

Life and Death: From Ancient Philosophy to Modern Physics

Nina Sotina



**SOCIETY
FOR
SCIENTIFIC
EXPLORATION**

1
00:00:10,390 --> 00:00:06,070

[Music]

2
00:00:12,950 --> 00:00:10,400

um in many cultures uh we find this idea

3
00:00:14,070 --> 00:00:12,960

that a human as well as any living

4
00:00:16,630 --> 00:00:14,080

organism

5
00:00:18,870 --> 00:00:16,640

is not just accumulation of molecules

6
00:00:21,189 --> 00:00:18,880

but there is something more

7
00:00:22,950 --> 00:00:21,199

that distinguishes a living organism

8
00:00:27,189 --> 00:00:22,960

from non-living

9
00:00:30,470 --> 00:00:27,199

in mythology in burial rights of china

10
00:00:33,750 --> 00:00:30,480

asian greece india and other cultures

11
00:00:36,069 --> 00:00:33,760

there is an idea that a soul or a spirit

12
00:00:37,750 --> 00:00:36,079

leaves the human body at the moment of

13
00:00:39,990 --> 00:00:37,760

death

14

00:00:42,549 --> 00:00:40,000

uh for example in asian chinese

15

00:00:46,470 --> 00:00:42,559

philosophy we find the idea that the

16

00:00:48,869 --> 00:00:46,480

soul is what also distinguishes the dead

17

00:00:52,229 --> 00:00:48,879

and the living

18

00:00:55,590 --> 00:00:52,239

in this regards it's amazing to look

19

00:00:58,150 --> 00:00:55,600

at the works of ancient greeks

20

00:01:00,790 --> 00:00:58,160

and they put away the moral aspect of

21

00:01:03,990 --> 00:01:00,800

soul and they tried to find the

22

00:01:05,670 --> 00:01:04,000

scientific explanation to this idea what

23

00:01:08,710 --> 00:01:05,680

is soul

24

00:01:10,149 --> 00:01:08,720

greek believed that a substance called

25

00:01:12,630 --> 00:01:10,159

psycho

26

00:01:15,990 --> 00:01:12,640

leave the body at the moment of death

27

00:01:19,109 --> 00:01:16,000

you can see on this vase a dying warrior

28

00:01:22,789 --> 00:01:19,119

and there is like a smoke coming out of

29

00:01:29,830 --> 00:01:25,830

uh a little bit about etymology of this

30

00:01:31,429 --> 00:01:29,840

word soul we use work psychology uh

31

00:01:34,789 --> 00:01:31,439

where it came from

32

00:01:36,950 --> 00:01:34,799

so the word soul in greek you can see it

33

00:01:41,510 --> 00:01:36,960

says psychian

34

00:01:45,190 --> 00:01:41,520

uh appears first in the 8th century bc

35

00:01:47,670 --> 00:01:45,200

in the hameric poem ilyad

36

00:01:50,389 --> 00:01:47,680

where he used it as something

37

00:01:53,190 --> 00:01:50,399

that a warrior could lose

38

00:01:54,710 --> 00:01:53,200

in the moment of death and here you can

39

00:01:56,709 --> 00:01:54,720

see uh

40

00:01:58,709 --> 00:01:56,719

the part of the poem

41

00:01:59,590 --> 00:01:58,719

in greek i'm not going to read it in

42

00:02:02,870 --> 00:01:59,600

greek

43

00:02:06,230 --> 00:02:02,880

but you can see underlined with red

44

00:02:11,190 --> 00:02:06,240

this uh first place that uh we can find

45

00:02:11,200 --> 00:02:13,510

in

46

00:02:19,350 --> 00:02:15,990

the 5th century the adjective an

47

00:02:22,390 --> 00:02:19,360

adjective insult in puchus

48

00:02:24,390 --> 00:02:22,400

appeared in the ordinary greek language

49

00:02:26,229 --> 00:02:24,400

and it didn't mean

50

00:02:28,869 --> 00:02:26,239

having soul

51

00:02:32,150 --> 00:02:28,879

it simply mean being alive

52

00:02:34,949 --> 00:02:32,160

and it was applied to human beings

53

00:02:40,309 --> 00:02:34,959

animals and plants and distinguish

54

00:02:44,869 --> 00:02:42,869

greeks try to answer the following

55

00:02:49,670 --> 00:02:44,879

questions

56

00:02:53,589 --> 00:02:49,680

is the substance soul material or not

57

00:02:54,949 --> 00:02:53,599

if it is material what it is made of

58

00:03:00,710 --> 00:02:54,959

and

59

00:03:06,869 --> 00:03:04,309

so let's look at the ideas of different

60

00:03:08,550 --> 00:03:06,879

philosophical schools

61

00:03:11,750 --> 00:03:08,560

hirocletus

62

00:03:13,509 --> 00:03:11,760

for example believed that the soul was

63

00:03:17,190 --> 00:03:13,519

bodily

64

00:03:20,149 --> 00:03:17,200

but composed of an unusually fine

65

00:03:22,869 --> 00:03:20,159

or rarer kind of matter

66

00:03:25,990 --> 00:03:22,879

the only difference he saw

67

00:03:27,830 --> 00:03:26,000

on in the soul and body

68

00:03:29,509 --> 00:03:27,840

was the difference in degree of

69

00:03:31,430 --> 00:03:29,519

properties

70

00:03:35,110 --> 00:03:31,440

of this matter such as

71

00:03:42,390 --> 00:03:39,030

similar views we find uh in epicurus

72

00:03:44,710 --> 00:03:42,400

epicurus uh was an atomist

73

00:03:47,430 --> 00:03:44,720

and in accordance with

74

00:03:50,550 --> 00:03:47,440

his atomism he believed that the soul

75

00:03:52,630 --> 00:03:50,560

like everything else in the world was

76

00:03:54,470 --> 00:03:52,640

composed of atoms

77

00:03:55,670 --> 00:03:54,480

atoms of wood

78

00:03:58,710 --> 00:03:55,680

material

79

00:04:00,550 --> 00:03:58,720

he said that it's atoms of some nameless

80

00:04:03,270 --> 00:04:00,560

kind of substance

81

00:04:05,910 --> 00:04:03,280

which is responsible for our sense

82

00:04:09,190 --> 00:04:06,710

uh

83

00:04:12,789 --> 00:04:09,200

the i it was they didn't just put the

84

00:04:16,229 --> 00:04:12,799

ideas they had a good reasoning why they

85

00:04:19,509 --> 00:04:16,239

believed the soul to be material

86

00:04:21,670 --> 00:04:19,519

they said the soul affects our body

87

00:04:24,150 --> 00:04:21,680

if soul affects our body and our body

88

00:04:27,189 --> 00:04:24,160

composed of matter

89

00:04:29,189 --> 00:04:27,199

then the soul is also material

90

00:04:31,749 --> 00:04:29,199

because only similar substance can

91

00:04:33,990 --> 00:04:31,759

affect similar each other

92

00:04:36,870 --> 00:04:34,000

uh in the best way it was formulated by

93

00:04:39,030 --> 00:04:36,880

stoic as you can see on the slide

94

00:04:41,830 --> 00:04:39,040

they said the soul is a body because

95

00:04:44,390 --> 00:04:41,840

only bodies affect one another and soul

96

00:04:47,189 --> 00:04:44,400

and body do affect one another for

97

00:04:49,909 --> 00:04:47,199

instance in case of bodily damage and

98

00:04:51,270 --> 00:04:49,919

emotions so that was the reasoning why

99

00:04:54,710 --> 00:04:51,280

it must be

100

00:04:57,510 --> 00:04:54,720

of some sort of material or matter

101
00:04:58,469 --> 00:04:57,520
now another question that uh

102
00:05:00,790 --> 00:04:58,479
they

103
00:05:05,430 --> 00:05:00,800
tried to understand and answer

104
00:05:09,110 --> 00:05:07,749
here we find different views on this

105
00:05:10,390 --> 00:05:09,120
issue

106
00:05:15,350 --> 00:05:10,400
the stoics

107
00:05:17,749 --> 00:05:15,360
agreed that the human soul is mortal

108
00:05:18,950 --> 00:05:17,759
but they also thought that it can

109
00:05:21,670 --> 00:05:18,960
survive

110
00:05:25,110 --> 00:05:21,680
uh the person's death so it stays for a

111
00:05:28,710 --> 00:05:25,120
little bit and then disappears

112
00:05:30,629 --> 00:05:28,720
it because also believe that the soul

113
00:05:32,390 --> 00:05:30,639

is dispersed at death along with its

114

00:05:34,950 --> 00:05:32,400

atomic structure

115

00:05:38,950 --> 00:05:34,960

that it loses the power

116

00:05:41,670 --> 00:05:38,960

that holds it in the organism

117

00:05:43,029 --> 00:05:41,680

so atoms atomic structure falls apart as

118

00:05:44,790 --> 00:05:43,039

as soon as

119

00:05:49,350 --> 00:05:44,800

of the soul atomic structure of the soul

120

00:05:50,950 --> 00:05:49,360

falls apart as soon as organism dies

121

00:05:52,870 --> 00:05:50,960

uh

122

00:05:54,950 --> 00:05:52,880

or pythagorean school

123

00:05:57,990 --> 00:05:54,960

also raised the question

124

00:06:00,309 --> 00:05:58,000

of what remains of a person of the death

125

00:06:02,870 --> 00:06:00,319

and here we find a very interesting

126

00:06:04,790 --> 00:06:02,880

different idea

127

00:06:07,430 --> 00:06:04,800

he believed that

128

00:06:10,390 --> 00:06:07,440

there is a quasi person

129

00:06:16,309 --> 00:06:10,400

and that quasi person this was a person

130

00:06:21,350 --> 00:06:18,950

uh in famous plato dialogues we also

131

00:06:23,590 --> 00:06:21,360

find a little bit of his ideas

132

00:06:26,390 --> 00:06:23,600

uh he

133

00:06:28,870 --> 00:06:26,400

believed that you can see here the

134

00:06:30,790 --> 00:06:28,880

uh paragraph from prada

135

00:06:34,710 --> 00:06:30,800

they think that after it has left the

136

00:06:37,350 --> 00:06:34,720

body it's no longer exists anywhere

137

00:06:40,230 --> 00:06:37,360

but that the soul is destroyed

138

00:06:43,110 --> 00:06:40,240

and dissolved on the day the man dies

139

00:06:45,830 --> 00:06:43,120

like breath or smoke so he viewed that

140

00:06:47,350 --> 00:06:45,840

as moist like a smoke

141

00:06:49,909 --> 00:06:47,360

um

142

00:06:52,150 --> 00:06:49,919

many centuries passed but scientists

143

00:06:54,150 --> 00:06:52,160

still didn't make much progress progress

144

00:06:56,150 --> 00:06:54,160

in understanding what distinguishes

145

00:06:57,990 --> 00:06:56,160

living and non-living

146

00:07:00,309 --> 00:06:58,000

if we look in the

147

00:07:05,029 --> 00:07:00,319

contemporary

148

00:07:05,990 --> 00:07:05,039

biophysics human organisms composed of

149

00:07:07,510 --> 00:07:06,000

cells

150

00:07:09,350 --> 00:07:07,520

which are mainly composed of

151
00:07:11,110 --> 00:07:09,360
biomolecules and the biomolecules

152
00:07:12,629 --> 00:07:11,120
composed of elementary particles

153
00:07:13,830 --> 00:07:12,639
basically

154
00:07:15,909 --> 00:07:13,840
um

155
00:07:17,909 --> 00:07:15,919
life is viewed as a continuous

156
00:07:19,990 --> 00:07:17,919
reversible it's important it's

157
00:07:21,909 --> 00:07:20,000
irreversible interactions of

158
00:07:24,390 --> 00:07:21,919
biomolecules

159
00:07:27,270 --> 00:07:24,400
the emotions mostly attributed to

160
00:07:30,469 --> 00:07:27,280
hormones produced in our body

161
00:07:32,710 --> 00:07:30,479
in modern physics and biology

162
00:07:35,670 --> 00:07:32,720
there is no place for such things

163
00:07:37,270 --> 00:07:35,680

feeling thoughts or the soul

164

00:07:39,510 --> 00:07:37,280

so we can see

165

00:07:41,670 --> 00:07:39,520

um

166

00:07:43,270 --> 00:07:41,680

that we have to admit that the modern

167

00:07:46,629 --> 00:07:43,280

scientific view

168

00:07:49,909 --> 00:07:46,639

on human being is much poorer than that

169

00:07:53,189 --> 00:07:49,919

of ancient greek philosophers

170

00:07:55,909 --> 00:07:53,199

um in 2016

171

00:07:58,710 --> 00:07:55,919

uh we went we presented similar idea in

172

00:08:02,629 --> 00:07:58,720

greece we were invited to present it in

173

00:08:06,390 --> 00:08:02,639

ancient olympia beautiful beautiful town

174

00:08:07,990 --> 00:08:06,400

uh and the president of greece prakopius

175

00:08:10,070 --> 00:08:08,000

pavlopoulos

176
00:08:12,790 --> 00:08:10,080
he was a keynote speaker and in his

177
00:08:15,830 --> 00:08:12,800
welcoming speech uh

178
00:08:17,029 --> 00:08:15,840
he said exactly this that that it is

179
00:08:19,189 --> 00:08:17,039
time

180
00:08:22,710 --> 00:08:19,199
like greek ancient greek philosophers to

181
00:08:24,230 --> 00:08:22,720
study the soul scientifically

182
00:08:24,950 --> 00:08:24,240
um

183
00:08:27,029 --> 00:08:24,960
so

184
00:08:30,790 --> 00:08:27,039
in recent

185
00:08:33,670 --> 00:08:30,800
recently um a new form of research

186
00:08:35,589 --> 00:08:33,680
quantum biology emerged

187
00:08:37,509 --> 00:08:35,599
quantum biology tries to describe

188
00:08:39,269 --> 00:08:37,519

biological systems

189

00:08:42,310 --> 00:08:39,279

using the tools

190

00:08:44,149 --> 00:08:42,320

of quantum mechanics

191

00:08:45,910 --> 00:08:44,159

how it encounters

192

00:08:48,230 --> 00:08:45,920

problems

193

00:08:49,829 --> 00:08:48,240

uh because quantum

194

00:08:52,070 --> 00:08:49,839

mechanics

195

00:08:55,030 --> 00:08:52,080

uses the probabilistic approach to the

196

00:08:56,870 --> 00:08:55,040

description of quantum system

197

00:08:59,350 --> 00:08:56,880

while the processes for observing

198

00:09:06,550 --> 00:08:59,360

biological organisms

199

00:09:11,190 --> 00:09:09,110

it's interesting that the founder of

200

00:09:13,590 --> 00:09:11,200

quantum mechanics

201
00:09:15,910 --> 00:09:13,600
erwin schroedinger was the first who

202
00:09:18,230 --> 00:09:15,920
pointed out this problem that quantum

203
00:09:20,550 --> 00:09:18,240
mechanics was unable to describe a

204
00:09:23,269 --> 00:09:20,560
behavior of living matter

205
00:09:26,389 --> 00:09:23,279
in his book what is life

206
00:09:27,350 --> 00:09:26,399
he wrote that in living organisms we

207
00:09:29,590 --> 00:09:27,360
face

208
00:09:32,550 --> 00:09:29,600
with events

209
00:09:35,590 --> 00:09:32,560
uh that um

210
00:09:37,670 --> 00:09:35,600
basically mechanism entirely different

211
00:09:40,710 --> 00:09:37,680
from the probability mechanisms of

212
00:09:45,030 --> 00:09:42,870
so what is different

213
00:09:47,590 --> 00:09:45,040

what is the difference between the

214

00:09:50,630 --> 00:09:47,600

chemistry of a living substance and

215

00:09:53,430 --> 00:09:50,640

non-living substance

216

00:09:55,269 --> 00:09:53,440

in non-living matter

217

00:09:57,190 --> 00:09:55,279

uh interactions occur very random

218

00:10:00,070 --> 00:09:57,200

collisions

219

00:10:01,590 --> 00:10:00,080

while in living organisms

220

00:10:05,430 --> 00:10:01,600

molecules

221

00:10:08,150 --> 00:10:05,440

are interact on the control of enzymes

222

00:10:12,710 --> 00:10:10,470

an enzyme is a protein having a

223

00:10:15,829 --> 00:10:12,720

particular shape you can see

224

00:10:19,750 --> 00:10:15,839

uh at one type of an enzyme on the

225

00:10:21,190 --> 00:10:19,760

diagram on the picture on the slide

226

00:10:23,350 --> 00:10:21,200

an enzyme

227

00:10:25,670 --> 00:10:23,360

has an active site

228

00:10:27,590 --> 00:10:25,680

where molecules bind and undergo

229

00:10:29,509 --> 00:10:27,600

chemical reaction

230

00:10:33,110 --> 00:10:29,519

what's interesting

231

00:10:35,110 --> 00:10:33,120

is that the active side of the enzyme

232

00:10:38,150 --> 00:10:35,120

can only accommodate

233

00:10:41,350 --> 00:10:38,160

molecule having particular shape

234

00:10:44,150 --> 00:10:41,360

so enzyme must be folded in the specific

235

00:10:46,310 --> 00:10:44,160

three-dimensional shape to accumulate

236

00:10:49,190 --> 00:10:46,320

uh the molecules

237

00:10:52,310 --> 00:10:49,200

i'm not going to go into details of this

238

00:10:53,269 --> 00:10:52,320

process but i want to emphasize here

239

00:10:54,870 --> 00:10:53,279

that

240

00:10:55,990 --> 00:10:54,880

um

241

00:10:57,670 --> 00:10:56,000

this

242

00:11:00,150 --> 00:10:57,680

process

243

00:11:01,590 --> 00:11:00,160

repeats again and again from generation

244

00:11:03,910 --> 00:11:01,600

to generation

245

00:11:06,630 --> 00:11:03,920

and there is no it does not exceed any

246

00:11:09,990 --> 00:11:06,640

molecular chaos here we do not observe

247

00:11:10,790 --> 00:11:10,000

it here on the contrary

248

00:11:18,790 --> 00:11:10,800

the

249

00:11:23,110 --> 00:11:21,990

so uh in our view we believe that

250

00:11:30,790 --> 00:11:23,120

the

251
00:11:31,829 --> 00:11:30,800
processes in living systems

252
00:11:34,870 --> 00:11:31,839
because

253
00:11:37,829 --> 00:11:34,880
they do not include the physical vacuum

254
00:11:41,430 --> 00:11:37,839
in the description

255
00:11:44,790 --> 00:11:41,440
if i accept the existence

256
00:11:47,590 --> 00:11:44,800
of the physical vacuum as a medium

257
00:11:50,310 --> 00:11:47,600
it will allow us to give deterministic

258
00:11:52,629 --> 00:11:50,320
description of the micro ball

259
00:11:54,150 --> 00:11:52,639
and as a result it will allow us to

260
00:11:56,949 --> 00:11:54,160
understand

261
00:11:58,230 --> 00:11:56,959
and to describe the processes that take

262
00:12:00,949 --> 00:11:58,240
place

263
00:12:02,550 --> 00:12:00,959

in the living organism

264

00:12:04,150 --> 00:12:02,560

uh you can find

265

00:12:07,190 --> 00:12:04,160

these ideas

266

00:12:09,350 --> 00:12:07,200

uh in book causal interpretation of

267

00:12:12,629 --> 00:12:09,360

quantum mechanics

268

00:12:15,990 --> 00:12:12,639

it will be published in the fall

269

00:12:19,430 --> 00:12:16,000

the author is nina sotina

270

00:12:24,949 --> 00:12:19,440

who is my mother and my co-author

271

00:12:28,069 --> 00:12:26,629

morning

272

00:12:30,389 --> 00:12:28,079

in my work

273

00:12:32,629 --> 00:12:30,399

i proved to using the causal

274

00:12:35,430 --> 00:12:32,639

approach of quantum mechanics

275

00:12:37,829 --> 00:12:35,440

that some special structures

276
00:12:39,590 --> 00:12:37,839
are formed in the physical vacuum around

277
00:12:42,790 --> 00:12:39,600
an atom

278
00:12:44,949 --> 00:12:42,800
obviously the more complex a quantum

279
00:12:47,910 --> 00:12:44,959
object is a an air

280
00:12:50,710 --> 00:12:47,920
molecule biomolecule is the more complex

281
00:12:52,710 --> 00:12:50,720
is in the structure component it in the

282
00:12:54,470 --> 00:12:52,720
physical vacuum

283
00:12:57,190 --> 00:12:54,480
the structures accompanying the

284
00:12:58,790 --> 00:12:57,200
biomolecules in the living system must

285
00:13:01,829 --> 00:12:58,800
be different from structures

286
00:13:04,629 --> 00:13:01,839
accompanying one living system

287
00:13:06,550 --> 00:13:04,639
such approach is in agreement with

288
00:13:08,310 --> 00:13:06,560

evgenium marcosti concept of

289

00:13:11,750 --> 00:13:08,320

biostructure

290

00:13:15,190 --> 00:13:11,760

markowski and his group in romania

291

00:13:17,509 --> 00:13:15,200

conducted a series of experimental plans

292

00:13:20,069 --> 00:13:17,519

to prove that there is a

293

00:13:21,829 --> 00:13:20,079

there exists a non-molecular material

294

00:13:25,590 --> 00:13:21,839

structure in the physical vehicle

295

00:13:30,150 --> 00:13:25,600

associated with a living organism

296

00:13:31,430 --> 00:13:30,160

a living plant was exposed to 200

297

00:13:34,389 --> 00:13:31,440

to 200

298

00:13:37,190 --> 00:13:34,399

atmosphere pressure at this pressure the

299

00:13:40,230 --> 00:13:37,200

living plant released a little amount of

300

00:13:43,110 --> 00:13:40,240

water and still remained alive

301
00:13:44,230 --> 00:13:43,120
the same experiment was done at that

302
00:13:46,710 --> 00:13:44,240
plant

303
00:13:49,670 --> 00:13:46,720
at the same pressure to

304
00:13:52,230 --> 00:13:49,680
100 atmospheres that that plant released

305
00:13:55,350 --> 00:13:52,240
also what it contained

306
00:13:57,269 --> 00:13:55,360
according to contemporary biochemistry

307
00:13:59,670 --> 00:13:57,279
the living community and the death

308
00:14:01,590 --> 00:13:59,680
consists of the same substance

309
00:14:03,670 --> 00:14:01,600
however it falls from markowski

310
00:14:09,110 --> 00:14:03,680
experiments they living can their

311
00:14:12,230 --> 00:14:09,990
note

312
00:14:15,269 --> 00:14:12,240
that markovsky is by structure and the

313
00:14:18,870 --> 00:14:15,279

beer field is not the same things

314

00:14:20,710 --> 00:14:18,880

their structures unlike few have a

315

00:14:24,470 --> 00:14:20,720

defined shape

316

00:14:25,990 --> 00:14:24,480

he viewed the by structures for a sponge

317

00:14:29,110 --> 00:14:26,000

the term the

318

00:14:32,069 --> 00:14:29,120

biological field was introduced by

319

00:14:34,389 --> 00:14:32,079

rich at the beginning of 20th century

320

00:14:37,590 --> 00:14:34,399

in physics a field has a property of

321

00:14:39,829 --> 00:14:37,600

continuity a special structure on the

322

00:14:43,030 --> 00:14:39,839

other hand is a system composed of

323

00:14:46,310 --> 00:14:43,040

elements of the arbitrary nature and has

324

00:14:49,030 --> 00:14:46,320

a certain space shape

325

00:14:51,829 --> 00:14:49,040

also here

326

00:14:54,150 --> 00:14:51,839

here lies a difference between

327

00:14:56,550 --> 00:14:54,160

structures and the physical

328

00:15:01,590 --> 00:14:59,030

despite the acoustic experience and

329

00:15:04,710 --> 00:15:01,600

other observations modern biology

330

00:15:07,269 --> 00:15:04,720

continues to develop within boundaries

331

00:15:10,230 --> 00:15:07,279

of molecular concept and doesn't include

332

00:15:12,710 --> 00:15:10,240

physical welcome in the description

333

00:15:14,230 --> 00:15:12,720

the main reason for that is the theory

334

00:15:17,750 --> 00:15:14,240

of relativity

335

00:15:20,629 --> 00:15:17,760

indeed if we accept the special special

336

00:15:22,629 --> 00:15:20,639

structure exists in physical welcome

337

00:15:25,509 --> 00:15:22,639

then it would be possible to link a

338

00:15:27,430 --> 00:15:25,519

coordinate system with the structures

339

00:15:30,389 --> 00:15:27,440

this way it will be possible to

340

00:15:33,670 --> 00:15:30,399

introduce an absolute motion of of

341

00:15:35,910 --> 00:15:33,680

objects with respect to vacuum

342

00:15:38,949 --> 00:15:35,920

however it would contradict the first

343

00:15:41,470 --> 00:15:38,959

postulate of special relativity

344

00:15:44,230 --> 00:15:41,480

therefore in our opinion the

345

00:15:46,629 --> 00:15:44,240

serialization prevents the further study

346

00:15:49,269 --> 00:15:46,639

of the physical welcome in our opinion

347

00:15:51,590 --> 00:15:49,279

to understand what is life we need to go

348

00:15:53,509 --> 00:15:51,600

towards a final level of matter and

349

00:15:54,550 --> 00:15:53,519

understand the property of the physical

350

00:15:57,350 --> 00:15:54,560

welcome

351

00:16:02,629 --> 00:15:59,910

thank you very much nadia and nina it

352

00:16:05,189 --> 00:16:02,639

was a fascinating presentation so i want

353

00:16:06,629 --> 00:16:05,199

to remain to

354

00:16:09,430 --> 00:16:06,639

tell the participants that they can put

355

00:16:11,910 --> 00:16:09,440

the questions in the chat and we'll ask

356

00:16:14,710 --> 00:16:11,920

them nina and nadia regarding this

357

00:16:16,310 --> 00:16:14,720

interesting presentation so uh

358

00:16:17,749 --> 00:16:16,320

nina and nadia could you elaborate a

359

00:16:22,150 --> 00:16:17,759

little bit more regarding the difference

360

00:16:28,790 --> 00:16:26,710

uh so buyer um by a field field is a

361

00:16:32,069 --> 00:16:28,800

specific term

362

00:16:32,870 --> 00:16:32,079

in uh physics which means something that

363

00:16:37,350 --> 00:16:32,880

has

364

00:16:39,590 --> 00:16:37,360

a continuity so it's defined it's it's

365

00:16:42,389 --> 00:16:39,600

every point every point

366

00:16:45,590 --> 00:16:42,399

it has a certain specific value so

367

00:16:48,150 --> 00:16:45,600

unlike structures structures are

368

00:16:51,189 --> 00:16:48,160

shaped so a good example of a structure

369

00:16:52,470 --> 00:16:51,199

is a vertex in liquid

370

00:16:54,550 --> 00:16:52,480

so

371

00:16:55,990 --> 00:16:54,560

liquid or we can have a liquid and then

372

00:16:58,470 --> 00:16:56,000

something happened and we have a vortex

373

00:17:00,870 --> 00:16:58,480

so vertex is a structure in the liquid

374

00:17:02,829 --> 00:17:00,880

again unlike field which is something

375

00:17:05,029 --> 00:17:02,839

that has

376

00:17:09,189 --> 00:17:05,039

continuity okay thank you very much for

377

00:17:13,429 --> 00:17:11,350

any additional comments that you want uh

378

00:17:15,510 --> 00:17:13,439

to make nina or nadia regarding your

379

00:17:18,390 --> 00:17:15,520

presentation maybe an afterthought

380

00:17:19,909 --> 00:17:18,400

i just again want to use this

381

00:17:24,150 --> 00:17:19,919

opportunity

382

00:17:29,110 --> 00:17:27,029

show that the title of the book

383

00:17:32,390 --> 00:17:29,120

that we plan to publish

384

00:17:35,270 --> 00:17:32,400

in the fall and if you anybody you know

385

00:17:38,150 --> 00:17:35,280

interested in this topic how quant is

386

00:17:40,070 --> 00:17:38,160

going to just explain this book will go

387

00:17:42,630 --> 00:17:40,080

step by step in the development of

388

00:17:45,669 --> 00:17:42,640

quantum mechanics and also we'll talk

389

00:17:48,789 --> 00:17:45,679

about how deterministic approach can

390

00:17:51,990 --> 00:17:48,799

lead to our bad understanding of atom

391

00:17:54,710 --> 00:17:52,000

and as a result the living the process

392

00:17:57,270 --> 00:17:54,720

and living organisms so and here's the

393

00:17:59,110 --> 00:17:57,280

email if anybody

394

00:18:00,549 --> 00:17:59,120

will have questions later on they can

395

00:18:04,549 --> 00:18:00,559

email us

396

00:18:05,830 --> 00:18:04,559

uh this is nina sotina my mother's email

397

00:18:08,230 --> 00:18:05,840

thank you very much

398

00:18:09,750 --> 00:18:08,240

so here's an additional question from

399

00:18:11,830 --> 00:18:09,760

christoph king

400

00:18:14,150 --> 00:18:11,840

is your castle interpretation of quantum

401
00:18:16,310 --> 00:18:14,160
mechanics deterministic similar to the

402
00:18:19,190 --> 00:18:16,320
super deterministic theories of quantum

403
00:18:21,909 --> 00:18:19,200
mechanics for example t hoft

404
00:18:22,789 --> 00:18:21,919
2016.

405
00:18:25,270 --> 00:18:22,799
okay

406
00:18:27,430 --> 00:18:25,280
let me pass it to my mother this

407
00:18:29,750 --> 00:18:27,440
question i may translate for her because

408
00:18:31,669 --> 00:18:29,760
english is not her first language we'll

409
00:18:36,630 --> 00:18:31,679
try to make it brief

410
00:18:41,510 --> 00:18:39,190
these are the same as the glasses

411
00:18:42,950 --> 00:18:41,520
is it the same as quantum

412
00:19:01,990 --> 00:18:42,960
theory

413
00:19:02,950 --> 00:19:02,000

um

414

00:19:05,750 --> 00:19:02,960

because

415

00:19:07,750 --> 00:19:05,760

again you can find more details in your

416

00:19:10,150 --> 00:19:07,760

book because it's a long discussion to

417

00:19:12,870 --> 00:19:10,160

go into details of the theory but it's

418

00:19:14,630 --> 00:19:12,880

more considered um

419

00:19:18,390 --> 00:19:14,640

starting from the beginning

420

00:19:21,029 --> 00:19:18,400

and uh this in her book she derives the

421

00:19:24,230 --> 00:19:21,039

schrodinger equation from the classical

422

00:19:27,350 --> 00:19:24,240

mechanics and shows how the schrodinger

423

00:19:31,430 --> 00:19:27,360

equation actually uh is the conditional

424

00:19:34,070 --> 00:19:31,440

stability of an electron in the atom

425

00:19:45,669 --> 00:19:34,080

okay thank you very much nadia so uh

426

00:19:50,630 --> 00:19:48,950

yes they can vibrate um

427

00:19:53,909 --> 00:19:50,640

it's again it's something that needs to

428

00:19:55,669 --> 00:19:53,919

be studied but yes it's possible

429

00:19:57,510 --> 00:19:55,679

okay thank you very much

430

00:19:59,669 --> 00:19:57,520

so there's an additional question we

431

00:20:03,590 --> 00:19:59,679

just want to emphasize that structures

432

00:20:06,149 --> 00:20:03,600

do not uh uh override by field it's just

433

00:20:09,270 --> 00:20:06,159

we just want to emphasize in the work

434

00:20:11,430 --> 00:20:09,280

that by structures because sometimes

435

00:20:13,750 --> 00:20:11,440

there is a confusion

436

00:20:15,510 --> 00:20:13,760

that by a field can affect them but by

437

00:20:18,149 --> 00:20:15,520

field is a field and structure is

438

00:20:21,510 --> 00:20:18,159

something that is not a field structure

439

00:20:22,870 --> 00:20:21,520

cannot be the field but one can coexist

440

00:20:24,149 --> 00:20:22,880

with another

441

00:20:25,350 --> 00:20:24,159

interesting

442

00:20:27,990 --> 00:20:25,360

so there's an additional question

443

00:20:29,750 --> 00:20:28,000

regarding uh if you could please expand

444

00:20:32,470 --> 00:20:29,760

about the difference between

445

00:20:34,070 --> 00:20:32,480

uh living and death plants regarding

446

00:20:35,350 --> 00:20:34,080

pressure as you establish in one of your

447

00:20:40,070 --> 00:20:35,360

slides

448

00:20:45,190 --> 00:20:42,630

it's one of the rare experiments that

449

00:20:48,549 --> 00:20:45,200

were not performed

450

00:20:49,750 --> 00:20:48,559

anywhere else at least as far as we know

451
00:20:53,029 --> 00:20:49,760
um

452
00:20:54,630 --> 00:20:53,039
in this experiment what's interesting

453
00:20:56,630 --> 00:20:54,640
that

454
00:20:57,990 --> 00:20:56,640
but chemically

455
00:21:00,549 --> 00:20:58,000
the dead

456
00:21:02,549 --> 00:21:00,559
plant the living plant and that plant is

457
00:21:03,990 --> 00:21:02,559
made from the same atoms roughly

458
00:21:05,669 --> 00:21:04,000
speaking

459
00:21:07,510 --> 00:21:05,679
and

460
00:21:08,789 --> 00:21:07,520
it's the same substance

461
00:21:12,070 --> 00:21:08,799
however

462
00:21:15,750 --> 00:21:12,080
what markowski showed in his experiment

463
00:21:17,270 --> 00:21:15,760

that as if water in the living plant is

464

00:21:20,149 --> 00:21:17,280

structured

465

00:21:22,310 --> 00:21:20,159

in the sense that when the it was on the

466

00:21:25,669 --> 00:21:22,320

living plant was under high pressure of

467

00:21:28,630 --> 00:21:25,679

200 atmospheres

468

00:21:32,470 --> 00:21:28,640

the water stay still remain there only a

469

00:21:34,710 --> 00:21:32,480

little bit of water uh was released as

470

00:21:37,669 --> 00:21:34,720

if water had a different structure in

471

00:21:39,990 --> 00:21:37,679

the living once the plant died

472

00:21:41,669 --> 00:21:40,000

it's as if the water was not structured

473

00:21:44,310 --> 00:21:41,679

anymore it's just

474

00:21:47,669 --> 00:21:44,320

released all its water and according to

475

00:21:50,149 --> 00:21:47,679

matkowski he believed that basically

476

00:21:51,909 --> 00:21:50,159

there are two forms of matter

477

00:21:54,870 --> 00:21:51,919

that there's a molecular matter but

478

00:21:57,270 --> 00:21:54,880

there is something else so we believe

479

00:21:59,110 --> 00:21:57,280

that this something else are structures

480

00:22:01,590 --> 00:21:59,120

in the physical vacuum that vacuum

481

00:22:03,830 --> 00:22:01,600

structured water for example

482

00:22:04,630 --> 00:22:03,840

so that um

483

00:22:11,350 --> 00:22:04,640

when

484

00:22:14,149 --> 00:22:11,360

has a different structure than it uh has

485

00:22:15,750 --> 00:22:14,159

when the organism is dead so according

486

00:22:18,630 --> 00:22:15,760

to markowski he said again the

487

00:22:20,310 --> 00:22:18,640

non-molecular biostructure that keeps

488

00:22:21,909 --> 00:22:20,320

the integrity

489

00:22:25,190 --> 00:22:21,919

of the living carbons and there is a

490

00:22:27,110 --> 00:22:25,200

molecular form

491

00:22:30,310 --> 00:22:27,120

okay excellent thank you very much

492

00:22:32,070 --> 00:22:30,320

uh john kovacher asks us if the work

493

00:22:34,149 --> 00:22:32,080

you're developing is only theoretical at

494

00:22:36,549 --> 00:22:34,159

the moment or if you do have some

495

00:22:37,669 --> 00:22:36,559

experimental data to support your vacuum

496

00:22:39,830 --> 00:22:37,679

theories

497

00:22:43,190 --> 00:22:39,840

there is an interesting experiment if

498

00:22:46,870 --> 00:22:43,200

anybody interested on helium 3

499

00:22:49,430 --> 00:22:46,880

superfluid helium 3 and we believe that

500

00:22:52,789 --> 00:22:49,440

in some properties the physical vacuum

501
00:22:55,510 --> 00:22:52,799
is like helium 3 the structures can form

502
00:22:57,909 --> 00:22:55,520
in helium-3 which we believe similar

503
00:22:59,250 --> 00:22:57,919
structures can exist

504
00:23:01,590 --> 00:22:59,260
in uh

505
00:23:03,510 --> 00:23:01,600
[Music]

506
00:23:05,830 --> 00:23:03,520
there is a direction in physics that

507
00:23:09,110 --> 00:23:05,840
study helium 3 and there are many

508
00:23:09,990 --> 00:23:09,120
experiments uh and the whole the whole

509
00:23:11,909 --> 00:23:10,000
like

510
00:23:13,590 --> 00:23:11,919
part of physics of scientists who

511
00:23:16,390 --> 00:23:13,600
studied the

512
00:23:17,990 --> 00:23:16,400
uh physical vacuum as a field as as the

513
00:23:20,870 --> 00:23:18,000

medium

514

00:23:22,710 --> 00:23:20,880

thanks a lot oh yeah very interesting uh

515

00:23:25,669 --> 00:23:22,720

so

516

00:23:28,070 --> 00:23:25,679

probably our final question if anyone

517

00:23:30,870 --> 00:23:28,080

don't ask any additional one afterwards

518

00:23:32,549 --> 00:23:30,880

so tia music excuse me if i pronounce

519

00:23:33,510 --> 00:23:32,559

that incorrectly

520

00:23:37,350 --> 00:23:33,520

ask

521

00:23:39,830 --> 00:23:37,360

enzymes versus thermodynamics in

522

00:23:42,390 --> 00:23:39,840

biological systems

523

00:23:46,070 --> 00:23:42,400

that's a very interesting question

524

00:23:46,910 --> 00:23:46,080

it's a very broad dropping

525

00:23:48,710 --> 00:23:46,920

and

526

00:23:51,830 --> 00:23:48,720

[Music]

527

00:23:54,070 --> 00:23:51,840

we did not go deep into that because we

528

00:23:56,149 --> 00:23:54,080

are physicists we look at it more like

529

00:23:59,750 --> 00:23:56,159

fight try to find the

530

00:24:02,470 --> 00:23:59,760

uh physics approach to description of

531

00:24:05,110 --> 00:24:02,480

life because biology and physics meets

532

00:24:07,750 --> 00:24:05,120

at the point of micro world

533

00:24:09,510 --> 00:24:07,760

so there is a there is no one

534

00:24:11,350 --> 00:24:09,520

good explanation of what happened in

535

00:24:13,990 --> 00:24:11,360

living organism in microworld it's

536

00:24:16,789 --> 00:24:14,000

described very well non-limit living but

537

00:24:18,390 --> 00:24:16,799

we see it does not describe the living

538

00:24:20,470 --> 00:24:18,400

substances the living organisms

539

00:24:23,190 --> 00:24:20,480

biomolecules but that's a very good

540

00:24:25,029 --> 00:24:23,200

question no we did not uh really study

541

00:24:26,630 --> 00:24:25,039

that

542

00:24:29,269 --> 00:24:26,640

okay thank you very much

543

00:24:31,750 --> 00:24:29,279

uh thank you very much nina i'll

544

00:24:33,990 --> 00:24:31,760

think uh you'll have you'll be able to

545

00:24:36,070 --> 00:24:34,000

ask nina nadia additional questions but

546

00:24:38,630 --> 00:24:36,080

for that let's uh pass a microphone to

547

00:24:41,750 --> 00:24:38,640

our program chair john cruz so he can

548

00:24:43,830 --> 00:24:41,760

tell us more about it

549

00:24:46,470 --> 00:24:43,840

thank you ramses and thank you very much

550

00:24:48,950 --> 00:24:46,480

for the presentation is very interesting

551

00:24:50,310 --> 00:24:48,960

coming from different perspectives and i