



1
00:00:04,130 --> 00:00:01,699
if it is at before observation before

2
00:00:05,990 --> 00:00:04,140
you open the lid the cat is both dead

3
00:00:08,330 --> 00:00:06,000
and alive now Schrodinger presented this

4
00:00:10,040 --> 00:00:08,340
as an absurdity case saying that this

5
00:00:12,740 --> 00:00:10,050
couldn't obviously couldn't possibly be

6
00:00:17,480 --> 00:00:12,750
true except it seems like maybe it is

7
00:00:20,029 --> 00:00:17,490
true so what we're interested in is what

8
00:00:21,859 --> 00:00:20,039
when a seer sees and somebody is gazing

9
00:00:23,120 --> 00:00:21,869
at this with remote viewing is if

10
00:00:26,060 --> 00:00:23,130
knowledge is gained through remote

11
00:00:27,859 --> 00:00:26,070
viewing does that caused a cat to be

12
00:00:41,810 --> 00:00:27,869
dead or alive does it collapse at

13
00:00:44,479 --> 00:00:41,820

superposition well I like kitties as

14

00:00:46,190 --> 00:00:44,489
much as anyone else so rather than using

15

00:00:52,220 --> 00:00:46,200
a kitty I decided to use a michelson

16

00:00:54,110 --> 00:00:52,230
interferometer so here comes the there's

17

00:00:56,270 --> 00:00:54,120
a laser low-powered laser sending

18

00:00:58,099 --> 00:00:56,280
photons into this system it goes through

19

00:01:00,349 --> 00:00:58,109
a half silver mirror and it goes through

20

00:01:02,779 --> 00:01:00,359
and bounces off of it and then it hits

21

00:01:05,750 --> 00:01:02,789
two mirrors they bounce off the mirrors

22

00:01:07,640 --> 00:01:05,760
they reconnect and there's where the

23

00:01:11,780 --> 00:01:07,650
interference pattern is formed now these

24

00:01:13,640 --> 00:01:11,790
two arms or the interference of the

25

00:01:16,160 --> 00:01:13,650
Michelson interferometer is very similar

26

00:01:18,350 --> 00:01:16,170

to the idea of two slits but the reason

27

00:01:19,940 --> 00:01:18,360

I use it in this form rather than a

28

00:01:22,310 --> 00:01:19,950

double slit apparatus is because I'm

29

00:01:25,280 --> 00:01:22,320

asking people to try to put their minds

30

00:01:26,840 --> 00:01:25,290

eye in one of the arms and I found it if

31

00:01:28,580 --> 00:01:26,850

I tried to describe to them that you

32

00:01:30,920 --> 00:01:28,590

have two slits that are 10 microns apart

33

00:01:32,719 --> 00:01:30,930

and to put your eye in front of one of

34

00:01:35,300 --> 00:01:32,729

them people can't see it and they can't

35

00:01:37,130 --> 00:01:35,310

imagine what what to do in this case

36

00:01:38,899 --> 00:01:37,140

it's very easy to imagine because it's

37

00:01:41,660 --> 00:01:38,909

about the size of your hand and I could

38

00:01:44,679 --> 00:01:41,670

show them put your eye here so they

39

00:01:46,789 --> 00:01:44,689

understand so this isn't a light-tight

40

00:01:48,410 --> 00:01:46,799

sealed room this shows the same

41

00:01:50,149 --> 00:01:48,420

apparatus if the laser going from the

42

00:01:53,030 --> 00:01:50,159

side showing that rather than getting

43

00:01:54,800 --> 00:01:53,040

the vertical bars like you'd get in a

44

00:01:55,910 --> 00:01:54,810

double set you get concentric circles

45

00:01:59,240 --> 00:01:55,920

but it's the same thing it's an

46

00:02:03,260 --> 00:01:59,250

interference pattern so here's the this

47

00:02:07,340 --> 00:02:03,270

is our 2,000 pounds solid steel Faraday

48

00:02:09,770 --> 00:02:07,350

cage light tight inside it is the target

49

00:02:11,600 --> 00:02:09,780

area in the interferometer we ask people

50

00:02:13,850 --> 00:02:11,610

from the outside to stick their minds

51

00:02:15,470 --> 00:02:13,860

eye over there to stick it in or

52

00:02:18,140 --> 00:02:15,480

take it out put it in take it out in a

53

00:02:21,770 --> 00:02:18,150

counterbalance fashion here we have a

54

00:02:23,480 --> 00:02:21,780

very sensitive camera not quite as

55

00:02:26,480 --> 00:02:23,490

sensitive as one Gary was using which is

56

00:02:28,310 --> 00:02:26,490

a hundred degree minus 100 degrees ours

57

00:02:32,030 --> 00:02:28,320

is only something like minus 20 degrees

58

00:02:34,910 --> 00:02:32,040

C but still pretty good so what the

59

00:02:36,770 --> 00:02:34,920

camera sees is when when an interference

60

00:02:39,230 --> 00:02:36,780

pattern is there you see a Ripley

61

00:02:40,400 --> 00:02:39,240

pattern and when there's no interference

62

00:02:42,650 --> 00:02:40,410

if you physically go into this

63

00:02:46,040 --> 00:02:42,660

interferometer and you block one of the

64

00:02:48,890 --> 00:02:46,050

of the arms you get a flat pattern so

65

00:02:50,449 --> 00:02:48,900

this is a no Ripley pattern and a Ripley

66

00:02:53,000 --> 00:02:50,459

pattern so that's expect that's what

67

00:02:54,440 --> 00:02:53,010

you'd expect to see so what we can do

68

00:02:55,900 --> 00:02:54,450

that as we take what the camera is

69

00:02:58,130 --> 00:02:55,910

actually looking at is looking at a

70

00:03:00,080 --> 00:02:58,140

two-dimensional surface and you take the

71

00:03:02,270 --> 00:03:00,090

cross-section of it and you can plot the

72

00:03:04,070 --> 00:03:02,280

cross section for both of these and you

73

00:03:06,620 --> 00:03:04,080

notice that for when one of the slits is

74

00:03:08,120 --> 00:03:06,630

actually blocked you get there are error

75

00:03:09,590 --> 00:03:08,130

bars here but they're so small you can't

76
00:03:12,590 --> 00:03:09,600
even see them whereas if the

77
00:03:15,770 --> 00:03:12,600
interference pattern is as present any

78
00:03:18,140 --> 00:03:15,780
tiny movement any vibration any

79
00:03:20,360 --> 00:03:18,150
temperature change makes the the system

80
00:03:21,740 --> 00:03:20,370
change because a quarter wavelength of

81
00:03:26,690 --> 00:03:21,750
light will cause the whole system to

82
00:03:28,729 --> 00:03:26,700
move so we go through a lot of a pre

83
00:03:30,620 --> 00:03:28,739
calibration time to make sure that the

84
00:03:32,330 --> 00:03:30,630
the interferometer is as stable as it

85
00:03:34,130 --> 00:03:32,340
can possibly be because of that little

86
00:03:35,660 --> 00:03:34,140
jittery movement so what we're looking

87
00:03:38,539 --> 00:03:35,670
for here then Anna counterbalanced

88
00:03:40,670 --> 00:03:38,549

fashion with mind in the Box mind out of

89

00:03:42,949 --> 00:03:40,680

the box is the difference between these

90

00:03:44,390 --> 00:03:42,959

two conditions the two ideal conditions

91

00:03:47,390 --> 00:03:44,400

and ideally you end up with this

92

00:03:49,250 --> 00:03:47,400

negative going pattern a nega- going

93

00:03:52,400 --> 00:03:49,260

Ripley wave that's what we ideally would

94

00:03:54,380 --> 00:03:52,410

get so some of the people we worked with

95

00:03:58,550 --> 00:03:54,390

were very advanced meditators this is

96

00:04:00,860 --> 00:03:58,560

Swami Veda bharti who's a meditator in

97

00:04:03,560 --> 00:04:00,870

the yogic tradition from the Himalayas

98

00:04:05,900 --> 00:04:03,570

and he came into the lab and meditated

99

00:04:08,360 --> 00:04:05,910

for 30 minutes and we have a little bell

100

00:04:09,320 --> 00:04:08,370

here which he used to not speak because

101
00:04:10,940 --> 00:04:09,330
he didn't want to break his

102
00:04:13,940 --> 00:04:10,950
concentration he rang the bell when he

103
00:04:16,009 --> 00:04:13,950
was ready to go so there is ringing the

104
00:04:18,140 --> 00:04:16,019
bell and now I'm in the same room at the

105
00:04:20,509 --> 00:04:18,150
other side of the room by the way from

106
00:04:22,310 --> 00:04:20,519
his perspective the seal the shielded

107
00:04:24,710 --> 00:04:22,320
room is roughly over there it starts

108
00:04:26,510 --> 00:04:24,720
over there so I'm now going to give him

109
00:04:27,410 --> 00:04:26,520
instructions by following a protocol

110
00:04:30,260 --> 00:04:27,420
that I've set up into

111
00:04:32,030 --> 00:04:30,270
of for the next 30 seconds put your mind

112
00:04:34,340 --> 00:04:32,040
in that spot where I told you to put it

113
00:04:36,380 --> 00:04:34,350

and try to see the incoming photons gain

114

00:04:37,910 --> 00:04:36,390

knowledge about the photons and now for

115

00:04:39,890 --> 00:04:37,920

the next 30 seconds take your mind out

116

00:04:41,660 --> 00:04:39,900

of the box and then put it in take it

117

00:04:46,190 --> 00:04:41,670

out put it in and take it out again and

118

00:04:48,590 --> 00:04:46,200

again so first of all before each

119

00:04:51,170 --> 00:04:48,600

session I ran a control condition where

120

00:04:52,940 --> 00:04:51,180

I did the same protocol except there was

121

00:04:54,590 --> 00:04:52,950

no one to putting their mind in and out

122

00:04:56,000 --> 00:04:54,600

of the box this is simply to test to see

123

00:04:58,610 --> 00:04:56,010

whether the equipment might have been

124

00:05:00,500 --> 00:04:58,620

biased in some way to and what you

125

00:05:03,050 --> 00:05:00,510

should end up with is a flatline in fact

126

00:05:05,150 --> 00:05:03,060

we get a flat line well when I we did

127

00:05:08,990 --> 00:05:05,160

their actual experiment what we got was

128

00:05:10,730 --> 00:05:09,000

this which is very close to what we had

129

00:05:12,740 --> 00:05:10,740

predicted what we hoped we would get and

130

00:05:14,660 --> 00:05:12,750

this means that there's a difference

131

00:05:18,110 --> 00:05:14,670

that was happening when he was asked to

132

00:05:23,510 --> 00:05:18,120

put his mind in versus out so again that

133

00:05:25,520 --> 00:05:23,520

was observed this was predicted and that

134

00:05:33,260 --> 00:05:25,530

would be the result of someone like me

135

00:05:34,970 --> 00:05:33,270

she okok you or brian greene here what

136

00:05:36,380 --> 00:05:34,980

i've done is i've since we have a camera

137

00:05:38,180 --> 00:05:36,390

taking pictures of the interference

138

00:05:39,770 --> 00:05:38,190

patterns i curate a movie out of it by

139

00:05:43,460 --> 00:05:39,780

simply taking the frames of the camera

140

00:05:45,890 --> 00:05:43,470

in sequence so when is this is for Swami

141

00:05:47,390 --> 00:05:45,900

Veda when his he was not observing the

142

00:05:49,430 --> 00:05:47,400

systems mine was not in the

143

00:05:51,610 --> 00:05:49,440

interferometer you get a fairly stable

144

00:05:53,450 --> 00:05:51,620

pattern and this this is the

145

00:05:55,220 --> 00:05:53,460

interference pattern as part of this

146

00:05:57,410 --> 00:05:55,230

concentric circle and it's using false

147

00:05:59,150 --> 00:05:57,420

color to highlight it but when his mind

148

00:06:00,980 --> 00:05:59,160

is in the box he get something that

149

00:06:03,050 --> 00:06:00,990

looks like a beating heart and what this

150

00:06:05,630 --> 00:06:03,060

shows is that he wasn't fully collapsing

151
00:06:07,610 --> 00:06:05,640
the system he was perturbing the system

152
00:06:09,980 --> 00:06:07,620
a little bit but it was perturbed enough

153
00:06:13,660 --> 00:06:09,990
in order for the result to end up with

154
00:06:19,310 --> 00:06:17,720
we did 18 sessions about half half of

155
00:06:21,140 --> 00:06:19,320
them were with meditators half with non

156
00:06:23,120 --> 00:06:21,150
meditators overall we got a significant

157
00:06:24,590 --> 00:06:23,130
result we're hoping by designed to get a

158
00:06:27,230 --> 00:06:24,600
negative z-score and that's what we got

159
00:06:29,240 --> 00:06:27,240
so that was nice but when we separated

160
00:06:31,760 --> 00:06:29,250
the data oh and the control conditions

161
00:06:34,130 --> 00:06:31,770
didn't show any tendency to show an

162
00:06:35,990 --> 00:06:34,140
artifact Schewel result we separate the

163
00:06:38,950 --> 00:06:36,000

data by meditators and non meditators

164

00:06:41,300 --> 00:06:38,960

all of the action rather than meditators

165

00:06:43,940 --> 00:06:41,310

a very strong result is

166

00:06:45,620 --> 00:06:43,950

publishes past January the pupil

167

00:06:48,800 --> 00:06:45,630

dilation study by the way hasn't been

168

00:06:50,710 --> 00:06:48,810

published yet that's it's still being

169

00:06:53,710 --> 00:06:50,720

prepared for submission for publication

170

00:06:56,360 --> 00:06:53,720

so among other things this suggests that

171

00:06:59,330 --> 00:06:56,370

meditators the reason I use meditators

172

00:07:01,310 --> 00:06:59,340

is because the task requires 30 seconds

173

00:07:03,290 --> 00:07:01,320

of very stable putting your mind over

174

00:07:05,540 --> 00:07:03,300

there somewhere and if you're not a

175

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

meditator and you don't have practice in

176

00:07:10,370 --> 00:07:07,560

mental discipline you may not be able to

177

00:07:11,840 --> 00:07:10,380

do that task so the reason why I had two

178

00:07:14,410 --> 00:07:11,850

kinds of people in the experiments

179

00:07:17,870 --> 00:07:14,420

because I expected that people who

180

00:07:20,900 --> 00:07:17,880

people who don't meditate and are from

181

00:07:22,670 --> 00:07:20,910

the MTV generation if asked to put your

182

00:07:25,100 --> 00:07:22,680

mind over there for 30 seconds and keep

183

00:07:26,030 --> 00:07:25,110

it there after one and a half seconds

184

00:07:27,320 --> 00:07:26,040

you'll forget that you're in an

185

00:07:30,290 --> 00:07:27,330

experiment you'll start thinking about

186

00:07:33,530 --> 00:07:30,300

dinner and that's I think why we didn't

187

00:07:35,030 --> 00:07:33,540

see a result in that group so the

188

00:07:36,950 --> 00:07:35,040

conclusions of these two experiments are

189

00:07:38,720 --> 00:07:36,960

peers that the mind sees the actual

190

00:07:42,410 --> 00:07:38,730

future at least in this instantiation of

191

00:07:44,150 --> 00:07:42,420

an experiment the mind interacts with

192

00:07:47,390 --> 00:07:44,160

matter at the quantum level and I'll say

193

00:07:50,480 --> 00:07:47,400

maybe because as Garrett has mentioned

194

00:07:52,670 --> 00:07:50,490

that because the interferometer uses

195

00:07:55,640 --> 00:07:52,680

mirrors it's also conceivable that may

196

00:07:58,130 --> 00:07:55,650

be what the effect of the meditating I

197

00:08:00,710 --> 00:07:58,140

was doing was changing the reflectivity

198

00:08:02,780 --> 00:08:00,720

of the mirror and I can't tell that in

199

00:08:04,610 --> 00:08:02,790

this particular design so the next

200

00:08:06,350 --> 00:08:04,620

version of this will actually use a real

201
00:08:07,820 --> 00:08:06,360
double slit in which case you can get

202
00:08:09,590 --> 00:08:07,830
rid of mirrors there's no mirrors in at

203
00:08:11,810 --> 00:08:09,600
all I still have to figure out how to

204
00:08:14,330 --> 00:08:11,820
tell people how to gain knowledge from

205
00:08:17,900 --> 00:08:14,340
something which is 10 microns across but

206
00:08:19,760 --> 00:08:17,910
I'll cross that want to get to it and in

207
00:08:22,280 --> 00:08:19,770
general that space-time separations are

208
00:08:24,560 --> 00:08:22,290
an illusion that's that's essentially

209
00:08:28,100 --> 00:08:24,570
what's I tells us anyway that we it

210
00:08:29,480 --> 00:08:28,110
every day perceptual reality things

211
00:08:31,040 --> 00:08:29,490
certainly appear and look to be

212
00:08:33,170 --> 00:08:31,050
different but at this level they're not

213
00:08:36,230 --> 00:08:33,180

so different here's a way of

214

00:08:39,560 --> 00:08:36,240

illustrating it what most people see

215

00:08:42,650 --> 00:08:39,570

here is a dark circle and a little bit

216

00:08:44,840 --> 00:08:42,660

less dark and a little less dark but

217

00:08:46,810 --> 00:08:44,850

course this is an illusion and you can

218

00:08:49,160 --> 00:08:46,820

demonstrate the illusion by simply

219

00:08:51,170 --> 00:08:49,170

covering the boundaries here the

220

00:08:52,910 --> 00:08:51,180

boundaries is what creates this illusion

221

00:08:55,160 --> 00:08:52,920

and now you can see that the background

222

00:08:58,160 --> 00:08:55,170

is actually all the same level

223

00:09:01,009 --> 00:08:58,170

illumination and the the illusion is

224

00:09:04,040 --> 00:09:01,019

created by a very subtle shading right

225

00:09:06,710 --> 00:09:04,050

at the edge and it the reason why this

226

00:09:09,139 --> 00:09:06,720

works is because if you see something in

227

00:09:10,490 --> 00:09:09,149

real life which has a shading of that

228

00:09:12,740 --> 00:09:10,500

type typically it's something like a

229

00:09:14,960 --> 00:09:12,750

step so you expect that it should go

230

00:09:17,780 --> 00:09:14,970

down and your expectations drive what

231

00:09:19,850 --> 00:09:17,790

you see so if I take these the boundary

232

00:09:22,819 --> 00:09:19,860

markers away then the illusion comes

233

00:09:24,620 --> 00:09:22,829

right back so our expectations are very

234

00:09:28,400 --> 00:09:24,630

strong drivers of what we actually

235

00:09:31,250 --> 00:09:28,410

perceive this is the experiment which is

236

00:09:34,490 --> 00:09:31,260

currently about to start it'll start

237

00:09:36,949 --> 00:09:34,500

when I go back home the people help me

238

00:09:39,710 --> 00:09:36,959

build this as Paul Wendland here and

239

00:09:43,129 --> 00:09:39,720

Robert rickenbach both optical engineers

240

00:09:46,280 --> 00:09:43,139

and the design of this thing is to look

241

00:09:47,930 --> 00:09:46,290

at the role of intention in a physical

242

00:09:49,639 --> 00:09:47,940

constant in this case the speed of light

243

00:09:51,439 --> 00:09:49,649

we want to see whether advanced

244

00:09:54,470 --> 00:09:51,449

meditators can change the speed of light

245

00:09:56,810 --> 00:09:54,480

and the way we do it is each one of