

Goodey, Olenici, Pugach – 2008

My Equipment



Fig. 5 - automatic system



Fig. 6 - manual system

1
00:00:04,970 --> 00:00:03,350
and and this yeah this was one of the

2
00:00:08,720 --> 00:00:04,980
things that went bump but in the day

3
00:00:10,970 --> 00:00:08,730
time unfortunately so this session is as

4
00:00:13,190 --> 00:00:10,980
Roger said already things that go bump

5
00:00:16,910 --> 00:00:13,200
in the night and the first speaker will

6
00:00:20,960 --> 00:00:16,920
be Thomas goodie and Rene Vail Vallejo

7
00:00:23,000 --> 00:00:20,970
and their topic is review of anomalous

8
00:00:26,000 --> 00:00:23,010
physical effects during solar eclipses

9
00:00:28,160 --> 00:00:26,010
eclipses in a proposal for coordinated

10
00:00:33,889 --> 00:00:28,170
experiments during the great American

11
00:00:35,959 --> 00:00:33,899
solar eclipse 21 August 2017 ah thank

12
00:00:39,590 --> 00:00:35,969
you very much good evening ladies and

13
00:00:42,260 --> 00:00:39,600

gentlemen I am very happy to be able to

14

00:00:44,139 --> 00:00:42,270

speak to you after you have shared

15

00:00:46,279 --> 00:00:44,149

yourself up with a good dinner

16

00:00:48,020 --> 00:00:46,289

unfortunately not everyone is back but

17

00:00:49,310 --> 00:00:48,030

there you go and many people have

18

00:00:52,939 --> 00:00:49,320

different plans for the great American

19

00:00:55,299 --> 00:00:52,949

eclipses as you can see and all sorts of

20

00:00:58,610 --> 00:00:55,309

plans from all the sorts of people

21

00:00:59,900 --> 00:00:58,620

anyway and the I'll show you a map now

22

00:01:02,119 --> 00:00:59,910

of the amount of the eclipses as it

23

00:01:04,640 --> 00:01:02,129

comes up so this is the eclipse as it

24

00:01:06,620 --> 00:01:04,650

will cost America on the 21st of August

25

00:01:08,480 --> 00:01:06,630

next year it comes in an Oregon and it

26

00:01:10,969 --> 00:01:08,490

comes along here a little north of

27

00:01:14,510 --> 00:01:10,979

Colorado you have to go to Wyoming on

28

00:01:16,219 --> 00:01:14,520

Alaska to see it and this if you want to

29

00:01:17,929 --> 00:01:16,229

see the Eclipse visually this is the

30

00:01:19,730 --> 00:01:17,939

area you should best be in for best

31

00:01:21,080 --> 00:01:19,740

weather then it comes down along here

32

00:01:23,810 --> 00:01:21,090

and it goes out in Carolina and North

33

00:01:25,789 --> 00:01:23,820

Cal in South Carolina here and it'll

34

00:01:28,550 --> 00:01:25,799

take about 60 minutes to cross America

35

00:01:30,620 --> 00:01:28,560

the duration at every point - at each

36

00:01:33,649 --> 00:01:30,630

point of totality along the centerline

37

00:01:35,719 --> 00:01:33,659

will be approximately two minutes so and

38

00:01:37,760 --> 00:01:35,729

if you are towards the edge it will be a

39

00:01:39,260 --> 00:01:37,770

bit less it's if you want to enjoy the

40

00:01:41,420 --> 00:01:39,270

eclipse you must see totality it's

41

00:01:43,490 --> 00:01:41,430

absolutely hopeless not to see totality

42

00:01:45,080 --> 00:01:43,500

which some people think is almost as

43

00:01:47,899 --> 00:01:45,090

good but it isn't now when you come to

44

00:01:49,580 --> 00:01:47,909

to see a total solar eclipse really like

45

00:01:50,840 --> 00:01:49,590

most things in life you'll get out of it

46

00:01:52,760 --> 00:01:50,850

what you put into it what you bring to

47

00:01:55,100 --> 00:01:52,770

it you see the guys on the on the Left

48

00:01:57,410 --> 00:01:55,110

haven't thought much about the guy on

49

00:01:58,160 --> 00:01:57,420

the right here this guy has been doing

50

00:02:00,260 --> 00:01:58,170

homework

51
00:02:04,459 --> 00:02:00,270
this guy has may not have got himself

52
00:02:07,999 --> 00:02:04,469
quite ready yet uh-huh so what I'm

53
00:02:09,589 --> 00:02:08,009
talking about here is a coordinates for

54
00:02:12,140 --> 00:02:09,599
coordinated experiments in physics

55
00:02:13,520 --> 00:02:12,150
during the solar eclipse with the aim of

56
00:02:15,500 --> 00:02:13,530
finding

57
00:02:18,050 --> 00:02:15,510
physics anomalies in the behavior of

58
00:02:19,640 --> 00:02:18,060
delicate to our physical equipment these

59
00:02:21,740 --> 00:02:19,650
have been persistently reported over

60
00:02:23,420 --> 00:02:21,750
more than sixty years and the type of

61
00:02:26,420 --> 00:02:23,430
equipment that appears to have given

62
00:02:29,510 --> 00:02:26,430
results is a gravimeters portion

63
00:02:31,160 --> 00:02:29,520

pendulums or so to debate 2d pendulums

64

00:02:32,510 --> 00:02:31,170

so called spherical pendulums this is

65

00:02:34,160 --> 00:02:32,520

these are pendulums that of which you

66

00:02:35,600 --> 00:02:34,170

consider the motion in an ellipse in

67

00:02:37,580 --> 00:02:35,610

other words not just a straight-line

68

00:02:39,470 --> 00:02:37,590

pendulum but a pendulum that that can

69

00:02:40,970 --> 00:02:39,480

that can develop an elliptical motion

70

00:02:43,670 --> 00:02:40,980

which actually they all do

71

00:02:46,280 --> 00:02:43,680

now speaking of gravimeter observations

72

00:02:48,440 --> 00:02:46,290

first three times the mean clear

73

00:02:50,960 --> 00:02:48,450

observations of anomalies by people

74

00:02:52,460 --> 00:02:50,970

using old-fashioned Lacoste lumber

75

00:02:53,930 --> 00:02:52,470

gravimeters which are mechanical with

76

00:02:55,759 --> 00:02:53,940

limiters there's several hundred of

77

00:02:58,970 --> 00:02:55,769

these in America and I'm sure that many

78

00:03:01,759 --> 00:02:58,980

of you have many of universities have

79

00:03:03,800 --> 00:03:01,769

access to department of geology who may

80

00:03:05,780 --> 00:03:03,810

have access to or my own gravimeters I'm

81

00:03:07,850 --> 00:03:05,790

sure that among all the people in this

82

00:03:11,540 --> 00:03:07,860

one at least ten women government is

83

00:03:12,979 --> 00:03:11,550

available for use and I strong a greater

84

00:03:14,120 --> 00:03:12,989

advantage of doing an experiment the

85

00:03:15,680 --> 00:03:14,130

glue of limit is it costs absolutely

86

00:03:16,729 --> 00:03:15,690

nothing you just have to look at it or

87

00:03:18,590 --> 00:03:16,739

hook it up to the computer and record

88

00:03:19,940 --> 00:03:18,600

what it does you don't even need a

89

00:03:22,340 --> 00:03:19,950

person to observe it you better stay

90

00:03:24,890 --> 00:03:22,350

away from it it works automatically the

91

00:03:27,229 --> 00:03:24,900

first observation of an anomaly was by a

92

00:03:29,000 --> 00:03:27,239

gentleman called Duval in Quebec in 1994

93

00:03:31,670 --> 00:03:29,010

actually a colleague of my colleague

94

00:03:33,380 --> 00:03:31,680

that when I felt here here was the start

95

00:03:35,930 --> 00:03:33,390

of the Eclipse this is the wording of

96

00:03:37,670 --> 00:03:35,940

the gravimeter it appeared to the value

97

00:03:39,560 --> 00:03:37,680

of gee appeared and I say appear to get

98

00:03:41,000 --> 00:03:39,570

a little higher during the clip so to

99

00:03:46,009 --> 00:03:41,010

drop back to normal levels immediately

100

00:03:49,310 --> 00:03:46,019

after the clips I'm sorry I believe this

101

00:03:51,319 --> 00:03:49,320

is milli gals so Michael Gelles again

102

00:03:53,240 --> 00:03:51,329

come and see us for details we have not

103

00:03:54,800 --> 00:03:53,250

enough time to cover everything come and

104

00:03:56,449 --> 00:03:54,810

see us later for the details because

105

00:03:58,580 --> 00:03:56,459

you'll find a very interesting this is

106

00:04:00,289 --> 00:03:58,590

an observation published in Physical

107

00:04:02,930 --> 00:04:00,299

Review by a guy called Mishra in India

108

00:04:04,490 --> 00:04:02,940

who was not on the central path on the

109

00:04:06,470 --> 00:04:04,500

Eclipse and by the way neither was

110

00:04:08,720 --> 00:04:06,480

neither was develop a central path you

111

00:04:12,650 --> 00:04:08,730

see this see here is the here's their

112

00:04:14,990 --> 00:04:12,660

value of of gee corrected for tidal

113

00:04:16,219 --> 00:04:15,000

effects shields you know gravimeters are

114

00:04:17,420 --> 00:04:16,229

capable of seeing the earth tides

115

00:04:19,849 --> 00:04:17,430

because they're very they're very

116

00:04:22,310 --> 00:04:19,859

sensitive you see this unexplained dip

117

00:04:24,380 --> 00:04:22,320

here which is rather interesting and you

118

00:04:27,440 --> 00:04:24,390

see a micro gal along this along this

119

00:04:29,360 --> 00:04:27,450

line the next one was a

120

00:04:30,980 --> 00:04:29,370

observation by a team led by a guy

121

00:04:32,990 --> 00:04:30,990

called Wang in China I mean this

122

00:04:35,090 --> 00:04:33,000

observation really it seems to me almost

123

00:04:36,830 --> 00:04:35,100

incontrovertible here's the start of the

124

00:04:39,110 --> 00:04:36,840

clips here's the end of the clips

125

00:04:41,720 --> 00:04:39,120

shortly before the start the values

126
00:04:43,160 --> 00:04:41,730
dropped here then they rose and were

127
00:04:44,210 --> 00:04:43,170
roughly as they should be during the

128
00:04:46,190 --> 00:04:44,220
clips in there towards the end of the

129
00:04:47,900 --> 00:04:46,200
clips it sort of came off this looks

130
00:04:49,520 --> 00:04:47,910
like an edge effect this gentle was

131
00:04:51,560 --> 00:04:49,530
directly on the centerline of the clips

132
00:04:54,800 --> 00:04:51,570
so he was an actually an eclipsed point

133
00:04:56,660 --> 00:04:54,810
of this in this area and the you see

134
00:04:59,060 --> 00:04:56,670
actually there's more effect out just

135
00:05:02,120 --> 00:04:59,070
outside the clips here on this side of

136
00:05:03,920 --> 00:05:02,130
the of the of the fourth contact so this

137
00:05:05,690 --> 00:05:03,930
is it I really again don't I don't see

138
00:05:07,550 --> 00:05:05,700

how this this can be controverted easily

139

00:05:10,160 --> 00:05:07,560

but you know the world is ignored it

140

00:05:11,600 --> 00:05:10,170

okay that is enough for forgiving tours

141

00:05:13,700 --> 00:05:11,610

and I strongly urge you if you can get

142

00:05:15,470 --> 00:05:13,710

hold of them in to Lea's with us we will

143

00:05:17,000 --> 00:05:15,480

make suggestions and you can do a very

144

00:05:19,820 --> 00:05:17,010

interesting experiment now they're being

145

00:05:21,380 --> 00:05:19,830

claims of an anomalous observations you

146

00:05:23,870 --> 00:05:21,390

in with the kilometer atomic clocks and

147

00:05:26,270 --> 00:05:23,880

with torsion pendulums by you in China

148

00:05:28,040 --> 00:05:26,280

Saxon and Allen in America and Phu

149

00:05:29,330 --> 00:05:28,050

gotchu is in acquaintance of our

150

00:05:32,150 --> 00:05:29,340

colleagues we're in touch with him

151
00:05:34,700 --> 00:05:32,160
however what I want to focus on now is

152
00:05:36,620 --> 00:05:34,710
anomalies in the behavior of delicate

153
00:05:38,600 --> 00:05:36,630
pendulums sensitive pendulums which a

154
00:05:40,820 --> 00:05:38,610
professor Harold and I and our colleague

155
00:05:43,220 --> 00:05:40,830
dmitriy olenich II have been working on

156
00:05:45,290 --> 00:05:43,230
for a number of years the these are the

157
00:05:48,910 --> 00:05:45,300
chief anomalous effects of the beam seen

158
00:05:51,950 --> 00:05:48,920
I shall only describe the most the most

159
00:05:54,350 --> 00:05:51,960
clear ones first that I will talk about

160
00:05:57,650 --> 00:05:54,360
the observations that Professor Morris

161
00:05:59,990 --> 00:05:57,660
Allies made in the 50s he performed a

162
00:06:01,490 --> 00:06:00,000
series of marathon experiments using a

163
00:06:03,020 --> 00:06:01,500

so called Pella conical pendulum which

164

00:06:04,850 --> 00:06:03,030

is a pendulum suspect suspended on a

165

00:06:06,020 --> 00:06:04,860

little round ball so that it has three

166

00:06:08,450 --> 00:06:06,030

degrees of freedom it can also rotate

167

00:06:10,810 --> 00:06:08,460

around the vertical axis this is a firt

168

00:06:12,770 --> 00:06:10,820

of poor photograph of his of his

169

00:06:13,970 --> 00:06:12,780

measurement circle with which he read

170

00:06:16,070 --> 00:06:13,980

the position of the pendulum which is

171

00:06:17,330 --> 00:06:16,080

here you can see that this was put this

172

00:06:18,800 --> 00:06:17,340

is obviously made of brass it's a pretty

173

00:06:21,860 --> 00:06:18,810

expensive piece of equipment at least

174

00:06:24,440 --> 00:06:21,870

this expensive as a car so that's it

175

00:06:27,100 --> 00:06:24,450

oops pardon me now this is a more

176
00:06:29,740 --> 00:06:27,110
general view of music of his equipment

177
00:06:32,390 --> 00:06:29,750
yeah this is these chief of laboratory

178
00:06:37,310 --> 00:06:32,400
operating the pendulum he what he

179
00:06:39,590 --> 00:06:37,320
conducted six series of experimental

180
00:06:40,279 --> 00:06:39,600
series each one month long operating the

181
00:06:42,529 --> 00:06:40,289
pendulum twenty

182
00:06:45,079 --> 00:06:42,539
four hours a day releasing it in other

183
00:06:46,459 --> 00:06:45,089
words about about a thousand times no

184
00:06:48,889 --> 00:06:46,469
not a thousand about a hundred times

185
00:06:51,019 --> 00:06:48,899
during the day and night with a team of

186
00:06:53,420 --> 00:06:51,029
seven people this was pretty marathan

187
00:06:55,339 --> 00:06:53,430
thing to do and the people not had to be

188
00:06:56,570 --> 00:06:55,349

trained to read the pendulum read the

189

00:06:59,089 --> 00:06:56,580

movement of the pendulum as well as

190

00:07:01,519 --> 00:06:59,099

simply release it and that was not cheap

191

00:07:03,019 --> 00:07:01,529

let me tell you he fought he claimed to

192

00:07:05,359 --> 00:07:03,029

observe systematical anomalies in the

193

00:07:06,859 --> 00:07:05,369

motion of the pendulum nothing to do

194

00:07:08,389 --> 00:07:06,869

with the clips is which he has

195

00:07:10,790 --> 00:07:08,399

attributed to an ionizer to be a space

196

00:07:12,799 --> 00:07:10,800

this is not consistent with physics as

197

00:07:15,679 --> 00:07:12,809

we know it but anyway that was that is

198

00:07:17,899 --> 00:07:15,689

his claim however in 1954 there was a

199

00:07:19,969 --> 00:07:17,909

partial eclipse in Paris it will the

200

00:07:22,850 --> 00:07:19,979

line of totality was a good 800 miles

201
00:07:24,019 --> 00:07:22,860
away from where he was and he didn't

202
00:07:25,820 --> 00:07:24,029
expect anything it was a purely

203
00:07:27,619 --> 00:07:25,830
accidental observational serendipitous

204
00:07:29,540 --> 00:07:27,629
that you own the pet during the Eclipse

205
00:07:33,230 --> 00:07:29,550
this is the track of the motion of the

206
00:07:36,589 --> 00:07:33,240
pendulum you see it's pretty you know

207
00:07:38,480 --> 00:07:36,599
it's pretty brutal and he had no idea

208
00:07:41,269 --> 00:07:38,490
that this was going to happen but in a

209
00:07:42,230 --> 00:07:41,279
purely accidental observation well

210
00:07:44,119 --> 00:07:42,240
that's pretty interesting

211
00:07:47,420 --> 00:07:44,129
and again there's no clear explanation

212
00:07:49,040 --> 00:07:47,430
for why it would do that to say to the

213
00:07:50,449 --> 00:07:49,050

gravitational effect sort of begs the

214

00:07:52,040 --> 00:07:50,459

question because it's not according to

215

00:07:53,119 --> 00:07:52,050

conventional theories of gravitation it

216

00:07:54,920 --> 00:07:53,129

may be nothing to do with gravitational

217

00:07:57,199 --> 00:07:54,930

ad something else anyway

218

00:08:00,049 --> 00:07:57,209

I became interested in this matter so

219

00:08:02,209 --> 00:08:00,059

did a professor professor ala Nietzsche

220

00:08:03,709 --> 00:08:02,219

and a chap in called mihaela in

221

00:08:05,209 --> 00:08:03,719

Bucharest professor McKay and also

222

00:08:06,920 --> 00:08:05,219

became interested quite independently

223

00:08:09,079 --> 00:08:06,930

and we could strike to various apparatus

224

00:08:11,329 --> 00:08:09,089

now this is an interesting observation I

225

00:08:14,149 --> 00:08:11,339

was in Portugal for an eclipse in 2005

226

00:08:15,920 --> 00:08:14,159

with my apparatus professor Michaela was

227

00:08:18,259 --> 00:08:15,930

in Bucharest with his apparatus and

228

00:08:19,969 --> 00:08:18,269

professor ala Nietzsche was in such Java

229

00:08:22,489 --> 00:08:19,979

northern Romania for his apparatus so

230

00:08:25,339 --> 00:08:22,499

these these three graphs were taking

231

00:08:27,589 --> 00:08:25,349

taken for the same eclipse in late 2005

232

00:08:28,939 --> 00:08:27,599

in widely separated positions now all of

233

00:08:30,709 --> 00:08:28,949

the movements are not particularly great

234

00:08:32,209 --> 00:08:30,719

in terms of the normal movements and

235

00:08:33,949 --> 00:08:32,219

pendulum any way that variations

236

00:08:36,709 --> 00:08:33,959

you'll notice that all three graphs

237

00:08:38,059 --> 00:08:36,719

though have a bottom have a have a

238

00:08:39,829 --> 00:08:38,069

minimum around the time of the Eclipse

239

00:08:41,360 --> 00:08:39,839

which is rather interesting I'm not

240

00:08:43,939 --> 00:08:41,370

putting this forward as definitive but I

241

00:08:46,670 --> 00:08:43,949

consider it very suggestive that's right

242

00:08:48,769 --> 00:08:46,680

that's what we saw in 2005 now in 2008

243

00:08:50,540 --> 00:08:48,779

we were operating in Eastern Europe it

244

00:08:53,150 --> 00:08:50,550

in a town in northern Romania called

245

00:08:53,560 --> 00:08:53,160

sutiaba I had this rather fine equipment

246

00:08:56,200 --> 00:08:53,570

to Bill

247

00:08:57,550 --> 00:08:56,210

which is a very solid tripod with the

248

00:09:00,370 --> 00:08:57,560

power conical pendulum in it and a

249

00:09:02,410 --> 00:09:00,380

automatic recording system I also in

250

00:09:05,440 --> 00:09:02,420

parallel operated a manual pendulum of

251
00:09:07,240 --> 00:09:05,450
the same dimensions and and the same

252
00:09:08,590 --> 00:09:07,250
dimensions and specification but in a

253
00:09:11,140 --> 00:09:08,600
different direction in a different

254
00:09:11,560 --> 00:09:11,150
azimuth or orientation in a separate

255
00:09:14,950 --> 00:09:11,570
room

256
00:09:18,280 --> 00:09:14,960
Prof and professor allen Ichi operated a

257
00:09:23,110 --> 00:09:18,290
19 metre long pendulum in a extremely

258
00:09:26,260 --> 00:09:23,120
solid medieval clock tower and 500

259
00:09:27,190 --> 00:09:26,270
kilometers away from us in Kiev unknown

260
00:09:32,260 --> 00:09:27,200
to us at the time

261
00:09:35,020 --> 00:09:32,270
professor pugach of the Natalie Academy

262
00:09:36,880 --> 00:09:35,030
in in Ukraine it was operating some

263
00:09:38,620 --> 00:09:36,890

several small torsion balances so we

264

00:09:40,330 --> 00:09:38,630

were all operating together or but I

265

00:09:41,590 --> 00:09:40,340

undaunted she knew one another but we

266

00:09:42,700 --> 00:09:41,600

didn't know the existence of lagash at

267

00:09:44,740 --> 00:09:42,710

that time ok

268

00:09:47,080 --> 00:09:44,750

what happened was ok this is what bugak

269

00:09:48,340 --> 00:09:47,090

saw on his torsion balances there's

270

00:09:50,680 --> 00:09:48,350

several of them you see one two three

271

00:09:52,990 --> 00:09:50,690

four they behave differently but there

272

00:09:56,290 --> 00:09:53,000

is a certain jump in in this one this

273

00:09:57,550 --> 00:09:56,300

one and this one not in that one at the

274

00:09:59,890 --> 00:09:57,560

time of the clips are slightly out

275

00:10:03,580 --> 00:09:59,900

somewhat after Tmax you see in the

276
00:10:04,960 --> 00:10:03,590
second part of the clips meanwhile these

277
00:10:05,500 --> 00:10:04,970
are my these are my results with my two

278
00:10:07,060 --> 00:10:05,510
pendulums

279
00:10:10,120 --> 00:10:07,070
the automatic pendulum which I was

280
00:10:11,830 --> 00:10:10,130
operating this is the chart of how it

281
00:10:13,720 --> 00:10:11,840
behaved during their clips and the

282
00:10:16,510 --> 00:10:13,730
manual pendulum which I was working

283
00:10:17,920 --> 00:10:16,520
myself did this as you can see these are

284
00:10:20,140 --> 00:10:17,930
pretty well synchronized with one

285
00:10:22,210 --> 00:10:20,150
another these at these dips and with a

286
00:10:23,500 --> 00:10:22,220
little luck jump in the middle and they

287
00:10:24,850 --> 00:10:23,510
were they were after the end of the

288
00:10:28,720 --> 00:10:24,860

total eclipse where we were somewhat

289

00:10:30,640 --> 00:10:28,730

after and now but the real start Allah

290

00:10:33,640 --> 00:10:30,650

is what Professor Lin hu saw which is

291

00:10:34,960 --> 00:10:33,650

here you see these are this this relates

292

00:10:38,710 --> 00:10:34,970

to the amount of precession of the

293

00:10:40,060 --> 00:10:38,720

pendulum in about in what he did every

294

00:10:42,010 --> 00:10:40,070

seven minutes in 35 minutes

295

00:10:44,380 --> 00:10:42,020

this is a long pendulum therefore very

296

00:10:46,240 --> 00:10:44,390

stable the longer the pendulum is in

297

00:10:48,760 --> 00:10:46,250

general the most stable is its behavior

298

00:10:53,350 --> 00:10:48,770

and he had a 19 meter long pendulum and

299

00:10:56,350 --> 00:10:53,360

you see this this glut one at 11:15 UT

300

00:10:58,690 --> 00:10:56,360

is relates to this line the pendulum

301
00:11:00,370 --> 00:10:58,700
clearly possessed more than all the

302
00:11:03,610 --> 00:11:00,380
other than in all the other 35-minute

303
00:11:05,350 --> 00:11:03,620
ones and I mean again I don't really see

304
00:11:06,880 --> 00:11:05,360
that this appears incontrovertible to me

305
00:11:07,360 --> 00:11:06,890
I don't really see how anyone could

306
00:11:09,010 --> 00:11:07,370
argue that

307
00:11:10,750 --> 00:11:09,020
that this is not due to some real

308
00:11:13,240 --> 00:11:10,760
physical effect so those are our

309
00:11:14,500 --> 00:11:13,250
litigious results and put all together

310
00:11:15,850 --> 00:11:14,510
the three of us the other very

311
00:11:17,860 --> 00:11:15,860
noticeable thing is all three of us

312
00:11:19,860 --> 00:11:17,870
noticed lkes our defects that we

313
00:11:23,620 --> 00:11:19,870

observed somewhat after the Eclipse

314

00:11:25,690 --> 00:11:23,630

displaced displaced later later than the

315

00:11:28,320 --> 00:11:25,700

central time of the clips and for three

316

00:11:31,600 --> 00:11:28,330

of us to see this independently is

317

00:11:33,700 --> 00:11:31,610

actually it is mutually supportive okay

318

00:11:35,950 --> 00:11:33,710

this is my conclusion until time and

319

00:11:37,930 --> 00:11:35,960

I've maintained it now I consider it an

320

00:11:39,790 --> 00:11:37,940

escapable conclusion but after the end

321

00:11:41,920 --> 00:11:39,800

of the visible Eclipse as the moon left

322

00:11:43,600 --> 00:11:41,930

the Sun some influence exerted itself on

323

00:11:44,650 --> 00:11:43,610

our region containing our equipment

324

00:11:46,630 --> 00:11:44,660

extending over field of at least

325

00:11:48,250 --> 00:11:46,640

hundreds of kilometers in width oh and I

326

00:11:50,230 --> 00:11:48,260

maintained this because I don't think

327

00:11:51,700 --> 00:11:50,240

I'm not saying that it even that it's an

328

00:11:52,960 --> 00:11:51,710

anomalous effect I'm saying that there

329

00:11:58,210 --> 00:11:52,970

was some such effect and I don't know

330

00:11:59,890 --> 00:11:58,220

what it was okay now professor belt in

331

00:12:01,240 --> 00:11:59,900

Japan along with myself he took his

332

00:12:03,220 --> 00:12:01,250

equipment to Japan for an eclipse in

333

00:12:06,160 --> 00:12:03,230

Japan I observed no anomaly at that time

334

00:12:07,630 --> 00:12:06,170

he observed an anomaly which it's not

335

00:12:09,970 --> 00:12:07,640

it's not you see there's the the

336

00:12:12,220 --> 00:12:09,980

Gaussian curve he I don't completely

337

00:12:14,380 --> 00:12:12,230

understand this method of analysis but

338

00:12:16,600 --> 00:12:14,390

he observed in an anomaly during the

339

00:12:18,610 --> 00:12:16,610

actual eclipse of a greater procession

340

00:12:20,949 --> 00:12:18,620

about an addition to about one third of

341

00:12:23,380 --> 00:12:20,959

what the normal Foucault effect is okay

342

00:12:24,579 --> 00:12:23,390

now subsequent to that time professor

343

00:12:26,320 --> 00:12:24,589

Allah teaches been building a

344

00:12:29,079 --> 00:12:26,330

specialized building in his hat and his

345

00:12:30,370 --> 00:12:29,089

place in northern Romania for housing

346

00:12:32,260 --> 00:12:30,380

pendulums that this is it's under

347

00:12:33,790 --> 00:12:32,270

construction here you see here's the

348

00:12:35,320 --> 00:12:33,800

here's the pendulum Tyler sticking up

349

00:12:37,780 --> 00:12:35,330

from there and the pendulum is pendel

350

00:12:39,460 --> 00:12:37,790

operating room is down here the woman is

351
00:12:41,740 --> 00:12:39,470
now completed it's a bit much bigger now

352
00:12:43,930 --> 00:12:41,750
and it holds too it's purely for

353
00:12:47,620 --> 00:12:43,940
operating pendulums yes too long

354
00:12:49,810 --> 00:12:47,630
pendulum is about six meters long so and

355
00:12:52,360 --> 00:12:49,820
now actually I'll show you it in a

356
00:12:53,769 --> 00:12:52,370
moment I'll now explain the construction

357
00:12:55,000 --> 00:12:53,779
of the pendulum which we have in the

358
00:12:56,260 --> 00:12:55,010
room over there which you may see and

359
00:12:58,690 --> 00:12:56,270
which is the pendulum we recommend

360
00:13:01,210 --> 00:12:58,700
people to use over the pattern which we

361
00:13:02,980 --> 00:13:01,220
recommend during the clips next year the

362
00:13:04,960 --> 00:13:02,990
suspension is absolutely foolproof it

363
00:13:07,480 --> 00:13:04,970

has a 1 meter rod which bends to and fro

364

00:13:09,310 --> 00:13:07,490

this suspension is due to professor volt

365

00:13:12,190 --> 00:13:09,320

even call it the veldt can't cantilever

366

00:13:13,990 --> 00:13:12,200

suspension it has the it has the great

367

00:13:16,420 --> 00:13:14,000

advantage is absolutely foolproof and

368

00:13:18,190 --> 00:13:16,430

requires no maintenance there's a a wire

369

00:13:19,840 --> 00:13:18,200

hanging down from that and I would

370

00:13:21,199 --> 00:13:19,850

recommend a pen to have about five

371

00:13:22,819 --> 00:13:21,209

meters of wire

372

00:13:25,989 --> 00:13:22,829

there's a Bob there Bob of the ala

373

00:13:28,609 --> 00:13:25,999

Nietzsche style which is lenticular and

374

00:13:29,809 --> 00:13:28,619

therefore is is symmetrical and has the

375

00:13:32,600 --> 00:13:29,819

least possible air resistance he

376

00:13:34,850 --> 00:13:32,610

invented this Bob and under that there's

377

00:13:37,400 --> 00:13:34,860

an alle dad which means a device for

378

00:13:41,019 --> 00:13:37,410

determining actor for determine azimuth

379

00:13:43,639 --> 00:13:41,029

direction in space which is my invention

380

00:13:44,900 --> 00:13:43,649

consisting it is the optical isla dad

381

00:13:47,210 --> 00:13:44,910

with four light beams in an M for

382

00:13:48,769 --> 00:13:47,220

configuration and a little point on the

383

00:13:50,179 --> 00:13:48,779

bottom of the Bob interrupts the

384

00:13:52,220 --> 00:13:50,189

interrupts these light beams as it goes

385

00:13:53,989 --> 00:13:52,230

to enthroned we take the timings from

386

00:13:55,819 --> 00:13:53,999

this and some complex software which

387

00:13:57,499 --> 00:13:55,829

again I wrote determines the four

388

00:14:00,919 --> 00:13:57,509

important parameters the pendulum motion

389

00:14:02,389 --> 00:14:00,929

the period the amplitude the azimuth of

390

00:14:04,249 --> 00:14:02,399

the major axis of the ellipse of

391

00:14:05,689 --> 00:14:04,259

swinging and the semi minor axis of the

392

00:14:08,359 --> 00:14:05,699

ellipse in other words the eccentricity

393

00:14:10,100 --> 00:14:08,369

which gradually develop

394

00:14:13,100 --> 00:14:10,110

but sometimes any weight has a complex

395

00:14:18,590 --> 00:14:13,110

patterns which we can determine okay now

396

00:14:20,720 --> 00:14:18,600

here is and here is that a video of the

397

00:14:25,280 --> 00:14:20,730

launch of our pendulum in Romania by

398

00:14:29,059 --> 00:14:25,290

dmitriy olenich II here it goes this is

399

00:14:31,100 --> 00:14:29,069

the Ali dad consisting or in this case a

400

00:14:32,780 --> 00:14:31,110

four vernier photogate switch our I

401
00:14:35,090 --> 00:14:32,790
think many of you will know what those

402
00:14:36,739 --> 00:14:35,100
are they are available in many physics

403
00:14:37,850 --> 00:14:36,749
laboratories and they added and the

404
00:14:39,470 --> 00:14:37,860
little point on the bottom of the

405
00:14:41,269 --> 00:14:39,480
pendulum which you cannot see interrupts

406
00:14:42,650 --> 00:14:41,279
the photo gates and gives us sixteen

407
00:14:43,910 --> 00:14:42,660
events in each complete cycle of the

408
00:14:45,470 --> 00:14:43,920
pendulum eight one way and then eight

409
00:14:47,359 --> 00:14:45,480
the other way on off on off on off on

410
00:14:49,519 --> 00:14:47,369
off one way and then back again doing

411
00:14:51,530 --> 00:14:49,529
the same thing and we collect hundreds

412
00:14:53,989 --> 00:14:51,540
and thousands of numbers from this and

413
00:14:56,780 --> 00:14:53,999

that finally gives us the results okay

414

00:14:57,980 --> 00:14:56,790

now I'm going to hand over to Professor

415

00:15:03,850 --> 00:14:57,990

feels who's going to discuss the real

416

00:15:09,859 --> 00:15:06,829

okay they're very good I think well I

417

00:15:15,590 --> 00:15:09,869

have to go this Mike if I get tired

418

00:15:18,609 --> 00:15:15,600

and there yeah please okay let's go now

419

00:15:23,289 --> 00:15:18,619

to some more physics of the pendulum

420

00:15:27,530 --> 00:15:23,299

well I want to go to the theory here but

421

00:15:29,559 --> 00:15:27,540

the intention is to demonstrate what

422

00:15:31,420 --> 00:15:29,569

that we have a rigorous scientific

423

00:15:33,970 --> 00:15:31,430

approach to

424

00:15:36,810 --> 00:15:33,980

pendulum experiments before trimming

425

00:15:39,490 --> 00:15:36,820

anomalous behavior what must one must

426

00:15:42,610 --> 00:15:39,500

know the precise classical physics

427

00:15:44,500 --> 00:15:42,620

behind the pendulum Foucault pendulum is

428

00:15:48,550 --> 00:15:44,510

generally presented in textbooks as an

429

00:15:50,380 --> 00:15:48,560

idea is the 2d I'm gonna cost later but

430

00:15:52,840 --> 00:15:50,390

in fact that system is much more

431

00:15:57,370 --> 00:15:52,850

complicated in it could be considered as

432

00:16:00,400 --> 00:15:57,380

a very low speed gyroscope with highly

433

00:16:08,139 --> 00:16:00,410

nonlinear response actually sad thank

434

00:16:11,710 --> 00:16:08,149

you inhale and and then reopened Roma

435

00:16:13,420 --> 00:16:11,720

are inherently I said anisotropic that

436

00:16:17,560 --> 00:16:13,430

means that they have to different eigen

437

00:16:21,190 --> 00:16:17,570

frequencies for different directions at

438

00:16:23,829 --> 00:16:21,200

90 degrees so the observer nominee is

439

00:16:25,630 --> 00:16:23,839

actually appear in the form of the time

440

00:16:32,160 --> 00:16:25,640

dependence of the orientation of those

441

00:16:34,870 --> 00:16:32,170

eigen axis and say this is a sample of

442

00:16:36,750 --> 00:16:34,880

pure measurement to determine the eigen

443

00:16:40,449 --> 00:16:36,760

axis and then once it and the slow axis

444

00:16:42,280 --> 00:16:40,459

where was is a maximum period by the way

445

00:16:44,590 --> 00:16:42,290

the period precision is the point one

446

00:16:47,519 --> 00:16:44,600

part in 1 million in our measurements

447

00:16:54,630 --> 00:16:51,910

Cameron owners actually mid his doctoral

448

00:16:58,060 --> 00:16:54,640

thesis on the Foucault pendulum and

449

00:17:01,590 --> 00:16:58,070

especially studied the anisotropy of the

450

00:17:08,370 --> 00:17:04,380

is the question that finally suggest

451
00:17:14,460 --> 00:17:08,380
that this the the behavior can be

452
00:17:18,540 --> 00:17:14,470
modeled on on a sphere so actually the

453
00:17:22,100 --> 00:17:18,550
each each elliptical orbit can be

454
00:17:24,480 --> 00:17:22,110
transferred to the geographical

455
00:17:29,880 --> 00:17:24,490
longitude and latitude of the of the

456
00:17:33,540 --> 00:17:29,890
sphere so then actually than the the

457
00:17:38,400 --> 00:17:33,550
equator contains the rectilinear of

458
00:17:45,360 --> 00:17:38,410
oscillations and the upper hemisphere is

459
00:17:48,720 --> 00:17:45,370
for it's for left-handed ellipse and the

460
00:17:50,940 --> 00:17:48,730
other one the the other side what

461
00:17:54,030 --> 00:17:50,950
happens then with this representation is

462
00:17:57,870 --> 00:17:54,040
that we can model the the behavior with

463
00:18:01,050 --> 00:17:57,880

time of the pendulum as a circle on that

464

00:18:02,790 --> 00:18:01,060

sphere yeah you're too modest when a you

465

00:18:05,280 --> 00:18:02,800

know you say that this new modernization

466

00:18:06,560 --> 00:18:05,290

isn't a lead you to you yes yeah that's

467

00:18:11,520 --> 00:18:06,570

all right

468

00:18:14,100 --> 00:18:11,530

okay enough two minutes and if I if I

469

00:18:16,890 --> 00:18:14,110

use this model now back to the to the

470

00:18:19,890 --> 00:18:16,900

original data of Camilla Knowles then we

471

00:18:23,760 --> 00:18:19,900

see that these data actually fall on

472

00:18:27,690 --> 00:18:23,770

that circle and in our own experiments

473

00:18:30,150 --> 00:18:27,700

then we suggest that we experiment

474

00:18:32,850 --> 00:18:30,160

experiment around the bottom part of

475

00:18:37,470 --> 00:18:32,860

that circle that we saw there so that

476

00:18:41,460 --> 00:18:37,480

bottom azimuth actually is the slow axis

477

00:18:45,120 --> 00:18:41,470

azimuth and the animal is usually short

478

00:18:47,580 --> 00:18:45,130

as a variation in time of that sort okay

479

00:18:48,930 --> 00:18:47,590

we can just drag it yeah man the blue

480

00:18:50,340 --> 00:18:48,940

dots are actually the actual

481

00:18:53,910 --> 00:18:50,350

experimental data that we've received

482

00:18:55,530 --> 00:18:53,920

the red line is a quadratic quadratic

483

00:18:57,630 --> 00:18:55,540

trend line and you see how extremely

484

00:18:59,040 --> 00:18:57,640

accurate our pendulum is look how

485

00:19:03,060 --> 00:18:59,050

closely fitting is it's real it really

486

00:19:04,650 --> 00:19:03,070

surprised me myself here's his rep his

487

00:19:07,260 --> 00:19:04,660

reference now I'll finish off we've got

488

00:19:09,480 --> 00:19:07,270

one minute okay now that if we can

489

00:19:11,940 --> 00:19:09,490

persuade some people possibly you or

490

00:19:13,740 --> 00:19:11,950

friends of yours to set up pendulums

491

00:19:15,270 --> 00:19:13,750

it should not be thought of as the one

492

00:19:17,310 --> 00:19:15,280

experiment that can only be done during

493

00:19:19,290 --> 00:19:17,320

the solar eclipse the upcoming eclipse

494

00:19:21,000 --> 00:19:19,300

you can use it from long time as a

495

00:19:21,540 --> 00:19:21,010

teaching aid the in physics of the

496

00:19:23,340 --> 00:19:21,550

pendulum

497

00:19:25,680 --> 00:19:23,350

even without anomalous is extremely

498

00:19:27,510 --> 00:19:25,690

extremely interesting and important

499

00:19:29,100 --> 00:19:27,520

there some students look at a pendulum

500

00:19:31,620 --> 00:19:29,110

furthermore there are two more

501
00:19:33,420 --> 00:19:31,630
opportunities for you for very much the

502
00:19:35,880 --> 00:19:33,430
same things enough annual ellipse

503
00:19:38,370 --> 00:19:35,890
crosses America in 2023 like that and

504
00:19:39,930 --> 00:19:38,380
there's a total eclipse in 2024

505
00:19:42,560 --> 00:19:39,940
you could even with guard an experiment

506
00:19:45,150 --> 00:19:42,570
in 2017 as a rehearsal for these two and

507
00:19:46,710 --> 00:19:45,160
basically I think that this is a

508
00:19:48,870 --> 00:19:46,720
challenge to America to find out

509
00:19:50,460 --> 00:19:48,880
something new and remember the great

510
00:19:52,260 --> 00:19:50,470
advantage of organizing an experiment of

511
00:19:54,420 --> 00:19:52,270
this sort is that you don't have to be

512
00:19:56,610 --> 00:19:54,430
on the path of the Illit of the Eclipse

513
00:19:58,880 --> 00:19:56,620

anywhere in America or even Canada I

514

00:20:01,680 --> 00:19:58,890

must or Mexico will be a very will be

515

00:20:03,930 --> 00:20:01,690

experience a partial partial eclipse and

516

00:20:05,820 --> 00:20:03,940

it will be the data will be equally

517

00:20:08,460 --> 00:20:05,830

valuable as you see in the previous

518

00:20:10,140 --> 00:20:08,470

analyses some of the effects would were

519

00:20:11,340 --> 00:20:10,150

seen at the very end or the very

520

00:20:13,230 --> 00:20:11,350

beginning of the clips in other words

521

00:20:16,680 --> 00:20:13,240

when the moon was virtually just

522

00:20:18,300 --> 00:20:16,690

touching the Sun in the sky so don't

523

00:20:20,370 --> 00:20:18,310

think I'm out to the path it's not worth

524

00:20:22,320 --> 00:20:20,380

it if you live if you live down there or

525

00:20:24,630 --> 00:20:22,330

you live up here live up here or up here

526

00:20:27,150 --> 00:20:24,640

wherever you're such a result will be an

527

00:20:29,130 --> 00:20:27,160

extreme interest and really compared to

528

00:20:30,630 --> 00:20:29,140

the cost of other and original physics

529

00:20:32,190 --> 00:20:30,640

experiments the cost is absolutely

530

00:20:37,140 --> 00:20:32,200

minimal okay thank you very much

531

00:20:39,840 --> 00:20:37,150

gentlemen ladies and gentlemen thank you

532

00:20:47,160 --> 00:20:39,850

for the interesting presentation do we

533

00:20:50,310 --> 00:20:47,170

have questions so the main effect that

534

00:20:52,110 --> 00:20:50,320

you observed was a small change in the

535

00:20:54,060 --> 00:20:52,120

gravitational fields apparent

536

00:20:56,970 --> 00:20:54,070

gravitational field strength I wouldn't

537

00:20:58,560 --> 00:20:56,980

say that for the pendulum for the for

538

00:21:01,920 --> 00:20:58,570

gravimeters the only thing they can

539

00:21:04,110 --> 00:21:01,930

measure is that the direction of the

540

00:21:07,650 --> 00:21:04,120

direction of gravity in the downward

541

00:21:10,620 --> 00:21:07,660

direction and but in the variations are

542

00:21:13,560 --> 00:21:10,630

very small with pendulums the the

543

00:21:15,270 --> 00:21:13,570

effects may so far that have been seen

544

00:21:16,830 --> 00:21:15,280

and be manifested in a variation of the

545

00:21:18,630 --> 00:21:16,840

precession wait because you know a

546

00:21:20,070 --> 00:21:18,640

Foucault pendulum processes as it you

547

00:21:21,860 --> 00:21:20,080

know and it swings to and fro the

548

00:21:23,940 --> 00:21:21,870

direction of swinging gladly processes

549

00:21:24,960 --> 00:21:23,950

clockwise in their.all hemisphere so

550

00:21:27,570 --> 00:21:24,970

there's really not much of an

551
00:21:30,150 --> 00:21:27,580
explanation at all for that well

552
00:21:31,470 --> 00:21:30,160
no you see it's an act this is an

553
00:21:33,630 --> 00:21:31,480
unexplained phenomena this is the point

554
00:21:35,580 --> 00:21:33,640
and we want to basically we want to have

555
00:21:37,980 --> 00:21:35,590
as many possible replications in America

556
00:21:40,320 --> 00:21:37,990
into and 21st of August 2017 as possible

557
00:21:41,940 --> 00:21:40,330
because at the moment some guy sees it

558
00:21:43,890 --> 00:21:41,950
and sees something in an eclipse you've

559
00:21:46,140 --> 00:21:43,900
seen the type of thing okay well well

560
00:21:47,790 --> 00:21:46,150
maybe he was drunk maybe he's lying who

561
00:21:49,560 --> 00:21:47,800
knows but if you've got six or seven

562
00:21:51,390 --> 00:21:49,570
people reporting anomalies correlated

563
00:21:53,010 --> 00:21:51,400

with the same Eclipse then such

564

00:21:56,760 --> 00:21:53,020

explanations can no longer be maintained

565

00:21:58,740 --> 00:21:56,770

just word actually this changes the end

566

00:22:00,510 --> 00:21:58,750

yet and isotropy okay or depends on

567

00:22:01,980 --> 00:22:00,520

Michael yeah that's the way that's how

568

00:22:03,990 --> 00:22:01,990

it manifests its no how about the

569

00:22:06,030 --> 00:22:04,000

torsion pendulum you mention it but I

570

00:22:08,400 --> 00:22:06,040

don't think you actually that's torsion

571

00:22:09,900 --> 00:22:08,410

pendulum a large torsion pendulum which

572

00:22:11,610 --> 00:22:09,910

you know you twist it it kind of goes

573

00:22:13,770 --> 00:22:11,620

like that and comes back and comes back

574

00:22:17,100 --> 00:22:13,780

the only thing you well in theory the

575

00:22:18,750 --> 00:22:17,110

only thing you can observe no no in in

576

00:22:21,870 --> 00:22:18,760

prejudice theory the only thing you can

577

00:22:24,000 --> 00:22:21,880

observe is the period and a variation of

578

00:22:27,150 --> 00:22:24,010

the period was noticed in 1970 mice Axl

579

00:22:28,440 --> 00:22:27,160

and Alan however actually you see the

580

00:22:30,390 --> 00:22:28,450

Pentium hangs down it might possibly

581

00:22:31,560 --> 00:22:30,400

also act as a stationary pendulum you

582

00:22:32,850 --> 00:22:31,570

know in other words the direction of

583

00:22:34,980 --> 00:22:32,860

gravity might change slightly

584

00:22:36,780 --> 00:22:34,990

and many torsion pendulum is not set up

585

00:22:38,880 --> 00:22:36,790

to show that it depends on the

586

00:22:40,770 --> 00:22:38,890

instrumentation a colleague of ours a

587

00:22:42,000 --> 00:22:40,780

professor Casella Finland thinks he

588

00:22:45,270 --> 00:22:42,010

detected something like that in an

589

00:22:46,980 --> 00:22:45,280

eclipse in 1991 in Mexico but he wasn't

590

00:22:49,530 --> 00:22:46,990

fully instrumented you see you need i

591

00:22:51,510 --> 00:22:49,540

any apparatus with somebody sets up

592

00:22:53,070 --> 00:22:51,520

should be instrumented so that all

593

00:22:55,140 --> 00:22:53,080

possible deviations can be monitored

594

00:22:56,910 --> 00:22:55,150

however I consider that it's very

595

00:22:58,740 --> 00:22:56,920

important to have several sets of

596

00:23:03,650 --> 00:22:58,750

standardized apparatus so that we can

597

00:23:05,880 --> 00:23:03,660

compare or apples to apples thank you I

598

00:23:08,040 --> 00:23:05,890

have a question in the comments so the

599

00:23:10,110 --> 00:23:08,050

question is how large is the effect on

600

00:23:12,060 --> 00:23:10,120

the on the gravimeter so that refer to

601
00:23:13,440 --> 00:23:12,070
the scale I could notice that one milli

602
00:23:17,520 --> 00:23:13,450
gal several million

603
00:23:19,890 --> 00:23:17,530
quite clear to us what Michael got keep

604
00:23:21,420 --> 00:23:19,900
saying that several micro gal not very

605
00:23:23,870 --> 00:23:21,430
large but quite clearly noticeable as

606
00:23:27,960 --> 00:23:23,880
you can see for these my comment is that

607
00:23:30,540 --> 00:23:27,970
unless you do a statistical analysis you

608
00:23:33,180 --> 00:23:30,550
will not convince anyone so I think you

609
00:23:34,740 --> 00:23:33,190
need a statistical analysis yes ideally

610
00:23:39,000 --> 00:23:34,750
what several parameters don't like the

611
00:23:39,990 --> 00:23:39,010
background yes but you see let's go up

612
00:23:42,660 --> 00:23:40,000
here

613
00:23:44,980 --> 00:23:42,670

but for say for example look at the one

614

00:23:47,470 --> 00:23:44,990

that gravimeter was taking many many

615

00:23:48,790 --> 00:23:47,480

many readings and then it you know it's

616

00:23:49,930 --> 00:23:48,800

not just one reading its taking a

617

00:23:51,910 --> 00:23:49,940

reading every second or something like

618

00:23:54,100 --> 00:23:51,920

that and there are a lot of readings I

619

00:23:56,980 --> 00:23:54,110

agree that ideally there'll be several

620

00:23:58,600 --> 00:23:56,990

of limiters doing their job and so that

621

00:24:00,370 --> 00:23:58,610

you can't just say well it was broken

622

00:24:02,110 --> 00:24:00,380

because it could be you see yeah I'm

623

00:24:04,180 --> 00:24:02,120

just saying that's for example for the

624

00:24:06,880 --> 00:24:04,190

gravity meter you have to come compare

625

00:24:08,500 --> 00:24:06,890

the data to what you see over one one

626

00:24:11,710 --> 00:24:08,510

year and oh yeah so absolutely

627

00:24:14,860 --> 00:24:11,720

absolutely this Memphis but we have like

628

00:24:16,720 --> 00:24:14,870

a like a like a significance of the

629

00:24:19,120 --> 00:24:16,730

effect do we have a number for that I

630

00:24:20,980 --> 00:24:19,130

haven't got the number know these in the

631

00:24:22,000 --> 00:24:20,990

Wang it's pretty good and I think he

632

00:24:23,260 --> 00:24:22,010

does have a number somewhere in it the

633

00:24:27,490 --> 00:24:23,270

Wang report which was in Physical Review

634

00:24:29,920 --> 00:24:27,500

the do valve I think he did some kind of

635

00:24:32,590 --> 00:24:29,930

analysis of that sort didn't he Sigma

636

00:24:33,820 --> 00:24:32,600

Vishwas report is very this is this is

637

00:24:35,200 --> 00:24:33,830

just my point it's nice if you

638

00:24:37,180 --> 00:24:35,210

understand all the physics of your

639

00:24:39,520 --> 00:24:37,190

pendulum but you need to go to

640

00:24:42,070 --> 00:24:39,530

statistically oh yes certainly certainly

641

00:24:43,780 --> 00:24:42,080

analysis certainly and certainly

642

00:24:46,420 --> 00:24:43,790

duplication with several sets of

643

00:24:48,880 --> 00:24:46,430

equipment is extremely important so I

644

00:24:51,010 --> 00:24:48,890

want to say that first I love your

645

00:24:52,900 --> 00:24:51,020

enthusiasm well thank you I mean I'm not

646

00:24:54,370 --> 00:24:52,910

a practice speaker I explain it all in

647

00:24:56,020 --> 00:24:54,380

the short time available and I also

648

00:24:58,300 --> 00:24:56,030

really love the idea of having a

649

00:24:59,650 --> 00:24:58,310

large-scale experiment with a lot of

650

00:25:02,470 --> 00:24:59,660

people involved yes you're getting a

651
00:25:04,270 --> 00:25:02,480
cheap way under cheap one I was

652
00:25:05,680 --> 00:25:04,280
wondering though what you know a lot of

653
00:25:07,900 --> 00:25:05,690
times when people have so much

654
00:25:10,600 --> 00:25:07,910
enthusiasm and so much excitement and

655
00:25:13,240 --> 00:25:10,610
they're expecting or looking for a

656
00:25:14,890 --> 00:25:13,250
specific outcome experimenter effect

657
00:25:17,590 --> 00:25:14,900
comes into play I'd wonder if you

658
00:25:19,900 --> 00:25:17,600
considered psychokinesis or PK well I'd

659
00:25:22,480 --> 00:25:19,910
be affecting your pendulums could I this

660
00:25:26,050 --> 00:25:22,490
is this is something that we cannot

661
00:25:29,680 --> 00:25:26,060
exclude however um perhaps the best way

662
00:25:31,180 --> 00:25:29,690
to exclude it you see very often the

663
00:25:32,380 --> 00:25:31,190

pendulum will not be in the clips trap

664

00:25:34,680 --> 00:25:32,390

they'll be off it so there will be no

665

00:25:39,040 --> 00:25:34,690

great excitement by the event itself and

666

00:25:40,660 --> 00:25:39,050

indeed because we have the automated

667

00:25:43,030 --> 00:25:40,670

monitoring system which is pretty

668

00:25:45,340 --> 00:25:43,040

accurate the only thing needed is some

669

00:25:47,200 --> 00:25:45,350

thought for the operator is that say

670

00:25:49,390 --> 00:25:47,210

every year every 40 minutes or something

671

00:25:50,650 --> 00:25:49,400

he stops the pendulum he brings it off

672

00:25:53,020 --> 00:25:50,660

to the side he attaches it with a little

673

00:25:54,790 --> 00:25:53,030

cord he steadies it he way

674

00:25:56,920 --> 00:25:54,800

for a couple of minutes that come down

675

00:25:58,300 --> 00:25:56,930

and then he burns the cord so then he

676
00:25:59,890 --> 00:25:58,310
presses the right button on the computer

677
00:26:01,990 --> 00:25:59,900
to start up the recording again and he

678
00:26:04,510 --> 00:26:02,000
places the cord you see it's not very

679
00:26:07,540 --> 00:26:04,520
exciting and he doesn't even really have

680
00:26:09,070 --> 00:26:07,550
to know when the clips is and enormous

681
00:26:10,390 --> 00:26:09,080
the quantities of numbers come flowing

682
00:26:13,990 --> 00:26:10,400
down the screen but they mean nothing to

683
00:26:15,940 --> 00:26:14,000
him furthermore we hope that the in such

684
00:26:17,980 --> 00:26:15,950
an experiment we people will organize a

685
00:26:20,020 --> 00:26:17,990
small team perhaps of students to

686
00:26:21,940 --> 00:26:20,030
operate the pendulum for about five days

687
00:26:23,800 --> 00:26:21,950
over the Eclipse non-stop it's not very

688
00:26:25,240 --> 00:26:23,810

hard work really you know you can you

689

00:26:26,830 --> 00:26:25,250

can do six hours of its standing on your

690

00:26:28,840 --> 00:26:26,840

head so if you had like four people

691

00:26:31,180 --> 00:26:28,850

doing six hours six hours six hours six

692

00:26:33,190 --> 00:26:31,190

hours you could happily operate for fire

693

00:26:34,360 --> 00:26:33,200

for five days what the day of the

694

00:26:35,890 --> 00:26:34,370

clipped two days before the day and the

695

00:26:36,970 --> 00:26:35,900

clips and the day after and they don't

696

00:26:38,860 --> 00:26:36,980

really have to know much about their

697

00:26:41,290 --> 00:26:38,870

clips they don't have to watch TV so I

698

00:26:43,720 --> 00:26:41,300

you know that the chance that they will

699

00:26:45,310 --> 00:26:43,730

see that they clips is enough it's not

700

00:26:46,720 --> 00:26:45,320

going to happen because ideally you will

701
00:26:48,760 --> 00:26:46,730
try and keep them as a divorce from the

702
00:26:50,080 --> 00:26:48,770
mat as possible ideally housewives will

703
00:26:52,030 --> 00:26:50,090
have note the slightest interest in the

704
00:26:55,750 --> 00:26:52,040
clips would be the best possible later

705
00:26:58,300 --> 00:26:55,760
and racer by by varying the experimenter

706
00:27:00,340 --> 00:26:58,310
you can help to dissipate yes but we

707
00:27:02,050 --> 00:27:00,350
have with it yes but in this situation

708
00:27:05,020 --> 00:27:02,060
we have abs we have absolutely no

709
00:27:07,180 --> 00:27:05,030
operator effect Alice was plagued by a

710
00:27:09,400 --> 00:27:07,190
Pareto effect in his operations because

711
00:27:10,600 --> 00:27:09,410
reading the pendulum by staking sites

712
00:27:12,970 --> 00:27:10,610
with the cycling method and so on

713
00:27:14,220 --> 00:27:12,980

inevitably involves inviting when you

714

00:27:17,680 --> 00:27:14,230

change the operator the results change

715

00:27:20,470 --> 00:27:17,690

but with our automatic alidade recording

716

00:27:22,540 --> 00:27:20,480

system though you know you couldn't fake

717

00:27:25,060 --> 00:27:22,550

it because you get like eight thousand

718

00:27:26,680 --> 00:27:25,070

numbers for every 40 minutes so you'd

719

00:27:28,090 --> 00:27:26,690

have to have to fake it you need a you

720

00:27:30,820 --> 00:27:28,100

need a huge system to just calculate

721

00:27:32,020 --> 00:27:30,830

your calculate fake numbers so that's

722

00:27:35,710 --> 00:27:32,030

what that's also an advantage of this

723

00:27:38,050 --> 00:27:35,720

system so compared to other things like

724

00:27:40,630 --> 00:27:38,060

the accelerometer and a cell phone or

725

00:27:44,220 --> 00:27:40,640

laser ring gyro where does the pendulum

726

00:27:46,420 --> 00:27:44,230

fall in terms of sensitivity to the

727

00:27:48,940 --> 00:27:46,430

precession that's a very good question

728

00:27:51,070 --> 00:27:48,950

because there has been have been one or

729

00:27:54,580 --> 00:27:51,080

two interesting results made effectively

730

00:27:55,780 --> 00:27:54,590

using micro accelerometers you know the

731

00:27:57,790 --> 00:27:55,790

type that they put them on a chip now

732

00:27:59,950 --> 00:27:57,800

and I could discuss that but there's not

733

00:28:01,210 --> 00:27:59,960

time um oh and I would think I think I

734

00:28:02,650 --> 00:28:01,220

could also suggest experiments that can

735

00:28:04,390 --> 00:28:02,660

be done using that however

736

00:28:05,770 --> 00:28:04,400

the sensitivity of Pentium well it's

737

00:28:06,670 --> 00:28:05,780

hard to say it depends exactly what you

738

00:28:08,650 --> 00:28:06,680

mean to

739

00:28:10,240 --> 00:28:08,660

depends what type of effect you think is

740

00:28:11,530 --> 00:28:10,250

acting on the pendulum but I would say

741

00:28:13,810 --> 00:28:11,540

Milly that we're talking about

742

00:28:15,370 --> 00:28:13,820

precession yeah which is a laser ring

743

00:28:18,310 --> 00:28:15,380

gyro is also very sensitive to

744

00:28:20,410 --> 00:28:18,320

precession oh yes but it isn't it is not

745

00:28:22,480 --> 00:28:20,420

physical system in the same sense it

746

00:28:26,170 --> 00:28:22,490

does not involve angular momentum and

747

00:28:28,990 --> 00:28:26,180

angular angular moment of inertia and so

748

00:28:30,250 --> 00:28:29,000

on so I would rather stick as close as

749

00:28:32,560 --> 00:28:30,260

possible to equipment that has already

750

00:28:34,390 --> 00:28:32,570

been shown to observe anomalous well I

751
00:28:36,460 --> 00:28:34,400
mean other experiments will also be good

752
00:28:38,560 --> 00:28:36,470
but it's a bit striking Alcala the duck

753
00:28:39,910 --> 00:28:38,570
you can never repeat an eclipse you know

754
00:28:42,490 --> 00:28:39,920
you only have one shot you only have one

755
00:28:46,390 --> 00:28:42,500
shot at it way of him yeah just there

756
00:28:49,990 --> 00:28:46,400
just a other question yeah actually the

757
00:28:54,790 --> 00:28:50,000
the the precision of the gravitational

758
00:29:02,320 --> 00:28:54,800
constant big G is in 1 to 1000 to 1

759
00:29:03,550 --> 00:29:02,330
million and our our effects actually and

760
00:29:06,160 --> 00:29:03,560
that order of magnitude

761
00:29:07,600 --> 00:29:06,170
yes I would say well Newton to you see

762
00:29:11,140 --> 00:29:07,610
yes I would say we're working in

763
00:29:12,340 --> 00:29:11,150

millions but not not hundred millions I

764

00:29:13,960 --> 00:29:12,350

would say we are not working in 10 to

765

00:29:15,520 --> 00:29:13,970

the minus 8 but we are certainly on the

766

00:29:17,320 --> 00:29:15,530

tenth or minus 6 or 10 to the minus 7

767

00:29:20,500 --> 00:29:17,330

level this is only a very ballpark

768

00:29:23,190 --> 00:29:20,510

figure yeah and so we are at the fringe

769

00:29:26,020 --> 00:29:23,200

of the the precision of gravitation so

770

00:29:28,300 --> 00:29:26,030

this might be a graph there's no effect

771

00:29:30,280 --> 00:29:28,310

but it's not where is that predicted by

772

00:29:33,040 --> 00:29:30,290

Newton you see it's not predicted by

773

00:29:34,960 --> 00:29:33,050

Einstein but the sign that predicts

774

00:29:37,200 --> 00:29:34,970

there's something which I went but I

775

00:29:40,750 --> 00:29:37,210

intend to do to the 18 but not that and

776

00:29:42,370 --> 00:29:40,760

I personally think that it that I mean

777

00:29:44,770 --> 00:29:42,380

it's a new asset if it exists it's a new

778

00:29:46,540 --> 00:29:44,780

effect and whether its gravitational not

779

00:29:48,640 --> 00:29:46,550

is is to some extent a linguistic

780

00:29:50,770 --> 00:29:48,650

question in other words do you intend to

781

00:29:52,210 --> 00:29:50,780

change the theory currently held of

782

00:29:54,370 --> 00:29:52,220

gravitation subsume it under the same

783

00:29:57,010 --> 00:29:54,380

rubric I would suggest that it might be

784

00:29:59,140 --> 00:29:57,020

more convenient for for logical purposes

785

00:30:01,330 --> 00:29:59,150

to consider it under a different under a

786

00:30:02,650 --> 00:30:01,340

different heading but that when we know

787

00:30:04,270 --> 00:30:02,660

more about it we'll be able to decide

788

00:30:06,340 --> 00:30:04,280

that I think what we need now is to see

789

00:30:08,080 --> 00:30:06,350

if we can get any results thank you very

790

00:30:09,650 --> 00:30:08,090

much for your interesting talk and thank