

Show 462

THE
**SKEPTIC
ZONE**
PODCAST

www.skepticzone.tv

27 August 2017

This week Eran Segev chats to Astronomer Dr Pamela Gay

Exciting news for the Northern Rivers Vaccination Supporters Group as they have been nominated the North Coast Primary Health Network's 2017 Community Choice Excellence Award.

Brew Ha Ha: Science in less time than it takes to order a coffee
With Shuj Esufali - Let's make algae Australian of the Year!

Anti-Vax doctor outs himself after a screening of VaXXed

Maynard at Sydney Science Festival - Schools Event at the Australian Museum

The Skeptic Zone Podcast
Show 462 - 27 August 2017



1
00:00:09,110 --> 00:00:05,990

[Music]

2
00:00:11,840 --> 00:00:09,120

welcome to the skeptic zone the podcast

3
00:00:13,890 --> 00:00:11,850

from Australia for science and reason

4
00:00:16,880 --> 00:00:13,900

[Music]

5
00:00:22,650 --> 00:00:16,890

[Applause]

6
00:00:25,329 --> 00:00:22,660

[Music]

7
00:00:28,389 --> 00:00:25,339

yes it's the skeptic zone podcast

8
00:00:31,330 --> 00:00:28,399

episode number 462 for the 27th of

9
00:00:33,959 --> 00:00:31,340

August 2017 richardsaunders here with

10
00:00:35,829 --> 00:00:33,969

you from a very sunny Sydney Australia

11
00:00:38,290 --> 00:00:35,839

but not too hot

12
00:00:40,780 --> 00:00:38,300

winters still here not for long I've

13
00:00:43,060 --> 00:00:40,790

noticed things are blooming the

14

00:00:46,210 --> 00:00:43,070

weather's getting warmer but for the

15

00:00:47,619 --> 00:00:46,220

moment it's it's very nice coming up on

16

00:00:50,709 --> 00:00:47,629

this week's show apart from the weather

17

00:00:53,399 --> 00:00:50,719

report a grain of salt with Iran say

18

00:00:56,770 --> 00:00:53,409

give Iran is gallivanting globe-trotting

19

00:01:00,100 --> 00:00:56,780

he was recently in North America where

20

00:01:02,920 --> 00:01:00,110

the lucky dog witnessed the total solar

21

00:01:04,719 --> 00:01:02,930

eclipse more about the Eclipse in a

22

00:01:08,350 --> 00:01:04,729

moment folks more about that in a moment

23

00:01:11,020 --> 00:01:08,360

and he caught up with a dear old friend

24

00:01:13,780 --> 00:01:11,030

of the skeptics our dr. pamela gaye the

25

00:01:17,200 --> 00:01:13,790

famous astronomer now pamela is the

26

00:01:20,020 --> 00:01:17,210

director of the technology and citizen

27

00:01:23,530 --> 00:01:20,030

science at the Astronomical Society of

28

00:01:26,230 --> 00:01:23,540

the Pacific that's quite a title and

29

00:01:30,160 --> 00:01:26,240

iran chats to pamela about her work

30

00:01:31,860 --> 00:01:30,170

there and the outreach they do including

31

00:01:34,300 --> 00:01:31,870

mapping planets

32

00:01:36,580 --> 00:01:34,310

following that it's the raw skeptic

33

00:01:38,380 --> 00:01:36,590

report with heidi robertson exciting

34

00:01:40,450 --> 00:01:38,390

news for the Northern Rivers vaccination

35

00:01:43,539 --> 00:01:40,460

supporters a group as they have been

36

00:01:46,740 --> 00:01:43,549

nominated for the North Coast primary

37

00:01:50,230 --> 00:01:46,750

health networks 2017 Community Choice

38

00:01:53,560 --> 00:01:50,240

excellent award Heidi will tell us about

39

00:01:56,109 --> 00:01:53,570

this nomination and how you how you can

40

00:01:58,960 --> 00:01:56,119

vote further organization in that award

41

00:02:00,820 --> 00:01:58,970

links on the show notes and it's so nice

42

00:02:04,120 --> 00:02:00,830

to see that a group like that is getting

43

00:02:06,490 --> 00:02:04,130

even more recognition then coming up

44

00:02:09,639 --> 00:02:06,500

after that it's brouhaha science from

45

00:02:13,869 --> 00:02:09,649

Australia science TV with SJ Yousuf Ali

46

00:02:16,660 --> 00:02:13,879

talking about algae what do you want to

47

00:02:19,899 --> 00:02:16,670

know about algae and how important it is

48

00:02:21,220 --> 00:02:19,909

and they think at the the Australia

49

00:02:23,710 --> 00:02:21,230

science TV they think it should be

50

00:02:26,199 --> 00:02:23,720

nominated for Australian of the Year hmm

51
00:02:27,729 --> 00:02:26,209
that's an interesting one then we bring

52
00:02:30,129 --> 00:02:27,739
you what's turning out to be a major

53
00:02:35,010 --> 00:02:30,139
story here in Australia about a

54
00:02:39,630 --> 00:02:35,020
Melbourne GP who has been investigate

55
00:02:42,160 --> 00:02:39,640
after he outed himself on a video at a

56
00:02:46,480 --> 00:02:42,170
screening of the movie VAX

57
00:02:50,110 --> 00:02:46,490
where he almost boasted about helping

58
00:02:53,290 --> 00:02:50,120
parents dodge a vaccination for their

59
00:03:00,490 --> 00:02:53,300
children and as I say later on in the

60
00:03:03,100 --> 00:03:00,500
report this vast movement silver linings

61
00:03:04,930 --> 00:03:03,110
there are many good things coming out

62
00:03:07,600 --> 00:03:04,940
about this awful movie being shown

63
00:03:10,380 --> 00:03:07,610

around Australia including the outing of

64

00:03:14,410 --> 00:03:10,390

anti vaccination doctors by themselves

65

00:03:16,780 --> 00:03:14,420

by themselves and what's the expression

66

00:03:21,490 --> 00:03:16,790

they only open their mouth to change

67

00:03:24,040 --> 00:03:21,500

feet oh boy a very interesting and

68

00:03:28,600 --> 00:03:24,050

revealing story and a continuing story

69

00:03:30,940 --> 00:03:28,610

about anti vaccination GPS went around

70

00:03:33,190 --> 00:03:30,950

off the show may not spooky action more

71

00:03:36,070 --> 00:03:33,200

from the recent Sydney Science Festival

72

00:03:38,710 --> 00:03:36,080

and once again Maynard runs around a

73

00:03:41,800 --> 00:03:38,720

scientific institution interviewing all

74

00:03:44,170 --> 00:03:41,810

sorts of scientists this time it's at

75

00:03:47,320 --> 00:03:44,180

the Australian Museum where Maynard and

76

00:03:50,110 --> 00:03:47,330

I were all of last week performing for

77

00:03:52,960 --> 00:03:50,120

the science festival as part of the

78

00:03:55,570 --> 00:03:52,970

school's events performing our mystery

79

00:03:57,160 --> 00:03:55,580

investigator show and there's a bit some

80

00:03:59,560 --> 00:03:57,170

clips some highlights from the mystery

81

00:04:01,840 --> 00:03:59,570

investigator show a bit later on but

82

00:04:03,850 --> 00:04:01,850

before that may not speaks to people

83

00:04:07,600 --> 00:04:03,860

from the Australian mathematical science

84

00:04:10,480 --> 00:04:07,610

Institute dr. Ann Massa from jenolan

85

00:04:12,670 --> 00:04:10,490

caves which is a wonderful cave system

86

00:04:15,030 --> 00:04:12,680

west of Sydney then it's Thomas

87

00:04:18,640 --> 00:04:15,040

Jefferies from the joint academic

88

00:04:21,099 --> 00:04:18,650

microbiology seminars known as jams and

89

00:04:23,650 --> 00:04:21,109

then older from the wild life Sydney

90

00:04:25,480 --> 00:04:23,660

Seward Darling Harbour and she and her

91

00:04:28,480 --> 00:04:25,490

colleagues brought along lots of stick

92

00:04:30,250 --> 00:04:28,490

insects that was a lot of fun now just

93

00:04:31,480 --> 00:04:30,260

getting back to the solar eclipse if you

94

00:04:34,150 --> 00:04:31,490

remember last week on the show we

95

00:04:35,770 --> 00:04:34,160

chatted to Evan Bernstein from the

96

00:04:38,530 --> 00:04:35,780

skeptics guide to the universe who was

97

00:04:40,720 --> 00:04:38,540

very excited very excited about going to

98

00:04:43,360 --> 00:04:40,730

see that solar eclipse he did I'm

99

00:04:46,719 --> 00:04:43,370

delighted to report he made it and the

100

00:04:48,350 --> 00:04:46,729

skies were clear for Evan and his

101
00:04:51,160 --> 00:04:48,360
friends and family who were they

102
00:04:57,140 --> 00:04:51,170
and here's a short clip that he made

103
00:05:00,110 --> 00:04:57,150
during during the solar eclipse okay we

104
00:05:03,610 --> 00:05:00,120
are about four minutes from totality and

105
00:05:06,800 --> 00:05:03,620
the skies have gotten darker and

106
00:05:11,810 --> 00:05:06,810
everybody is on pins and needles waiting

107
00:05:13,220 --> 00:05:11,820
for the actual moment so stay tuned okay

108
00:05:15,230 --> 00:05:13,230
two minutes out two minutes to go I'm

109
00:05:17,000 --> 00:05:15,240
gonna let this thing run and hopefully

110
00:05:33,620 --> 00:05:17,010
we'll see the shadow wash over us from

111
00:05:37,060 --> 00:05:33,630
this direction we're facing west we are

112
00:05:49,190 --> 00:05:37,070
in totality folks look Jupiter above us

113
00:05:56,220 --> 00:05:51,909

just amazing

114

00:05:56,230 --> 00:06:02,409

[Music]

115

00:06:07,850 --> 00:06:05,330

congratulations Evan I'm so thrilled and

116

00:06:10,010 --> 00:06:07,860

delighted for you and your friends and

117

00:06:12,530 --> 00:06:10,020

family and all the people all the people

118

00:06:15,440 --> 00:06:12,540

who saw the solar eclipse and I'm

119

00:06:18,850 --> 00:06:15,450

jealous I'm very jealous but now it's

120

00:06:25,240 --> 00:06:18,860

time for me to run downstairs open up a

121

00:06:28,940 --> 00:06:25,250

box of imported Indian curry yes

122

00:06:33,170 --> 00:06:28,950

imported if they come in these little

123

00:06:34,940 --> 00:06:33,180

boxes they're very cheap and you take

124

00:06:38,420 --> 00:06:34,950

them out of the box and then into sort

125

00:06:41,750 --> 00:06:38,430

of a foil pouch new undo that pour the

126
00:06:43,670 --> 00:06:41,760
contents into a bowl heat up some rice

127
00:06:47,150 --> 00:06:43,680
and mix it all together

128
00:06:50,000 --> 00:06:47,160
and it makes an excellent excellent

129
00:06:52,610 --> 00:06:50,010
lunch or dinner imported Indian curry

130
00:06:55,490 --> 00:06:52,620
and then you can add some spices if you

131
00:06:58,060 --> 00:06:55,500
wish or yogurt or things like that maybe

132
00:07:01,190 --> 00:06:58,070
make some papadums in the microwave

133
00:07:04,670 --> 00:07:01,200
sounds good to me while I'm enjoying all

134
00:07:20,640 --> 00:07:04,680
that I hope you enjoy the sceptic zone

135
00:07:31,360 --> 00:07:23,590
let's all take this with a grain of salt

136
00:07:33,570 --> 00:07:31,370
is around second I am at the moonrise

137
00:07:35,800 --> 00:07:33,580
hotel we're actually sitting at a gym

138
00:07:40,180 --> 00:07:35,810

because that's the place that's why it's

139

00:07:42,939 --> 00:07:40,190

quiet it's it's true we're stepping away

140

00:07:46,659 --> 00:07:42,949

from all of the revelry and all of the

141

00:07:48,430 --> 00:07:46,669

celebration after a day of watching the

142

00:07:50,409 --> 00:07:48,440

moon get in the way of our view of the

143

00:07:52,480 --> 00:07:50,419

Sun and the voice that you're hearing

144

00:07:57,550 --> 00:07:52,490

and most of you probably recognize is

145

00:07:59,290 --> 00:07:57,560

that Pamela gay Oh much better although

146

00:08:01,810 --> 00:07:59,300

you can probably tell by my voice that

147

00:08:06,490 --> 00:08:01,820

you know I've gone through through

148

00:08:10,060 --> 00:08:06,500

something but we just had an eclipse

149

00:08:14,469 --> 00:08:10,070

weekend and then some it was wonderful

150

00:08:15,610 --> 00:08:14,479

by all accounts you tell us about your

151
00:08:18,659 --> 00:08:15,620
experience with the Eclipse what

152
00:08:22,330 --> 00:08:18,669
happened to you so this entire adventure

153
00:08:26,050 --> 00:08:22,340
started on Friday morning when we all

154
00:08:30,400 --> 00:08:26,060
began to converge on this beautiful moon

155
00:08:32,019 --> 00:08:30,410
Apollo themed hotel in st. Louis

156
00:08:34,560 --> 00:08:32,029
Missouri in the middle of the United

157
00:08:37,420 --> 00:08:34,570
States group of us went on an amazingly

158
00:08:39,130 --> 00:08:37,430
sometimes harrowing bike ride in which I

159
00:08:42,430 --> 00:08:39,140
got lost and we went down a highway at

160
00:08:46,510 --> 00:08:42,440
one point because this is what I do we

161
00:08:49,630 --> 00:08:46,520
had two days of science and arts and

162
00:08:53,590 --> 00:08:49,640
science related music and then this

163
00:08:56,500 --> 00:08:53,600

morning before the Sun was fully up we

164

00:08:58,930 --> 00:08:56,510

boarded cars we boarded buses and we

165

00:09:03,100 --> 00:08:58,940

drove about a hundred and sixty

166

00:09:06,670 --> 00:09:03,110

kilometers to Carbondale Illinois which

167

00:09:08,560 --> 00:09:06,680

is near the point of maximum totality

168

00:09:11,460 --> 00:09:08,570

here in the United States we had roughly

169

00:09:14,440 --> 00:09:11,470

two minutes and 40 seconds of totality

170

00:09:16,420 --> 00:09:14,450

during which I expect I experienced two

171

00:09:18,190 --> 00:09:16,430

minutes and 40 seconds of a little tiny

172

00:09:20,860 --> 00:09:18,200

very annoying cloud being directly

173

00:09:22,090 --> 00:09:20,870

between me and Jim Cantore of The

174

00:09:24,009 --> 00:09:22,100

Weather Channel

175

00:09:26,050 --> 00:09:24,019

as people all around us were able to see

176

00:09:28,720 --> 00:09:26,060

a few seconds here a few minutes there

177

00:09:31,509 --> 00:09:28,730

well yeah you know we were in two buses

178

00:09:35,259 --> 00:09:31,519

and my the bus I was on was the other

179

00:09:38,350 --> 00:09:35,269

bus that went into a an area just

180

00:09:40,090 --> 00:09:38,360

outside Carbondale and we had we saw the

181

00:09:43,360 --> 00:09:40,100

whole thing I know I know

182

00:09:46,329 --> 00:09:43,370

it's the the running joke all weekend

183

00:09:49,420 --> 00:09:46,339

has been I was going to abandon the

184

00:09:52,030 --> 00:09:49,430

entire team because my two prior

185

00:09:56,139 --> 00:09:52,040

attempts to see a solar eclipse included

186

00:09:57,850 --> 00:09:56,149

getting rained upon and when we all went

187

00:09:59,920 --> 00:09:57,860

to the Yucatan Peninsula the day the

188

00:10:03,460 --> 00:09:59,930

Mayan calendar ended we actually did

189

00:10:06,639 --> 00:10:03,470

almost die on a Mexican ferry i I know

190

00:10:08,980 --> 00:10:06,649

that somebody has to be that tail end of

191

00:10:12,610 --> 00:10:08,990

the Gaussian distribution of faiths and

192

00:10:15,309 --> 00:10:12,620

it seems to be my destiny or at least my

193

00:10:17,590 --> 00:10:15,319

statistically improbable reality to

194

00:10:20,050 --> 00:10:17,600

always be that tail end of the Gaussian

195

00:10:22,809 --> 00:10:20,060

distribution so I joked all weekend I

196

00:10:24,460 --> 00:10:22,819

was going to abandon all of you go hang

197

00:10:26,559 --> 00:10:24,470

out with the Weather Channel and there'd

198

00:10:28,059 --> 00:10:26,569

be a little tiny cloud over only my head

199

00:10:30,819 --> 00:10:28,069

and you'd all have a fabulous experience

200

00:10:32,019 --> 00:10:30,829

and it sort of happened it totally

201
00:10:35,230 --> 00:10:32,029
happened there was this little tiny

202
00:10:37,120 --> 00:10:35,240
Peninsula of cloud that like only

203
00:10:40,120 --> 00:10:37,130
affected me and Jim Cantore and our

204
00:10:43,120 --> 00:10:40,130
camera crew hmm yeah you'll have to

205
00:10:45,280 --> 00:10:43,130
continue trying it's worth it I I'm

206
00:10:47,199 --> 00:10:45,290
going to and I'm going to make sure that

207
00:10:50,650 --> 00:10:47,209
I always stay far away from people I

208
00:10:54,429 --> 00:10:50,660
care about so um let's move move on from

209
00:10:56,910 --> 00:10:54,439
the Eclipse can you tell me a little bit

210
00:10:59,079 --> 00:10:56,920
about what you do now I mean you

211
00:11:01,090 --> 00:10:59,089
listeners to astronomy cast will know

212
00:11:02,590 --> 00:11:01,100
that your title has changed it has you

213
00:11:04,300 --> 00:11:02,600

no longer the university of southern

214

00:11:07,449 --> 00:11:04,310

Illinois Edwardsville is that correct

215

00:11:09,670 --> 00:11:07,459

it's true so back in January I was hired

216

00:11:12,550 --> 00:11:09,680

by the Astronomical Society of the

217

00:11:14,470 --> 00:11:12,560

Pacific and you may be thinking wait she

218

00:11:16,300 --> 00:11:14,480

lives in Illinois doesn't she and that

219

00:11:18,850 --> 00:11:16,310

sure doesn't touch an ocean no no it

220

00:11:21,670 --> 00:11:18,860

touches the Mississippi River but it's

221

00:11:24,220 --> 00:11:21,680

an international organization and just

222

00:11:26,290 --> 00:11:24,230

as Australia is a Pacific nation the

223

00:11:29,769 --> 00:11:26,300

United States is a Pacific nation and

224

00:11:32,410 --> 00:11:29,779

this international organization well

225

00:11:34,750 --> 00:11:32,420

Illinois still part of the US and

226

00:11:37,030 --> 00:11:34,760

so now I'm the director of technology

227

00:11:39,670 --> 00:11:37,040

and citizen science at the Astronomical

228

00:11:42,360 --> 00:11:39,680

Society of the Pacific and I'm working

229

00:11:44,530 --> 00:11:42,370

to take this more than hundred-year-old

230

00:11:48,460 --> 00:11:44,540

organization that was founded right

231

00:11:50,439 --> 00:11:48,470

after an eclipse from people that were

232

00:11:53,139 --> 00:11:50,449

taking through the first scientific data

233

00:11:54,850 --> 00:11:53,149

ever of an eclipse and helping them move

234

00:11:57,400 --> 00:11:54,860

from the photographic air into the

235

00:11:59,800 --> 00:11:57,410

digital era that's fantastic and but you

236

00:12:01,210 --> 00:11:59,810

still so the director of cosmic ways I'm

237

00:12:03,220 --> 00:12:01,220

still the director of cosmic West

238

00:12:05,829 --> 00:12:03,230

technically principal investigators the

239

00:12:08,259 --> 00:12:05,839

phrase that nASA uses on our paperwork

240

00:12:10,000 --> 00:12:08,269

I'm the person that hurts the paperwork

241

00:12:10,540 --> 00:12:10,010

to make sure the citizen science gets

242

00:12:12,730 --> 00:12:10,550

done

243

00:12:14,019 --> 00:12:12,740

yeah well this that has been something

244

00:12:14,800 --> 00:12:14,029

that you've been focused on for many

245

00:12:16,750 --> 00:12:14,810

years now

246

00:12:19,769 --> 00:12:16,760

I mean you visited Australia several

247

00:12:21,910 --> 00:12:19,779

times and some of some of the reason

248

00:12:26,439 --> 00:12:21,920

some of the reasons that you visited

249

00:12:30,370 --> 00:12:26,449

were to raise funds for so we launched

250

00:12:32,439 --> 00:12:30,380

back in January of 2012 and at that

251

00:12:35,050 --> 00:12:32,449

point in time we were funded off of two

252

00:12:37,000 --> 00:12:35,060

separate NASA grants we had a series of

253

00:12:39,519 --> 00:12:37,010

different mission contracts we had some

254

00:12:42,009 --> 00:12:39,529

corporate sponsors but over the years

255

00:12:44,769 --> 00:12:42,019

the amount of funding available for

256

00:12:47,290 --> 00:12:44,779

people to do the kind of science in

257

00:12:49,060 --> 00:12:47,300

science education that I work on has

258

00:12:51,000 --> 00:12:49,070

fluctuated we went through a period

259

00:12:54,210 --> 00:12:51,010

called sequestration where they

260

00:12:57,790 --> 00:12:54,220

radically changed everyone's budgets and

261

00:13:00,550 --> 00:12:57,800

it was the donations of people like

262

00:13:02,920 --> 00:13:00,560

those out in our audience and it was

263

00:13:06,130 --> 00:13:02,930

because of the help of people like you

264

00:13:09,970 --> 00:13:06,140

and Richard that we were able to reach

265

00:13:12,400 --> 00:13:09,980

out and say can you help us bridge from

266

00:13:16,360 --> 00:13:12,410

today to tomorrow and that tomorrow came

267

00:13:18,009 --> 00:13:16,370

and today we're once again NASA funded

268

00:13:20,170 --> 00:13:18,019

project I'm not speaking for NASA right

269

00:13:21,910 --> 00:13:20,180

now right now I'm speaking is regular

270

00:13:26,650 --> 00:13:21,920

human being working for the Astronomical

271

00:13:29,920 --> 00:13:26,660

Society of the Pacific but we were able

272

00:13:31,780 --> 00:13:29,930

to carry on and get to this today where

273

00:13:34,000 --> 00:13:31,790

we're working to generate new citizen

274

00:13:35,410 --> 00:13:34,010

science projects and hopefully if we're

275

00:13:37,930 --> 00:13:35,420

going to be launching a brand-new

276

00:13:40,809 --> 00:13:37,940

project in the not-too-distant future to

277

00:13:41,550 --> 00:13:40,819

get help labeling astronaut photos this

278

00:13:43,170 --> 00:13:41,560

is the next

279

00:13:45,930 --> 00:13:43,180

big thing we're gonna be looking to do

280

00:13:49,320 --> 00:13:45,940

because there's a whole lot of science

281

00:13:52,170 --> 00:13:49,330

in these pictures that are forest fires

282

00:13:54,240 --> 00:13:52,180

a flooding of farmer's fields and all

283

00:13:55,650 --> 00:13:54,250

their different states and shapes across

284

00:13:58,260 --> 00:13:55,660

the world sorry so these are photos

285

00:13:59,519 --> 00:13:58,270

taken by astronauts from space yes so

286

00:14:03,240 --> 00:13:59,529

the astronauts in the International

287

00:14:07,110 --> 00:14:03,250

Space Station have taken more than one

288

00:14:08,790 --> 00:14:07,120

and a half million photos and we know

289

00:14:10,320 --> 00:14:08,800

where the space station was when they

290

00:14:12,390 --> 00:14:10,330

took the photos and we know what camera

291

00:14:15,720 --> 00:14:12,400

and lens they were using but these

292

00:14:18,150 --> 00:14:15,730

photos aren't labeled so to make them

293

00:14:20,790 --> 00:14:18,160

usable for science we need to get the

294

00:14:24,480 --> 00:14:20,800

help of anyone out there who just wants

295

00:14:26,970 --> 00:14:24,490

to explore our world from an eagle-eyed

296

00:14:31,320 --> 00:14:26,980

view if that eagle was flying 300 miles

297

00:14:33,690 --> 00:14:31,330

up with the zoom lens that's amazing so

298

00:14:35,370 --> 00:14:33,700

when is this launching we're we're still

299

00:14:36,780 --> 00:14:35,380

waiting for a final approval to come

300

00:14:38,340 --> 00:14:36,790

from NASA headquarters again I'm not

301
00:14:40,290 --> 00:14:38,350
speaking for NASA today just to make

302
00:14:42,780 --> 00:14:40,300
that clear we're still waiting for word

303
00:14:45,720 --> 00:14:42,790
from NASA headquarters and now that the

304
00:14:47,670 --> 00:14:45,730
Eclipse is behind us we're hoping to be

305
00:14:50,520 --> 00:14:47,680
able to turn this around fairly quickly

306
00:14:53,100 --> 00:14:50,530
and get all of our software certified

307
00:14:55,079 --> 00:14:53,110
because well this is the kind of launch

308
00:14:57,680 --> 00:14:55,089
that we want it to be just as nominal as

309
00:15:00,600 --> 00:14:57,690
any spacecraft lunch is it going to be

310
00:15:02,520 --> 00:15:00,610
similar to things like Galaxy Zoo where

311
00:15:04,230 --> 00:15:02,530
you basically have the photos online and

312
00:15:06,300 --> 00:15:04,240
people are expected to provide the

313
00:15:08,310 --> 00:15:06,310

information online and then you kind of

314

00:15:09,690 --> 00:15:08,320

average out the results or see if

315

00:15:11,400 --> 00:15:09,700

everybody says the same thing that's

316

00:15:13,290 --> 00:15:11,410

exactly what we're doing so it's gonna

317

00:15:16,320 --> 00:15:13,300

be a multi-step process where we start

318

00:15:18,420 --> 00:15:16,330

out by asking is this a picture of outer

319

00:15:20,820 --> 00:15:18,430

space or looking down at the surface of

320

00:15:23,520 --> 00:15:20,830

the planet and depending on how you

321

00:15:26,550 --> 00:15:23,530

answer it then asks so do you see things

322

00:15:29,100 --> 00:15:26,560

like farms and oceans and coastlines or

323

00:15:31,470 --> 00:15:29,110

do you see the moon and stars and we're

324

00:15:33,030 --> 00:15:31,480

gonna work on narrowing it down and for

325

00:15:35,160 --> 00:15:33,040

those photos that are looking straight

326

00:15:37,320 --> 00:15:35,170

down at the earth or maybe at a slightly

327

00:15:39,180 --> 00:15:37,330

oblique angle we're gonna ask people to

328

00:15:41,960 --> 00:15:39,190

try and Center the photos up on Google

329

00:15:44,790 --> 00:15:41,970

Maps so that we can get the actual

330

00:15:46,769 --> 00:15:44,800

latitude and longitude of what it is

331

00:15:48,570 --> 00:15:46,779

that people are able to see in these

332

00:15:50,850 --> 00:15:48,580

images and they can really be used for

333

00:15:53,700 --> 00:15:50,860

science that way that's fantastic but

334

00:15:56,160 --> 00:15:53,710

what projects we have ongoing

335

00:15:58,320 --> 00:15:56,170

so currently we have mercury mappers

336

00:16:00,990 --> 00:15:58,330

Mars mappers which is about to get new

337

00:16:03,870 --> 00:16:01,000

data in the coming months we have moon

338

00:16:07,019 --> 00:16:03,880

mappers we are working to finish off

339

00:16:09,030 --> 00:16:07,029

Vesta so that we can bring series on and

340

00:16:10,829 --> 00:16:09,040

we have great new things planned for the

341

00:16:13,199 --> 00:16:10,839

future including what we're going to be

342

00:16:15,600 --> 00:16:13,209

working with the acai Rose Rex team to

343

00:16:18,690 --> 00:16:15,610

look at the asteroid Bennu so it's new

344

00:16:20,160 --> 00:16:18,700

things on a regular basis just keep

345

00:16:22,470 --> 00:16:20,170

helping us do science because there's

346

00:16:27,540 --> 00:16:22,480

more data than people so we need all the

347

00:16:31,440 --> 00:16:27,550

people that's very exciting so this you

348

00:16:34,800 --> 00:16:31,450

organized this Eclipse escape because

349

00:16:36,120 --> 00:16:34,810

that was through astronomy cast yes is

350

00:16:39,420 --> 00:16:36,130

there anything else that you're planning

351
00:16:41,519 --> 00:16:39,430
through a story guys so right now we're

352
00:16:44,040 --> 00:16:41,529
looking ahead and trying to figure out

353
00:16:48,030 --> 00:16:44,050
what it is we want to do next and what

354
00:16:49,350 --> 00:16:48,040
I'm hoping to do is in 2019 because 2018

355
00:16:51,360 --> 00:16:49,360
we have an International Astronomical

356
00:16:52,829 --> 00:16:51,370
Union meeting and that might eat a

357
00:16:55,170 --> 00:16:52,839
little bit of my summer by which I mean

358
00:16:57,480 --> 00:16:55,180
at least two weeks so we're looking

359
00:17:01,140 --> 00:16:57,490
ahead to 2019 so that we can wrap this

360
00:17:03,060 --> 00:17:01,150
up and plan well for the future and go

361
00:17:05,790 --> 00:17:03,070
sit around a campfire on top of a

362
00:17:07,679 --> 00:17:05,800
supervolcano in Yellowstone and look at

363
00:17:10,230 --> 00:17:07,689

the stars and roast marshmallows because

364

00:17:12,210 --> 00:17:10,240

sounds great that's that's kind of what

365

00:17:14,130 --> 00:17:12,220

I'm thinking feels right to do next

366

00:17:16,079 --> 00:17:14,140

okay very good I hope I'll be able to

367

00:17:17,819 --> 00:17:16,089

join you then I hope so too it's really

368

00:17:26,189 --> 00:17:17,829

been a pleasure thank you thanks very

369

00:17:28,049 --> 00:17:26,199

much Pamela thank you hi this is Ben

370

00:17:29,970 --> 00:17:28,059

Radford and this is Pascual Romero from

371

00:17:32,160 --> 00:17:29,980

the squaring the strange podcast every

372

00:17:34,710 --> 00:17:32,170

week my co-host and I cast a skeptical

373

00:17:36,930 --> 00:17:34,720

eye on a different topic monsters ghosts

374

00:17:39,120 --> 00:17:36,940

demons mysteries and even current events

375

00:17:41,160 --> 00:17:39,130

are dissected and discussed with a fun

376

00:17:42,690 --> 00:17:41,170

unscripted and skeptical take that

377

00:17:45,270 --> 00:17:42,700

you're sure to enjoy fine this is

378

00:17:59,380 --> 00:17:45,280

squirting strange calm iTunes or on your

379

00:18:14,330 --> 00:18:03,350

it's the raw skeptic report with ID

380

00:18:16,220 --> 00:18:14,340

Robertson hello everyone as part of the

381

00:18:18,980 --> 00:18:16,230

Northern Rivers vaccination supporters

382

00:18:21,980 --> 00:18:18,990

group I can say that we are pretty

383

00:18:24,410 --> 00:18:21,990

chuffed that our group has recently been

384

00:18:26,120 --> 00:18:24,420

nominated for an excellence award from

385

00:18:29,120 --> 00:18:26,130

the North Coast primary health care

386

00:18:31,700 --> 00:18:29,130

network we have now heard that we are

387

00:18:35,180 --> 00:18:31,710

one of four finalists for the Community

388

00:18:37,730 --> 00:18:35,190

Choice Award the public can look at the

389

00:18:41,000 --> 00:18:37,740

four videos each two minutes in duration

390

00:18:44,630 --> 00:18:41,010

and decide which organization or group

391

00:18:46,970 --> 00:18:44,640

will get their vote we will put the link

392

00:18:50,840 --> 00:18:46,980

to the videos in this week's show notes

393

00:18:54,470 --> 00:18:50,850

at skeptic zone TV as well as on the

394

00:18:56,270 --> 00:18:54,480

skeptic zone Facebook page as skeptic

395

00:18:58,460 --> 00:18:56,280

zone listeners it would be great to have

396

00:19:01,940 --> 00:18:58,470

your support should you think we might

397

00:19:04,640 --> 00:19:01,950

be deserving of the award it is allowed

398

00:19:08,390 --> 00:19:04,650

for the public to vote every day once a

399

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

day if they like here is the audio of

400

00:19:13,580 --> 00:19:10,260

the short video we made for the public

401
00:19:18,200 --> 00:19:16,250
we were introduced by social media as

402
00:19:20,510 --> 00:19:18,210
all concerned people within our

403
00:19:22,190 --> 00:19:20,520
community really worried about news that

404
00:19:25,460 --> 00:19:22,200
had come out that our vaccination rates

405
00:19:27,710 --> 00:19:25,470
were so low we got together and we

406
00:19:32,220 --> 00:19:27,720
thought we needed to do something about

407
00:19:36,750 --> 00:19:35,009
we all live in this region so we know

408
00:19:38,789 --> 00:19:36,760
what the cultural narrative is we know

409
00:19:41,899 --> 00:19:38,799
how much misinformation there is and we

410
00:19:45,000 --> 00:19:41,909
know how scared people are of vaccines

411
00:19:48,350 --> 00:19:45,010
we also know that parents just want to

412
00:19:50,580 --> 00:19:48,360
make the safest decisions for their kids

413
00:19:51,990 --> 00:19:50,590

fears become so much bigger when you

414

00:19:54,419 --> 00:19:52,000

don't talk about them or if you don't

415

00:19:56,159 --> 00:19:54,429

have anybody to speak to about them when

416

00:19:57,899 --> 00:19:56,169

you're fearful of immunizations you

417

00:20:00,690 --> 00:19:57,909

think that the worst-case scenario

418

00:20:01,710 --> 00:20:00,700

is every case so you think that the

419

00:20:04,379 --> 00:20:01,720

worst thing that could possibly happen

420

00:20:06,240 --> 00:20:04,389

is going to happen to your child who you

421

00:20:08,610 --> 00:20:06,250

love and you want to protect and it's

422

00:20:09,930 --> 00:20:08,620

not reality but it becomes reality in

423

00:20:12,250 --> 00:20:09,940

your mind because that's what you fear

424

00:20:16,990 --> 00:20:15,160

what we did is that we've developed some

425

00:20:18,940 --> 00:20:17,000

tools we've developed some resources

426
00:20:21,130 --> 00:20:18,950
we've written a website we've developed

427
00:20:23,890 --> 00:20:21,140
all sorts of memes and infographics that

428
00:20:25,830 --> 00:20:23,900
have provided our members with the tools

429
00:20:29,140 --> 00:20:25,840
to then go on and have peer-to-peer

430
00:20:31,300 --> 00:20:29,150
conversations our concert we call a

431
00:20:33,580 --> 00:20:31,310
thousand cups of tea because literally

432
00:20:35,620 --> 00:20:33,590
it takes sitting around a table having a

433
00:20:37,900 --> 00:20:35,630
thousand cups of tea listening to

434
00:20:43,510 --> 00:20:37,910
people's concerns and addressing each

435
00:20:46,540 --> 00:20:43,520
one at a time it often takes time to

436
00:20:49,080 --> 00:20:46,550
explain things in a way that someone

437
00:20:52,840 --> 00:20:49,090
understands or in a culturally safe way

438
00:20:55,570 --> 00:20:52,850

helping people find good sources of

439

00:20:59,020 --> 00:20:55,580

information it's been a really important

440

00:21:01,690 --> 00:20:59,030

part people are listening to what we say

441

00:21:04,180 --> 00:21:01,700

and even if they're not changing their

442

00:21:06,370 --> 00:21:04,190

minds straight away it does at least

443

00:21:10,430 --> 00:21:06,380

open the dialogue and get people

444

00:21:16,369 --> 00:21:13,549

I can kind of sympathize with people who

445

00:21:18,649 --> 00:21:16,379

has attempted but I can also let them

446

00:21:21,470 --> 00:21:18,659

know that the other side of the fence is

447

00:21:22,820 --> 00:21:21,480

extremely scary two of my children have

448

00:21:24,680 --> 00:21:22,830

had whooping cough you know my

449

00:21:27,350 --> 00:21:24,690

daughter's left off her life long lung

450

00:21:29,810 --> 00:21:27,360

disease from whooping cough not getting

451
00:21:32,299 --> 00:21:29,820
the vaccines is so much worse than any

452
00:21:35,400 --> 00:21:32,309
reaction that can happen if if a

453
00:21:39,220 --> 00:21:35,410
reaction is to happen with the vaccines

454
00:21:42,880 --> 00:21:39,230
we remain a grassroots unfunded group of

455
00:21:46,150 --> 00:21:42,890
local volunteers we have no affiliations

456
00:21:48,610 --> 00:21:46,160
or sponsors and our only formal

457
00:21:51,820 --> 00:21:48,620
collaboration is as part of the vaccine

458
00:21:53,230 --> 00:21:51,830
safety net meaning that our website has

459
00:21:55,240 --> 00:21:53,240
been ratified by the World Health

460
00:21:57,100 --> 00:21:55,250
Organization as an up-to-date and

461
00:22:00,180 --> 00:21:57,110
reliable source of information for

462
00:22:03,070 --> 00:22:00,190
vaccines and vaccine preventable disease

463
00:22:04,930 --> 00:22:03,080

I'll keep you updated on how we went in

464

00:22:22,810 --> 00:22:04,940

the voting the winner will be announced

465

00:22:25,150 --> 00:22:22,820

in September and now direct from the

466

00:22:28,540 --> 00:22:25,160

cafe and Australia's Science Channel

467

00:22:31,450 --> 00:22:28,550

it's brouhaha science in less time than

468

00:22:38,770 --> 00:22:31,460

it takes to order a coffee with such

469

00:22:40,810 --> 00:22:38,780

j-su folly sorry Serena Williams Kayne

470

00:22:45,010 --> 00:22:40,820

and Elon Musk there's a new contender

471

00:22:46,770 --> 00:22:45,020

for greatest of all time algae algae is

472

00:22:48,010 --> 00:22:46,780

responsible for all life on the planet

473

00:22:49,870 --> 00:22:48,020

yep

474

00:22:51,610 --> 00:22:49,880

what kind of just looks like sludge is

475

00:22:53,830 --> 00:22:51,620

the reason we're here this morning

476

00:22:56,620 --> 00:22:53,840

Australian scientists released a study

477

00:22:59,260 --> 00:22:56,630

showing that about 650 million years ago

478

00:23:01,300 --> 00:22:59,270

there was an algae explosion both in the

479

00:23:03,910 --> 00:23:01,310

number of different types and the sheer

480

00:23:05,680 --> 00:23:03,920

amounts of it out of this explosion more

481

00:23:07,630 --> 00:23:05,690

complex life began forming

482

00:23:10,330 --> 00:23:07,640

leading to everything we see around us

483

00:23:13,180 --> 00:23:10,340

today the evidence they found suggest

484

00:23:15,910 --> 00:23:13,190

this happen in Central Australia algae

485

00:23:19,840 --> 00:23:15,920

is Australian sorry well you can thank

486

00:23:21,520 --> 00:23:19,850

us later along with giving us life algae

487

00:23:24,130 --> 00:23:21,530

could also be the thing that saves us

488

00:23:26,680 --> 00:23:24,140

around the world scientists are using it

489

00:23:29,290 --> 00:23:26,690

to produce new clean fuels and create

490

00:23:31,840 --> 00:23:29,300

new food source it might even help clean

491

00:23:35,490 --> 00:23:31,850

the end so today we're launching a new

492

00:23:38,530 --> 00:23:35,500

campaign algae for 2018 Australia via

493

00:23:40,180 --> 00:23:38,540

forget your retired sports stars for an

494

00:23:42,550 --> 00:23:40,190

Australian that has contributed more to

495

00:23:43,930 --> 00:23:42,560

our way of life algae really is the

496

00:23:45,610 --> 00:23:43,940

greatest of all time

497

00:23:51,790 --> 00:23:45,620

it's time it gets the recognition it

498

00:24:18,100 --> 00:23:51,800

deserves for more brouhaha and

499

00:24:21,300 --> 00:24:18,110

Australian science visit w-w-w the last

500

00:24:23,830 --> 00:24:21,310

month or so we've been talking about the

501
00:24:25,900 --> 00:24:23,840
anti-vaccination movie vac stat - at

502
00:24:28,660 --> 00:24:25,910
Australia and subsequently of course

503
00:24:32,050 --> 00:24:28,670
Polly Tommy one of the producers was

504
00:24:34,570 --> 00:24:32,060
denied re-entry to Australia for at

505
00:24:38,110 --> 00:24:34,580
least three years when she left for New

506
00:24:40,570 --> 00:24:38,120
Zealand you can of course catch up on

507
00:24:41,470 --> 00:24:40,580
those reports over the last few weeks of

508
00:24:45,460 --> 00:24:41,480
the sceptic zone

509
00:24:49,450 --> 00:24:45,470
well it seems vac stay is the gift that

510
00:24:52,300 --> 00:24:49,460
just keeps on giving during one of these

511
00:24:55,240 --> 00:24:52,310
screenings of vac stin Melbourne during

512
00:24:57,730 --> 00:24:55,250
the Q&A and on the stage taking

513
00:24:59,380 --> 00:24:57,740

questions was Polly Tommy and Meryl Dory

514

00:25:02,530 --> 00:24:59,390

the former president of the Australian

515

00:25:05,350 --> 00:25:02,540

vaccination skeptics Network one of the

516

00:25:09,040 --> 00:25:05,360

the people lined up to ask questions or

517

00:25:11,760 --> 00:25:09,050

give statements was a Melbourne doctor

518

00:25:16,990 --> 00:25:11,770

by the name of dr. John peace

519

00:25:20,950 --> 00:25:17,000

P ie SS II who happily told the the

520

00:25:23,050 --> 00:25:20,960

crowd of his efforts to keep people from

521

00:25:25,960 --> 00:25:23,060

being immunized to keep children from

522

00:25:30,130 --> 00:25:25,970

being immunized and we take up the story

523

00:25:33,700 --> 00:25:30,140

reported on The Guardian The Guardian

524

00:25:37,030 --> 00:25:33,710

com an article published on the 24th of

525

00:25:40,330 --> 00:25:37,040

August by Melissa daily which says in

526
00:25:42,310 --> 00:25:40,340
part doctor investigated that were

527
00:25:46,450 --> 00:25:42,320
helping vaccinating children to avoid

528
00:25:48,760 --> 00:25:46,460
the no jab no play laws a Melbourne

529
00:25:51,520 --> 00:25:48,770
doctor who promotes quote natural

530
00:25:53,590 --> 00:25:51,530
healing in quit and helps parents to

531
00:25:55,240 --> 00:25:53,600
avoid compulsory vaccination for their

532
00:25:57,220 --> 00:25:55,250
children is reportedly being

533
00:25:59,380 --> 00:25:57,230
investigated by Australia's

534
00:26:03,549 --> 00:25:59,390
watchdog the Australian health

535
00:26:05,620 --> 00:26:03,559
practitioner regulation agency AHPRA is

536
00:26:08,470 --> 00:26:05,630
reportedly investigating doctor john

537
00:26:10,659 --> 00:26:08,480
pease who boasted at a meeting of anti

538
00:26:13,120 --> 00:26:10,669

vaccinators that he can help parents

539

00:26:16,570 --> 00:26:13,130

jump through the hoops and get their

540

00:26:20,470 --> 00:26:16,580

children exempt from victoria's quote no

541

00:26:24,070 --> 00:26:20,480

jab no pay and quote legislation pieces

542

00:26:27,340 --> 00:26:24,080

medical registration with AHPRA shows he

543

00:26:30,340 --> 00:26:27,350

has previously been ordered to undertake

544

00:26:33,070 --> 00:26:30,350

further education on Thursday Victoria's

545

00:26:36,010 --> 00:26:33,080

Acting Health Minister John Foley told

546

00:26:38,740 --> 00:26:36,020

Radio 3 aw in Melbourne that it was

547

00:26:41,020 --> 00:26:38,750

quote not good enough and quote piece

548

00:26:43,210 --> 00:26:41,030

was still being investigated after

549

00:26:47,070 --> 00:26:43,220

concerns about his anti vaccination

550

00:26:49,450 --> 00:26:47,080

comments were raised in August 2016

551
00:26:51,250 --> 00:26:49,460
quote by failing to vaccinate their

552
00:26:53,770 --> 00:26:51,260
children parents are putting their kids

553
00:26:56,280 --> 00:26:53,780
and others in our community at risk of

554
00:27:00,430 --> 00:26:56,290
terrible diseases or death end quote

555
00:27:02,560 --> 00:27:00,440
Foley said in a video from an anti

556
00:27:05,049 --> 00:27:02,570
vaccination event held in August this

557
00:27:08,200 --> 00:27:05,059
year published by The Herald Sun paste

558
00:27:11,530 --> 00:27:08,210
explains how he tries to beat compulsory

559
00:27:14,080 --> 00:27:11,540
vaccination quote now I'm a doctor who

560
00:27:16,450 --> 00:27:14,090
has been working hard for 18 months to

561
00:27:19,600 --> 00:27:16,460
try and help parents get exemption from

562
00:27:22,960 --> 00:27:19,610
vaccinated pain for vaccinated play with

563
00:27:25,710 --> 00:27:22,970

mixed success you need a doctor's letter

564

00:27:28,030 --> 00:27:25,720

of contry indication in the right form

565

00:27:30,490 --> 00:27:28,040

provided the doctor has the

566

00:27:32,530 --> 00:27:30,500

qualifications required for Novak's no

567

00:27:35,890 --> 00:27:32,540

pay or is a registered medical

568

00:27:38,830 --> 00:27:35,900

practitioner for no facts no plate in

569

00:27:40,930 --> 00:27:38,840

quote he said the health department told

570

00:27:44,620 --> 00:27:40,940

the Guardian Australia it has referred

571

00:27:47,470 --> 00:27:44,630

one anti vaccination doctor to AHPRA but

572

00:27:51,250 --> 00:27:47,480

could not reveal further details due to

573

00:27:54,850 --> 00:27:51,260

confidentiality laws here are some clips

574

00:27:58,180 --> 00:27:54,860

gathered from the media and this story

575

00:28:00,030 --> 00:27:58,190

has made just about every TV news here

576

00:28:02,140 --> 00:28:00,040

in Australia and I've noticed

577

00:28:05,649 --> 00:28:02,150

internationally - it's been reported

578

00:28:09,010 --> 00:28:05,659

quite widely but here are some clips of

579

00:28:10,600 --> 00:28:09,020

the relevant people speaking about this

580

00:28:12,700 --> 00:28:10,610

recent event

581

00:28:14,889 --> 00:28:12,710

good evening a rebel anti-vaxxer has

582

00:28:16,720 --> 00:28:14,899

spoken out after being exposed as one of

583

00:28:19,180 --> 00:28:16,730

a group of Melbourne gp's under

584

00:28:21,070 --> 00:28:19,190

investigation it comes after a video was

585

00:28:22,389 --> 00:28:21,080

made public in which it was claimed

586

00:28:24,130 --> 00:28:22,399

doctors have helped hundreds of families

587

00:28:28,000 --> 00:28:24,140

avoid vaccines

588

00:28:29,820 --> 00:28:28,010

Andy Kearney has the story a doctor in

589

00:28:32,380 --> 00:28:29,830

the spotlight and under investigation

590

00:28:34,269 --> 00:28:32,390

are you worried about the investigation

591

00:28:35,830 --> 00:28:34,279

well of course I'm not very comfortable

592

00:28:38,980 --> 00:28:35,840

we were having my life taken over by it

593

00:28:40,509 --> 00:28:38,990

but you see you know I'm I am quite

594

00:28:42,759 --> 00:28:40,519

convinced that there are many many

595

00:28:45,250 --> 00:28:42,769

children being damaged in our society by

596

00:28:47,649 --> 00:28:45,260

unsafe vaccines Melbourne doctor john

597

00:28:50,470 --> 00:28:47,659

pease faces accusations he's helping

598

00:28:52,960 --> 00:28:50,480

families dodge compulsory vaccinations

599

00:28:56,440 --> 00:28:52,970

it's believed another two gp's are also

600

00:28:59,230 --> 00:28:56,450

being investigated by authorities Nathan

601
00:29:02,440 --> 00:28:59,240
Templeton has more Nathan a number of

602
00:29:04,539 --> 00:29:02,450
GPS are under investigation good morning

603
00:29:06,820 --> 00:29:04,549
Larry and Kylie yes this explosive video

604
00:29:09,399 --> 00:29:06,830
that's just emerged was taken earlier

605
00:29:12,070 --> 00:29:09,409
this month now there was a screening of

606
00:29:14,560 --> 00:29:12,080
the controversial documentary fact and

607
00:29:17,560 --> 00:29:14,570
this footage shows the Q&A that was held

608
00:29:19,960 --> 00:29:17,570
afterwards and in it - GPS dr. John

609
00:29:22,000 --> 00:29:19,970
Pease and dr. narrative James can be

610
00:29:24,820 --> 00:29:22,010
heard telling the crowd how over the

611
00:29:28,720 --> 00:29:24,830
past 18 months or so they have helped up

612
00:29:31,690 --> 00:29:28,730
to 600 families avoid having their

613
00:29:34,570 --> 00:29:31,700

children vaccinated dr. Pease also goes

614

00:29:37,240 --> 00:29:34,580

into great detail about how doctors can

615

00:29:39,789 --> 00:29:37,250

find loopholes so that anti-vaxxer

616

00:29:43,299 --> 00:29:39,799

marie's can get exemptions from those

617

00:29:45,850 --> 00:29:43,309

compulsory immunizations he also speaks

618

00:29:47,950 --> 00:29:45,860

out against the no jab no play

619

00:29:50,379 --> 00:29:47,960

regulations now there has been an

620

00:29:52,269 --> 00:29:50,389

investigation underway for some time at

621

00:29:54,220 --> 00:29:52,279

least three gPS

622

00:29:56,139 --> 00:29:54,230

are being looked into but now that this

623

00:29:58,230 --> 00:29:56,149

video has come out and it's made

624

00:30:01,090 --> 00:29:58,240

front-page news you would expect that

625

00:30:03,669 --> 00:30:01,100

investigation to really ramp up now

626

00:30:05,139 --> 00:30:03,679

Larry and Chloe a Melbourne GP who

627

00:30:07,149 --> 00:30:05,149

claims to have helped hundreds of

628

00:30:09,460 --> 00:30:07,159

parents dodge vaccinations for their

629

00:30:11,740 --> 00:30:09,470

children has spoken out arguing he's

630

00:30:14,019 --> 00:30:11,750

done nothing illegal but doctors have

631

00:30:16,629 --> 00:30:14,029

slammed john pease saying he's spreading

632

00:30:19,779 --> 00:30:16,639

dangerous misinformation Dougal BT with

633

00:30:22,029 --> 00:30:19,789

the story a qualified general

634

00:30:23,950 --> 00:30:22,039

practitioner - an advocate for the rogue

635

00:30:26,140 --> 00:30:23,960

anti-vaccination movement

636

00:30:27,910 --> 00:30:26,150

I am quite convinced that there are many

637

00:30:30,640 --> 00:30:27,920

many children being damaged in our

638

00:30:32,500 --> 00:30:30,650

society by unsafe vaccines dr. John

639

00:30:34,570 --> 00:30:32,510

piece along with naturopath colleague

640

00:30:36,910 --> 00:30:34,580

narrator James were filmed earlier this

641

00:30:40,230 --> 00:30:36,920

month claiming to help Melbourne parents

642

00:30:46,860 --> 00:30:40,240

avoid immunizations for their children

643

00:30:51,820 --> 00:30:49,300

but the doctor who's being investigated

644

00:30:53,860 --> 00:30:51,830

says he's done nothing wrong so it's

645

00:30:56,170 --> 00:30:53,870

totally legal but they don't like it

646

00:30:58,090 --> 00:30:56,180

because they don't want anyone to be

647

00:30:59,950 --> 00:30:58,100

allowed not to vaccinate without penalty

648

00:31:02,410 --> 00:30:59,960

he's group accused of spreading

649

00:31:04,630 --> 00:31:02,420

dangerous propaganda if you have a child

650

00:31:07,060 --> 00:31:04,640

that's been you know brain damaged by

651
00:31:08,710 --> 00:31:07,070
vaccines do you want to vaccinate their

652
00:31:10,540 --> 00:31:08,720
child further of course not

653
00:31:14,560 --> 00:31:10,550
the government says the medical research

654
00:31:16,720 --> 00:31:14,570
is clear vaccination saves lives other

655
00:31:18,970 --> 00:31:16,730
doctors have hit out calling for him to

656
00:31:20,200 --> 00:31:18,980
be barred from practice I think it's

657
00:31:21,520 --> 00:31:20,210
extraordinary that he can hold his

658
00:31:23,710 --> 00:31:21,530
medical registration in the same

659
00:31:25,900 --> 00:31:23,720
organisation that I do surgeon John

660
00:31:28,900 --> 00:31:25,910
Cunningham says concerned parents are

661
00:31:30,850 --> 00:31:28,910
being misled they've been given the fear

662
00:31:33,430 --> 00:31:30,860
campaign and they're being sucked up

663
00:31:38,680 --> 00:31:33,440

into the cult think of the anti-vaxxers

664

00:31:40,840 --> 00:31:38,690

it's all about supporting an anti

665

00:31:42,790 --> 00:31:40,850

vaccination stance but authorities say

666

00:31:47,080 --> 00:31:42,800

he and the others have to be held to

667

00:31:48,700 --> 00:31:47,090

account dr. John piece is accused of

668

00:31:51,910 --> 00:31:48,710

assisting family as opposed to

669

00:31:54,940 --> 00:31:51,920

compulsory child vaccinations I've been

670

00:31:58,510 --> 00:31:54,950

approached by hundreds of parents who

671

00:32:00,430 --> 00:31:58,520

want to get exemption from the penalties

672

00:32:02,440 --> 00:32:00,440

for not vaccinating he's one of three

673

00:32:04,360 --> 00:32:02,450

Melbourne doctors at the centre of an

674

00:32:05,890 --> 00:32:04,370

investigation by the Victorian Health

675

00:32:08,800 --> 00:32:05,900

Department and the Australian health

676
00:32:10,480 --> 00:32:08,810
practitioner regulation agency I've been

677
00:32:13,000 --> 00:32:10,490
going according to the law the letters

678
00:32:15,430 --> 00:32:13,010
that I write according to the

679
00:32:18,760 --> 00:32:15,440
requirements of the the legislation they

680
00:32:21,820 --> 00:32:18,770
are totally legal I am astonished that

681
00:32:26,440 --> 00:32:21,830
there are any people who have been

682
00:32:31,180 --> 00:32:26,450
through medical degrees who would deign

683
00:32:33,430 --> 00:32:31,190
to stoop to the level of supporting the

684
00:32:35,710 --> 00:32:33,440
anti-vaccination movement the film VAX

685
00:32:37,690 --> 00:32:35,720
has been causing controversy by linking

686
00:32:39,519 --> 00:32:37,700
the measles mumps rubella vaccine

687
00:32:43,149 --> 00:32:39,529
autism which has been medically

688
00:32:45,430 --> 00:32:43,159

discredited it is so important that

689

00:32:49,659 --> 00:32:45,440

everyone in the and those clips thanks

690

00:32:52,720 --> 00:32:49,669

to the 10 Network the Seven Network The

691

00:32:56,500 --> 00:32:52,730

Nine Network and the ABC here in

692

00:32:59,860 --> 00:32:56,510

Australia now what I find interesting

693

00:33:03,639 --> 00:32:59,870

about this whole story is that during

694

00:33:08,470 --> 00:33:03,649

the the VAX screening and afterwards

695

00:33:11,289 --> 00:33:08,480

during the QA people felt embolden one

696

00:33:14,649 --> 00:33:11,299

might say they felt the ability to be

697

00:33:16,419 --> 00:33:14,659

able to vent to like minded people but

698

00:33:19,149 --> 00:33:16,429

of course it was all video and this

699

00:33:21,419 --> 00:33:19,159

video ended up online and so they're

700

00:33:25,360 --> 00:33:21,429

really damning themselves now with their

701
00:33:27,340 --> 00:33:25,370
out of their own mouths so yes there is

702
00:33:29,159 --> 00:33:27,350
the silver lining to this awful movie

703
00:33:33,580 --> 00:33:29,169
VAX being shown up and down the country

704
00:33:41,169 --> 00:33:33,590
these these anti vaccination doctors are

705
00:33:42,970 --> 00:33:41,179
simply outing themselves since recording

706
00:33:45,310 --> 00:33:42,980
that story a couple of days ago there

707
00:33:47,919 --> 00:33:45,320
have been further updates and again we

708
00:33:50,289 --> 00:33:47,929
look to the Guardian The Guardian calm

709
00:33:53,320 --> 00:33:50,299
with an update to this story published

710
00:33:55,419 --> 00:33:53,330
on Saturday the 26th of August Melbourne

711
00:33:59,139 --> 00:33:55,429
GP accused of helping parents avoid

712
00:34:00,419 --> 00:33:59,149
vaccinations reprimanded thirteen years

713
00:34:03,370 --> 00:34:00,429

ago

714

00:34:07,649 --> 00:34:03,380

medical practitioners Board of Victoria

715

00:34:10,839 --> 00:34:07,659

ordered dr. John peace be counseled in

716

00:34:12,940 --> 00:34:10,849

2004 for failing to quote make

717

00:34:16,629 --> 00:34:12,950

appropriate investigations of patient's

718

00:34:18,520 --> 00:34:16,639

symptoms and quote a Melbourne doctor

719

00:34:21,159 --> 00:34:18,530

under investigation for helping parents

720

00:34:24,159 --> 00:34:21,169

evade compulsory vaccinations was

721

00:34:26,950 --> 00:34:24,169

reprimanded a decade ago for failing to

722

00:34:29,169 --> 00:34:26,960

properly treat patients with potentially

723

00:34:32,710 --> 00:34:29,179

life-threatening illnesses like cancer

724

00:34:34,809 --> 00:34:32,720

and depression the story goes on by

725

00:34:38,139 --> 00:34:34,819

Friday the Medical Board of Australia

726

00:34:40,899 --> 00:34:38,149

told piece that it intended to revoke

727

00:34:43,510 --> 00:34:40,909

his medical registration piece a

728

00:34:45,609 --> 00:34:43,520

supporter of alternative medicine has a

729

00:34:48,909 --> 00:34:45,619

right of reply before that occurs

730

00:34:51,320 --> 00:34:48,919

including an opportunity to outline why

731

00:34:54,380 --> 00:34:51,330

his license should not be revoked

732

00:34:57,740 --> 00:34:54,390

the time period usually allowed for a

733

00:35:00,380 --> 00:34:57,750

reply is one week but a report uncovered

734

00:35:03,710 --> 00:35:00,390

by Guardian Australia shows that

735

00:35:07,430 --> 00:35:03,720

concerns about peace were raised as far

736

00:35:09,860 --> 00:35:07,440

back as 2001 when Medicare Australia

737

00:35:12,620 --> 00:35:09,870

reported him because he charged Medicare

738

00:35:16,070 --> 00:35:12,630

for long and prolonged consultations and

739

00:35:19,400 --> 00:35:16,080

because he made an abnormally high

740

00:35:24,550 --> 00:35:19,410

number of pathology requests during the

741

00:35:27,650 --> 00:35:24,560

year 2000 he rendered 2137 services for

742

00:35:31,220 --> 00:35:27,660

707 patients and the total Medicare

743

00:35:34,430 --> 00:35:31,230

benefit of eighty seven thousand five

744

00:35:37,010 --> 00:35:34,440

hundred and seventy dollars that year in

745

00:35:39,170 --> 00:35:37,020

July 2003 a professional review

746

00:35:42,710 --> 00:35:39,180

committee investigating the allegations

747

00:35:45,350 --> 00:35:42,720

found that peices conduct during 2000

748

00:35:48,530 --> 00:35:45,360

quote caused a significant threat to the

749

00:35:51,590 --> 00:35:48,540

life or health of his patients it was

750

00:35:53,540 --> 00:35:51,600

concerned that dr. Pierce failed to make

751
00:35:56,420 --> 00:35:53,550
appropriate investigations of patients

752
00:36:00,190 --> 00:35:56,430
symptoms of possibly serious conditions

753
00:36:03,230 --> 00:36:00,200
such as cancer meningitis depression and

754
00:36:06,020 --> 00:36:03,240
anemia in quote a report from the

755
00:36:08,870 --> 00:36:06,030
professional services review scheme said

756
00:36:10,850 --> 00:36:08,880
this information was referred to the

757
00:36:14,690 --> 00:36:10,860
medical practitioners Board of Victoria

758
00:36:18,500 --> 00:36:14,700
which in August 2004 ordered that piece

759
00:36:21,860 --> 00:36:18,510
be reprimanded counseled repay medical

760
00:36:25,070 --> 00:36:21,870
benefits totaling 18,000 179 dollars and

761
00:36:27,320 --> 00:36:25,080
be disqualified for 18 months from

762
00:36:30,770 --> 00:36:27,330
providing certain GP services to

763
00:36:32,750 --> 00:36:30,780

patients and the the story goes on with

764

00:36:35,720 --> 00:36:32,760

more details and I'll certainly link to

765

00:36:39,200 --> 00:36:35,730

this in the show notes and very much

766

00:36:41,660 --> 00:36:39,210

related to this story was the activities

767

00:36:43,550 --> 00:36:41,670

of Polly Tommie here in Australia uel

768

00:36:45,320 --> 00:36:43,560

had mentioned before has been banned

769

00:36:50,930 --> 00:36:45,330

from coming back to Australia for three

770

00:36:52,280 --> 00:36:50,940

years and in an online rant video online

771

00:36:56,120 --> 00:36:52,290

rant published it

772

00:36:59,570 --> 00:36:56,130

we are vast Facebook page Polly Tommy

773

00:37:02,870 --> 00:36:59,580

briefly mentions this situation I look

774

00:37:04,370 --> 00:37:02,880

at Australia and it's laughable what is

775

00:37:05,450 --> 00:37:04,380

happening over there they're taking that

776

00:37:08,390 --> 00:37:05,460

poor doctor they try

777

00:37:11,120 --> 00:37:08,400

take that poor doctor down now that's

778

00:37:13,040 --> 00:37:11,130

not surprising I guess but what's what's

779

00:37:15,380 --> 00:37:13,050

also interesting about this online rant

780

00:37:18,800 --> 00:37:15,390

which goes for about five or six or

781

00:37:21,020 --> 00:37:18,810

seven minutes or so is that it really

782

00:37:25,460 --> 00:37:21,030

does show that these people are so

783

00:37:27,710 --> 00:37:25,470

wrapped up in their world of conspiracy

784

00:37:34,040 --> 00:37:27,720

theories have a listen to this short

785

00:37:35,870 --> 00:37:34,050

excerpt so far we are so far up here and

786

00:37:37,430 --> 00:37:35,880

you guys are so far down here and I get

787

00:37:39,050 --> 00:37:37,440

you're panicking I get that you're

788

00:37:40,970 --> 00:37:39,060

sending up every troll that you can I'm

789

00:37:43,130 --> 00:37:40,980

seeing I'm seeing people coming out of

790

00:37:44,930 --> 00:37:43,140

the woodwork now that with that 20 years

791

00:37:47,780 --> 00:37:44,940

ago and they vanish and I'll all back

792

00:37:51,470 --> 00:37:47,790

out again so you clearly have had some

793

00:37:53,690 --> 00:37:51,480

kind of emergency alert email get back

794

00:37:55,790 --> 00:37:53,700

out get into the game we're losing

795

00:37:58,460 --> 00:37:55,800

they're winning we have to stop it now

796

00:37:59,570 --> 00:37:58,470

and no one's getting a bonus no holiday

797

00:38:02,210 --> 00:37:59,580

for you next year

798

00:38:03,530 --> 00:38:02,220

no Christmas bonus so here she is

799

00:38:06,800 --> 00:38:03,540

implying that there's some sort of

800

00:38:10,660 --> 00:38:06,810

overarching central control sending out

801
00:38:13,339 --> 00:38:10,670
emails to doctors and trolls apparently

802
00:38:17,210 --> 00:38:13,349
and then she implies of course that if

803
00:38:19,880 --> 00:38:17,220
the doctors aren't vaccinating or towing

804
00:38:21,079 --> 00:38:19,890
the pharmaceutical big pharma line or

805
00:38:23,740 --> 00:38:21,089
something like this then they're not

806
00:38:26,000 --> 00:38:23,750
going to get money in the form of

807
00:38:29,089 --> 00:38:26,010
bonuses or their holidays or something

808
00:38:33,470 --> 00:38:29,099
like this it's it's it's again it's it's

809
00:38:35,690 --> 00:38:33,480
this Illuminati conspiracy theory evil

810
00:38:38,690 --> 00:38:35,700
Big Pharma controlling everything frame

811
00:38:43,220 --> 00:38:38,700
of mind that dictates so much of their

812
00:38:45,200 --> 00:38:43,230
actions and finally if there was any

813
00:38:48,530 --> 00:38:45,210

doubt which there shouldn't be by now

814

00:38:52,310 --> 00:38:48,540

that these people are vehemently anti

815

00:38:54,380 --> 00:38:52,320

vaccination and not pro-choice as the

816

00:38:58,970 --> 00:38:54,390

Australian vaccination skeptics Network

817

00:39:01,220 --> 00:38:58,980

likes to say in public listen to this

818

00:39:04,099 --> 00:39:01,230

clip from Polly Tommy because there's

819

00:39:06,829 --> 00:39:04,109

more and more and more babies being born

820

00:39:08,660 --> 00:39:06,839

that are not going to be vaccinated over

821

00:39:12,680 --> 00:39:08,670

our dead bodies do you come near our

822

00:39:14,660 --> 00:39:12,690

babies with a needle of any kind I don't

823

00:39:16,670 --> 00:39:14,670

forget that Polly Tommy and Merrill Dory

824

00:39:19,280 --> 00:39:16,680

were quite happy to sit side by side on

825

00:39:22,310 --> 00:39:19,290

the stage during a

826
00:39:25,560 --> 00:39:22,320
of axle during the Q&A we will bring you

827
00:39:40,480 --> 00:39:25,570
any updates to this developing story

828
00:39:45,020 --> 00:39:44,000
QED 2017 is fast approaching and you

829
00:39:46,880 --> 00:39:45,030
don't want to miss it

830
00:39:49,130 --> 00:39:46,890
in the acid QED has brought you the

831
00:39:51,620 --> 00:39:49,140
arrows of time the origin of recording

832
00:39:53,750 --> 00:39:51,630
an escape from the Westboro Baptists the

833
00:39:56,180 --> 00:39:53,760
sex bias of sex science and all manner

834
00:39:59,030 --> 00:39:56,190
of other science pseudoscience activism

835
00:40:00,530 --> 00:39:59,040
slacktivism and more plus insects for

836
00:40:03,170 --> 00:40:00,540
breakfast mmm YUM

837
00:40:05,270 --> 00:40:03,180
QED 2017 takes place on the fourteenth

838
00:40:07,430 --> 00:40:05,280

and fifteenth of October in Manchester

839

00:40:09,410 --> 00:40:07,440

England we've already known speakers

840

00:40:12,020 --> 00:40:09,420

like Sophie Wilson co-inventor of the

841

00:40:14,090 --> 00:40:12,030

armed computer chip Simon Singh who will

842

00:40:16,100 --> 00:40:14,100

be showing how to crack a genuine Enigma

843

00:40:17,150 --> 00:40:16,110

machine Phil's great and talking through

844

00:40:19,040 --> 00:40:17,160

the real-life cover-up of the

845

00:40:21,800 --> 00:40:19,050

Hillsborough tragedy and physicists

846

00:40:23,900 --> 00:40:21,810

Helen cherski and Tim O'Brien we'll have

847

00:40:25,550 --> 00:40:23,910

a live show from the para pod voice and

848

00:40:28,850 --> 00:40:25,560

the whole event will be emceed by ace

849

00:40:29,750 --> 00:40:28,860

position Dave anak have some laughs meet

850

00:40:32,270 --> 00:40:29,760

some new friends

851
00:40:34,370 --> 00:40:32,280
make new connections all thrown 109

852
00:40:34,820 --> 00:40:34,380
pounds including all the mates those

853
00:40:37,790 --> 00:40:34,830
times

854
00:40:40,850 --> 00:40:37,800
panels podcasts workshops our subtle -

855
00:40:43,880 --> 00:40:40,860
statement and lots more check out QED

856
00:40:44,990 --> 00:40:43,890
con dot org the details we'll see you in

857
00:40:51,770 --> 00:40:45,000
October

858
00:40:51,780 --> 00:40:59,650
his main art spooky action at a distance

859
00:41:04,940 --> 00:41:02,330
yes all the hustle and bustle of the

860
00:41:07,010 --> 00:41:04,950
Australian Museum during the Sydney

861
00:41:09,230 --> 00:41:07,020
Science Festival we're here wandering

862
00:41:11,390 --> 00:41:09,240
around in our lab coats hoping to meet a

863
00:41:13,550 --> 00:41:11,400

few scientists or some people that are

864

00:41:15,320 --> 00:41:13,560

just getting all science we're in the

865

00:41:17,750 --> 00:41:15,330

main hall here where they have lots of

866

00:41:20,180 --> 00:41:17,760

people we've got commercial people like

867

00:41:23,450 --> 00:41:20,190

3m Australia we've got various tertiary

868

00:41:25,790 --> 00:41:23,460

adjust institutions here UTS is here and

869

00:41:29,900 --> 00:41:25,800

so here they're the they're the site

870

00:41:30,860 --> 00:41:29,910

near the nuclear people I just look over

871

00:41:31,760 --> 00:41:30,870

there there's a whole bunch of kids

872

00:41:35,270 --> 00:41:31,770

having a lot of fun with the

873

00:41:37,190 --> 00:41:35,280

non-newtonian fluid which means that III

874

00:41:38,960 --> 00:41:37,200

yeah what year Newton Newton mucked

875

00:41:40,870 --> 00:41:38,970

around with it oh no he didn't no Newton

876

00:41:42,650 --> 00:41:40,880

wasn't allowed to play with that stuff

877

00:41:45,410 --> 00:41:42,660

we're here at the Australian

878

00:41:46,790 --> 00:41:45,420

mathematical Science Institute booth now

879

00:41:47,750 --> 00:41:46,800

this is a bit of an issue with me

880

00:41:50,120 --> 00:41:47,760

because I've never been particularly

881

00:41:51,500 --> 00:41:50,130

good with maths but what's your favorite

882

00:41:53,690 --> 00:41:51,510

area of mathematics have you got your

883

00:41:57,470 --> 00:41:53,700

degree yet yes I have my PhD in maths

884

00:42:00,020 --> 00:41:57,480

indeed you do your thesis on

885

00:42:03,500 --> 00:42:00,030

I studied not theory so studying tying

886

00:42:05,180 --> 00:42:03,510

of knots but in the fourth dimension ah

887

00:42:07,520 --> 00:42:05,190

so does that mean you had to rotate the

888

00:42:10,190 --> 00:42:07,530

third dimension by 90 degrees or you're

889

00:42:14,180 --> 00:42:10,200

talking about time I'm talking about me

890

00:42:15,620 --> 00:42:14,190

though it's it's another spatial

891

00:42:17,120 --> 00:42:15,630

dimension and actually that's something

892

00:42:19,280 --> 00:42:17,130

we're looking at here not the fourth

893

00:42:20,960 --> 00:42:19,290

dimension but the second dimension and

894

00:42:22,940 --> 00:42:20,970

how do you take something like the earth

895

00:42:25,070 --> 00:42:22,950

which is a three-dimensional object and

896

00:42:27,050 --> 00:42:25,080

draw a two-dimensional map of it so how

897

00:42:28,580 --> 00:42:27,060

do you go down a dimension this is

898

00:42:30,380 --> 00:42:28,590

fantastic actually talking my language

899

00:42:33,080 --> 00:42:30,390

here now I have read the book flatland

900

00:42:35,060 --> 00:42:33,090

which looks at this very point so I

901
00:42:36,770 --> 00:42:35,070
imagine the way you do it is you would

902
00:42:39,470 --> 00:42:36,780
move the three-dimensional object

903
00:42:41,240 --> 00:42:39,480
through the two dimensions and then it

904
00:42:42,740 --> 00:42:41,250
would get wider and smaller or something

905
00:42:44,840 --> 00:42:42,750
like that am i anywhere close to the

906
00:42:47,060 --> 00:42:44,850
answer there's only one way of doing it

907
00:42:49,160 --> 00:42:47,070
it's not the way that we draw maps so in

908
00:42:50,420 --> 00:42:49,170
terms of navigation of drawing maps but

909
00:42:51,920 --> 00:42:50,430
that's certainly a way that you can go

910
00:42:53,480 --> 00:42:51,930
down a dimension by taking cross

911
00:42:56,440 --> 00:42:53,490
sections of a shape

912
00:42:59,540 --> 00:42:56,450
so can you tell us what the answer was D

913
00:43:01,339 --> 00:42:59,550

quickly or not for me in terms of

914

00:43:03,020 --> 00:43:01,349

studying the fourth dimension actually

915

00:43:06,109 --> 00:43:03,030

taking cross sections is actually what

916

00:43:08,089 --> 00:43:06,119

we did so I don't know how detailed you

917

00:43:10,099 --> 00:43:08,099

would like me to go but I think that's

918

00:43:11,839 --> 00:43:10,109

enough for us at home to get into it and

919

00:43:14,000 --> 00:43:11,849

what excited you about maths was

920

00:43:15,980 --> 00:43:14,010

something from an early age where just

921

00:43:17,930 --> 00:43:15,990

numbers and the fact that they unlock

922

00:43:20,180 --> 00:43:17,940

reality was your thing how did you get

923

00:43:22,280 --> 00:43:20,190

into it I didn't enjoy maths until I was

924

00:43:24,079 --> 00:43:22,290

in about year 11 or 12 at school and I

925

00:43:26,180 --> 00:43:24,089

never enjoyed maths when I was younger

926

00:43:28,550 --> 00:43:26,190

because it was boring in school it was

927

00:43:30,589 --> 00:43:28,560

doing calculations it was here's a page

928

00:43:33,140 --> 00:43:30,599

of 20 quadratic formula solve them and

929

00:43:35,690 --> 00:43:33,150

that didn't interest me and it was going

930

00:43:37,700 --> 00:43:35,700

to university and seeing proofs and

931

00:43:40,120 --> 00:43:37,710

seeing that creative side of mass which

932

00:43:42,440 --> 00:43:40,130

really got me excited about the subject

933

00:43:47,120 --> 00:43:42,450

in a shop I bet you'd be really good at

934

00:43:49,010 --> 00:43:47,130

making change oh you'd be great oh yeah

935

00:43:50,270 --> 00:43:49,020

that's 75 that's 25 cents change because

936

00:43:51,980 --> 00:43:50,280

I was really crap at that when I work

937

00:43:53,690 --> 00:43:51,990

for the railway I just imagine you'd be

938

00:43:55,609 --> 00:43:53,700

good at that actually can you do just

939

00:43:57,380 --> 00:43:55,619

stuff in your head really well do you

940

00:43:58,660 --> 00:43:57,390

ever do you ever need a calculator

941

00:44:01,370 --> 00:43:58,670

[Music]

942

00:44:03,050 --> 00:44:01,380

that's another myth of mathematics that

943

00:44:04,940 --> 00:44:03,060

to be good at maths you have to be fast

944

00:44:06,950 --> 00:44:04,950

at mental arithmetic and it's not true

945

00:44:08,510 --> 00:44:06,960

you talk to most people who have a PhD

946

00:44:11,180 --> 00:44:08,520

in math and they're really awful at

947

00:44:12,829 --> 00:44:11,190

mental arithmetic and I'm a geometer I'm

948

00:44:15,440 --> 00:44:12,839

all about shapes and patterns and I'm

949

00:44:17,599 --> 00:44:15,450

not good at numbers actually so when you

950

00:44:19,880 --> 00:44:17,609

see a problem you see it in like knots

951
00:44:21,589 --> 00:44:19,890
doing and undoing I see it in pictures I

952
00:44:23,839 --> 00:44:21,599
cannot do math until I draw a picture

953
00:44:25,940 --> 00:44:23,849
you were just into maths here are you oh

954
00:44:27,410 --> 00:44:25,950
yeah I love maths my favourite subjects

955
00:44:28,760 --> 00:44:27,420
I don't know what's your favourite area

956
00:44:29,750 --> 00:44:28,770
of math so you've got a favorite type of

957
00:44:32,240 --> 00:44:29,760
problem you like to solve

958
00:44:33,650 --> 00:44:32,250
I like geometry thank you well I think

959
00:44:36,330 --> 00:44:33,660
you'd come you've come to the right

960
00:44:38,290 --> 00:44:36,340
person enjoy your time here

961
00:44:41,350 --> 00:44:38,300
Jessica was excited about geometry

962
00:44:43,840 --> 00:44:41,360
wasn't she Richard and origami SS yes

963
00:44:45,310 --> 00:44:43,850

with all the maps they have there you

964

00:44:47,470 --> 00:44:45,320

can fold the all those shapes to make

965

00:44:49,390 --> 00:44:47,480

different globes of the world it's great

966

00:44:51,040 --> 00:44:49,400

I said remember there's some

967

00:44:53,380 --> 00:44:51,050

mathematical computer equation called a

968

00:44:54,730 --> 00:44:53,390

smooth and noodle map as well I'm sure

969

00:44:56,620 --> 00:44:54,740

saying that as people that they're going

970

00:44:58,630 --> 00:44:56,630

yeah he mentioned smooth noodle maps

971

00:45:02,640 --> 00:44:58,640

which is also the name of a Devo album I

972

00:45:06,460 --> 00:45:04,420

where are you from

973

00:45:08,410 --> 00:45:06,470

this is jenolan caves and we're about

974

00:45:10,510 --> 00:45:08,420

three and a half hours west of Sydney

975

00:45:12,250 --> 00:45:10,520

and we're here because we're actually

976

00:45:15,130 --> 00:45:12,260

promoting a lot of the good science that

977

00:45:17,170 --> 00:45:15,140

we're doing out there so I'm a guide and

978

00:45:18,730 --> 00:45:17,180

I'm actually a paleontologist out there

979

00:45:20,530 --> 00:45:18,740

as well so we're gonna see what we

980

00:45:22,090 --> 00:45:20,540

Ferrari now I know more difference

981

00:45:24,460 --> 00:45:22,100

between a static not just a like tight

982

00:45:26,700 --> 00:45:24,470

but that's where it ends to me okay well

983

00:45:28,600 --> 00:45:26,710

there's more to it than that I'm sure

984

00:45:30,130 --> 00:45:28,610

what are you showing people here you've

985

00:45:31,900 --> 00:45:30,140

got some rocks and it looks like this um

986

00:45:33,730 --> 00:45:31,910

is that a crystal formation of some sort

987

00:45:35,770 --> 00:45:33,740

absolutely we brought some of our

988

00:45:38,320 --> 00:45:35,780

limestone rock and the limestone is

989

00:45:40,480 --> 00:45:38,330

particularly exciting stuff because lime

990

00:45:43,420 --> 00:45:40,490

stones formed from the remains of living

991

00:45:45,400 --> 00:45:43,430

creatures so the limestone is what the

992

00:45:46,600 --> 00:45:45,410

crystal comes from so typically they're

993

00:45:48,280 --> 00:45:46,610

almost the same thing

994

00:45:53,230 --> 00:45:48,290

so does limestone eventually turn into

995

00:45:55,900 --> 00:45:53,240

oil no limestone turns into beautiful

996

00:45:57,460 --> 00:45:55,910

cave crystal so and it's a chemical

997

00:45:59,950 --> 00:45:57,470

thing that can happen over many many

998

00:46:02,920 --> 00:45:59,960

millions of years our limestone here is

999

00:46:06,460 --> 00:46:02,930

actually what's left of a vast belt of a

1000

00:46:08,380 --> 00:46:06,470

shallow sea that was a Western New South

1001
00:46:11,080 --> 00:46:08,390
Wales central New South Wales in this

1002
00:46:13,900 --> 00:46:11,090
case is over 400 million years ago so

1003
00:46:18,610 --> 00:46:13,910
what we've got our sea shells and corals

1004
00:46:20,290 --> 00:46:18,620
have look we're just having a look

1005
00:46:21,910 --> 00:46:20,300
through we got only a close look up here

1006
00:46:24,050 --> 00:46:21,920
never mind glasses under to get make

1007
00:46:27,260 --> 00:46:24,060
sure I get a really good look

1008
00:46:28,940 --> 00:46:27,270
and so this is an ancient world okay in

1009
00:46:32,360 --> 00:46:28,950
ancient coral and when you said four

1010
00:46:35,140 --> 00:46:32,370
million years to do 430 million years

1011
00:46:37,160 --> 00:46:35,150
ago so when this was a shallow sea

1012
00:46:39,290 --> 00:46:37,170
dinosaurs weren't even gonna peer for

1013
00:46:41,000 --> 00:46:39,300

another 200 million years well this is a

1014

00:46:41,900 --> 00:46:41,010

shallow sea life on land was just

1015

00:46:44,810 --> 00:46:41,910

getting started

1016

00:46:46,040 --> 00:46:44,820

and most of the life was in the sea you

1017

00:46:48,260 --> 00:46:46,050

weren't going to get your birds or

1018

00:46:50,510 --> 00:46:48,270

mammals forget many many betting and

1019

00:46:51,770 --> 00:46:50,520

certainly no walking fish Mexican

1020

00:46:54,170 --> 00:46:51,780

walking fish not yet they hadn't come

1021

00:46:56,120 --> 00:46:54,180

out not yet you had early fishes and

1022

00:46:58,130 --> 00:46:56,130

these early fishes were fabulous because

1023

00:46:59,720 --> 00:46:58,140

they had no fins they had no Jaws well

1024

00:47:02,090 --> 00:46:59,730

John's fish were starting up at about

1025

00:47:04,040 --> 00:47:02,100

the same time but the world was as far

1026
00:47:06,650 --> 00:47:04,050
as backbone creatures the world was a

1027
00:47:08,630 --> 00:47:06,660
world of fishes and most of the life was

1028
00:47:11,360 --> 00:47:08,640
in the sea so this was what you find all

1029
00:47:14,000 --> 00:47:11,370
over the globe so these are critics and

1030
00:47:16,340 --> 00:47:14,010
critics are fabulous related to your

1031
00:47:17,720 --> 00:47:16,350
starfish and the Quint nodes are

1032
00:47:20,420 --> 00:47:17,730
actually still around today but they're

1033
00:47:23,030 --> 00:47:20,430
very very ancient and it's the mineral

1034
00:47:23,600 --> 00:47:23,040
in the shells the coral for this case

1035
00:47:26,540 --> 00:47:23,610
crinoid

1036
00:47:28,730 --> 00:47:26,550
that makes the mineral rock so calcium

1037
00:47:31,010 --> 00:47:28,740
carbonate shells calcium carbonate rock

1038
00:47:33,140 --> 00:47:31,020

and then you get the calcium carbonate

1039

00:47:35,750 --> 00:47:33,150

crystal in the chemical reaction that

1040

00:47:38,030 --> 00:47:35,760

will form that is when your rock could

1041

00:47:40,490 --> 00:47:38,040

be dissolved away by acidic waters

1042

00:47:43,130 --> 00:47:40,500

happens naturally and then the water

1043

00:47:46,370 --> 00:47:43,140

enters caves it ends up dripping into

1044

00:47:48,530 --> 00:47:46,380

caves and the extra carbon dioxide that

1045

00:47:51,020 --> 00:47:48,540

makes it acidic evaporates as escapes

1046

00:47:53,270 --> 00:47:51,030

the crystal forms and it's beautiful

1047

00:47:55,010 --> 00:47:53,280

stuff and what's the most exciting thing

1048

00:47:56,750 --> 00:47:55,020

you've found there in your career at the

1049

00:47:58,400 --> 00:47:56,760

john cave so far have you found a rock

1050

00:47:59,210 --> 00:47:58,410

you went man this rock is really unique

1051

00:48:01,490 --> 00:47:59,220

what have you found

1052

00:48:03,920 --> 00:48:01,500

yeah that's excited you well I'm

1053

00:48:07,250 --> 00:48:03,930

actually a vertebrate paleontologist and

1054

00:48:09,320 --> 00:48:07,260

I actually got most excited at least up

1055

00:48:11,600 --> 00:48:09,330

until now by something somebody else had

1056

00:48:14,510 --> 00:48:11,610

found but it wasn't identified as what

1057

00:48:15,720 --> 00:48:14,520

we had so it's mega food I say too big a

1058

00:48:17,880 --> 00:48:15,730

photo and

1059

00:48:20,070 --> 00:48:17,890

thought for a long time oh well there

1060

00:48:21,420 --> 00:48:20,080

was the Diprotodon of jenolan caves and

1061

00:48:21,930 --> 00:48:21,430

that's the biggest marsupial that we

1062

00:48:23,790 --> 00:48:21,940

know of

1063

00:48:26,520 --> 00:48:23,800

fabulous Hannibal with a look a large

1064

00:48:28,230 --> 00:48:26,530

one but oh yes yes yes they're like big

1065

00:48:30,690 --> 00:48:28,240

one best but they are not one best so

1066

00:48:32,280 --> 00:48:30,700

they're called the giant lumbus but they

1067

00:48:34,800 --> 00:48:32,290

weren't there was actually a real giant

1068

00:48:36,270 --> 00:48:34,810

love but but what what I did was I

1069

00:48:39,030 --> 00:48:36,280

actually would it had a good look at it

1070

00:48:41,370 --> 00:48:39,040

that's me and I really identified it as

1071

00:48:43,320 --> 00:48:41,380

a different animal okay so you can see

1072

00:48:44,790 --> 00:48:43,330

that I'm actually going chipping through

1073

00:48:47,550 --> 00:48:44,800

the rock to have a good look at the

1074

00:48:49,560 --> 00:48:47,560

skull it's stuff in the rock and what it

1075

00:48:52,320 --> 00:48:49,570

is instead is an edible called as a

1076

00:48:53,760 --> 00:48:52,330

group of chorus so difference in the

1077

00:48:55,650 --> 00:48:53,770

spine where you went a hawk was long

1078

00:48:57,450 --> 00:48:55,660

like that yes there's one tooth there's

1079

00:48:59,400 --> 00:48:57,460

the killer tooth if you get to what's

1080

00:49:01,680 --> 00:48:59,410

called the premolar and so i chipped

1081

00:49:04,109 --> 00:49:01,690

away and there was the premolar that is

1082

00:49:05,430 --> 00:49:04,119

what is distinctive so size said you

1083

00:49:07,140 --> 00:49:05,440

know shouldn't be a deaf program it's a

1084

00:49:09,420 --> 00:49:07,150

bit too small but when I found that

1085

00:49:10,859 --> 00:49:09,430

killer tooth that was what I said yep

1086

00:49:12,690 --> 00:49:10,869

that's it and that was really great

1087

00:49:15,210 --> 00:49:12,700

because that means we can identify that

1088

00:49:17,400 --> 00:49:15,220

animal and that is what you'd expect to

1089

00:49:19,530 --> 00:49:17,410

have been in general its nickname is the

1090

00:49:22,620 --> 00:49:19,540

swamp owl and it would have been lucky

1091

00:49:25,560 --> 00:49:22,630

around in the waterways maybe even in

1092

00:49:27,240 --> 00:49:25,570

what's now the Blue Lake and though they

1093

00:49:30,090 --> 00:49:27,250

were the animals would expect to have

1094

00:49:31,980 --> 00:49:30,100

found only the Ice Age living with the

1095

00:49:33,690 --> 00:49:31,990

Aboriginal people died out maybe thirty

1096

00:49:35,340 --> 00:49:33,700

five thirty thousand years ago

1097

00:49:36,359 --> 00:49:35,350

what have all the kids been asked what's

1098

00:49:37,710 --> 00:49:36,369

the thing that's been exciting them

1099

00:49:40,109 --> 00:49:37,720

about your rocks here from the john

1100

00:49:42,420 --> 00:49:40,119

caves yeah well I mean they love seeing

1101
00:49:43,830 --> 00:49:42,430
fossils I think I think if you ask some

1102
00:49:46,070 --> 00:49:43,840
kid if they want to see something that

1103
00:49:48,570 --> 00:49:46,080
got fossils in it they'll go yeah right

1104
00:49:51,030 --> 00:49:48,580
do you want to touch something that was

1105
00:49:54,030 --> 00:49:51,040
alive 200 million years before the

1106
00:49:55,500 --> 00:49:54,040
dinosaurs oh yeah yeah and where can we

1107
00:49:58,410 --> 00:49:55,510
find you online before we go

1108
00:50:00,960 --> 00:49:58,420
okay that jenolan caves dark day you is

1109
00:50:02,849 --> 00:50:00,970
there Arthur as our address and there is

1110
00:50:04,560 --> 00:50:02,859
a website and that's got lots of

1111
00:50:06,510 --> 00:50:04,570
interesting things on it we're going to

1112
00:50:08,170 --> 00:50:06,520
be developing special things for the

1113
00:50:09,700 --> 00:50:08,180

schools coming up

1114

00:50:12,069 --> 00:50:09,710

we got a new program that we're going to

1115

00:50:15,519 --> 00:50:12,079

try to launch it about early 2018 and

1116

00:50:17,799 --> 00:50:15,529

that'll include things on specifically

1117

00:50:20,019 --> 00:50:17,809

science that's related to jenolan the

1118

00:50:22,539 --> 00:50:20,029

minerals the scape science the

1119

00:50:24,789 --> 00:50:22,549

paleontology programs that are actually

1120

00:50:26,920 --> 00:50:24,799

really relevant to what kids might be

1121

00:50:29,380 --> 00:50:26,930

interested in what the school curriculum

1122

00:50:31,390 --> 00:50:29,390

at some point might be that's a little

1123

00:50:33,940 --> 00:50:31,400

ways down the line and what New South

1124

00:50:36,099 --> 00:50:33,950

Wales is all about in the past to the

1125

00:50:38,019 --> 00:50:36,109

present so we've got living you know

1126

00:50:40,420 --> 00:50:38,029

ecosystems lots of endangered species

1127

00:50:42,880 --> 00:50:40,430

lots of stops cool thank you have a good

1128

00:50:48,010 --> 00:50:42,890

day happy science week thank you - thank

1129

00:50:49,630 --> 00:50:48,020

you this room is just full of people

1130

00:50:51,910 --> 00:50:49,640

have done science it's full of people

1131

00:50:54,370 --> 00:50:51,920

Bennett University for more than the day

1132

00:50:58,140 --> 00:50:54,380

that I was there and I went on the day

1133

00:51:03,150 --> 00:51:00,870

I've just wanted past the joint academic

1134

00:51:04,230 --> 00:51:03,160

microbiology seminars or jams as they're

1135

00:51:06,269 --> 00:51:04,240

known if you're looking for your

1136

00:51:08,069 --> 00:51:06,279

weaponized bird flu and you've got some

1137

00:51:10,529 --> 00:51:08,079

money left in a blackops budget are you

1138

00:51:12,450 --> 00:51:10,539

get the guys to come - we focus on lots

1139

00:51:14,430 --> 00:51:12,460

of different types of microorganisms not

1140

00:51:17,430 --> 00:51:14,440

all bad but yeah we do work with

1141

00:51:19,049 --> 00:51:17,440

pathogens and dangerous bacteria have

1142

00:51:20,849 --> 00:51:19,059

you had the level 5 suit on everything

1143

00:51:22,170 --> 00:51:20,859

on some of my colleagues have yep so

1144

00:51:24,240 --> 00:51:22,180

some of them are currently working on a

1145

00:51:26,430 --> 00:51:24,250

bowler wearing the UM wearing the full

1146

00:51:27,839 --> 00:51:26,440

suits to protect them but what I find

1147

00:51:29,519 --> 00:51:27,849

weird about a bowl is you've got the guy

1148

00:51:30,750 --> 00:51:29,529

with the suit then standing 20 feet away

1149

00:51:32,880 --> 00:51:30,760

there's someone with a clipboard and

1150

00:51:34,289 --> 00:51:32,890

shorts that's always a bit weird that's

1151

00:51:37,200 --> 00:51:34,299

an administrative problem but if you're

1152

00:51:38,490 --> 00:51:37,210

actually handling the bacteria then yeah

1153

00:51:39,900 --> 00:51:38,500

I mean and so those guys are working in

1154

00:51:41,819 --> 00:51:39,910

some pretty tough conditions but when

1155

00:51:43,769 --> 00:51:41,829

you're actually handling the viruses

1156

00:51:45,720 --> 00:51:43,779

then you need need that level of

1157

00:51:47,160 --> 00:51:45,730

protection yep well having that protects

1158

00:51:48,960 --> 00:51:47,170

the rest of our skin from getting sick

1159

00:51:50,880 --> 00:51:48,970

from these diseases yeah now you've got

1160

00:51:52,440 --> 00:51:50,890

down the front here a couple of now you

1161

00:51:54,059 --> 00:51:52,450

got you know you favor the bacterias

1162

00:51:55,170 --> 00:51:54,069

you've got no time for the viruses where

1163

00:51:57,359 --> 00:51:55,180

do you sit where do you sit

1164

00:51:59,190 --> 00:51:57,369

I work with bacteria but I'm a lot of my

1165

00:52:01,140 --> 00:51:59,200

colleagues work with viruses as well and

1166

00:52:03,150 --> 00:52:01,150

microscopic higher organisms are

1167

00:52:04,769 --> 00:52:03,160

eukaryotes let's say we do everything

1168

00:52:06,120 --> 00:52:04,779

and funghi now what have you got down

1169

00:52:07,650 --> 00:52:06,130

here and you've been asking if you got

1170

00:52:09,630 --> 00:52:07,660

climb idiot here that's because it's

1171

00:52:11,579 --> 00:52:09,640

kind of a microbiology thing it's like a

1172

00:52:12,990 --> 00:52:11,589

small it's not a virus but it's a small

1173

00:52:14,970 --> 00:52:13,000

back that has it work where does it sit

1174

00:52:15,990 --> 00:52:14,980

in your frontier so that's the yeah

1175

00:52:18,000 --> 00:52:16,000

that's your right that's sort of halfway

1176
00:52:19,950 --> 00:52:18,010
between in this behavior between a virus

1177
00:52:21,000 --> 00:52:19,960
and a bacterium and we don't have that

1178
00:52:23,250 --> 00:52:21,010
one here but we do have similar

1179
00:52:25,859 --> 00:52:23,260
organisms so what we've got is a whole

1180
00:52:27,599 --> 00:52:25,869
suite here of different viruses fungi

1181
00:52:29,849 --> 00:52:27,609
and bacterias that do different things

1182
00:52:32,010 --> 00:52:29,859
some are good and some are bad so we

1183
00:52:33,450 --> 00:52:32,020
have the good guys like yeast which is a

1184
00:52:35,430 --> 00:52:33,460
fungus that of course we used to make

1185
00:52:37,019 --> 00:52:35,440
bread and beer now I'm looking at what

1186
00:52:39,510 --> 00:52:37,029
might is that the chicken pox one the

1187
00:52:41,490 --> 00:52:39,520
spotted one yeah was that small percent

1188
00:52:42,930 --> 00:52:41,500

small needles that's amazing but we do

1189

00:52:45,000 --> 00:52:42,940

have the small pox one as well

1190

00:52:47,970 --> 00:52:45,010

this is golden staph so this is an

1191

00:52:50,250 --> 00:52:47,980

antibiotic resistant bacteria so you can

1192

00:52:52,230 --> 00:52:50,260

see that it's wearing a cape that's a

1193

00:52:54,029 --> 00:52:52,240

super bug so this is where a lot of

1194

00:52:56,460 --> 00:52:54,039

research is focused on the moment in

1195

00:52:57,839 --> 00:52:56,470

understanding how these bacteria become

1196

00:52:59,039 --> 00:52:57,849

resistant to antibiotics

1197

00:53:00,150 --> 00:52:59,049

yeah and how we can prevent that

1198

00:53:01,829 --> 00:53:00,160

happening because that's a massive

1199

00:53:03,390 --> 00:53:01,839

problem at the moment but what's what is

1200

00:53:04,289 --> 00:53:03,400

the current method that most most

1201
00:53:06,450 --> 00:53:04,299
antibiotics

1202
00:53:08,069 --> 00:53:06,460
killed the bacteria like that dude they

1203
00:53:08,790 --> 00:53:08,079
deny them food do they take something

1204
00:53:10,260 --> 00:53:08,800
out of their Dean

1205
00:53:11,490 --> 00:53:10,270
well how do they normally work what's

1206
00:53:13,410 --> 00:53:11,500
the mechanism and there's a few

1207
00:53:15,840 --> 00:53:13,420
different mechanisms so classically they

1208
00:53:17,790 --> 00:53:15,850
interfered with the chemicals that make

1209
00:53:20,580 --> 00:53:17,800
the cell wall or the structure of the

1210
00:53:22,770 --> 00:53:20,590
bacteria by interfering the synthesis of

1211
00:53:25,020 --> 00:53:22,780
those chemicals but now there's a lot of

1212
00:53:26,370 --> 00:53:25,030
types they interrupt different stages of

1213
00:53:29,640 --> 00:53:26,380

what's called the metabolism of the

1214

00:53:31,530 --> 00:53:29,650

cells so that's how the cell grows from

1215

00:53:33,120 --> 00:53:31,540

the instructions in its genome to

1216

00:53:35,550 --> 00:53:33,130

actually performing functions via

1217

00:53:36,960 --> 00:53:35,560

enzymes and it blocks different stages

1218

00:53:38,940 --> 00:53:36,970

and different antibiotics work in

1219

00:53:41,160 --> 00:53:38,950

different ways some target the genes

1220

00:53:43,370 --> 00:53:41,170

that get switched on some interfere with

1221

00:53:45,330 --> 00:53:43,380

parts of the cell that are being made by

1222

00:53:47,460 --> 00:53:45,340

constructive parts of the cell like the

1223

00:53:50,280 --> 00:53:47,470

cell wall being synthesized now see

1224

00:53:51,600 --> 00:53:50,290

we've got some ecoli back there that's

1225

00:53:54,180 --> 00:53:51,610

pretty much everywhere poo is everywhere

1226

00:53:55,350 --> 00:53:54,190

isn't it yep yep so we coli : really is

1227

00:53:57,600 --> 00:53:55,360

everywhere it's sort of the model

1228

00:53:59,430 --> 00:53:57,610

organism that we use in the lab but it's

1229

00:54:01,320 --> 00:53:59,440

also present in our bodies and in our

1230

00:54:04,140 --> 00:54:01,330

guts and it's also present in things

1231

00:54:05,460 --> 00:54:04,150

like um waterways and then some are good

1232

00:54:08,040 --> 00:54:05,470

and some are bad so a lot of these

1233

00:54:09,330 --> 00:54:08,050

species are very variable so if it's in

1234

00:54:10,590 --> 00:54:09,340

the right place doing the right thing

1235

00:54:13,020 --> 00:54:10,600

it's good for you and it's part of our

1236

00:54:15,930 --> 00:54:13,030

natural micro flora but also different

1237

00:54:17,580 --> 00:54:15,940

strains can cause disease particularly

1238

00:54:19,920 --> 00:54:17,590

if they're coming from say feces into

1239

00:54:21,810 --> 00:54:19,930

water and then we're consuming them so

1240

00:54:23,790 --> 00:54:21,820

yeah these things are quite complicated

1241

00:54:24,840 --> 00:54:23,800

in different species do different things

1242

00:54:28,440 --> 00:54:24,850

in different environments

1243

00:54:29,940 --> 00:54:28,450

now would you encounter polio in the

1244

00:54:31,470 --> 00:54:29,950

wild very normally here now I know

1245

00:54:33,480 --> 00:54:31,480

people might not be getting it as much

1246

00:54:36,600 --> 00:54:33,490

in Australia but is it is this a turn-up

1247

00:54:38,940 --> 00:54:36,610

anyway is it our blue normally I've

1248

00:54:40,380 --> 00:54:38,950

believe largely it's been eradicated in

1249

00:54:42,540 --> 00:54:40,390

Australia but in other parts of the

1250

00:54:44,670 --> 00:54:42,550

world it's not but the actual organism

1251

00:54:47,460 --> 00:54:44,680

that causes it potentially could exist

1252

00:54:49,800 --> 00:54:47,470

at a low level so there's a theory

1253

00:54:51,690 --> 00:54:49,810

called the bus backing hypothesis that's

1254

00:54:54,630 --> 00:54:51,700

a bit of a calm loving that don't say it

1255

00:54:56,700 --> 00:54:54,640

again the bus pecking hypothesis so

1256

00:54:59,010 --> 00:54:56,710

those two people were content that was

1257

00:55:00,810 --> 00:54:59,020

his last name but but what it is is the

1258

00:55:03,480 --> 00:55:00,820

theory that everything is everywhere and

1259

00:55:05,490 --> 00:55:03,490

the environment selects so a lot of

1260

00:55:07,560 --> 00:55:05,500

microorganisms occur everywhere on the

1261

00:55:09,600 --> 00:55:07,570

planet at a really low abundance and

1262

00:55:11,700 --> 00:55:09,610

when the environment changes they can

1263

00:55:13,410 --> 00:55:11,710

become really abundant really quickly so

1264

00:55:15,600 --> 00:55:13,420

that's something to be aware of when we

1265

00:55:17,550 --> 00:55:15,610

think of things like climate change in

1266

00:55:18,810 --> 00:55:17,560

pollution and what what would that will

1267

00:55:20,910 --> 00:55:18,820

pause in the environment and what

1268

00:55:22,950 --> 00:55:20,920

bacteria might respond to that

1269

00:55:25,020 --> 00:55:22,960

so where can we find the joint academic

1270

00:55:26,280 --> 00:55:25,030

microbiology seminars online bit more

1271

00:55:29,790 --> 00:55:26,290

about we've been telling us you can find

1272

00:55:31,920 --> 00:55:29,800

us online at jams dot org dot au

1273

00:55:33,840 --> 00:55:31,930

so what jams is is we're a monthly

1274

00:55:36,390 --> 00:55:33,850

meeting of microbiologists that meet in

1275

00:55:38,460 --> 00:55:36,400

Sydney and we welcome the public to come

1276

00:55:41,430 --> 00:55:38,470

to that what would it do Oh hidden if we

1277

00:55:44,460 --> 00:55:41,440

haven't been the Uni but no sort of it

1278

00:55:45,420 --> 00:55:44,470

tends to be academic but we welcome

1279

00:55:47,700 --> 00:55:45,430

everyone and we're happy to always have

1280

00:55:49,080 --> 00:55:47,710

a chat and explain what we're doing and

1281

00:55:50,460 --> 00:55:49,090

so that's once a month on the last

1282

00:55:52,350 --> 00:55:50,470

Tuesday of the month and you can check

1283

00:55:55,020 --> 00:55:52,360

out our website we also do a lot of

1284

00:55:57,330 --> 00:55:55,030

talks and events with the public as well

1285

00:56:03,020 --> 00:55:57,340

so lots of Twitter one there our Twitter

1286

00:56:06,150 --> 00:56:03,030

is at gems org au so at symbol J AMS o

1287

00:56:07,830 --> 00:56:06,160

RG au and if you send us a tweet we

1288

00:56:11,520 --> 00:56:07,840

always happy to get in touch and talk

1289

00:56:13,200 --> 00:56:11,530

about microbiology of course on the

1290

00:56:15,120 --> 00:56:13,210

science floor here for the Sydney

1291

00:56:16,560 --> 00:56:15,130

Festival of Scientific got here and what

1292

00:56:19,200 --> 00:56:16,570

are you showing the kids today

1293

00:56:21,120 --> 00:56:19,210

my name is Olga I'm from wildlife cities

1294

00:56:22,860 --> 00:56:21,130

ER and we're just got some little stick

1295

00:56:24,900 --> 00:56:22,870

insects there we've got some young ones

1296

00:56:27,900 --> 00:56:24,910

some older ones and a few different

1297

00:56:30,180 --> 00:56:27,910

species too you can see the ones that

1298

00:56:32,370 --> 00:56:30,190

look like coat up leaves they're

1299

00:56:35,310 --> 00:56:32,380

actually spiny leaf insects I known as

1300

00:56:37,110 --> 00:56:35,320

the McClay Spectre and they're not

1301

00:56:38,700 --> 00:56:37,120

actually a leaf insect surprisingly no

1302

00:56:40,010 --> 00:56:38,710

because I do find them all over

1303

00:56:42,600 --> 00:56:40,020

Australia or just on the east coast

1304

00:56:44,970 --> 00:56:42,610

mainly on the East Coast but we do have

1305

00:56:47,160 --> 00:56:44,980

phasmid all over Australia all different

1306

00:56:49,670 --> 00:56:47,170

species so we do have a little bit of a

1307

00:56:52,339 --> 00:56:49,680

selection a few different

1308

00:56:54,770 --> 00:56:52,349

a few different ones for the kids to

1309

00:56:57,500 --> 00:56:54,780

have a look at the most popular ones of

1310

00:56:59,630 --> 00:56:57,510

course are always the biggest Oh which

1311

00:57:01,730 --> 00:56:59,640

in this case is the spiny leaf insect

1312

00:57:05,299 --> 00:57:01,740

you can see that the heavy abdomen on

1313

00:57:07,010 --> 00:57:05,309

the female that's full of eggs Wow and

1314

00:57:10,160 --> 00:57:07,020

so how many eggs would she drop in one

1315

00:57:12,380 --> 00:57:10,170

go she drops them one at a time although

1316

00:57:14,690 --> 00:57:12,390

she actually flicks them away far away

1317

00:57:17,120 --> 00:57:14,700

and if you have a close look at the eggs

1318

00:57:20,450 --> 00:57:17,130

they have a little nodule on the end

1319

00:57:22,579 --> 00:57:20,460

that's scented it actually attracts ants

1320

00:57:24,799 --> 00:57:22,589

and the ants come over pick up the egg

1321

00:57:27,410 --> 00:57:24,809

and carry it down into their nest

1322

00:57:30,380 --> 00:57:27,420

because they think it's food but they

1323

00:57:32,990 --> 00:57:30,390

don't eat the egg and so when the young

1324

00:57:36,020 --> 00:57:33,000

hatch out do they eat the ants no no the

1325

00:57:38,599 --> 00:57:36,030

young are also vegetarian so they're all

1326
00:57:41,260 --> 00:57:38,609
herbivores they eat eucalyptus leaf you

1327
00:57:43,760 --> 00:57:41,270
know I look at her she's so cute and

1328
00:57:45,380 --> 00:57:43,770
they'll actually climb out they look

1329
00:57:47,390 --> 00:57:45,390
like ants when they're little they'll

1330
00:57:50,180 --> 00:57:47,400
climb out of the ant nest climb all the

1331
00:57:52,010 --> 00:57:50,190
way up at the tree and then they sort of

1332
00:57:54,140 --> 00:57:52,020
slow down quite a lot you can see how

1333
00:57:55,250 --> 00:57:54,150
slow she is the babies are actually

1334
00:57:58,760 --> 00:57:55,260
quite fast

1335
00:58:00,260 --> 00:57:58,770
oh and now does she they solar-powered

1336
00:58:01,670 --> 00:58:00,270
like when it's warm they're more active

1337
00:58:03,140 --> 00:58:01,680
when it's cold they just go into a leaf

1338
00:58:03,559 --> 00:58:03,150

and stay then that's a really good

1339

00:58:05,960 --> 00:58:03,569

question

1340

00:58:08,270 --> 00:58:05,970

just like reptiles these guys are

1341

00:58:10,819 --> 00:58:08,280

ectotherms so they are cold-blooded and

1342

00:58:13,220 --> 00:58:10,829

they do rely on solar energy to help

1343

00:58:14,690 --> 00:58:13,230

them move wow that's quite cool and now

1344

00:58:16,370 --> 00:58:14,700

people are pretty happy to have stick

1345

00:58:17,690 --> 00:58:16,380

insects on them and stuff like that they

1346

00:58:19,220 --> 00:58:17,700

probably wouldn't feel the same way

1347

00:58:21,230 --> 00:58:19,230

about spiders why do you think people

1348

00:58:22,670 --> 00:58:21,240

have got the arachnophobia where they

1349

00:58:25,250 --> 00:58:22,680

don't necessarily feel bad about the

1350

00:58:26,839 --> 00:58:25,260

stick insect oh to be honest a lot of

1351

00:58:29,359 --> 00:58:26,849

people do feel bad about the stick

1352

00:58:31,789 --> 00:58:29,369

insects until we tell them that they're

1353

00:58:33,920 --> 00:58:31,799

not able to bite them so I think with

1354

00:58:35,630 --> 00:58:33,930

spiders a lot of it it's just people

1355

00:58:38,180 --> 00:58:35,640

don't understand that most spiders

1356

00:58:42,200 --> 00:58:38,190

aren't willing to sacrifice their venom

1357

00:58:44,599 --> 00:58:42,210

on a large animal also spiders don't eat

1358

00:58:46,160 --> 00:58:44,609

you yeah they don't eat us and if you're

1359

00:58:47,280 --> 00:58:46,170

not a threat to them they don't feel the

1360

00:58:49,740 --> 00:58:47,290

need to use them

1361

00:58:52,320 --> 00:58:49,750

so we did have a spiders exhibition here

1362

00:58:54,830 --> 00:58:52,330

just a little while ago you're saying

1363

00:58:58,080 --> 00:58:54,840

the movie six legged freaks is not true

1364

00:59:02,970 --> 00:58:58,090

no the six you may throw that

1365

00:59:07,320 --> 00:59:02,980

eight-legged freak so the insect was a

1366

00:59:09,060 --> 00:59:07,330

pretty dull movie the little six legged

1367

00:59:11,340 --> 00:59:09,070

freaks and then we've got arachnids of

1368

00:59:13,050 --> 00:59:11,350

course the eight legged freaks okay look

1369

00:59:14,730 --> 00:59:13,060

this is brother just lining up to have a

1370

00:59:16,800 --> 00:59:14,740

good look like kids love him anything

1371

00:59:19,380 --> 00:59:16,810

that moves and as long as it doesn't

1372

00:59:21,360 --> 00:59:19,390

bite them suddenly feel like oh I'm an

1373

00:59:23,070 --> 00:59:21,370

adding animal Wrangler it really gives

1374

00:59:25,110 --> 00:59:23,080

them a bit of a hands-on experience I

1375

00:59:27,270 --> 00:59:25,120

think it's a it's a great way to bring

1376

00:59:28,410 --> 00:59:27,280

nature into the classroom as well as we

1377

00:59:32,220 --> 00:59:28,420

can where can we find more of your

1378

00:59:36,600 --> 00:59:32,230

nature online online we do have a

1379

00:59:39,960 --> 00:59:36,610

website wild life Sydney z.com did I you

1380

00:59:41,790 --> 00:59:39,970

I believe wow you caught me off guard oh

1381

00:59:44,070 --> 00:59:41,800

okay and have a good day here with the

1382

00:59:45,480 --> 00:59:44,080

kids no worries thank you so much I hope

1383

00:59:48,570 --> 00:59:45,490

you guys have a great time here at the

1384

00:59:49,800 --> 00:59:48,580

Science Festival see ya well Richard

1385

00:59:51,240 --> 00:59:49,810

look we've been wandering around here

1386

00:59:52,860 --> 00:59:51,250

now what have you seen I've seen a few

1387

00:59:54,480 --> 00:59:52,870

people had seen a stick insect we've

1388

00:59:56,400 --> 00:59:54,490

seen I've tried to get bird flu

1389

00:59:57,570 --> 00:59:56,410

weaponized there unsuccessfully down

1390

01:00:00,210 --> 00:59:57,580

with those scientists what do you been

1391

01:00:03,360 --> 01:00:00,220

up to I was just looking at the the gene

1392

01:00:05,130 --> 01:00:03,370

technology from jellyfish and tiny

1393

01:00:07,530 --> 01:00:05,140

little creatures that swarm and multiply

1394

01:00:09,510 --> 01:00:07,540

in a drop of water mmm

1395

01:00:10,560 --> 01:00:09,520

hey look I love the person that the

1396

01:00:12,600 --> 01:00:10,570

University of Sydney they're they've a

1397

01:00:15,030 --> 01:00:12,610

big person enjoy what you do and it'll

1398

01:00:16,920 --> 01:00:15,040

work out I couldn't agree more the

1399

01:00:18,870 --> 01:00:16,930

hardest bit is finding the thing to

1400

01:00:21,240 --> 01:00:18,880

enjoy it pays isn't that Richard that's

1401
01:00:23,670 --> 01:00:21,250
a tough bit we and we're trying minato

1402
01:00:25,140 --> 01:00:23,680
how we're trying I found it but these

1403
01:00:27,750 --> 01:00:25,150
days I just seem to be making ramen to

1404
01:00:30,060 --> 01:00:27,760
you hello skeptic zone cub reporter mane

1405
01:00:31,980 --> 01:00:30,070
out of here at a very tense moment in

1406
01:00:33,990 --> 01:00:31,990
this Sydney Science Festival as we are

1407
01:00:36,090 --> 01:00:34,000
waiting to do a couple of shows of

1408
01:00:37,140 --> 01:00:36,100
skeptics investigators thingy mystery

1409
01:00:39,750 --> 01:00:37,150
investigators always get that wrong

1410
01:00:41,970 --> 01:00:39,760
Richard Nam in the show hello we just

1411
01:00:44,040 --> 01:00:41,980
focus we're here about to perform for

1412
01:00:47,040 --> 01:00:44,050
two groups of school students would

1413
01:00:48,510 --> 01:00:47,050

perform your morning mmm and that

1414

01:00:50,130 --> 01:00:48,520

munching sound you can hear is actually

1415

01:00:52,530 --> 01:00:50,140

our breakfast which happens to consist

1416

01:00:55,320 --> 01:00:52,540

of a minty each yes I was up at 4:00

1417

01:00:56,550 --> 01:00:55,330

this morning don't ask and been going

1418

01:00:58,350 --> 01:00:56,560

all day and I completely forgot to have

1419

01:01:00,280 --> 01:00:58,360

breakfast so that good Australian tip

1420

01:01:01,930 --> 01:01:00,290

for all you overseas listeners

1421

01:01:03,670 --> 01:01:01,940

if you can't have breakfast have a minty

1422

01:01:05,440 --> 01:01:03,680

at least and it cures any breath problem

1423

01:01:07,660 --> 01:01:05,450

we have as well it does and we're

1424

01:01:10,690 --> 01:01:07,670

preparing we've got our divining rods

1425

01:01:13,540 --> 01:01:10,700

the juggling balls touch and bending

1426

01:01:16,420 --> 01:01:13,550

spoon mmm now the or by the by the way

1427

01:01:19,780 --> 01:01:16,430

if speaking of spoons see if you can

1428

01:01:22,360 --> 01:01:19,790

find on youtube I play the spoons by

1429

01:01:24,610 --> 01:01:22,370

Clive done from dad's Arnie's yes that's

1430

01:01:26,560 --> 01:01:24,620

a song I play the spoons it's terrible

1431

01:01:28,510 --> 01:01:26,570

but you'll enjoy it all right well we

1432

01:01:30,520 --> 01:01:28,520

better get ready in about 10 minutes the

1433

01:01:32,890 --> 01:01:30,530

rooms gonna be packed this theater will

1434

01:01:35,080 --> 01:01:32,900

be packed with big groups of high school

1435

01:01:36,610 --> 01:01:35,090

students they hold the microphone and I

1436

01:01:38,470 --> 01:01:36,620

will apply a little the wonders of

1437

01:01:40,300 --> 01:01:38,480

science I'll be hearing this is

1438

01:01:42,610 --> 01:01:40,310

maynard's contribution to science

1439

01:01:44,600 --> 01:01:42,620

everybody you often wondered well this

1440

01:01:49,170 --> 01:01:44,610

is it

1441

01:01:53,650 --> 01:01:49,180

[Music]

1442

01:01:55,750 --> 01:01:53,660

wonder what I'm like doing that noise

1443

01:01:57,760 --> 01:01:55,760

you can hear is high school students

1444

01:02:03,950 --> 01:01:57,770

filing in and doing what high school

1445

01:02:13,290 --> 01:02:11,130

is the Northwest and this Haskell's from

1446

01:02:15,630 --> 01:02:13,300

Seven Hills Sagan hear these screams of

1447

01:02:21,420 --> 01:02:15,640

delight hopefully from the his seven

1448

01:02:37,060 --> 01:02:33,940

[Music]

1449

01:03:06,499 --> 01:02:55,720

[Applause]

1450

01:03:11,999 --> 01:03:09,390

to appear on TV movies and things like

1451

01:03:14,819 --> 01:03:12,009

that I did a show on channel 7 so Mexico

1452

01:03:17,689 --> 01:03:14,829

and also Mac - sometimes on home a

1453

01:03:24,390 --> 01:03:17,699

healthy TV shows and then I am playing a

1454

01:03:26,669 --> 01:03:24,400

theater for high schools the show went

1455

01:03:28,529 --> 01:03:26,679

very well and then came the time for

1456

01:03:33,269 --> 01:03:28,539

Richard to lie on the bed of nails

1457

01:03:35,669 --> 01:03:33,279

Willie survived really live to put

1458

01:03:57,209 --> 01:03:35,679

yourself on the bed of nails another day

1459

01:04:08,429 --> 01:03:57,219

hope so who's there Richard Saunders on

1460

01:04:10,439 --> 01:04:08,439

the bed of tetanus if you haven't be

1461

01:04:12,239 --> 01:04:10,449

very careful with the liner and one

1462

01:04:13,100 --> 01:04:12,249

thing you must never do is let anybody

1463

01:04:17,820 --> 01:04:13,110

stand on

1464

01:04:30,550 --> 01:04:17,830

[Applause]

1465

01:04:34,550 --> 01:04:32,690

richard has survived the bed of nails

1466

01:04:36,200 --> 01:04:34,560

and the children are frankly amazed in

1467

01:05:05,930 --> 01:04:36,210

that kind of a way that children are

1468

01:05:16,150 --> 01:05:05,940

sometimes for another year at the Sydney

1469

01:05:16,160 --> 01:05:21,540

[Music]

1470

01:05:32,910 --> 01:05:28,240

on may not condone are you welcome to

1471

01:05:35,290 --> 01:05:32,920

bunga bunga 39 39 episodes 39 events 39

1472

01:05:37,540 --> 01:05:35,300

cataclysms with a show the challenges

1473

01:05:40,460 --> 01:05:37,550

the government the god and your very

1474

01:05:42,380 --> 01:05:40,470

self on today's show you'll hear

1475

01:05:43,880 --> 01:05:42,390

Angela here there are times are lots of

1476

01:05:49,190 --> 01:05:43,890

it that we all managed to get pretty

1477

01:05:50,300 --> 01:05:49,200

grabbing that thing over there and two

1478

01:05:51,740 --> 01:05:50,310

more we hear from you

1479

01:05:56,270 --> 01:05:51,750

well we won't be talking about this

1480

01:06:05,210 --> 01:05:56,280

you're a selfish arrogant on Manor

1481

01:06:16,420 --> 01:06:05,220

calmed are you are you

1482

01:06:20,930 --> 01:06:18,860

thank you for listening to the skeptic

1483

01:06:24,530 --> 01:06:20,940

zone coming up next week more reports

1484

01:06:27,110 --> 01:06:24,540

from Iran Sega Vizia travels around the

1485

01:06:29,960 --> 01:06:27,120

world heading for the European skeptics

1486

01:06:32,600 --> 01:06:29,970

Congress coming up in Poland where I'm

1487

01:06:36,920 --> 01:06:32,610

delighted to say he will be a speaker if

1488

01:06:39,620 --> 01:06:36,930

you want to attend that meeting which is

1489

01:06:43,250 --> 01:06:39,630

coming up in September the 22nd to the

1490

01:06:45,860 --> 01:06:43,260

24th of September you can find links in

1491

01:06:48,530 --> 01:06:45,870

the show notes and thank you to all

1492

01:06:50,330 --> 01:06:48,540

those people who contribute to the

1493

01:06:52,700 --> 01:06:50,340

skeptic zone I often say this and I

1494

01:06:55,700 --> 01:06:52,710

really mean it if it wasn't for people

1495

01:06:57,530 --> 01:06:55,710

there chipping in contributing weekly or

1496

01:07:01,580 --> 01:06:57,540

sometimes donations there would be no

1497

01:07:04,160 --> 01:07:01,590

skeptic zone so all you people who

1498

01:07:06,140 --> 01:07:04,170

listen for free without chipping in

1499

01:07:07,970 --> 01:07:06,150

that's you know I'm glad you're

1500

01:07:09,470 --> 01:07:07,980

listening I'm delighted thank you very

1501
01:07:12,140 --> 01:07:09,480
much for listening and I hope you enjoy

1502
01:07:14,150 --> 01:07:12,150
the show but for all those people who do

1503
01:07:16,910 --> 01:07:14,160
contribute even if it's a dollar a week

1504
01:07:18,890 --> 01:07:16,920
by patreon or two dollars a week by

1505
01:07:21,530 --> 01:07:18,900
patreon or four dollars or whatever the

1506
01:07:25,280 --> 01:07:21,540
case may be or even micropayments

1507
01:07:27,500 --> 01:07:25,290
in a special thank you for you it's you

1508
01:07:30,770 --> 01:07:27,510
who make the show possible for everybody

1509
01:07:33,070 --> 01:07:30,780
else but for everybody who listens I

1510
01:07:38,000 --> 01:07:33,080
hope the show keeps you entertained

1511
01:07:40,820 --> 01:07:38,010
informed and in a very real sense I hope

1512
01:07:43,610 --> 01:07:40,830
we are good company for you I'm looking

1513
01:07:46,610 --> 01:07:43,620

forward to next week Maynard and I are

1514

01:07:48,530 --> 01:07:46,620

off to a high school here in Sydney to

1515

01:07:50,840 --> 01:07:48,540

perform the our mystery investigators

1516

01:07:53,150 --> 01:07:50,850

show once again should be a lot of fun

1517

01:07:56,180 --> 01:07:53,160

oh and don't forget to check out my

1518

01:07:58,760 --> 01:07:56,190

notes podcasts at Maynard comm dot au

1519

01:08:01,190 --> 01:07:58,770

but for this week this is Richard

1520

01:08:05,470 --> 01:08:01,200

Saunders signing off from Sydney

1521

01:08:11,690 --> 01:08:07,880

you've been listening to the skeptic

1522

01:08:14,600 --> 01:08:11,700

zone podcast visit our website at WWF

1523

01:08:18,260 --> 01:08:14,610

tech zone TV for contacts an archive of

1524

01:08:21,170 --> 01:08:18,270

all episodes since 2008 and our online

1525

01:08:23,890 --> 01:08:21,180

store please support the skeptic zone by

1526

01:08:26,900 --> 01:08:23,900

following us on twitter at skeptic zone

1527

01:08:28,430 --> 01:08:26,910

liking us on facebook and leaving a

1528

01:08:30,499 --> 01:08:28,440

review on itunes

1529

01:08:33,289 --> 01:08:30,509

you can also show your support by

1530

01:08:36,920 --> 01:08:33,299

subscribing via PayPal for as little as

1531

01:08:39,079 --> 01:08:36,930

99 cents a week the skeptic zone is an

1532

01:08:41,030 --> 01:08:39,089

independent production the views and

1533

01:08:43,249 --> 01:08:41,040

opinions expressed on the skeptic zone

1534

01:08:46,099 --> 01:08:43,259

and not necessarily those of Australian

1535

01:09:01,590 --> 01:08:46,109

skeptic team or any other skeptical

1536

01:09:01,600 --> 01:09:21,510

[Music]