

1
00:00:00,000 --> 00:00:03,839
I think exploration for inviting me to

2
00:00:01,500 --> 00:00:06,990
give this talk and thinking Daniel

3
00:00:03,839 --> 00:00:09,179
Sheehan and Dominic are the invitation

4
00:00:06,990 --> 00:00:10,679
and the courtesy and the comfort of the

5
00:00:09,179 --> 00:00:12,960
nice hotel

6
00:00:10,679 --> 00:00:15,030
basically I'm here to talk on behalf of

7
00:00:12,960 --> 00:00:17,190
my colleague mark Melissa and I are the

8
00:00:15,029 --> 00:00:20,719
co editors of the book that was

9
00:00:17,190 --> 00:00:23,189
published last February of 2009 the

10
00:00:20,719 --> 00:00:25,829
double-a presses bit frontiers of

11
00:00:23,189 --> 00:00:29,820
profession science and there's the book

12
00:00:25,829 --> 00:00:32,219
cover and the book was designed to be an

13
00:00:29,820 --> 00:00:35,219
academic monograph for the purpose of

14
00:00:32,219 --> 00:00:38,340
reaching advanced undergraduate students

15
00:00:35,219 --> 00:00:40,739
graduate students faculty airspace and

16
00:00:38,340 --> 00:00:44,340
physics professors who are interested in

17
00:00:40,738 --> 00:00:47,429
exploring propulsion physics as well as

18
00:00:44,340 --> 00:00:51,420
that industry scientist we start with

19
00:00:47,429 --> 00:00:53,128
our aspirations aspirations are always

20
00:00:51,420 --> 00:00:55,129
provided by the wonderful science

21
00:00:53,128 --> 00:00:58,890
fiction that we have in world literature

22
00:00:55,128 --> 00:01:01,289
that have inspired midnight motorists we

23
00:00:58,890 --> 00:01:03,600
know long deceased and who've in spite

24
00:01:01,289 --> 00:01:04,948
of the my generation and the other

25
00:01:03,600 --> 00:01:09,780
generations to come

26
00:01:04,948 --> 00:01:12,030
and basically before 1994 where Brad was

27
00:01:09,780 --> 00:01:14,250
only a science fiction that since that

28
00:01:12,030 --> 00:01:15,930
time that the advent of algae-based were

29

00:01:14,250 --> 00:01:17,909
broad metric theory that was published

30
00:01:15,930 --> 00:01:21,689
in classical quantum gravity the

31
00:01:17,909 --> 00:01:23,490
principles have now been postulated here

32
00:01:21,688 --> 00:01:25,139
the merge of scientific progress has

33
00:01:23,489 --> 00:01:27,478
observed that we start with Einstein's

34
00:01:25,140 --> 00:01:29,460
general theory of relativity and the

35
00:01:27,478 --> 00:01:32,700
evolution of quantum mechanics

36
00:01:29,459 --> 00:01:35,009
electrodynamics Bundys negative mass

37
00:01:32,700 --> 00:01:36,450
potential Bob for loops guidelines to

38
00:01:35,009 --> 00:01:38,728
anti-gravity which appeared in the

39
00:01:36,450 --> 00:01:41,490
film's rather than American Journal of

40
00:01:38,728 --> 00:01:44,069
physics there's something that said Kip

41
00:01:41,489 --> 00:01:46,078
Thorne and his grad students derived the

42
00:01:44,069 --> 00:01:49,139
first solution for traversable in his

43
00:01:46,078 --> 00:01:51,279

and then part but now came along with is

44

00:01:49,140 --> 00:01:53,379
our claim of a gravity shield fall

45

00:01:51,280 --> 00:01:56,439
al-kabir publication in the journal of

46

00:01:53,379 --> 00:02:00,339
classical quantum gravity of work drive

47

00:01:56,439 --> 00:02:02,469
they have been house and co-authors help

48

00:02:00,340 --> 00:02:05,140
Rodolfo and so forth and their shelves

49

00:02:02,469 --> 00:02:07,420
as a quantum drag effect called vacuum

50

00:02:05,140 --> 00:02:10,509
bag and chimney lives first patent on

51

00:02:07,420 --> 00:02:13,420
his transient market inertial thruster

52

00:02:10,508 --> 00:02:15,639
and not visitors publication and his new

53

00:02:13,419 --> 00:02:18,539
answer in his book which was a component

54

00:02:15,639 --> 00:02:22,229
of everything published from 1988 to

55

00:02:18,539 --> 00:02:24,340
1995 all in traditional Bavarian has

56

00:02:22,229 --> 00:02:26,409
everything he learned that are about him

57

00:02:24,340 --> 00:02:27,819
including time machines and that was

58
00:02:26,409 --> 00:02:31,900
peddled by the American Institute of

59
00:02:27,819 --> 00:02:33,340
Physics press and they like this at the

60
00:02:31,900 --> 00:02:36,189
beginning of the day for propulsion

61
00:02:33,340 --> 00:02:39,069
physics program that he was the manager

62
00:02:36,189 --> 00:02:41,859
for at NASA Glenn he has a space drawn

63
00:02:39,068 --> 00:02:44,979
concepts and issues and how put out my

64
00:02:41,860 --> 00:02:47,410
boss has developed the polarizable

65
00:02:44,979 --> 00:02:49,479
vacuum and propulsion George Hathaway

66
00:02:47,409 --> 00:02:52,568
was looking at an old test of the power

67
00:02:49,479 --> 00:02:54,340
of gravity shield and Jade and clay and

68
00:02:52,568 --> 00:02:56,979
Bob Ford we're looking at quantum vacuum

69
00:02:54,340 --> 00:02:58,840
energy propulsion so you have that

70
00:02:56,979 --> 00:03:00,219
progress and that's just not that's not

71
00:02:58,840 --> 00:03:03,459
anything that's not an all-inclusive

72
00:03:00,219 --> 00:03:05,169
list there were many other fields many

73
00:03:03,459 --> 00:03:08,199
other topics and physics that were being

74
00:03:05,169 --> 00:03:10,809
evaluated the books purpose was to look

75
00:03:08,199 --> 00:03:12,039
at comparing all the possibilities of

76
00:03:10,810 --> 00:03:13,269
the different types of breakthrough

77
00:03:12,039 --> 00:03:15,669
propulsion physics that would be

78
00:03:13,269 --> 00:03:18,310
proposed by various investigators around

79
00:03:15,669 --> 00:03:20,078
the world not just the hot topics when

80
00:03:18,310 --> 00:03:22,689
we are interested exploring the physics

81
00:03:20,079 --> 00:03:23,520
aerospace engineers and managers without

82
00:03:22,689 --> 00:03:25,169
any higher

83
00:03:23,520 --> 00:03:26,939
because this is the point the people

84
00:03:25,169 --> 00:03:28,559
that work with the policy makers in

85
00:03:26,939 --> 00:03:30,539
government they get the funding they

86

00:03:28,560 --> 00:03:33,000
start the programs and they execute them

87
00:03:30,539 --> 00:03:34,560
and unfortunately the aerospace

88
00:03:33,000 --> 00:03:37,199
engineers are at the cutting edge of

89
00:03:34,560 --> 00:03:38,939
physics physicists are so the idea is to

90
00:03:37,199 --> 00:03:41,579
pay the cutting edge of physics the

91
00:03:38,939 --> 00:03:44,250
filtering and bakery out the the

92
00:03:41,580 --> 00:03:45,930
out-of-the-box ideas to the people in

93
00:03:44,250 --> 00:03:48,060
aerospace engineering who can hopefully

94
00:03:45,930 --> 00:03:50,400
take program develop problems based on

95
00:03:48,060 --> 00:03:54,120
these ideas in order to show it can be

96
00:03:50,400 --> 00:03:57,960
done that could be done next in the way

97
00:03:54,120 --> 00:04:00,360
of here's that we may now here's what's

98
00:03:57,960 --> 00:04:02,849
unresolved and so there's unfinished

99
00:04:00,360 --> 00:04:04,830
business for students and pioneers to

100
00:04:02,849 --> 00:04:08,849

wrap up just to work on to solve

101

00:04:04,830 --> 00:04:10,800

problems on the diamonds to distinguish

102

00:04:08,849 --> 00:04:13,530

films from frontier where that is very

103

00:04:10,800 --> 00:04:15,600

important because this subject is batted

104

00:04:13,530 --> 00:04:17,189

they deal initially at the very

105

00:04:15,599 --> 00:04:19,709

beginning and it still does to a little

106

00:04:17,189 --> 00:04:21,719

small what much smaller degree a lot of

107

00:04:19,709 --> 00:04:24,240

division for the ministry an academic

108

00:04:21,720 --> 00:04:25,530

community because they know the physics

109

00:04:24,240 --> 00:04:27,090

they said they may look at the numbers

110

00:04:25,529 --> 00:04:28,469

they look at the equations and say they

111

00:04:27,089 --> 00:04:30,119

say to themselves well breakthrough

112

00:04:28,470 --> 00:04:32,190

profession physician or such thing they

113

00:04:30,120 --> 00:04:35,040

will drive the wormholes these things

114

00:04:32,189 --> 00:04:37,019

are impossible to attain so they think

115
00:04:35,040 --> 00:04:39,540
that that kind of stuff is to science

116
00:04:37,019 --> 00:04:41,759
fiction for them to dive into but often

117
00:04:39,540 --> 00:04:44,129
beers paper Morrison theories both are

118
00:04:41,759 --> 00:04:46,110
paper that visitors built and so forth

119
00:04:44,129 --> 00:04:49,709
have a brought that into mainstream

120
00:04:46,110 --> 00:04:51,750
physics or here's this is the first

121
00:04:49,709 --> 00:04:53,639
witness book that covers the concept of

122
00:04:51,750 --> 00:04:56,009
gravity control propulsion faster than

123
00:04:53,639 --> 00:05:01,199
light travel related energy conversion

124
00:04:56,009 --> 00:05:05,069
and managing such research in our 18

125
00:05:01,199 --> 00:05:07,289
years authors 2712 offers 22 chapters on

126
00:05:05,069 --> 00:05:09,000
this alien of pages took us on this

127
00:05:07,290 --> 00:05:10,950
three years to put the book together and

128
00:05:09,000 --> 00:05:12,839
as a varieties in favor to that in

129
00:05:10,949 --> 00:05:14,759
envision correctly approaching 2,000

130
00:05:12,839 --> 00:05:17,819
copies sold and it's actually a

131
00:05:14,759 --> 00:05:18,779
best-seller for the inaudible a press in

132
00:05:17,819 --> 00:05:22,230
that series

133
00:05:18,779 --> 00:05:24,299
nearly these series and progress of

134
00:05:22,230 --> 00:05:25,600
astronautics and Aeronautics are usually

135
00:05:24,300 --> 00:05:28,449
jet engine development

136
00:05:25,600 --> 00:05:30,129
rocket fuel's rocket engineer dynamics

137
00:05:28,449 --> 00:05:32,889
astrodynamics and things like that so

138
00:05:30,129 --> 00:05:35,769
this was a smash head for these guys

139
00:05:32,889 --> 00:05:38,439
mark and I over the other news and of

140
00:05:35,769 --> 00:05:40,329
the lead author affiliations 40% didn't

141
00:05:38,439 --> 00:05:42,459
also thirteen percent whatever the US

142
00:05:40,329 --> 00:05:44,050
government labs and thirty percent were

143

00:05:42,459 --> 00:05:46,589
private industry consultants with ten

144
00:05:44,050 --> 00:05:50,800
percent a university is 70 percent for

145
00:05:46,589 --> 00:05:53,919
and here's the list of authors some of

146
00:05:50,800 --> 00:05:55,420
who maybe wanted to if anyone was going

147
00:05:53,920 --> 00:05:57,970
to be desperately letter Jimmy would

148
00:05:55,420 --> 00:06:01,030
work and what it is my boss all put off

149
00:05:57,970 --> 00:06:02,890
and some of these names you may not

150
00:06:01,029 --> 00:06:05,679
recognize but you may recognize Bob

151
00:06:02,889 --> 00:06:07,839
forward we have this power a period of

152
00:06:05,680 --> 00:06:09,879
years which were pulled from the LR

153
00:06:07,839 --> 00:06:11,919
devil a nuclear and future Floyd

154
00:06:09,879 --> 00:06:13,389
Technical Committee they have every a

155
00:06:11,920 --> 00:06:15,100
stands for the American Institute of

156
00:06:13,389 --> 00:06:17,110
Aeronautics and Astronautics and it's a

157
00:06:15,100 --> 00:06:19,689

worldwide aerospace professional Society

158

00:06:17,110 --> 00:06:22,389

it's been around since the beginning of

159

00:06:19,689 --> 00:06:23,949

the 60s and it was a major of the rel

160

00:06:22,389 --> 00:06:26,259

canonical' society with the American

161

00:06:23,949 --> 00:06:31,389

Astronomical Society there are these

162

00:06:26,259 --> 00:06:33,579

were our period years the organization

163

00:06:31,389 --> 00:06:37,209

the belt started this way began in

164

00:06:33,579 --> 00:06:38,709

understanding the problem which is

165

00:06:37,209 --> 00:06:41,669

looking at the history of Aitkin for

166

00:06:38,709 --> 00:06:45,430

patient physics and as it was done by

167

00:06:41,670 --> 00:06:48,310

organizations like my Institute project

168

00:06:45,430 --> 00:06:49,990

we lowered the NASA program and so forth

169

00:06:48,310 --> 00:06:51,670

including our days in the context and

170

00:06:49,990 --> 00:06:53,410

then evaluating the limits of

171

00:06:51,670 --> 00:06:55,150

interstellar technology based on the

172
00:06:53,410 --> 00:06:58,030
advanced physics that we know like solar

173
00:06:55,149 --> 00:07:01,109
cells in power propulsion and antimatter

174
00:06:58,029 --> 00:07:03,339
rockets nuclear propulsion and so forth

175
00:07:01,110 --> 00:07:07,180
profession without rocket that was

176
00:07:03,339 --> 00:07:09,159
looking at a real journey of reaction in

177
00:07:07,180 --> 00:07:11,470
space drives without violating the new

178
00:07:09,160 --> 00:07:13,560
conservation that recover space drive

179
00:07:11,470 --> 00:07:16,330
physics pioneers gravity control

180
00:07:13,560 --> 00:07:18,790
non-viable ages and other approaches

181
00:07:16,329 --> 00:07:22,419
then the faster the on travel will be

182
00:07:18,790 --> 00:07:24,879
based on faster concepts in general to

183
00:07:22,420 --> 00:07:27,310
researchers traversable inhales and

184
00:07:24,879 --> 00:07:29,170
web-browser have been faster by

185
00:07:27,310 --> 00:07:31,449
communications and quantum physics by a

186

00:07:29,170 --> 00:07:34,059

low mortality event

187

00:07:31,449 --> 00:07:35,710

considerations basically licking

188

00:07:34,059 --> 00:07:38,379

animation from the quantum vacuum energy

189

00:07:35,709 --> 00:07:40,959

from sanity lessons and non-viable

190

00:07:38,379 --> 00:07:42,669

attention places like possible cold

191

00:07:40,959 --> 00:07:45,278

fusion and magnetic motors and things

192

00:07:42,668 --> 00:07:46,778

like that from this player failure at

193

00:07:45,278 --> 00:07:49,930

this part of the book published the

194

00:07:46,778 --> 00:07:52,990

computation tears and conventions needed

195

00:07:49,930 --> 00:07:54,939

to have a universe away which when we

196

00:07:52,990 --> 00:07:56,978

talk about these things what kind of

197

00:07:54,939 --> 00:07:58,300

computer programs are applicable for

198

00:07:56,978 --> 00:08:00,668

evaluating breakthrough propulsion

199

00:07:58,300 --> 00:08:02,379

physics translating different orders of

200

00:08:00,668 --> 00:08:05,459
physics into a common injury anything

201
00:08:02,379 --> 00:08:08,199
and then how to do pioneering research

202
00:08:05,459 --> 00:08:10,359
they I've investigated to make that is

203
00:08:08,199 --> 00:08:12,879
to understand the fact that spaceflight

204
00:08:10,360 --> 00:08:15,069
is really hard folks if you look at this

205
00:08:12,879 --> 00:08:16,870
log scale to find out as we go further

206
00:08:15,069 --> 00:08:18,819
and further out of the solar system and

207
00:08:16,870 --> 00:08:21,038
further through the Kuiper belt out to

208
00:08:18,819 --> 00:08:24,009
the aircar now blowing all the way to

209
00:08:21,038 --> 00:08:27,128
Alpha Centauri which is about him just

210
00:08:24,009 --> 00:08:29,889
inside of a million astronomical units

211
00:08:27,129 --> 00:08:33,820
about half a million astronomical units

212
00:08:29,889 --> 00:08:36,579
you see about the technique and energy

213
00:08:33,820 --> 00:08:38,800
demand infrastructure and change in

214
00:08:36,578 --> 00:08:41,500

velocity is gets harder and harder and

215

00:08:38,799 --> 00:08:43,359

harder and harder so I keep this picture

216

00:08:41,500 --> 00:08:45,610

in mind as we progress further into the

217

00:08:43,360 --> 00:08:47,259

talk here when you look at that picture

218

00:08:45,610 --> 00:08:49,360

we want to say well if they're going to

219

00:08:47,259 --> 00:08:51,850

have a profession technology how much

220

00:08:49,360 --> 00:08:53,470

propeller is going to be needed we will

221

00:08:51,850 --> 00:08:54,970

look at an example propeller required

222

00:08:53,470 --> 00:08:58,269

for the mass of the Space Shuttle

223

00:08:54,970 --> 00:09:01,839

Orbiter past 43 light-years so you have

224

00:08:58,269 --> 00:09:04,149

a three axis trophy or showing the pilot

225

00:09:01,839 --> 00:09:07,089

mass increasing in this direction on

226

00:09:04,149 --> 00:09:09,669

nine axis and then rocket efficiency

227

00:09:07,089 --> 00:09:12,440

given in terms of its specific impulse

228

00:09:09,669 --> 00:09:14,958

and seconds increases fairly well

229
00:09:12,440 --> 00:09:17,389
and fission bomb propulsion to the

230
00:09:14,958 --> 00:09:20,628
antimatter rocket 250 thousand second

231
00:09:17,389 --> 00:09:23,028
specific impulse so Rockets get better

232
00:09:20,629 --> 00:09:25,759
that axis and then of course we have

233
00:09:23,028 --> 00:09:27,919
mission adoration the trips get along

234
00:09:25,759 --> 00:09:30,110
the along my toxins and where you learn

235
00:09:27,919 --> 00:09:33,769
from this kind of thing is through the

236
00:09:30,110 --> 00:09:35,870
look at this you see but with specific

237
00:09:33,769 --> 00:09:38,360
impulse in a few thousands of seconds

238
00:09:35,870 --> 00:09:39,799
you're gonna need about 10 billion super

239
00:09:38,360 --> 00:09:42,230
tape there's a propellant in the

240
00:09:39,799 --> 00:09:44,599
dictionary will there's the specific

241
00:09:42,230 --> 00:09:47,149
impulse increases then the propellant

242
00:09:44,600 --> 00:09:51,079
mass drops dramatically that's very less

243
00:09:47,149 --> 00:09:52,669
however consequently the duration of the

244
00:09:51,078 --> 00:09:55,188
mission is going to be a thousand years

245
00:09:52,669 --> 00:09:58,250
if you want to shorten in addition to me

246
00:09:55,188 --> 00:10:00,110
reasonable within a lifespan then as you

247
00:09:58,250 --> 00:10:02,360
see the propellant requiring that your

248
00:10:00,110 --> 00:10:04,009
skyrockets back up again and that's what

249
00:10:02,360 --> 00:10:06,800
you wave for this use and conventionally

250
00:10:04,009 --> 00:10:08,480
until you in physics and this is what

251
00:10:06,799 --> 00:10:10,578
the purpose of our research is about is

252
00:10:08,480 --> 00:10:13,909
how do we overcome this terrible issue

253
00:10:10,578 --> 00:10:15,378
well Bob frisbee who's now retired for

254
00:10:13,909 --> 00:10:17,870
the Jet Propulsion Laboratory

255
00:10:15,379 --> 00:10:21,230
dead-ass started in our bulky but

256
00:10:17,870 --> 00:10:23,778
Davison 85-page chopper 2 and here's the

257

00:10:21,230 --> 00:10:25,310
graph of the cruise speed velocity of an

258
00:10:23,778 --> 00:10:27,559
interstellar mission versus the trip

259
00:10:25,309 --> 00:10:30,528
time and then each of these diagonal

260
00:10:27,559 --> 00:10:32,119
values represent interstellar features

261
00:10:30,528 --> 00:10:34,698
or planetary features and hair style

262
00:10:32,120 --> 00:10:37,519
features at increasing distance for

263
00:10:34,698 --> 00:10:38,349
example the heliopause is out of here

264
00:10:37,519 --> 00:10:40,929
today

265
00:10:38,350 --> 00:10:44,310
line and the gravitational is of the Sun

266
00:10:40,929 --> 00:10:48,309
is at 550 Lu here and the Kuiper belt is

267
00:10:44,309 --> 00:10:50,439
4,200 to 1000 I will not ban your cloud

268
00:10:48,309 --> 00:10:52,269
rise within this bound and this is

269
00:10:50,440 --> 00:10:53,950
interstellar distance from 33

270
00:10:52,269 --> 00:10:56,049
light-years the fading light so that

271
00:10:53,950 --> 00:10:58,870

would be a vision mission so they're

272

00:10:56,049 --> 00:11:01,509

going to look at the fact that the layer

273

00:10:58,870 --> 00:11:02,889

of the increase velocity the rather it's

274

00:11:01,509 --> 00:11:06,490

going to take to get there

275

00:11:02,889 --> 00:11:07,720

the faster you go the shorter this time

276

00:11:06,490 --> 00:11:11,110

it's going to take you to get there and

277

00:11:07,720 --> 00:11:12,910

then you compare this the requirement of

278

00:11:11,110 --> 00:11:13,810

the propulsion capabilities that are

279

00:11:12,909 --> 00:11:16,689

going to be able to meet those

280

00:11:13,809 --> 00:11:18,429

requirements so here Bob frisbee took a

281

00:11:16,690 --> 00:11:21,160

look and saw how these propulsion

282

00:11:18,429 --> 00:11:23,949

technologies NEP is nuclear electric

283

00:11:21,159 --> 00:11:25,899

propulsion and so how they mesh in how

284

00:11:23,950 --> 00:11:29,740

they cut across the slice of the

285

00:11:25,899 --> 00:11:31,539

distance versus time versus speed axis

286

00:11:29,740 --> 00:11:32,950
and here the other part of the

287

00:11:31,539 --> 00:11:34,299
professional capabilities that we

288

00:11:32,950 --> 00:11:36,220
theater-style initially matter

289

00:11:34,299 --> 00:11:38,769
antimatter beam energy and fusion Ram

290

00:11:36,220 --> 00:11:40,540
Jackson so badass he took a look at the

291

00:11:38,769 --> 00:11:42,699
anus of interstellar flight technology

292

00:11:40,539 --> 00:11:45,429
he looked at those profession concepts

293

00:11:42,700 --> 00:11:47,080
and apply two filters a bag of v

294

00:11:45,429 --> 00:11:49,209
capability man against the change of

295

00:11:47,080 --> 00:11:51,820
velocity needed to be there and to get

296

00:11:49,210 --> 00:11:53,650
to the cruise speedy the infrastructure

297

00:11:51,820 --> 00:11:55,060
requirements are like how big can you

298

00:11:53,649 --> 00:11:57,399
build your talents to carry the

299

00:11:55,059 --> 00:11:59,049
propellant as well as radiation

300
00:11:57,399 --> 00:12:01,240
shielding within the potential system

301
00:11:59,049 --> 00:12:03,129
and so forth and then the technology

302
00:12:01,240 --> 00:12:05,440
requirements on building it and we apply

303
00:12:03,129 --> 00:12:08,379
these three folders and as say for that

304
00:12:05,440 --> 00:12:11,170
last big list of possibilities they

305
00:12:08,379 --> 00:12:14,049
start getting really them into very few

306
00:12:11,169 --> 00:12:15,669
number of possibilities self-serving a

307
00:12:14,049 --> 00:12:17,769
questionable you know a theory of a new

308
00:12:15,669 --> 00:12:22,120
definitely else they survived all three

309
00:12:17,769 --> 00:12:23,710
failure so it's not very helpful so a

310
00:12:22,120 --> 00:12:26,139
proportion talk now this tells us

311
00:12:23,710 --> 00:12:28,360
application technology even to the even

312
00:12:26,139 --> 00:12:30,039
fish to the raiment of innovative

313
00:12:28,360 --> 00:12:32,139
physics is basically an adequate for

314

00:12:30,039 --> 00:12:34,269
timely interstellar flight to circumvent

315
00:12:32,139 --> 00:12:35,830
these new limits are these limits we

316
00:12:34,269 --> 00:12:38,299
gotta have the new propulsion physics of

317
00:12:35,830 --> 00:12:40,410
some sort even if the

318
00:12:38,299 --> 00:12:42,750
impossible investigating physics in

319
00:12:40,409 --> 00:12:45,329
terms of spaceflight introduces new

320
00:12:42,750 --> 00:12:47,639
perspectives to solving the mysteries of

321
00:12:45,330 --> 00:12:49,350
science may optimistically of

322
00:12:47,639 --> 00:12:51,299
reification physicists discovered a new

323
00:12:49,350 --> 00:12:52,980
class of technologies would result in

324
00:12:51,299 --> 00:12:55,219
revolutionize in space flight and

325
00:12:52,980 --> 00:12:58,980
enabling humanity to reach the other

326
00:12:55,220 --> 00:13:01,050
debate of the stars here's an envelop

327
00:12:58,980 --> 00:13:03,240
that mark likes to use show people its

328
00:13:01,049 --> 00:13:05,490

history repeating itself to exceed the

329

00:13:03,240 --> 00:13:08,039

limits apply our technology we want to

330

00:13:05,490 --> 00:13:10,049

see entirely different technology and

331

00:13:08,039 --> 00:13:12,360

that was given from the book by

332

00:13:10,049 --> 00:13:14,849

fostering titled innovation the

333

00:13:12,360 --> 00:13:16,800

attackers advantage publishing 86 here

334

00:13:14,850 --> 00:13:19,290

is showing that the Masters that have

335

00:13:16,799 --> 00:13:21,209

mastered a certain type of technology

336

00:13:19,289 --> 00:13:23,879

are using incremental evolutionary

337

00:13:21,210 --> 00:13:26,519

approach to improve the technology till

338

00:13:23,879 --> 00:13:29,370

it fills performance flatlines that

339

00:13:26,519 --> 00:13:31,939

revolutionary pioneers engage in

340

00:13:29,370 --> 00:13:34,769

research and develop disruptive in

341

00:13:31,940 --> 00:13:36,690

disruptive innovations that basically

342

00:13:34,769 --> 00:13:38,279

lead to revolutionary technologies that

343
00:13:36,690 --> 00:13:42,660
they're way above the performance

344
00:13:38,279 --> 00:13:45,149
flatline so basically we're looking at

345
00:13:42,659 --> 00:13:47,549
compare revolutionary research twelve

346
00:13:45,149 --> 00:13:50,399
additional research we master the know

347
00:13:47,549 --> 00:13:52,289
like how they mastered said that our

348
00:13:50,399 --> 00:13:56,220
Savior technology and the sea and

349
00:13:52,289 --> 00:13:59,789
advanced it back in tubes if they may we

350
00:13:56,220 --> 00:14:01,860
have the piston driven propeller

351
00:13:59,789 --> 00:14:02,909
fighters that we advanced among the

352
00:14:01,860 --> 00:14:05,370
really line

353
00:14:02,909 --> 00:14:08,009
with the future recorded the main

354
00:14:05,370 --> 00:14:10,950
concept so this is what an example of

355
00:14:08,009 --> 00:14:12,870
evolutionary research mastery what we

356
00:14:10,950 --> 00:14:14,850
already know is looks like and then

357
00:14:12,870 --> 00:14:16,470
revolutionary research leads to the

358
00:14:14,850 --> 00:14:19,769
invention of the steam engine which may

359
00:14:16,470 --> 00:14:23,730
beyond the concept of using cells to

360
00:14:19,769 --> 00:14:25,470
generate thrust sized a transistors the

361
00:14:23,730 --> 00:14:28,860
jet engine and hopefully in the future

362
00:14:25,470 --> 00:14:32,460
warp drives an example of revolutionary

363
00:14:28,860 --> 00:14:34,320
research there very things that we

364
00:14:32,460 --> 00:14:36,870
discovered in the abated profession

365
00:14:34,320 --> 00:14:38,910
physics program at NASA is without a

366
00:14:36,870 --> 00:14:42,870
look at these three things now speed and

367
00:14:38,909 --> 00:14:45,120
energy because really propulsion methods

368
00:14:42,870 --> 00:14:47,070
that eliminate the need for propellant

369
00:14:45,120 --> 00:14:49,350
or beaming energy you just don't want to

370
00:14:47,070 --> 00:14:51,750
take so much with you how can we have a

371

00:14:49,350 --> 00:14:53,759
fast interstellar trip without having to

372
00:14:51,750 --> 00:14:56,820
drive all that power with you or are

373
00:14:53,759 --> 00:14:59,069
that propellant the energy source is the

374
00:14:56,820 --> 00:15:00,240
big driver of the engineering speed to

375
00:14:59,070 --> 00:15:01,920
spend it all is simply whether existing

376
00:15:00,240 --> 00:15:03,779
units like light speed limit to

377
00:15:01,919 --> 00:15:04,860
dramatically reduce trans at times and

378
00:15:03,779 --> 00:15:07,769
that leads to faster and light

379
00:15:04,860 --> 00:15:10,139
considerations and energy are leaves us

380
00:15:07,769 --> 00:15:12,629
to what methods do we have available to

381
00:15:10,139 --> 00:15:15,179
power these these types of technologies

382
00:15:12,629 --> 00:15:16,799
or these types of physics the

383
00:15:15,179 --> 00:15:18,870
state-of-the-art assessment that we've

384
00:15:16,799 --> 00:15:19,919
looked at now shows that no big things

385
00:15:18,870 --> 00:15:22,080

are aiming it at this time

386

00:15:19,919 --> 00:15:23,849

most research that's being done that

387

00:15:22,080 --> 00:15:25,889

steps more to in the scientific method

388

00:15:23,850 --> 00:15:27,509

which is just defining the problem and

389

00:15:25,889 --> 00:15:30,539

collecting the data theoretically and

390

00:15:27,509 --> 00:15:32,610

some empirically some research has been

391

00:15:30,539 --> 00:15:34,589

on as far as stop stealing fair which is

392

00:15:32,610 --> 00:15:37,860

fairly hypothesis and testing it and

393

00:15:34,590 --> 00:15:39,090

then the degree of activities use dozens

394

00:15:37,860 --> 00:15:43,769

of research they publish directly

395

00:15:39,090 --> 00:15:45,420

related our papers they publish publish

396

00:15:43,769 --> 00:15:46,799

directly related to billions okay other

397

00:15:45,419 --> 00:15:48,629

system should have said their papers

398

00:15:46,799 --> 00:15:50,370

were directly related to goals hundreds

399

00:15:48,629 --> 00:15:52,830

of researchers covered related basic

400
00:15:50,370 --> 00:15:54,960
physics now a recent phase work their

401
00:15:52,830 --> 00:15:57,629
mistress credibility and Pete's progress

402
00:15:54,960 --> 00:15:59,009
so there's a lot of this going on and

403
00:15:57,629 --> 00:16:00,809
this is the problem that has to be

404
00:15:59,009 --> 00:16:03,689
avoided because this is where theta

405
00:16:00,809 --> 00:16:05,609
sweet word concerns federal policymakers

406
00:16:03,690 --> 00:16:09,150
when it comes to time to asking for

407
00:16:05,610 --> 00:16:11,730
funding for these type of projects when

408
00:16:09,149 --> 00:16:14,409
we look at the women maybe our physics

409
00:16:11,730 --> 00:16:16,149
to break through spaceflight

410
00:16:14,409 --> 00:16:17,708
those foundations of the main physics

411
00:16:16,149 --> 00:16:19,740
that we're looking at now by plugging

412
00:16:17,708 --> 00:16:22,628
back in zero point energies

413
00:16:19,740 --> 00:16:24,610
dark energy dark matter of the Big Bang

414
00:16:22,629 --> 00:16:27,610
and quantum entanglement in

415
00:16:24,610 --> 00:16:29,318
teleportation and what we're asking is

416
00:16:27,610 --> 00:16:31,329
whether than unresolved questions in

417
00:16:29,318 --> 00:16:33,519
these area of physics and then we look

418
00:16:31,328 --> 00:16:35,438
at the debut of envision slightly faster

419
00:16:33,519 --> 00:16:37,089
right in the end of the stars what are

420
00:16:35,438 --> 00:16:38,980
the critical issues in the lens of the

421
00:16:37,089 --> 00:16:40,600
physics and news and you find that

422
00:16:38,980 --> 00:16:43,778
there's the collision where these two

423
00:16:40,600 --> 00:16:45,250
sides intersect the intersection reveals

424
00:16:43,778 --> 00:16:46,870
the important problems that need to be

425
00:16:45,250 --> 00:16:49,379
solved they live in vain through

426
00:16:46,870 --> 00:16:52,360
profession conference our concept and

427
00:16:49,379 --> 00:16:54,519
this is the foundation of a bill is

428

00:16:52,360 --> 00:16:56,110
making out rigorous foundations of what

429
00:16:54,519 --> 00:16:59,500
we know in physics and what are the

430
00:16:56,110 --> 00:17:01,720
unknowns and then what we desire for our

431
00:16:59,500 --> 00:17:03,850
future space transport system for

432
00:17:01,720 --> 00:17:07,269
interstellar travel and then we're there

433
00:17:03,850 --> 00:17:10,959
intersection occurs is what we are doing

434
00:17:07,269 --> 00:17:14,139
in the bill to explain so here are the

435
00:17:10,959 --> 00:17:16,509
vision bigger goals mass speed and

436
00:17:14,140 --> 00:17:18,579
energy as I described earlier and then

437
00:17:16,509 --> 00:17:20,558
read the bill may envision concepts and

438
00:17:18,578 --> 00:17:22,658
categories and then here are the

439
00:17:20,558 --> 00:17:25,298
rigorous foundations of science that we

440
00:17:22,659 --> 00:17:27,669
well the now let's hear the trades the

441
00:17:25,298 --> 00:17:29,710
theories the spa and the curiosities

442
00:17:27,669 --> 00:17:31,990

that come out of those areas of science

443

00:17:29,710 --> 00:17:37,298

and then in the middle of the important

444

00:17:31,990 --> 00:17:39,400

problems intersection and I mean you

445

00:17:37,298 --> 00:17:42,389

could see there's quite a detailed chart

446

00:17:39,400 --> 00:17:46,509

of very well highly interconnected

447

00:17:42,390 --> 00:17:47,740

concepts it's too long there's only

448

00:17:46,509 --> 00:17:49,929

enough time for me to go through this

449

00:17:47,740 --> 00:17:52,630

but these are all the concepts that we

450

00:17:49,929 --> 00:17:54,700

evaluated in the book in those 22

451

00:17:52,630 --> 00:17:57,850

chapters but we've only looked at a

452

00:17:54,700 --> 00:18:00,038

couple of these topics the books table

453

00:17:57,849 --> 00:18:02,079

of contents is laid out there like this

454

00:18:00,038 --> 00:18:03,609

we have to fail written by Barrett

455

00:18:02,079 --> 00:18:05,319

returned we originally had arthur c

456

00:18:03,609 --> 00:18:07,079

clarke but he died while was we human in

457
00:18:05,319 --> 00:18:08,759
a script so we

458
00:18:07,079 --> 00:18:11,609
asked our good friend that we tend to

459
00:18:08,759 --> 00:18:15,089
occasionally and do the and do that for

460
00:18:11,609 --> 00:18:17,099
us so we have to the contextual history

461
00:18:15,089 --> 00:18:18,928
of breakthrough propulsion physics was

462
00:18:17,099 --> 00:18:21,748
done by Paul Wester who is a space

463
00:18:18,929 --> 00:18:25,889
journalist he has the Centauri Dreams

464
00:18:21,749 --> 00:18:27,360
website his about frisbees chapter Mark

465
00:18:25,888 --> 00:18:30,449
Miller says the chapters and space

466
00:18:27,359 --> 00:18:33,449
drives I've got gravity control George

467
00:18:30,450 --> 00:18:35,730
Hathaway in Toronto has fabulous

468
00:18:33,450 --> 00:18:38,639
superconductors and my environment

469
00:18:35,730 --> 00:18:41,220
mechanical devices is a anti-gravity

470
00:18:38,638 --> 00:18:43,618
gyros which have been tested and shown

471
00:18:41,220 --> 00:18:45,058
not to be anti-gravity they're basically

472
00:18:43,618 --> 00:18:47,388
they basically are non-volatile

473
00:18:45,058 --> 00:18:49,769
anti-gravity devices the on the shooter

474
00:18:47,388 --> 00:18:52,288
examination is done by Steve authority

475
00:18:49,769 --> 00:18:55,200
at the Air Force Academy it's electric

476
00:18:52,288 --> 00:18:59,099
gravity unification that that was an oil

477
00:18:55,200 --> 00:19:01,499
test counts and very lifters we are a

478
00:18:59,099 --> 00:19:05,459
two chapters cover that because that is

479
00:19:01,499 --> 00:19:07,230
a long very a several decade old concept

480
00:19:05,460 --> 00:19:09,389
that people have been fighting over or

481
00:19:07,230 --> 00:19:10,798
the finally found out that telling

482
00:19:09,388 --> 00:19:12,269
somebody if there's have nothing to do

483
00:19:10,798 --> 00:19:15,239
is they appointed you nothing to do with

484
00:19:12,269 --> 00:19:18,089
electro gravity it's not even oil in its

485

00:19:15,239 --> 00:19:20,819
neutral particle and they have testing

486
00:19:18,089 --> 00:19:23,449
Dennett national some mash Sandia

487
00:19:20,819 --> 00:19:25,278
National Laboratory by a mere a tile and

488
00:19:23,450 --> 00:19:28,139
clarity is a private investigator

489
00:19:25,278 --> 00:19:30,028
scientists in the defense industry who

490
00:19:28,138 --> 00:19:31,248
did is also and then he said others

491
00:19:30,028 --> 00:19:33,808
other topics that we've covered

492
00:19:31,249 --> 00:19:35,759
yesterday this the quantum vacuum

493
00:19:33,808 --> 00:19:38,460
initializer stochastic Petri dynamics

494
00:19:35,759 --> 00:19:41,249
relativistic spaceflight or faster no

495
00:19:38,460 --> 00:19:44,788
topics faster light communications

496
00:19:41,249 --> 00:19:47,129
space powers zero point energy Steiner

497
00:19:44,788 --> 00:19:49,888
in Russells free energy curves

498
00:19:47,128 --> 00:19:51,538
computational tools so now we're going

499
00:19:49,888 --> 00:19:52,498

to get into there a couple of the topics

500

00:19:51,538 --> 00:19:57,210

where drives

501

00:19:52,499 --> 00:19:59,489

oh so you make it work drives and they

502

00:19:57,210 --> 00:20:01,788

ask the question is it possible and the

503

00:19:59,489 --> 00:20:03,619

answer is yes Einstein's theory is where

504

00:20:01,788 --> 00:20:06,499

we'll go paint them that's where our

505

00:20:03,618 --> 00:20:09,648

Kabir discover the metric by looking at

506

00:20:06,499 --> 00:20:10,999

how do I wanna leave a ship the space at

507

00:20:09,648 --> 00:20:13,219

web speed how does it work

508

00:20:10,999 --> 00:20:15,139

the ship looks like it's ball surfing on

509

00:20:13,220 --> 00:20:17,538

a wave of space-time faster than light

510

00:20:15,138 --> 00:20:19,488

but yeah the reference frame the ship is

511

00:20:17,538 --> 00:20:21,200

in it's not violating the special

512

00:20:19,489 --> 00:20:23,090

relativity principle because the

513

00:20:21,200 --> 00:20:25,038

spaceship is with an inertial frame

514
00:20:23,089 --> 00:20:27,558
that's always traveling less than light

515
00:20:25,038 --> 00:20:30,378
that it's the remote observers outside

516
00:20:27,558 --> 00:20:32,329
that we abundant that we're better fed

517
00:20:30,378 --> 00:20:35,358
up by negative vacuum energy that

518
00:20:32,329 --> 00:20:37,699
creates this will drive effect when they

519
00:20:35,358 --> 00:20:38,528
were outside looking at this they say

520
00:20:37,700 --> 00:20:40,819
this thing

521
00:20:38,528 --> 00:20:43,608
transitive space our super limited

522
00:20:40,819 --> 00:20:45,918
speeds and it's absolute supreme speeds

523
00:20:43,608 --> 00:20:48,168
not effective the energy required

524
00:20:45,919 --> 00:20:50,599
however is extremely high and the unity

525
00:20:48,169 --> 00:20:53,179
of the SteriPEN to a negative mass

526
00:20:50,598 --> 00:20:54,710
equivalence because your carriers you

527
00:20:53,179 --> 00:20:57,499
out of the Balaton is called sub balki

528
00:20:54,710 --> 00:21:01,069
energy and this is the most difficult

529
00:20:57,499 --> 00:21:04,098
thing to engineer commercially and those

530
00:21:01,069 --> 00:21:05,989
are different genre nothing moves except

531
00:21:04,098 --> 00:21:09,259
the traveler you set up the negative

532
00:21:05,989 --> 00:21:10,909
energy shell and this is a this is a

533
00:21:09,259 --> 00:21:12,288
fictitious diagram this is not a world

534
00:21:10,909 --> 00:21:15,080
where they live site this is called a

535
00:21:12,288 --> 00:21:18,278
thorn diagram and a flam diagram is a

536
00:21:15,079 --> 00:21:21,710
constant picture in time and radius and

537
00:21:18,278 --> 00:21:24,348
we're looking at a constant angle θ

538
00:21:21,710 --> 00:21:26,298
and so this not particular spherical and

539
00:21:24,348 --> 00:21:28,489
safer so we're just taking a slice

540
00:21:26,298 --> 00:21:29,808
through constant only one angle so

541
00:21:28,489 --> 00:21:31,399
basically we're going to have a field

542

00:21:29,808 --> 00:21:33,888
with negative energy that has odd

543
00:21:31,398 --> 00:21:34,699
replace of gravitational force it dishes

544
00:21:33,888 --> 00:21:36,498
space out

545
00:21:34,700 --> 00:21:38,269
wholesome fear dopant keeps it from

546
00:21:36,499 --> 00:21:40,579
collapse and there's no event horizon

547
00:21:38,269 --> 00:21:42,288
were singularity like a block wall so

548
00:21:40,579 --> 00:21:44,269
travelers should be able to go inside

549
00:21:42,288 --> 00:21:46,190
that now and then through the fear

550
00:21:44,269 --> 00:21:48,710
without didn't we depart and come out

551
00:21:46,190 --> 00:21:50,659
the other side the night stay at PNA

552
00:21:48,710 --> 00:21:53,329
which is the a theory right but KB which

553
00:21:50,659 --> 00:21:55,099
is serious this is me on this space this

554
00:21:53,329 --> 00:21:56,598
is the normos based on continuing what

555
00:21:55,098 --> 00:21:58,220
you would really otherwise travel

556
00:21:56,598 --> 00:22:00,829

through but this is a shortcut through

557

00:21:58,220 --> 00:22:04,368

hyperspace need and you get there in

558

00:22:00,829 --> 00:22:08,269

just a matter of seconds there's a big

559

00:22:04,368 --> 00:22:10,220

valentine square wave made out nobody on

560

00:22:08,269 --> 00:22:13,329

the Sony you can see what kind of

561

00:22:10,220 --> 00:22:16,308

there's a galaxy there when his

562

00:22:13,329 --> 00:22:18,428

anti-gravitational out they can't

563

00:22:16,308 --> 00:22:21,769

activate now I like to call that snooze

564

00:22:18,429 --> 00:22:23,210

they that know when there's actually

565

00:22:21,769 --> 00:22:26,298

acting like a spherical Christmas

566

00:22:23,210 --> 00:22:27,798

ornament a spherical one's so the image

567

00:22:26,298 --> 00:22:31,128

on the inside coming from the other side

568

00:22:27,798 --> 00:22:34,308

of the world now is basically distorted

569

00:22:31,128 --> 00:22:36,199

and inverted there's a flat Wien whole

570

00:22:34,308 --> 00:22:38,000

one of us can take many shapes that can

571
00:22:36,200 --> 00:22:39,889
be spherical that to be fact that that

572
00:22:38,000 --> 00:22:45,980
we retain the way that can be polyhedral

573
00:22:39,888 --> 00:22:51,019
and self-worth so any of the concepts of

574
00:22:45,980 --> 00:22:52,610
all where drives a locality basically in

575
00:22:51,019 --> 00:22:55,609
the unresolved issues are the

576
00:22:52,609 --> 00:22:57,878
unobtainable mad about energy negative

577
00:22:55,609 --> 00:23:01,849
ten of the formula tools required to

578
00:22:57,878 --> 00:23:03,678
create a 100 meter diameter wheel bubble

579
00:23:01,849 --> 00:23:06,319
so that you can only have a wave the

580
00:23:03,679 --> 00:23:08,330
very corners per second it gets it's

581
00:23:06,319 --> 00:23:10,519
still bad really even today the speed of

582
00:23:08,329 --> 00:23:12,500
the snails crawl when a day as they as a

583
00:23:10,519 --> 00:23:15,470
snails crawl it's about negative 20 or

584
00:23:12,500 --> 00:23:18,230
30 something channels so the this is

585
00:23:15,470 --> 00:23:20,179
this is based on the energy study done

586
00:23:18,230 --> 00:23:21,950
by Matt visitors colleagues who looked

587
00:23:20,179 --> 00:23:24,679
at the gravitational interaction between

588
00:23:21,950 --> 00:23:27,740
web bubble the spaceship and they were

589
00:23:24,679 --> 00:23:30,590
perfect in the space time and the energy

590
00:23:27,740 --> 00:23:32,929
conditions and basically we they

591
00:23:30,589 --> 00:23:34,609
discovered that it deprives you just

592
00:23:32,929 --> 00:23:35,990
impractical if you've been out that this

593
00:23:34,609 --> 00:23:37,308
mission negative energy pulled out of

594
00:23:35,990 --> 00:23:39,829
the vacuum the basically it's

595
00:23:37,308 --> 00:23:41,750
impractical to use another native energy

596
00:23:39,829 --> 00:23:43,908
conditions or the conditions are what

597
00:23:41,750 --> 00:23:47,599
allows you to create that kind of energy

598
00:23:43,909 --> 00:23:49,100
out of the vacuum control ability is are

599

00:23:47,599 --> 00:23:51,199
causally disconnected since i've been

600
00:23:49,099 --> 00:23:53,058
you created world bevel the starship is

601
00:23:51,200 --> 00:23:55,069
not able to causally connect to it

602
00:23:53,058 --> 00:23:56,690
you're not able to control it so about

603
00:23:55,069 --> 00:23:58,908
maybe problem you always have closed

604
00:23:56,690 --> 00:24:01,519
timelike curves or time machines in work

605
00:23:58,909 --> 00:24:03,590
drives and wormholes and momentum

606
00:24:01,519 --> 00:24:05,808
conservation hasn't been evaluated on

607
00:24:03,589 --> 00:24:07,609
this caveat though by saying that

608
00:24:05,808 --> 00:24:09,769
Einstein's general theory field

609
00:24:07,609 --> 00:24:11,508
equations already have conservation was

610
00:24:09,769 --> 00:24:13,399
built into them it's just out there

611
00:24:11,509 --> 00:24:15,870
having been demonstrated explicitly by

612
00:24:13,398 --> 00:24:18,129
any of the theorists are john cream

613
00:24:15,869 --> 00:24:20,319

requirement more locality by looking at

614

00:24:18,130 --> 00:24:22,240

virtual causal communication and that it

615

00:24:20,319 --> 00:24:25,349

is communicating backwards in time by

616

00:24:22,240 --> 00:24:27,910

way of a corner entitlement experiment

617

00:24:25,349 --> 00:24:30,788

so this is what the book sections look

618

00:24:27,910 --> 00:24:33,279

like four-wheel drives Indian Hills and

619

00:24:30,788 --> 00:24:35,740

interconnected out of the rigorous known

620

00:24:33,279 --> 00:24:38,980

things the unknown of the interesting

621

00:24:35,740 --> 00:24:41,288

curiosities then the hypothesis and test

622

00:24:38,980 --> 00:24:42,929

of the vacuum fluctuations that are

623

00:24:41,288 --> 00:24:46,450

needed to create the negative energy

624

00:24:42,929 --> 00:24:48,190

issues in their names and the concepts

625

00:24:46,450 --> 00:24:50,710

of their of the goal vision driven of

626

00:24:48,190 --> 00:24:55,409

the day up of the veil driven visions

627

00:24:50,710 --> 00:24:58,450

that's right it is that john cream is

628
00:24:55,409 --> 00:25:01,870
experimental design for a retro causal

629
00:24:58,450 --> 00:25:03,190
experience for FTL suddenly and i don't

630
00:25:01,869 --> 00:25:05,558
have too much time to talk about that

631
00:25:03,190 --> 00:25:07,419
but that's in the book this is martin

632
00:25:05,558 --> 00:25:09,759
else's notion of space drives he's

633
00:25:07,419 --> 00:25:11,770
making that you know without violating

634
00:25:09,759 --> 00:25:13,929
in momentum energy conservation is there

635
00:25:11,769 --> 00:25:16,658
where we can manipulate space-time or

636
00:25:13,929 --> 00:25:18,970
inertial frames back to create a space

637
00:25:16,659 --> 00:25:21,490
drive that would submit a differential

638
00:25:18,970 --> 00:25:23,319
sale or an induction sir or a diode sale

639
00:25:21,490 --> 00:25:26,470
and these are just a fairly straight of

640
00:25:23,319 --> 00:25:29,019
purposes only and he's looking at thrust

641
00:25:26,470 --> 00:25:31,269
and pressure in area calculations as a

642
00:25:29,019 --> 00:25:34,440
way of deriving a conceptualization of

643
00:25:31,269 --> 00:25:37,179
these things and this is you know

644
00:25:34,440 --> 00:25:38,919
metadata above a of some sort or change

645
00:25:37,179 --> 00:25:41,530
initial frames would push on that in

646
00:25:38,919 --> 00:25:43,059
space and so this is what he's kind of

647
00:25:41,529 --> 00:25:47,099
thinking in his mind he would like to

648
00:25:43,058 --> 00:25:51,629
see happen but then here's another way

649
00:25:47,099 --> 00:25:54,788
this is the soap bubble analogy of the

650
00:25:51,630 --> 00:26:01,030
space-time be worked in such a way that

651
00:25:54,788 --> 00:26:02,710
that pushes you forward okay and so this

652
00:26:01,029 --> 00:26:05,109
is the initial for notifications

653
00:26:02,710 --> 00:26:07,569
propulsion so these are the concepts be

654
00:26:05,109 --> 00:26:10,779
explored that Bob Forge gravitational

655
00:26:07,569 --> 00:26:13,629
dipole Martin Taylor is for validating

656

00:26:10,779 --> 00:26:16,240
device and here the concepts that are

657
00:26:13,630 --> 00:26:18,520
involved in the biggest foundations and

658
00:26:16,240 --> 00:26:19,960
curiosities have been the theory of

659
00:26:18,519 --> 00:26:22,000
envisions the concepts and categories

660
00:26:19,960 --> 00:26:24,360
and then everything that intersection

661
00:26:22,000 --> 00:26:27,279
between that needs to be studied

662
00:26:24,359 --> 00:26:29,079
space drive science issues they are made

663
00:26:27,279 --> 00:26:31,869
in two dozen approaches to eliminate all

664
00:26:29,079 --> 00:26:33,460
specific issues and opportunities their

665
00:26:31,869 --> 00:26:35,649
objections and objectives

666
00:26:33,460 --> 00:26:37,419
conservation of momentum net external

667
00:26:35,650 --> 00:26:40,570
force that is your conservation because

668
00:26:37,419 --> 00:26:43,450
remember Newton's third law says option

669
00:26:40,569 --> 00:26:45,428
equals reaction and we don't know

670
00:26:43,450 --> 00:26:48,610

everything that has reaction with drives

671

00:26:45,429 --> 00:26:51,130

well drive is probably the closest I

672

00:26:48,609 --> 00:26:54,939

think to meeting this definition because

673

00:26:51,130 --> 00:26:57,549

there is no there is no use of news

674

00:26:54,940 --> 00:26:59,080

they've now it doesn't need to occur our

675

00:26:57,548 --> 00:26:59,740

tradition Bavarian here's that's a

676

00:26:59,079 --> 00:27:01,899

different story

677

00:26:59,740 --> 00:27:04,029

a commercially named he was a fixated

678

00:27:01,900 --> 00:27:06,610

thing in space so it's a fixed total the

679

00:27:04,029 --> 00:27:08,649

Explorer is doing is doing the moving

680

00:27:06,609 --> 00:27:11,408

he's going to be a rocket he's going to

681

00:27:08,650 --> 00:27:12,700

health to expel propellant or in here to

682

00:27:11,409 --> 00:27:13,990

move forward through the air hole but

683

00:27:12,700 --> 00:27:16,298

that's okay because the window is a

684

00:27:13,990 --> 00:27:18,419

shortcut so did seem to study

685
00:27:16,298 --> 00:27:20,918
interstellar distances very quickly and

686
00:27:18,419 --> 00:27:22,960
so there's nothing out there are you

687
00:27:20,919 --> 00:27:25,540
solve curiosities I can issue Fame for

688
00:27:22,960 --> 00:27:26,590
meters we don't know basically from the

689
00:27:25,539 --> 00:27:28,240
earliest times during their initial

690
00:27:26,589 --> 00:27:28,899
frames come from you don't know how they

691
00:27:28,240 --> 00:27:30,579
are

692
00:27:28,900 --> 00:27:32,740
it's the fundamental basis of it

693
00:27:30,579 --> 00:27:34,298
generates are these big out of inertial

694
00:27:32,740 --> 00:27:35,970
frame but we don't know about much about

695
00:27:34,298 --> 00:27:38,200
it other than that machs piece of

696
00:27:35,970 --> 00:27:40,150
space-time density this is interesting

697
00:27:38,200 --> 00:27:40,659
this is not a experimental error here

698
00:27:40,150 --> 00:27:42,880
mark

699
00:27:40,659 --> 00:27:45,190
if this was 10 to the negative n plus or

700
00:27:42,880 --> 00:27:47,020
minus 26 kilogram per cubic meter this

701
00:27:45,190 --> 00:27:50,558
is the way she say the arranging for the

702
00:27:47,019 --> 00:27:53,440
tend to be negative way to 10 to the 26

703
00:27:50,558 --> 00:27:56,379
and I thought was a bad way very not

704
00:27:53,440 --> 00:27:59,169
docking according back in density this

705
00:27:56,380 --> 00:28:01,809
is again a ways it's not representative

706
00:27:59,169 --> 00:28:03,250
of our measuring error this is represent

707
00:28:01,808 --> 00:28:05,200
the better table is right there this is

708
00:28:03,250 --> 00:28:08,200
the better table I tell you we won't

709
00:28:05,200 --> 00:28:09,880
experience the many look at the density

710
00:28:08,200 --> 00:28:11,319
of space-time because this gives us an

711
00:28:09,880 --> 00:28:14,200
idea what can we do to manipulate

712
00:28:11,319 --> 00:28:15,700
initial feelings or a better space-time

713

00:28:14,200 --> 00:28:18,460
so you look at the density of their

714
00:28:15,700 --> 00:28:21,069
matter they are depressed dark matter

715
00:28:18,460 --> 00:28:23,319
and it helped us to have the same mass

716
00:28:21,069 --> 00:28:27,220
densities dark energy based on the

717
00:28:23,319 --> 00:28:28,349
misery of time to a supernova redshift

718
00:28:27,220 --> 00:28:30,360
far out and

719
00:28:28,349 --> 00:28:31,709
the edge of the universe the mass

720
00:28:30,359 --> 00:28:33,689
density is telling the negative

721
00:28:31,710 --> 00:28:35,460
twenty-six kilograms per cubic meter the

722
00:28:33,690 --> 00:28:38,009
energy density of the Nano joule per

723
00:28:35,460 --> 00:28:40,440
cubic meter if you take the

724
00:28:38,009 --> 00:28:42,538
electromagnetic zero energy and you

725
00:28:40,440 --> 00:28:44,788
integrated to the nucleon Compton

726
00:28:42,538 --> 00:28:46,230
frequency this is the energy basis this

727
00:28:44,788 --> 00:28:48,629

is the mass density you get from that

728

00:28:46,230 --> 00:28:51,329
energy and I think this would be

729

00:28:48,630 --> 00:28:54,419
intended 113 Joule per cubic meter and

730

00:28:51,329 --> 00:28:57,538
then look at these numbers are compared

731

00:28:54,419 --> 00:28:59,309
to the days module is calculated for jdi

732

00:28:57,538 --> 00:29:01,500
eternity the stress versus strain which

733

00:28:59,308 --> 00:29:03,259
is the gravitational coupling constant

734

00:29:01,500 --> 00:29:06,388
out there in Einstein's field equations

735

00:29:03,259 --> 00:29:08,690
relating the geometry will on the left

736

00:29:06,388 --> 00:29:11,699
and the space and letter the matter

737

00:29:08,690 --> 00:29:12,960
energy on the right and this is the

738

00:29:11,700 --> 00:29:15,000
coupling constant multiplied that by

739

00:29:12,960 --> 00:29:16,919
that matter energy here's the units and

740

00:29:15,000 --> 00:29:19,319
it is what you get in terms of kilogram

741

00:29:16,919 --> 00:29:22,110
per cubic meter it's on the area of turn

742
00:29:19,319 --> 00:29:25,428
of the TV five kilogram per cubic meter

743
00:29:22,109 --> 00:29:28,678
shows you that space is extremely stiff

744
00:29:25,429 --> 00:29:31,169
space is extremely stiff the vacuum cpe

745
00:29:28,679 --> 00:29:33,480
if you can add it all up would give you

746
00:29:31,169 --> 00:29:36,149
something that where it's not within

747
00:29:33,480 --> 00:29:37,919
that ballpark but it gets close and it

748
00:29:36,148 --> 00:29:40,619
shows that I am NOT an energy that we

749
00:29:37,919 --> 00:29:42,299
have access to cosmological is very weak

750
00:29:40,619 --> 00:29:44,459
compared to that you would be to been a

751
00:29:42,298 --> 00:29:47,398
space and of course up to the point in

752
00:29:44,460 --> 00:29:49,649
that space is even stiffer and there's a

753
00:29:47,398 --> 00:29:51,209
frame they are they are the reference

754
00:29:49,648 --> 00:29:53,250
frames against which acceleration is

755
00:29:51,210 --> 00:29:55,129
measured their forms are property of

756
00:29:53,250 --> 00:29:58,048
space-time that is not fairly understood

757
00:29:55,128 --> 00:29:59,788
everyone we have max Percival times 10

758
00:29:58,048 --> 00:30:01,679
versions of knots principals out there

759
00:29:59,788 --> 00:30:02,250
with their own ideas of how to explain

760
00:30:01,679 --> 00:30:04,620
Yosha

761
00:30:02,250 --> 00:30:06,839
our space-time is work by the presence

762
00:30:04,619 --> 00:30:09,209
of mass energy viable Einstein equations

763
00:30:06,839 --> 00:30:11,519
which is given here you see a ball of

764
00:30:09,210 --> 00:30:13,829
matter is very better space around it in

765
00:30:11,519 --> 00:30:18,210
the web machine that nice whether she

766
00:30:13,829 --> 00:30:20,250
registration gravity this is the first

767
00:30:18,210 --> 00:30:23,429
that we associated at the geometrical

768
00:30:20,250 --> 00:30:24,898
craving of that space and that's what we

769
00:30:23,429 --> 00:30:26,759
would call the merical field gradient

770

00:30:24,898 --> 00:30:29,069
generate so V also predicts my

771
00:30:26,759 --> 00:30:30,509
administrative relative initial forms

772
00:30:29,069 --> 00:30:32,139
and the facility of we're trading losses

773
00:30:30,509 --> 00:30:33,490
and this is well

774
00:30:32,140 --> 00:30:34,929
by general relativity is called the

775
00:30:33,490 --> 00:30:37,808
interstate in fact or the gravitational

776
00:30:34,929 --> 00:30:40,630
Faraday effect and unfortunately the

777
00:30:37,808 --> 00:30:42,069
loss of gravity pull be there's no

778
00:30:40,630 --> 00:30:43,540
successful measuring it because there

779
00:30:42,069 --> 00:30:45,369
were problems with the highest

780
00:30:43,539 --> 00:30:47,710
sensitivity Christian drivers that they

781
00:30:45,369 --> 00:30:49,058
use they were just done there's a

782
00:30:47,710 --> 00:30:50,710
problem there's technical problems they

783
00:30:49,058 --> 00:30:53,829
could not verify the firm dragging

784
00:30:50,710 --> 00:30:56,259

effect at all Montaigne there basically

785

00:30:53,829 --> 00:30:58,119

is in Austria at the National Research

786

00:30:56,259 --> 00:31:00,819

Center's it's now the asterisk to the

787

00:30:58,119 --> 00:31:04,689

technology the trees he was looking at

788

00:31:00,819 --> 00:31:06,990

rotating ways putting him in a cryogenic

789

00:31:04,690 --> 00:31:09,730

Dewar are that could hear him and

790

00:31:06,990 --> 00:31:11,829

putting the ring on a haven a motivator

791

00:31:09,730 --> 00:31:14,980

and spinning them up a few hundred rpm

792

00:31:11,829 --> 00:31:17,079

and basically he put accelerometers out

793

00:31:14,980 --> 00:31:17,500

of armies and I began seeing an unusual

794

00:31:17,079 --> 00:31:20,949

force

795

00:31:17,500 --> 00:31:23,200

he began mopping the fearsome measuring

796

00:31:20,950 --> 00:31:24,940

and discovered a what looked like that

797

00:31:23,200 --> 00:31:26,740

we had a magnetic effect something

798

00:31:24,940 --> 00:31:28,840

similar till they understand the fact

799

00:31:26,740 --> 00:31:32,048
that with a very hard gravitational

800

00:31:28,839 --> 00:31:34,000
coupling constant like about probably 18

801

00:31:32,048 --> 00:31:35,798
meters or maybe ten or twelve orders of

802

00:31:34,000 --> 00:31:38,410
magnitude larger than general seventy

803

00:31:35,798 --> 00:31:39,970
would protect but it was rather high so

804

00:31:38,410 --> 00:31:41,980
he developed a theory thinking that

805

00:31:39,970 --> 00:31:44,679
possibly the superconducting states of

806

00:31:41,980 --> 00:31:46,870
the letters in this liquid helium we're

807

00:31:44,679 --> 00:31:49,809
covering with gravitational field

808

00:31:46,869 --> 00:31:52,779
somehow and create an anomalous constant

809

00:31:49,808 --> 00:31:55,869
value are very our firm driving force on

810

00:31:52,779 --> 00:31:58,058
the outside of the system as turning on

811

00:31:55,869 --> 00:32:00,548
he keeps our here enacted with our group

812

00:31:58,058 --> 00:32:02,440
and he gave him a lot of input and he

813
00:32:00,548 --> 00:32:04,450
took that input to redesign experiment

814
00:32:02,440 --> 00:32:06,548
two or three times to measure he

815
00:32:04,450 --> 00:32:08,890
graduated away from accelerometers and

816
00:32:06,548 --> 00:32:11,619
into laser journals he even obtained the

817
00:32:08,890 --> 00:32:13,360
laser gyros from about a used on Soviet

818
00:32:11,619 --> 00:32:15,969
based of missiles which were highly

819
00:32:13,359 --> 00:32:17,949
sensitive he reproduced the effect

820
00:32:15,970 --> 00:32:20,110
either the coupling constant got smaller

821
00:32:17,950 --> 00:32:23,919
and then he finally got to the point to

822
00:32:20,109 --> 00:32:25,709
where he had to take the waves off who

823
00:32:23,919 --> 00:32:28,419
can measure the fact just with the

824
00:32:25,710 --> 00:32:30,100
holder then he took behave it off and I

825
00:32:28,419 --> 00:32:32,169
was measured with some effect which is

826
00:32:30,099 --> 00:32:35,319
to helium so the thing is

827

00:32:32,169 --> 00:32:36,999
it's a bust he's still getting bad are

828
00:32:35,319 --> 00:32:39,668
still measuring the force but there's no

829
00:32:36,999 --> 00:32:41,470
Thea to explain it we have to spit this

830
00:32:39,669 --> 00:32:43,480
this is jordyn closed chapter in a bit

831
00:32:41,470 --> 00:32:45,100
looking at the quantum vacuum zero point

832
00:32:43,480 --> 00:32:47,169
energies and the dynamical Casimir

833
00:32:45,099 --> 00:32:49,839
effect you take the Casimir cavity but

834
00:32:47,169 --> 00:32:51,249
you also have unbounded in the cavity

835
00:32:49,839 --> 00:32:54,788
and there is a net force that's

836
00:32:51,249 --> 00:32:57,100
generated in keeping with F equals MA

837
00:32:54,788 --> 00:32:58,658
and the third law and you could push

838
00:32:57,099 --> 00:33:02,378
against the vacuum fluctuations you

839
00:32:58,659 --> 00:33:04,570
generate a really really thrust and it

840
00:33:02,378 --> 00:33:07,238
is not quite measurably that I think

841
00:33:04,569 --> 00:33:08,678

we're just on the verge of possibly

842

00:33:07,239 --> 00:33:10,149
designing it explained to actually

843

00:33:08,679 --> 00:33:13,899
measuring us in the near future

844

00:33:10,148 --> 00:33:15,969
they are the thrust equations when it

845

00:33:13,898 --> 00:33:19,288
design of fusion the robotics are has

846

00:33:15,970 --> 00:33:21,700
been White team Glenn Research Center in

847

00:33:19,288 --> 00:33:23,259
including looked at the possibility of

848

00:33:21,700 --> 00:33:27,278
whether solid fusion could be a power

849

00:33:23,259 --> 00:33:29,618
source it's it's not a it's not an

850

00:33:27,278 --> 00:33:32,528
open-and-shut case yet sign of fusion

851

00:33:29,618 --> 00:33:35,858
does exist and it does produce power but

852

00:33:32,528 --> 00:33:38,169
it's basically on the chemical acoustic

853

00:33:35,858 --> 00:33:41,408
system and it is not going to be any

854

00:33:38,169 --> 00:33:42,940
breakthrough power at all it's not at

855

00:33:41,409 --> 00:33:44,499
the very kind of energy to lead to a

856
00:33:42,940 --> 00:33:46,929
breakthrough that we could that we could

857
00:33:44,499 --> 00:33:49,269
depend on our curiosities as you guys

858
00:33:46,929 --> 00:33:51,249
may have heard by now are voyagers and

859
00:33:49,269 --> 00:33:53,460
pioneers as well as other spacecraft

860
00:33:51,249 --> 00:33:58,200
that have been for the last few years

861
00:33:53,460 --> 00:34:01,600
have been theory an additional sunsetted

862
00:33:58,200 --> 00:34:04,058
attractive force on them and if there's

863
00:34:01,599 --> 00:34:05,738
been at least anybody so basically

864
00:34:04,058 --> 00:34:08,199
there's a real force of gravity acting

865
00:34:05,739 --> 00:34:10,720
the systematic analysis of all these

866
00:34:08,199 --> 00:34:13,989
forces measured by all the different

867
00:34:10,719 --> 00:34:16,750
spacecraft are showing a demonstrable

868
00:34:13,989 --> 00:34:19,658
force that's consistent is repeatable it

869
00:34:16,750 --> 00:34:20,829
has the same elements however we don't

870
00:34:19,659 --> 00:34:21,789
know what the source of it is and so

871
00:34:20,829 --> 00:34:25,059
people are looking at alternative

872
00:34:21,789 --> 00:34:29,309
theories of gravity I think that more

873
00:34:25,059 --> 00:34:34,050
curiosities involving dark energy

874
00:34:29,309 --> 00:34:37,170
the big bang on there are the things

875
00:34:34,050 --> 00:34:38,810
that can these things will tell us these

876
00:34:37,170 --> 00:34:42,360
things may tell us something about

877
00:34:38,809 --> 00:34:45,090
space-time and vacuum energy that might

878
00:34:42,360 --> 00:34:49,829
lead us to explore some names that could

879
00:34:45,090 --> 00:34:51,390
ghosts and very propulsion here's what

880
00:34:49,829 --> 00:34:55,079
the mysteries of physics would look like

881
00:34:51,389 --> 00:34:56,309
as we covered them in our book and we

882
00:34:55,079 --> 00:35:01,279
all interconnected to all these

883
00:34:56,309 --> 00:35:04,590
different concepts and last max

884

00:35:01,280 --> 00:35:07,530
particular challenge was as a man as a

885
00:35:04,590 --> 00:35:09,510
NASA probe banana tree he was tasked

886
00:35:07,530 --> 00:35:11,580
with having to beat down the skeptical

887
00:35:09,510 --> 00:35:13,920
academics and there are incredible

888
00:35:11,579 --> 00:35:16,049
scientists and visionaries who are all

889
00:35:13,920 --> 00:35:18,389
the people who publish in peer review

890
00:35:16,050 --> 00:35:20,370
for out-of-the-box thinkers be able to

891
00:35:18,389 --> 00:35:22,259
come forward get some support to be able

892
00:35:20,369 --> 00:35:24,929
study some of these interesting problems

893
00:35:22,260 --> 00:35:26,330
so we looked at what whether they what

894
00:35:24,929 --> 00:35:28,889
are the features that we want in a

895
00:35:26,329 --> 00:35:30,719
visionary per year we want to combine

896
00:35:28,889 --> 00:35:33,150
vision of credibility to consider the

897
00:35:30,719 --> 00:35:35,639
possibilities research rigorously and

898
00:35:33,150 --> 00:35:37,590

impartially a judge others River and

899

00:35:35,639 --> 00:35:39,599

impartiality but not the feasibility

900

00:35:37,590 --> 00:35:42,090

that's one important characteristics

901

00:35:39,599 --> 00:35:43,829

you've got to have you want to do small

902

00:35:42,090 --> 00:35:45,390

increments of progress if a little bit

903

00:35:43,829 --> 00:35:47,460

less provocative so you know still

904

00:35:45,389 --> 00:35:49,099

controversy emphasis on physical

905

00:35:47,460 --> 00:35:52,730

observables and use appropriate

906

00:35:49,099 --> 00:35:55,589

comparisons with energy for example in

907

00:35:52,730 --> 00:35:57,780

space-time propulsion the key driver is

908

00:35:55,590 --> 00:35:59,910

rocket efficiency or potential efficacy

909

00:35:57,780 --> 00:36:01,620

is measured by the specific impulse you

910

00:35:59,909 --> 00:36:04,049

cannot use specific impulse for world

911

00:36:01,619 --> 00:36:06,329

drives or where events or applying

912

00:36:04,050 --> 00:36:07,890

vacuum thrusts because it has no unit in

913
00:36:06,329 --> 00:36:09,750
those genres but the specific impulse

914
00:36:07,889 --> 00:36:11,759
comes out of the rocket equation which

915
00:36:09,750 --> 00:36:14,130
is Newtonian physics so you've gotta

916
00:36:11,760 --> 00:36:16,080
talk in terms of energy and then secant

917
00:36:14,130 --> 00:36:18,210
apply qualified critiques by building in

918
00:36:16,079 --> 00:36:21,659
also peer reviewers who are interested

919
00:36:18,210 --> 00:36:26,039
in willing to to examine these things

920
00:36:21,659 --> 00:36:28,219
look at the river and judge the their

921
00:36:26,039 --> 00:36:30,719
effectiveness and whatnot

922
00:36:28,219 --> 00:36:32,309
my concluding remarks I understand a

923
00:36:30,719 --> 00:36:33,709
fault requires discoveries in physics

924
00:36:32,309 --> 00:36:35,909
rather than just technological

925
00:36:33,710 --> 00:36:37,409
refinements physics has advanced

926
00:36:35,909 --> 00:36:39,599
sufficiently beware

927
00:36:37,409 --> 00:36:42,000
research based our breakthroughs has

928
00:36:39,599 --> 00:36:43,679
begun and it's been in progress since

929
00:36:42,000 --> 00:36:45,420
the mid-1990s

930
00:36:43,679 --> 00:36:47,819
even if desired breakthroughs are

931
00:36:45,420 --> 00:36:49,380
impossible at least the path of this

932
00:36:47,820 --> 00:36:51,269
study proves our provides novel

933
00:36:49,380 --> 00:36:53,369
approaches scientific investigations to

934
00:36:51,269 --> 00:36:55,469
continue looking into those curiosities

935
00:36:53,369 --> 00:36:57,239
of nature and the cosmos like dark

936
00:36:55,469 --> 00:36:59,309
energy dark matter and there's an

937
00:36:57,239 --> 00:37:01,439
ominous forces acting on our spacecraft

938
00:36:59,309 --> 00:37:03,119
but are far outside the solar system

939
00:37:01,440 --> 00:37:04,559
and that the breakthroughs are formed

940
00:37:03,119 --> 00:37:17,539
space flight and much more will be

941

00:37:04,559 --> 00:37:27,869
revolutionized thank you very much and

942
00:37:17,539 --> 00:37:31,130
we do have time for questions ok tell me

943
00:37:27,869 --> 00:37:34,739
what his question was ok

944
00:37:31,130 --> 00:37:36,180
Bobby good idea to use the microphone is

945
00:37:34,739 --> 00:37:38,669
there any thought using the known

946
00:37:36,179 --> 00:37:41,250
properties of UFOs as a guide to your

947
00:37:38,670 --> 00:37:43,200
thinking and or such I'm still having

948
00:37:41,250 --> 00:37:48,929
trouble hearing what's going on the

949
00:37:43,199 --> 00:37:51,989
question is is there any asking ok is

950
00:37:48,929 --> 00:37:54,389
there any application or wisdom to be

951
00:37:51,989 --> 00:37:58,949
taken from UFO research that might help

952
00:37:54,389 --> 00:38:03,509
you or the answer is yes enero secretly

953
00:37:58,949 --> 00:38:05,609
also an overtly no because they the

954
00:38:03,510 --> 00:38:07,980
mainstream academic still about the

955
00:38:05,610 --> 00:38:09,539

topic of UFOs are you really having

956

00:38:07,980 --> 00:38:11,340
credibility with them especially with

957

00:38:09,539 --> 00:38:12,840
policymakers and decision makers in

958

00:38:11,340 --> 00:38:15,120
charge of funding and programmatic

959

00:38:12,840 --> 00:38:16,769
better than here the topic of UFOs so

960

00:38:15,119 --> 00:38:19,199
for the purpose of doing this officially

961

00:38:16,769 --> 00:38:22,869
without billionaire phones but we did

962

00:38:19,199 --> 00:38:25,059
consider it under the table and yes

963

00:38:22,869 --> 00:38:27,219
there is a subset of us we've looked at

964

00:38:25,059 --> 00:38:30,150
UFO data and we've looked at all the

965

00:38:27,219 --> 00:38:31,899
physical events and physical

966

00:38:30,150 --> 00:38:33,960
descriptions that were provided by

967

00:38:31,900 --> 00:38:37,510
investigators from shark Valley to

968

00:38:33,960 --> 00:38:39,369
yourself and and whatnot and George

969

00:38:37,510 --> 00:38:41,770
Hathaway and so forth and we've been

970
00:38:39,369 --> 00:38:45,549
able to use that data as input to give

971
00:38:41,769 --> 00:38:47,860
us an idea and that data does drive the

972
00:38:45,550 --> 00:38:49,240
concepts that we did derive later on

973
00:38:47,860 --> 00:38:50,800
that we were the brought the millions of

974
00:38:49,239 --> 00:38:53,259
the original NASA program white whale

975
00:38:50,800 --> 00:38:55,960
drives and wormholes for example at the

976
00:38:53,260 --> 00:38:57,400
lives Utah launched that all right would

977
00:38:55,960 --> 00:39:01,090
used to work for Bob bivolo for six

978
00:38:57,400 --> 00:39:04,450
years we have the experience of a

979
00:39:01,090 --> 00:39:06,910
scientist and the investigator seeing a

980
00:39:04,449 --> 00:39:08,500
window that look like a rainbow open up

981
00:39:06,909 --> 00:39:10,839
with the creature crawling through and

982
00:39:08,500 --> 00:39:13,269
then the potential use that I actually

983
00:39:10,840 --> 00:39:14,980
see eliminating the sky in broad

984
00:39:13,269 --> 00:39:16,630
daylight with the travel of thought that

985
00:39:14,980 --> 00:39:18,610
came through it well that's an example

986
00:39:16,630 --> 00:39:22,750
of data about indicators around there

987
00:39:18,610 --> 00:39:24,700
involved I mean our geometry tells you

988
00:39:22,750 --> 00:39:27,010
that a man who looks like we intersect

989
00:39:24,699 --> 00:39:29,469
surf space it appears as a very bright

990
00:39:27,010 --> 00:39:31,720
intense intensity by way of light and

991
00:39:29,469 --> 00:39:34,179
then as it was an intersection that's

992
00:39:31,719 --> 00:39:36,009
larger larger then it opens up indicated

993
00:39:34,179 --> 00:39:37,569
through the hole and things will be

994
00:39:36,010 --> 00:39:39,910
billion out of it so that's a detail

995
00:39:37,570 --> 00:39:42,430
appear to datasets that we've verified

996
00:39:39,909 --> 00:39:44,679
that the day of Utah range that matched

997
00:39:42,429 --> 00:39:49,029
well I know as a physicist or burglar

998

00:39:44,679 --> 00:39:51,519
would do what was we haven't seen UFOs

999
00:39:49,030 --> 00:39:54,160
do performances that adhere to the world

1000
00:39:51,519 --> 00:39:55,989
web because the web driver basically

1001
00:39:54,159 --> 00:39:58,279
it's just between stars that we don't

1002
00:39:55,989 --> 00:40:00,679
see EF is more beware

1003
00:39:58,280 --> 00:40:03,430
we see them doing related materials and

1004
00:40:00,679 --> 00:40:07,909
proclamations they disappear reappear

1005
00:40:03,429 --> 00:40:09,949
that's that's that one is undeterred yet

1006
00:40:07,909 --> 00:40:14,059
III would think the Ravens be

1007
00:40:09,949 --> 00:40:16,250
possibility still prepared effective

1008
00:40:14,059 --> 00:40:18,199
anything else and I think they're anti

1009
00:40:16,250 --> 00:40:20,269
gravity we have anti-gravity and

1010
00:40:18,199 --> 00:40:22,069
Einstein's true theory but although it's

1011
00:40:20,269 --> 00:40:24,980
overdue and I talked about in my chopper

1012
00:40:22,070 --> 00:40:27,680

you both in my three chapters there are

1013

00:40:24,980 --> 00:40:29,360
other aspects of anti-gravity the

1014

00:40:27,679 --> 00:40:31,369
properties of negative ocular energy

1015

00:40:29,360 --> 00:40:33,769
that will create a repressive force that

1016

00:40:31,369 --> 00:40:36,319
allows simply levitated up and he refers

1017

00:40:33,769 --> 00:40:39,320
to exhibit that so there's an how could

1018

00:40:36,320 --> 00:40:41,000
a scale as my vacuum model it's a

1019

00:40:39,320 --> 00:40:43,340
different fate of relativity where

1020

00:40:41,000 --> 00:40:44,539
instead of the space-time univision a

1021

00:40:43,340 --> 00:40:47,360
spacetime

1022

00:40:44,539 --> 00:40:50,150
as a paralyzed by vacuum of the 2008

1023

00:40:47,360 --> 00:40:53,420
fluctuations and if you observe a field

1024

00:40:50,150 --> 00:40:56,119
on that medium the fluctuations are

1025

00:40:53,420 --> 00:40:59,059
polarized that creates a spacetime been

1026

00:40:56,119 --> 00:41:01,429
in effect 72 will grab you one holes and

1027
00:40:59,059 --> 00:41:03,199
we say we see that we surround aspects

1028
00:41:01,429 --> 00:41:10,029
of what he put in cherry can take one or

1029
00:41:03,199 --> 00:41:10,029
two more quick questions here back there

1030
00:41:10,449 --> 00:41:19,730
I hate to continue the fear potent topic

1031
00:41:16,670 --> 00:41:24,289
of UFOs but I'm driven to ask if you

1032
00:41:19,730 --> 00:41:27,590
know the name Bob Lazar about what the

1033
00:41:24,289 --> 00:41:30,050
name Bob Lazar you don't know that name

1034
00:41:27,590 --> 00:41:33,140
he claims to have worked in the area 51

1035
00:41:30,050 --> 00:41:35,660
and to have worked with captured UFOs

1036
00:41:33,139 --> 00:41:39,049
and to have investigated the physics of

1037
00:41:35,659 --> 00:41:41,960
propulsion and he states that I believe

1038
00:41:39,050 --> 00:41:45,470
element 113 which is as-yet-undiscovered

1039
00:41:41,960 --> 00:41:45,809
on earth is an island of stability and

1040
00:41:45,469 --> 00:41:49,228
other

1041
00:41:45,809 --> 00:41:51,739
as unstable regions of nuclei and that

1042
00:41:49,228 --> 00:41:54,328
in element 113 the strong nuclear force

1043
00:41:51,739 --> 00:41:56,789
extends slightly behind the nucleus and

1044
00:41:54,329 --> 00:41:58,619
aliens have discovered a way to amplify

1045
00:41:56,789 --> 00:42:03,019
that force and use it to create

1046
00:41:58,619 --> 00:42:04,789
artificial wormholes for transport so I

1047
00:42:03,018 --> 00:42:08,578
know I'm sorry

1048
00:42:04,789 --> 00:42:11,160
this is hard to do shortly but that that

1049
00:42:08,579 --> 00:42:12,930
is one Avenue I think the wormhole idea

1050
00:42:11,159 --> 00:42:16,920
is the solution to this problem and that

1051
00:42:12,929 --> 00:42:19,108
is one bit of forbidden knowledge that

1052
00:42:16,920 --> 00:42:19,409
you might use in the future okay thank

1053
00:42:19,108 --> 00:42:22,048
you

1054
00:42:19,409 --> 00:42:23,670
thank you yeah these are actually to

1055

00:42:22,048 --> 00:42:28,219
question about the legitimate the end of

1056
00:42:23,670 --> 00:42:30,749
the table really have to be brief

1057
00:42:28,219 --> 00:42:33,479
how many of sky Nelson and my question

1058
00:42:30,748 --> 00:42:35,759
is you mentioned retroactive causation

1059
00:42:33,478 --> 00:42:38,688
as a means of communicating into the

1060
00:42:35,759 --> 00:42:42,838
past can you elaborate on how that would

1061
00:42:38,688 --> 00:42:44,009
impact space travel so how a retroactive

1062
00:42:42,838 --> 00:42:45,568
communication into the past could

1063
00:42:44,009 --> 00:42:46,469
actually influence space travel is there

1064
00:42:45,568 --> 00:42:48,869
some connection there that you were

1065
00:42:46,469 --> 00:42:52,318
making which part of being able to

1066
00:42:48,869 --> 00:42:54,269
operate how retroactive communication

1067
00:42:52,318 --> 00:42:55,768
where you just transfer your vision back

1068
00:42:54,268 --> 00:42:57,448
and forth you're just transferring

1069
00:42:55,768 --> 00:42:59,159

information does that actually I know

1070

00:42:57,449 --> 00:43:01,679

really well now and where there's a

1071

00:42:59,159 --> 00:43:03,389

thought that doesn't apply the space

1072

00:43:01,679 --> 00:43:05,759

travel that we don't know we've all

1073

00:43:03,389 --> 00:43:06,989

personally don't think so FTL

1074

00:43:05,759 --> 00:43:10,998

communications it's just going to need

1075

00:43:06,989 --> 00:43:13,499

FTL communications I don't think that I

1076

00:43:10,998 --> 00:43:14,788

put that on the side probably because he

1077

00:43:13,498 --> 00:43:16,828

won't believe that question will be to

1078

00:43:14,789 --> 00:43:19,170

be addressed and why well join

1079

00:43:16,829 --> 00:43:21,359

creaminess research is specifically for

1080

00:43:19,170 --> 00:43:22,920

a communication system and it doesn't

1081

00:43:21,358 --> 00:43:25,858

have any application for space travel

1082

00:43:22,920 --> 00:43:29,028

their table in your teleportation okay

1083

00:43:25,858 --> 00:43:29,028

again thank you very much

