1
00:00:07,369 --> 00:00:04,849
this is an update of work i began little

2
00:00:14,150 --> 00:00:07,379
over a year ago and i gave a preliminary

3
00:00:16,010 --> 00:00:14,160
report at the last annual meeting it's a

4
00:00:20,000 --> 00:00:16,020
collaboration i have with a number of

5
00:00:22,460 --> 00:00:20,010
physicists at purdue university what

6
00:00:26,050 --> 00:00:22,470
happened is that i was living national

7
00:00:28,609 --> 00:00:26,060
solar observatory and mark john popper

8
00:00:30,800 --> 00:00:28,619
showed me two articles that caught my

9
00:00:36,110 --> 00:00:30,810
attention which i'll show you in a few

10
00:00:38,540 --> 00:00:36,120
minutes and that led me to contact efron

11
00:00:40,670 --> 00:00:38,550
Fishbach and his colleagues at Purdue

12
00:00:44,510 --> 00:00:40,680
I've been collaborating with them sets

13
00:00:48,290 --> 00:00:44,520

it's a problem involving nuclear physics

14
00:00:50,569 --> 00:00:48,300
and which I know extremely little and

15
00:00:52,939 --> 00:00:50,579
solar physics so I am the solar physics

16
00:00:54,979 --> 00:00:52,949
bartleburt of the project and my

17
00:01:01,599 --> 00:00:54,989
colleagues here take care of the

18
00:01:06,260 --> 00:01:01,609
nucleophilic well this goes back to

19
00:01:10,870 --> 00:01:06,270
nineteen fifty-one influential article

20
00:01:10,880 --> 00:01:16,120
concerning whether active elements and

21
00:01:22,700 --> 00:01:20,600
they suspected that radioactivity was

22
00:01:25,070 --> 00:01:22,710
unaffected by an environmental effects

23
00:01:26,469 --> 00:01:25,080
they put this to the test they put some

24
00:01:29,300 --> 00:01:26,479
way home in the middle of a bomb

25
00:01:31,760 --> 00:01:29,310
exploded the bomb and they are able to

26
00:01:34,090 --> 00:01:31,770
monitor that account rates during the

27
00:01:38,090 --> 00:01:34,100
explosion and they found no change

28
00:01:40,940 --> 00:01:38,100
although the temperature went up to 2500

29
00:01:48,679 --> 00:01:40,950
degrees and pressure up to a thousand

30
00:01:52,130 --> 00:01:48,689
atmospheres and recent number 972 review

31
00:01:54,050 --> 00:01:52,140
article on nuclear decay rates say that

32
00:01:57,050 --> 00:01:54,060
one of the paradigms of nuclear physics

33
00:02:00,410 --> 00:01:57,060
nuclear science has been the general

34
00:02:03,440 --> 00:02:00,420
understanding that the half-life or

35
00:02:05,740 --> 00:02:03,450
decay constant of radioactive substance

36
00:02:08,389 --> 00:02:05,750
is independent of extra nuclear

37
00:02:11,540 --> 00:02:08,399
considerations and that's what we all

38
00:02:14,900 --> 00:02:11,550

learned in physics 101 but it happened

39
00:02:21,000 --> 00:02:18,570
now a quick review their verse kinds of

40
00:02:24,360 --> 00:02:21,010
decays alpha decay is a mission an alpha

41
00:02:28,800 --> 00:02:24,370
particle beta decay is a mission of an

42
00:02:31,890 --> 00:02:28,810
electron and the effects that I'll be

43
00:02:38,400 --> 00:02:31,900
talking about a pip involve only beta

44
00:02:40,230 --> 00:02:38,410
decays okay and that's difference

45
00:02:42,390 --> 00:02:40,240
between Peters and alpha alpha is

46
00:02:45,480 --> 00:02:42,400
governed by the strong nuclear force and

47
00:02:48,900 --> 00:02:45,490
beta decays by the weak nuclear force

48
00:02:50,820 --> 00:02:48,910
which also involves neutrinos which I

49
00:02:55,620 --> 00:02:50,830
think will play a key role in this

50
00:02:57,720 --> 00:02:55,630
project so here is an example of a decay

51
00:03:02,370 --> 00:02:57,730
of radium which is one of the subjects

52
00:03:07,430 --> 00:03:02,380
of the investigation when Peter part was

53
00:03:12,420 --> 00:03:07,440
emitted the rayon transfers to actinium

54
00:03:22,110 --> 00:03:12,430
the same atomic mass but a different

55
00:03:27,090 --> 00:03:22,120
atomic number okay okay now if caught my

56
00:03:30,320 --> 00:03:27,100
attention was the fact that a year ago

57
00:03:33,150 --> 00:03:30,330
and you either I learned about two

58
00:03:36,479 --> 00:03:33,160
experimental groups who would each been

59
00:03:39,530 --> 00:03:36,489
studying the decay rates of elements and

60
00:03:42,990 --> 00:03:39,540
each found an annual variation in the

61
00:03:45,060 --> 00:03:43,000
decay rates one group was carried out

62
00:03:46,949 --> 00:03:45,070
experiments carry out at brookhaven

63
00:03:51,810 --> 00:03:46,959

national laboratory by al Berg and his

64
00:03:54,000 --> 00:03:51,820
colleagues and this is a plot of the

65
00:03:57,479 --> 00:03:54,010
results is actually seven point running

66
00:03:59,750 --> 00:03:57,489
means to smooth it and that the red line

67
00:04:03,650 --> 00:03:59,760
is the inverse of the sun-earth distance

68
00:04:05,940 --> 00:04:03,660
and normalized to be similar to the

69
00:04:09,300 --> 00:04:05,950
amplitude of the decay rate variations

70
00:04:12,509 --> 00:04:09,310
and you see that they both that the

71
00:04:15,360 --> 00:04:12,519
decay rates seem to show a very obvious

72
00:04:18,240 --> 00:04:15,370
annual variation the phase is not

73
00:04:19,849 --> 00:04:18,250
exactly the same as the one you would

74
00:04:24,290 --> 00:04:19,859
expect from the sun-earth distance

75
00:04:26,899 --> 00:04:24,300
eccentricity another group

76
00:04:29,779 --> 00:04:26,909
in Germany seagulls and his colleagues

77
00:04:32,270 --> 00:04:29,789
who carried out announcer several

78
00:04:35,749 --> 00:04:32,280
elements but one which is radium and

79
00:04:39,260 --> 00:04:35,759
that went on for about 12 years and you

80
00:04:44,270 --> 00:04:39,270
see it's an even more striking fit to

81
00:04:46,969 --> 00:04:44,280
the annual variation curve so the

82
00:04:48,529 --> 00:04:46,979
question was what is going on and the

83
00:04:49,490 --> 00:04:48,539
spread mendel's of course will convince

84
00:04:51,529 --> 00:04:49,500
her something wrong with their

85
00:04:55,670 --> 00:04:51,539
experiment they were unable to pin down

86
00:04:56,990 --> 00:04:55,680
exactly what it was but obviously decay

87
00:04:58,610 --> 00:04:57,000
rate don't chain so there had to be

88
00:05:01,159 --> 00:04:58,620

something wrong with the experiment well

89
00:05:02,779 --> 00:05:01,169
perverse reasons are efron Fishbach

90
00:05:08,649 --> 00:05:02,789
decided to look into this more carefully

91
00:05:11,240 --> 00:05:08,659
and he finding these and one other

92
00:05:13,279 --> 00:05:11,250
experimental set all showing annual

93
00:05:16,059 --> 00:05:13,289
variation he suspected that something

94
00:05:18,350 --> 00:05:16,069
real was going on an annual variation

95
00:05:19,610 --> 00:05:18,360
suggested that maybe the Sun will be

96
00:05:26,899 --> 00:05:19,620
involved since the sun-earth distance

97
00:05:30,320 --> 00:05:26,909
varies on a one-year timescale so this

98
00:05:32,420 --> 00:05:30,330
is where I came in and as long as one is

99
00:05:33,800 --> 00:05:32,430
looking only at an annual variation for

100
00:05:37,309 --> 00:05:33,810
this will be very concerned because

101
00:05:40,519 --> 00:05:37,319
radon flux and temperature and pressure

102
00:05:42,649 --> 00:05:40,529
or vary with annual timescale so I

103
00:05:47,629 --> 00:05:42,659
thought if one is looking for evidence

104
00:05:49,430 --> 00:05:47,639
of a solar effect one should look for

105
00:05:52,309 --> 00:05:49,440
some other signal which one can

106
00:05:55,969 --> 00:05:52,319
associate with the Sun and one is solar

107
00:05:57,890 --> 00:05:55,979
rotation and there is no unique so

108
00:06:00,649 --> 00:05:57,900
rotation rate even the surface of the

109
00:06:05,300 --> 00:06:00,659
Sun the rotation rate varies over quite

110
00:06:07,999 --> 00:06:05,310
a wide range but a reasonable search ban

111
00:06:14,589 --> 00:06:08,009
would be between 10 and 15 cycles per

112
00:06:19,490 --> 00:06:14,599
year and the left-hand curve shows an a

113
00:06:22,040 --> 00:06:19,500

time-frequency analysis of some of the

114
00:06:26,269 --> 00:06:22,050
data from the Brookhaven experiment the

115
00:06:30,320 --> 00:06:26,279
chlorine Dana and it shows it shows very

116
00:06:33,499 --> 00:06:30,330
clearly that the one year once I could

117
00:06:34,590 --> 00:06:33,509
be a variation the very bottom running

118
00:06:36,810 --> 00:06:34,600
throughout the time scale

119
00:06:38,430 --> 00:06:36,820
drifting off toward fading away over

120
00:06:40,560 --> 00:06:38,440
towards the end interestingly enough

121
00:06:44,460 --> 00:06:40,570
this may be an experimental effect

122
00:06:47,250 --> 00:06:44,470
because all the all the variations seem

123
00:06:50,340 --> 00:06:47,260
to fade away towards the end that is

124
00:06:52,770 --> 00:06:50,350
shows very clearly features with

125
00:06:56,760 --> 00:06:52,780
frequencies of 10.9 cycles per year and

126
00:06:58,320 --> 00:06:56,770
twelve point seven cycles PR which fall

127
00:07:00,660 --> 00:06:58,330
in the surf band for possible rotation

128
00:07:03,540 --> 00:07:00,670
rates little on the low side that there

129
00:07:07,980 --> 00:07:03,550
we are on the right hand side is silicon

130
00:07:10,710 --> 00:07:07,990
and that shows are very little in the

131
00:07:13,590 --> 00:07:10,720
work in the search band and very little

132
00:07:16,050 --> 00:07:13,600
in the one cycle per year and this shows

133
00:07:18,480 --> 00:07:16,060
that different elements behave

134
00:07:20,430 --> 00:07:18,490
differently whatever is going on it's

135
00:07:26,640 --> 00:07:20,440
not uniform is not the same for all

136
00:07:30,360 --> 00:07:26,650
elements this is a power spectrum from

137
00:07:33,060 --> 00:07:30,370
the BNL data and chlorine on the Left

138
00:07:36,620 --> 00:07:33,070

silicon on the right and they showed

139
00:07:42,030 --> 00:07:36,630
clear peaks at one cycle PA 11.1 and

140
00:07:44,370 --> 00:07:42,040
12.7 but learn more pronounced for the

141
00:07:47,790 --> 00:07:44,380
chlorine then for the silicon as we

142
00:07:50,880 --> 00:07:47,800
recently just noticed we are going to do

143
00:07:53,250 --> 00:07:50,890
a test to say if this is real or not and

144
00:07:56,790 --> 00:07:53,260
that one simple test is to shuffle the

145
00:07:57,600 --> 00:07:56,800
data you have a list of times dates of

146
00:08:00,510 --> 00:07:57,610
measurement have lists of the

147
00:08:02,400 --> 00:08:00,520
measurements you don't change the time

148
00:08:04,650 --> 00:08:02,410
you don't change the measurements but

149
00:08:06,570 --> 00:08:04,660
you will arrange them you you shuffle

150
00:08:08,520 --> 00:08:06,580
them and you assign a measurement to the

151
00:08:12,060 --> 00:08:08,530
wrong time so you do this many times

152
00:08:15,810 --> 00:08:12,070
over and I did it ten thousand times and

153
00:08:18,930 --> 00:08:15,820
not once that I get a peak as big as the

154
00:08:22,650 --> 00:08:18,940
actual peak in the in the in the power

155
00:08:24,360 --> 00:08:22,660
spectrum and with a different display as

156
00:08:27,060 --> 00:08:24,370
over to infer there's only about one

157
00:08:29,730 --> 00:08:27,070
chance in a million of getting a peak in

158
00:08:35,930 --> 00:08:29,740
the search band as big as that which we

159
00:08:38,060 --> 00:08:35,940
actually find now this is the

160
00:08:40,880 --> 00:08:38,070
the work this is the book is a German

161
00:08:43,460 --> 00:08:40,890
experiment and on the left is radium on

162
00:08:45,650 --> 00:08:43,470
the right europium one of the elements

163
00:08:48,470 --> 00:08:45,660

they looked at and a tremendously strong

164
00:08:51,170 --> 00:08:48,480
signal at one cycle PR in radium and

165
00:08:53,750 --> 00:08:51,180
nothing in europium and this by itself

166
00:08:55,790 --> 00:08:53,760
tells you that is not an instrumental

167
00:08:58,040 --> 00:08:55,800
effect or an environmental effect

168
00:09:00,740 --> 00:08:58,050
because that would be you have the same

169
00:09:04,210 --> 00:09:00,750
instrumentation same environment for

170
00:09:07,910 --> 00:09:04,220
radium and for your opium and so you see

171
00:09:10,070 --> 00:09:07,920
this if it if the peak would you too if

172
00:09:12,770 --> 00:09:10,080
the modulation with you to environmental

173
00:09:15,440 --> 00:09:12,780
effects or instrumentation you see the

174
00:09:20,570 --> 00:09:15,450
same signal in both datasets and you

175
00:09:23,450 --> 00:09:20,580
don't so alright and this again is a

176
00:09:27,460 --> 00:09:23,460
power spectrum as i said the fact you

177
00:09:33,020 --> 00:09:27,470
see a tremendous peak sorry power of

178
00:09:35,660 --> 00:09:33,030
about 500 in the in Radian and in fact

179
00:09:38,600 --> 00:09:35,670
in nothing in europium shows that it is

180
00:09:44,000 --> 00:09:38,610
not an instrumental or an environmental

181
00:09:47,720 --> 00:09:44,010
effect and where it is interesting to be

182
00:09:50,480 --> 00:09:47,730
able to combine data sets and see what

183
00:09:52,700 --> 00:09:50,490
is common between two data sets as well

184
00:09:55,460 --> 00:09:52,710
as like forming a correlation function

185
00:09:58,130 --> 00:09:55,470
but working with power spectra instead

186
00:10:00,080 --> 00:09:58,140
of the time series themselves I lunker

187
00:10:03,920 --> 00:10:00,090
the details here but there is a way of

188
00:10:07,390 --> 00:10:03,930

combining a 2 power spectra s1 and s2 in

189
00:10:11,270 --> 00:10:07,400
such a way that what you form from it

190
00:10:13,610 --> 00:10:11,280
which is this quantity J it has the same

191
00:10:15,470 --> 00:10:13,620
exponential distribution that the power

192
00:10:18,050 --> 00:10:15,480
itself and that makes it easy to

193
00:10:20,120 --> 00:10:18,060
interpret the significance of whatever

194
00:10:24,760 --> 00:10:20,130
comes out of this power spectrum

195
00:10:29,060 --> 00:10:24,770
analysis and so what I've done here is

196
00:10:31,250 --> 00:10:29,070
to combine now here I'm looking for a

197
00:10:33,470 --> 00:10:31,260
link with neutrinos and in particular

198
00:10:35,600 --> 00:10:33,480
with lower energy neutrinos there are

199
00:10:38,600 --> 00:10:35,610
two leather neutrino experiments which

200
00:10:41,210 --> 00:10:38,610
you have data one is galax you know

201
00:10:42,980 --> 00:10:41,220
gallium experiment and the others home

202
00:10:47,690 --> 00:10:42,990
state using chlorine

203
00:10:51,139 --> 00:10:47,700
and so i combined data from those two

204
00:10:53,690 --> 00:10:51,149
neutrino experiments I also combine an

205
00:10:58,910 --> 00:10:53,700
oddly enough with it radiance data which

206
00:11:01,040 --> 00:10:58,920
appears to be related to neutrinos in a

207
00:11:04,940 --> 00:11:01,050
way that's very very interesting very

208
00:11:07,190 --> 00:11:04,950
surprising and it's a challenge to

209
00:11:10,160 --> 00:11:07,200
understand exactly why there is this

210
00:11:14,570 --> 00:11:10,170
close relationship but when you combine

211
00:11:17,120 --> 00:11:14,580
these four datasets GALEX and Akram for

212
00:11:19,460 --> 00:11:17,130
the for the guy x interval homestake an

213
00:11:22,040 --> 00:11:19,470

acronym for the homestake interval you

214
00:11:25,030 --> 00:11:22,050
get a tremendous peak with power of 40

215
00:11:27,410 --> 00:11:25,040
we're worried about the noise level and

216
00:11:30,290 --> 00:11:27,420
with that frequents will define a

217
00:11:35,360 --> 00:11:30,300
sharpie define frequency at eleven point

218
00:11:41,240 --> 00:11:35,370
eight five cycles per year and this is

219
00:11:45,980 --> 00:11:41,250
interesting because ah this is a gain a

220
00:11:48,530 --> 00:11:45,990
shuffle test showing is only about two

221
00:11:50,840 --> 00:11:48,540
chances in 10,000 of getting a

222
00:11:52,400 --> 00:11:50,850
statistics this large this is playing

223
00:11:56,030 --> 00:11:52,410
around only with the neutrino data

224
00:11:57,829 --> 00:11:56,040
leaving the the Akram data unchanged if

225
00:11:59,720 --> 00:11:57,839
you change akram Vader as well shuffle

226
00:12:04,220 --> 00:11:59,730
that too it will be a much more

227
00:12:06,980 --> 00:12:04,230
significant than that so this is a plot

228
00:12:11,030 --> 00:12:06,990
of the known internal rotation rate of

229
00:12:15,139 --> 00:12:11,040
the Sun and this is the convection zone

230
00:12:18,139 --> 00:12:15,149
from about point 7 5 solo a out to after

231
00:12:23,569 --> 00:12:18,149
the photosphere and the rotation raised

232
00:12:26,060 --> 00:12:23,579
about 14.5 cycles PR the idea sad gyro

233
00:12:28,370 --> 00:12:26,070
rotation rate below that is the

234
00:12:30,829 --> 00:12:28,380
radiative zone as is not as well well

235
00:12:33,740 --> 00:12:30,839
it's very well determine here not as

236
00:12:36,920 --> 00:12:33,750
well determine here that's about 13.5

237
00:12:40,160 --> 00:12:36,930
cycles per year that what we find from

238
00:12:43,460 --> 00:12:40,170

our analysis of neutrinos and the

239
00:12:46,870 --> 00:12:43,470
radiance and actually from the data de

240
00:12:52,060 --> 00:12:46,880
kado as well r is a much lower frequency

241
00:13:00,180 --> 00:12:56,000
ninth replication of this is that

242
00:13:01,740 --> 00:13:00,190
the neutrino data is telling us the

243
00:13:03,680 --> 00:13:01,750
rotation rate of the core of the Sun

244
00:13:07,280 --> 00:13:03,690
which really as otherwise unknown

245
00:13:10,440 --> 00:13:07,290
helioseismology does not go as deep as

246
00:13:18,000 --> 00:13:10,450
as the core which the radius about point

247
00:13:20,370 --> 00:13:18,010
two five and below so it is off but

248
00:13:22,800 --> 00:13:20,380
after all neutrinos are a result of

249
00:13:25,800 --> 00:13:22,810
nuclear reactions the nuclear reactions

250
00:13:28,860 --> 00:13:25,810
all occur in the core of the Sun so it's

251
00:13:30,810 --> 00:13:28,870
only logical that if neutrinos show any

252
00:13:33,570 --> 00:13:30,820
pure disa T is likely to be the

253
00:13:39,390 --> 00:13:33,580
periodicity of the core not over and out

254
00:13:43,040 --> 00:13:39,400
of there and there's one more one more

255
00:13:46,290 --> 00:13:43,050
test so so far we have two pointers that

256
00:13:48,480 --> 00:13:46,300
the decay rates and some of the other

257
00:13:52,380 --> 00:13:48,490
effects are related to the core of the

258
00:13:55,590 --> 00:13:52,390
Sun one row the Sun itself one is the

259
00:13:59,100 --> 00:13:55,600
annual variation and the other is there

260
00:14:01,230 --> 00:13:59,110
is through the pure disa T which we can

261
00:14:03,540 --> 00:14:01,240
relate to the rotation rate of the core

262
00:14:05,660 --> 00:14:03,550
as one more there's not a periodicity

263
00:14:07,980 --> 00:14:05,670

well known solar physics discovered by

264
00:14:13,230 --> 00:14:07,990
eric regain his colleagues many years

265
00:14:17,970 --> 00:14:13,240
ago which has a pure 154 days ok I

266
00:14:20,310 --> 00:14:17,980
haven't been watching you and it is an

267
00:14:23,130 --> 00:14:20,320
armload oscillation given by this

268
00:14:26,040 --> 00:14:23,140
formula the way I daresay both supposing

269
00:14:29,130 --> 00:14:26,050
the same oscillation occurs in the core

270
00:14:31,800 --> 00:14:29,140
of the Sun we use the same formula use

271
00:14:34,820 --> 00:14:31,810
the same values at L&M that will replace

272
00:14:38,340 --> 00:14:34,830
the rotation rate of the convection zone

273
00:14:41,790 --> 00:14:38,350
which gives the 1 1 for 4 days with the

274
00:14:49,680 --> 00:14:41,800
rotation rate of the core as we infer

275
00:14:53,250 --> 00:14:49,690
and this then leads us to expect peaks

276
00:14:55,680 --> 00:14:53,260
where the arrow is shown at 2.14 and

277
00:14:59,490 --> 00:14:55,690
here i show plots of what you find the

278
00:15:02,310 --> 00:14:59,500
B&L data and in the radium data and you

279
00:15:05,250 --> 00:15:02,320
find peaks at exactly where you expect

280
00:15:07,000 --> 00:15:05,260
them so this show that our mode

281
00:15:12,130 --> 00:15:07,010
oscillations also are going

282
00:15:15,970 --> 00:15:12,140
on in the car and don't give rise to do

283
00:15:21,100 --> 00:15:15,980
I stop this okay but I iron through and

284
00:15:24,000 --> 00:15:21,110
through NSA this is a search for a low

285
00:15:35,170 --> 00:15:24,010
defying frequency it turns up in both

286
00:15:38,590 --> 00:15:35,180
BNL and PTP data thank you Peter

287
00:15:41,410 --> 00:15:38,600
otherwise stop with the beating somebody

288
00:15:42,910 --> 00:15:41,420

else top deck thank you alright if you

289
00:15:44,440 --> 00:15:42,920
want to get a few days as as we

290
00:15:47,050 --> 00:15:44,450
mentioned at the beginning if you want

291
00:15:49,090 --> 00:15:47,060
to have a question please come to the

292
00:15:51,370 --> 00:15:49,100
center of the microphone there so we

293
00:15:56,290 --> 00:15:51,380
don't like I saw a hand go up in the

294
00:15:58,030 --> 00:15:56,300
back so please come on up of course if

295
00:16:00,520 --> 00:15:58,040
you have any quick comments while they

296
00:16:05,110 --> 00:16:00,530
look nvidia now I've got through my

297
00:16:08,620 --> 00:16:05,120
slides sir I have two questions about

298
00:16:11,080 --> 00:16:08,630
this interesting research and first and

299
00:16:14,440 --> 00:16:11,090
I see that in both the cases you showed

300
00:16:16,630 --> 00:16:14,450
the phase of the cycle does not really

301
00:16:20,020 --> 00:16:16,640
agree with the phase of the solar system

302
00:16:22,180 --> 00:16:20,030
exactly exam you explored what phase it

303
00:16:24,880 --> 00:16:22,190
is guys exactly exactly is this another

304
00:16:27,550 --> 00:16:24,890
phase your moment which my husband it

305
00:16:31,000 --> 00:16:27,560
means look Thea it means that the flux

306
00:16:33,130 --> 00:16:31,010
of neutrinos is not determined purely by

307
00:16:37,480 --> 00:16:33,140
the sun-earth distance of something else

308
00:16:41,080 --> 00:16:37,490
and if something else is related to the

309
00:16:44,050 --> 00:16:41,090
tilt of the sun's axis with respect to

310
00:16:45,790 --> 00:16:44,060
the ecliptic an example where you shane

311
00:16:47,650 --> 00:16:45,800
warne oh have you tied it into that and

312
00:16:49,960 --> 00:16:47,660
got the kinect fees should we have you

313
00:16:53,350 --> 00:16:49,970

tied it into that in dugout right the

314
00:16:55,090 --> 00:16:53,360
kinect fade Oh actually you had the

315
00:16:57,100 --> 00:16:55,100
phase there's no in the face is

316
00:17:00,190 --> 00:16:57,110
different different elements and so

317
00:17:02,520 --> 00:17:00,200
there are two a fetch each giving annual

318
00:17:05,020 --> 00:17:02,530
variation one is that earth-sun distance

319
00:17:06,490 --> 00:17:05,030
the other is whether you're seeing the

320
00:17:09,280 --> 00:17:06,500
northern hemisphere or southern

321
00:17:10,630 --> 00:17:09,290
hemisphere of the Sun yes and the myth

322
00:17:12,460 --> 00:17:10,640
the mixture of the two effects is

323
00:17:14,360 --> 00:17:12,470
different for different elements that's

324
00:17:17,360 --> 00:17:14,370
one cannot you

325
00:17:20,140 --> 00:17:17,370
push this pattern can we allow another

326
00:17:23,090 --> 00:17:20,150
have occurred so we not have a dialogue

327
00:17:30,830 --> 00:17:23,100
there's some other people waiting to ask

328
00:17:33,200 --> 00:17:30,840
questions any speculation as to why this

329
00:17:35,990 --> 00:17:33,210
neutrino flux influences all the

330
00:17:39,080 --> 00:17:36,000
different elements differently no that

331
00:17:41,810 --> 00:17:39,090
is a problem for nuclear physicists and

332
00:17:44,060 --> 00:17:41,820
it is not something that explained by

333
00:17:46,010 --> 00:17:44,070
current neutrino theory so if this

334
00:17:48,650 --> 00:17:46,020
effect is correct and the evidence seems

335
00:17:50,750 --> 00:17:48,660
pretty strong it will call for further

336
00:17:55,280 --> 00:17:50,760
development in the theory of neutrinos

337
00:17:57,530 --> 00:17:55,290
thank you this seems to be very

338
00:18:02,080 --> 00:17:57,540

important and so I'd looked into it a

339
00:18:05,000 --> 00:18:02,090
little bit too and and I offer one other

340
00:18:07,070 --> 00:18:05,010
not a theory but just an observation for

341
00:18:09,580 --> 00:18:07,080
your comment and that is that the

342
00:18:13,040 --> 00:18:09,590
creamer transactional interpretation

343
00:18:15,320 --> 00:18:13,050
implies in a sense that any emission

344
00:18:19,460 --> 00:18:15,330
like a radioactive decay must have a

345
00:18:23,540 --> 00:18:19,470
receiver a an absorber at the other end

346
00:18:25,910 --> 00:18:23,550
and so if radioactive decay has some

347
00:18:27,169 --> 00:18:25,920
variations involved it might have to do

348
00:18:29,390 --> 00:18:27,179
with what's around that could be

349
00:18:33,020 --> 00:18:29,400
absorbers and so perhaps this one being

350
00:18:35,750 --> 00:18:33,030
one big thing there yes well I think my

351
00:18:38,990 --> 00:18:35,760
guess is you're on the right track okay

352
00:18:41,720 --> 00:18:39,000
Buddhist but since we the case is that

353
00:18:44,600 --> 00:18:41,730
the flux of neutrinos and environment

354
00:18:47,570 --> 00:18:44,610
our density of neutrinos influences the

355
00:18:49,940 --> 00:18:47,580
decay rate this is the heretical

356
00:18:51,770 --> 00:18:49,950
suggestion but I suppose it may be put

357
00:18:53,900 --> 00:18:51,780
forward in this form your period of

358
00:18:55,280 --> 00:18:53,910
approximately twelve point seven your

359
00:18:57,380 --> 00:18:55,290
frequency about twelve point seven per

360
00:19:01,060 --> 00:18:57,390
year is also very close to a lunar

361
00:19:03,440 --> 00:19:01,070
period yes sure but it's distinguishable

362
00:19:06,620 --> 00:19:03,450
that's what I want to ask is it is the

363
00:19:08,900 --> 00:19:06,630

new no period outside the window of my