

01:11:46,470 --> 01:11:44,960

couple of crossover episodes with batman

1877

01:11:48,229 --> 01:11:46,480

and if you watch it one of the things

1878

01:11:50,950 --> 01:11:48,239

that their their version of the

1879

01:11:54,149 --> 01:11:50,960

batmobile called the black beauty has is

1880

01:11:55,750 --> 01:11:54,159

it has these little flying things come

1881

01:11:58,310 --> 01:11:55,760

out of the trunk

1882

01:12:00,630 --> 01:11:58,320

and fly soundlessly overhead with

1883

01:12:02,310 --> 01:12:00,640

cameras on board so you can see what's

1884

01:12:04,070 --> 01:12:02,320

below you

1885

01:12:06,790 --> 01:12:04,080

you may have seen these in real life in

1886

01:12:08,790 --> 01:12:06,800

the 21st century but this was this was

1887

01:12:10,310 --> 01:12:08,800

astonishing when i first saw this in

1888

01:12:12,950 --> 01:12:10,320

1967.

1889

01:12:14,229 --> 01:12:12,960

you absolutely see plenty of things

1890

01:12:16,390 --> 01:12:14,239

predicted

1891

01:12:18,229 --> 01:12:16,400

in science fiction partly their educated

1892

01:12:19,910 --> 01:12:18,239

guesses if you have a million monkeys

1893

01:12:21,110 --> 01:12:19,920

riding on a million typewriters they

1894

01:12:24,390 --> 01:12:21,120

will guess

1895

01:12:26,310 --> 01:12:24,400

the name of the president in 2022

1896

01:12:28,070 --> 01:12:26,320

um for the most part though science

1897

01:12:29,990 --> 01:12:28,080

fiction people are guessing as much as

1898

01:12:30,870 --> 01:12:30,000

anybody else sometimes we know a little

1899

01:12:32,470 --> 01:12:30,880

more

1900

01:12:34,229 --> 01:12:32,480

there was a guy who wrote a fantasy and

1901

01:12:35,830 --> 01:12:34,239

science fiction story just the other day

1902

01:12:39,590 --> 01:12:35,840

and it was about um

1903

01:12:41,270 --> 01:12:39,600

transplanting knowledge into the brain

1904

01:12:42,870 --> 01:12:41,280

and this guy knew where of he spoke

1905

01:12:46,070 --> 01:12:42,880

because he actually had invented the

1906

01:12:47,430 --> 01:12:46,080

first remote control pacemaker so there

1907

01:12:49,510 --> 01:12:47,440

are some people who were actually

1908

01:12:51,030 --> 01:12:49,520

scientists writing science fiction who

1909

01:12:52,070 --> 01:12:51,040

knew enough about the state of the art

1910

01:12:53,830 --> 01:12:52,080

and they could write some pretty

1911

01:12:55,110 --> 01:12:53,840

intelligent science fiction some of

1912

01:12:56,390 --> 01:12:55,120

which came true some of which didn't for

1913

01:12:59,270 --> 01:12:56,400

the most part the people who wrote

1914

01:13:02,149 --> 01:12:59,280

science fiction were not scientists

1915

01:13:03,830 --> 01:13:02,159

we would just read scientific american

1916

01:13:04,870 --> 01:13:03,840

find some cool ideas and turn a story

1917

01:13:06,709 --> 01:13:04,880

from it

1918

01:13:08,310 --> 01:13:06,719

larry niven was one of the masters of

1919

01:13:10,390 --> 01:13:08,320

taking a science fiction article or an

1920

01:13:12,229 --> 01:13:10,400

isaac asimov

1921

01:13:16,950 --> 01:13:12,239

article and turning that into this

1922

01:13:20,550 --> 01:13:18,709

i think that's it if you guys want to

1923

01:13:22,070 --> 01:13:20,560

know more about me and what i do if you

1924

01:13:24,070 --> 01:13:22,080

want to see galactic journey or the

1925

01:13:26,070 --> 01:13:24,080

books we publish

1926

01:13:27,510 --> 01:13:26,080

come up here and get a card

1927

01:13:29,210 --> 01:13:27,520

even if you throw the card away make me