
AB
GRAD
CON23

1
00:00:14,870 --> 00:00:10,629
[Music]

2
00:00:16,510 --> 00:00:14,880
hi everyone thank you for having me this

3
00:00:19,010 --> 00:00:16,520
is a very special moment for me because

4
00:00:22,070 --> 00:00:19,020
I am talking about going to talk about

5
00:00:24,710 --> 00:00:22,080
hydrothermal dance so being scrapes is a

6
00:00:27,170 --> 00:00:24,720
very special moment so I'm happy to

7
00:00:28,689 --> 00:00:27,180
share it with you and also about my PhD

8
00:00:32,630 --> 00:00:28,699
Journey

9
00:00:35,450 --> 00:00:32,640
so the link in hydrothermal veins is

10
00:00:39,229 --> 00:00:35,460
very important between the uh the ocean

11
00:00:43,010 --> 00:00:39,239
space Sciences since its Discovery in

12
00:00:45,709 --> 00:00:43,020
the 70s the efforts to study the deep

13
00:00:48,950 --> 00:00:45,719

ocean and these extreme environments has

14
00:00:51,709 --> 00:00:48,960
increased a lot in these last years also

15
00:00:53,569 --> 00:00:51,719
because of all the technology and all

16
00:00:57,590 --> 00:00:53,579
the improvements that it has been made

17
00:01:00,650 --> 00:00:57,600
through a study the deep sea and also

18
00:01:03,910 --> 00:01:00,660
not only it was an outstanding Discovery

19
00:01:06,530 --> 00:01:03,920
for your physicist geologists also for

20
00:01:09,289 --> 00:01:06,540
biology and microbiologists that we

21
00:01:11,810 --> 00:01:09,299
found these extreme ecosystems where we

22
00:01:14,390 --> 00:01:11,820
are finding these extremophiles that are

23
00:01:16,789 --> 00:01:14,400
high uh with a high diversity not only

24
00:01:19,490 --> 00:01:16,799
microbiology but also on microbiology

25
00:01:22,310 --> 00:01:19,500
and in a bigger scope herothermal veins

26
00:01:25,429 --> 00:01:22,320
are very important for astrobiology a

27
00:01:28,070 --> 00:01:25,439
bigger scope is a origin of library is a

28
00:01:30,469 --> 00:01:28,080
very important thing in our planet and

29
00:01:33,710 --> 00:01:30,479
also for looking

30
00:01:36,770 --> 00:01:33,720
um live elsewhere also Hamilton systems

31
00:01:40,730 --> 00:01:36,780
has been proposed not only a place where

32
00:01:44,630 --> 00:01:40,740
these structures have uh have created or

33
00:01:47,330 --> 00:01:44,640
originated the molecules uh for the

34
00:01:50,030 --> 00:01:47,340
cells but also for probably there there

35
00:01:52,370 --> 00:01:50,040
are similar structures uh existing in

36
00:01:54,590 --> 00:01:52,380
the icing wounds so this is one of the

37
00:01:58,249 --> 00:01:54,600
biggest scope that we are studying

38
00:02:00,530 --> 00:01:58,259

Hiroshima events but in particular in

39
00:02:02,990 --> 00:02:00,540
this topic we are exploring what is the

40
00:02:05,749 --> 00:02:03,000
Gulf of California and Mexico so if

41
00:02:07,670 --> 00:02:05,759
you're uh will hit the Gulf of

42
00:02:10,490 --> 00:02:07,680
California we are

43
00:02:12,050 --> 00:02:10,500
here in Scripps out the north if you

44
00:02:14,270 --> 00:02:12,060
cross the border here Tijuana and

45
00:02:18,410 --> 00:02:14,280
Ensenada excellent tacos if you want to

46
00:02:21,589 --> 00:02:18,420
stay longer you can tell me but for

47
00:02:23,630 --> 00:02:21,599
studying the Gulf of California uh the

48
00:02:25,809 --> 00:02:23,640
deep ocean has been studied for over a

49
00:02:29,869 --> 00:02:25,819
decade and we have well they have found

50
00:02:31,430 --> 00:02:29,879
uh that there is a series of transform

51
00:02:32,089 --> 00:02:31,440
false

52
00:02:35,030 --> 00:02:32,099
um

53
00:02:36,830 --> 00:02:35,040
and spreading centers which have led to

54
00:02:40,309 --> 00:02:36,840
the discovery of hydrothermal vent

55
00:02:44,290 --> 00:02:40,319
systems in particular we have found here

56
00:02:46,369 --> 00:02:44,300
it is uh impascular Basin at South

57
00:02:48,229 --> 00:02:46,379
of the peninsula of the Gulf of

58
00:02:50,030 --> 00:02:48,239
California we have found two

59
00:02:53,089 --> 00:02:50,040
hydrothermaline systems I'm sorry they

60
00:02:56,710 --> 00:02:53,099
they moved but here the yellow dot it's

61
00:03:01,070 --> 00:02:56,720
called Alka and the Red Dot is called

62
00:03:04,390 --> 00:03:01,080
Alka was discovered in 2015 and jagma

63
00:03:07,670 --> 00:03:04,400

has were discovering 2018

64
00:03:10,089 --> 00:03:07,680
these are the hierothermal band fields

65
00:03:13,430 --> 00:03:10,099
that are at a depth of

66
00:03:15,229 --> 00:03:13,440
3650 meters that this is the deepest

67
00:03:17,390 --> 00:03:15,239
known halothermal vein system in the

68
00:03:20,290 --> 00:03:17,400
Pacific Ocean where it has led us to

69
00:03:24,410 --> 00:03:20,300
study them as a very extreme ecosystem

70
00:03:26,809 --> 00:03:24,420
and we have found that the the chemistry

71
00:03:30,229 --> 00:03:26,819
of these harassment veins are it's very

72
00:03:32,930 --> 00:03:30,239
unique they are made of calcite and they

73
00:03:36,369 --> 00:03:32,940
have been some temperature measurements

74
00:03:39,530 --> 00:03:36,379
of between the 20 degrees to 100 degrees

75
00:03:41,630 --> 00:03:39,540
Celsius in around the 30 minutes while

76
00:03:44,330 --> 00:03:41,640
one of the the highest hydrothermal

77
00:03:46,670 --> 00:03:44,340
veins temperature goes around 300

78
00:03:49,610 --> 00:03:46,680
degrees so

79
00:03:50,990 --> 00:03:49,620
uh one of the questions that we have one

80
00:03:52,729 --> 00:03:51,000
of the big questions that we have for

81
00:03:55,430 --> 00:03:52,739
studying this hydrothermal vein systems

82
00:03:57,710 --> 00:03:55,440
is who are the microbes related to the

83
00:04:00,350 --> 00:03:57,720
hydrothermal fluids in the sediments of

84
00:04:02,089 --> 00:04:00,360
the Alka and jagma Halo thermal band

85
00:04:05,390 --> 00:04:02,099
feels because we don't know a lot of

86
00:04:07,670 --> 00:04:05,400
these heart Hamilton systems so the

87
00:04:08,570 --> 00:04:07,680
first question was who are them

88
00:04:11,350 --> 00:04:08,580

um

89
00:04:13,789 --> 00:04:11,360
so for this

90
00:04:17,890 --> 00:04:13,799
oceanographic expedition was made in

91
00:04:22,790 --> 00:04:17,900
2018 about the research vessel Falcor

92
00:04:25,430 --> 00:04:22,800
and these research vessel has a ROV

93
00:04:29,510 --> 00:04:25,440
called Sebastian which is a Rover that

94
00:04:32,050 --> 00:04:29,520
left us submerged and with our robotic

95
00:04:34,969 --> 00:04:32,060
arm it had it was able to take some

96
00:04:37,249 --> 00:04:34,979
samples of the sediments so here you can

97
00:04:38,749 --> 00:04:37,259
see a little insight about how are the

98
00:04:41,330 --> 00:04:38,759
sediments around these hierothermal

99
00:04:44,870 --> 00:04:41,340
vents all the things all the white stuff

100
00:04:47,710 --> 00:04:44,880
that you see around is microbial mat so

101
00:04:52,490 --> 00:04:47,720
we collected around very

102
00:04:56,090 --> 00:04:52,500
approach course sediments and all these

103
00:04:58,730 --> 00:04:56,100
curl samples were section

104
00:05:00,770 --> 00:04:58,740
um on the ship and it will stop

105
00:05:05,270 --> 00:05:00,780
something with um

106
00:05:07,730 --> 00:05:05,280
for taking DNA extraction to do poor

107
00:05:09,590 --> 00:05:07,740
Water Analysis but in the lab we made

108
00:05:13,370 --> 00:05:09,600
some iron chromatography DNA

109
00:05:14,810 --> 00:05:13,380
amplification of 16s some sequencing and

110
00:05:17,749 --> 00:05:14,820
bioinformatics and of course some

111
00:05:19,730 --> 00:05:17,759
statistical analysis and so here I'm

112
00:05:23,810 --> 00:05:19,740
going to present you some of the of the

113
00:05:26,090 --> 00:05:23,820

results of of this so one of the

114
00:05:29,390 --> 00:05:26,100
questions we also have in the first

115
00:05:31,790 --> 00:05:29,400
place is how are Alka and Jack Maja are

116
00:05:34,969 --> 00:05:31,800
compared how are these aerothermal vein

117
00:05:38,090 --> 00:05:34,979
systems related because uh our contigma

118
00:05:41,029 --> 00:05:38,100
are like two kilometers away so we

119
00:05:44,090 --> 00:05:41,039
wanted to compare how much are they

120
00:05:46,010 --> 00:05:44,100
similar in terms of the geochemistry and

121
00:05:50,770 --> 00:05:46,020
all the microbiology that we have been

122
00:05:53,749 --> 00:05:50,780
found in so we perform this MDS analysis

123
00:05:56,330 --> 00:05:53,759
so if you see that we have three

124
00:05:59,330 --> 00:05:56,340
different locations Alka and jagmada are

125
00:06:01,490 --> 00:05:59,340
the Hamilton films but we also have a

126
00:06:03,409 --> 00:06:01,500
Dollar location that is called your

127
00:06:06,290 --> 00:06:03,419
vacuum I'm sorry for the names all the

128
00:06:09,469 --> 00:06:06,300
names are native words from the region

129
00:06:12,770 --> 00:06:09,479
so that's how we decided Well scientists

130
00:06:15,409 --> 00:06:12,780
have decided to to name them uh these

131
00:06:18,110 --> 00:06:15,419
both are hydrothermal vent systems but

132
00:06:22,010 --> 00:06:18,120
all the vacuum is a site between them

133
00:06:25,370 --> 00:06:22,020
but it's a death site so it's not active

134
00:06:29,510 --> 00:06:25,380
anymore so we use it as an outsider to

135
00:06:34,450 --> 00:06:29,520
do this uh test so in general terms you

136
00:06:37,730 --> 00:06:34,460
can see that they are very similar okay

137
00:06:42,350 --> 00:06:37,740
and here is this is the outsider your

138
00:06:45,409 --> 00:06:42,360

vacuum that it looks um not that similar

139
00:06:47,870 --> 00:06:45,419
to them so they are sharing uh a lot of

140
00:06:50,150 --> 00:06:47,880
of things but where exactly we don't say

141
00:06:53,450 --> 00:06:50,160
we don't know what if it's radio

142
00:06:56,090 --> 00:06:53,460
chemistry of this the microbiology so

143
00:06:57,950 --> 00:06:56,100
um we want to go further in to study the

144
00:07:00,290 --> 00:06:57,960
microbial composition of both of them

145
00:07:02,270 --> 00:07:00,300
and compare them and to see if they are

146
00:07:05,090 --> 00:07:02,280
related or what are the difference

147
00:07:05,749 --> 00:07:05,100
between them and one of the

148
00:07:09,650 --> 00:07:05,759
um

149
00:07:11,510 --> 00:07:09,660
a biggest surprises that we have is that

150
00:07:13,909 --> 00:07:11,520
the microbes are related to the

151
00:07:17,090 --> 00:07:13,919
hydrothermal fluids but between Alka and

152
00:07:20,409 --> 00:07:17,100
jagma the haritha well the microbes are

153
00:07:22,870 --> 00:07:20,419
different they have we have different a

154
00:07:27,290 --> 00:07:22,880
film composition

155
00:07:31,129 --> 00:07:27,300
uh but the only uh film they share is

156
00:07:33,830 --> 00:07:31,139
Thermo thermosogata so this is a very

157
00:07:35,870 --> 00:07:33,840
um interesting thing to to explore that

158
00:07:37,550 --> 00:07:35,880
we are finding different microbial

159
00:07:39,770 --> 00:07:37,560
communities between those those

160
00:07:42,909 --> 00:07:39,780
hydrothermal veins but we are they are

161
00:07:46,969 --> 00:07:42,919
sharing one so this is telling us about

162
00:07:50,510 --> 00:07:46,979
the thermophilic and hydrothermal fluids

163
00:07:52,010 --> 00:07:50,520

all the ambiento all the the conditions

164
00:07:56,749 --> 00:07:52,020
the extreme conditions that are around

165
00:07:59,210 --> 00:07:56,759
and also they tell us about all the um

166
00:08:02,270 --> 00:07:59,220
your Chemistry that is happening is

167
00:08:03,950 --> 00:08:02,280
telling us about all it's very complex I

168
00:08:06,409 --> 00:08:03,960
think that all the metabolism that is

169
00:08:08,990 --> 00:08:06,419
going on between these sediments around

170
00:08:12,230 --> 00:08:09,000
Harold Hamilton events so we are trying

171
00:08:14,529 --> 00:08:12,240
to explore furthermore about this uh

172
00:08:16,969 --> 00:08:14,539
group The thermosogoda that they are

173
00:08:21,409 --> 00:08:16,979
extremophiles they are adopted more than

174
00:08:24,830 --> 00:08:21,419
50 degrees or 80 degrees Celsius so we

175
00:08:26,270 --> 00:08:24,840
are trying to to understand if these are

176
00:08:28,790 --> 00:08:26,280
like the same families that they are

177
00:08:32,029 --> 00:08:28,800
sharing or not that's one of the next

178
00:08:33,949 --> 00:08:32,039
steps for this but also the implications

179
00:08:37,089 --> 00:08:33,959
for astrobiology in term for a

180
00:08:40,490 --> 00:08:37,099
hypothermal veins is that we are uh ex

181
00:08:42,769 --> 00:08:40,500
still exploring a lot of findings of

182
00:08:44,990 --> 00:08:42,779
thermophilic microbial communities in

183
00:08:47,269 --> 00:08:45,000
this hydrothermal vein systems so try to

184
00:08:50,389 --> 00:08:47,279
understand the limits of Life on our

185
00:08:52,190 --> 00:08:50,399
Earth as it is one of the deepest points

186
00:08:54,829 --> 00:08:52,200
of the Pacific Ocean it is telling us a

187
00:08:58,370 --> 00:08:54,839
lot of information about that and also

188
00:09:00,769 --> 00:08:58,380

all another step for the investigation

189
00:09:02,810 --> 00:09:00,779
that is going on it's applying it to the

190
00:09:06,889 --> 00:09:02,820
icy moons with habitable habitability

191
00:09:08,110 --> 00:09:06,899
models where we can try to have these

192
00:09:12,170 --> 00:09:08,120
ecological

193
00:09:14,990 --> 00:09:12,180
models and now we have data to try to

194
00:09:17,630 --> 00:09:15,000
simulate this we have your Chemistry

195
00:09:20,810 --> 00:09:17,640
data we have microbiology data so we can

196
00:09:23,570 --> 00:09:20,820
try to approach ecological model to the

197
00:09:26,570 --> 00:09:23,580
isomers if someone in the isemons one so

198
00:09:29,230 --> 00:09:26,580
collaborate please let me know

199
00:09:32,150 --> 00:09:29,240
um uh well the highlights of this

200
00:09:33,710 --> 00:09:32,160
presentations to take away I want you to

201
00:09:35,930 --> 00:09:33,720
well to

202
00:09:37,790 --> 00:09:35,940
uh to show you some of the hydrothermal

203
00:09:41,030 --> 00:09:37,800
veins how the hydrothermal vent system

204
00:09:44,210 --> 00:09:41,040
looks like in pascara Basin but this is

205
00:09:46,130 --> 00:09:44,220
the first uh insight into Jack Maja

206
00:09:48,050 --> 00:09:46,140
ahara thermal vent feel and its

207
00:09:51,590 --> 00:09:48,060
microbiology the first time that we have

208
00:09:53,630 --> 00:09:51,600
seen this our findings provide valuable

209
00:09:55,850 --> 00:09:53,640
insight into the deep sea biosphere and

210
00:09:57,829 --> 00:09:55,860
that we are learning that we there are a

211
00:10:00,490 --> 00:09:57,839
lot of information that still need to be

212
00:10:04,610 --> 00:10:00,500
processed and to know and to discover

213
00:10:06,829 --> 00:10:04,620

and we have uh found a diverse range of

214
00:10:08,930 --> 00:10:06,839
extremophiles in microbial communities

215
00:10:11,329 --> 00:10:08,940
right now I'm just talking about the

216
00:10:14,750 --> 00:10:11,339
thermophiles but we have methane

217
00:10:16,910 --> 00:10:14,760
oxidizers anaerobic micro microbial

218
00:10:19,970 --> 00:10:16,920
organisms so there are a lot of things

219
00:10:21,889 --> 00:10:19,980
going not in the in the tab and well

220
00:10:24,410 --> 00:10:21,899
knowing that the Pescadero Basin is the

221
00:10:26,630 --> 00:10:24,420
deepest hydrothermal ecosystem in the

222
00:10:28,850 --> 00:10:26,640
Pacific Ocean well it implies that we

223
00:10:32,389 --> 00:10:28,860
are still understanding the limits of

224
00:10:34,730 --> 00:10:32,399
life on Earth ambitions so with this I

225
00:10:36,650 --> 00:10:34,740
want to thank you please uh if you want

226
00:10:39,230 --> 00:10:36,660
to know a little more about the Mexican

227
00:10:41,210 --> 00:10:39,240
astrology Society there is a link and I

228
00:10:42,769 --> 00:10:41,220
am also from the astrobiology lab at

229
00:10:43,800 --> 00:10:42,779
unan and we are happy to collaborate

230
00:10:48,540 --> 00:10:43,810
thank you

231
00:10:58,370 --> 00:10:49,600
[Music]

232
00:11:02,329 --> 00:11:00,110
thank you for your talk

233
00:11:04,970 --> 00:11:02,339
um I was just curious do you find many

234
00:11:07,069 --> 00:11:04,980
Nano prokaryotes like Nano archaea or

235
00:11:09,650 --> 00:11:07,079
like candidate Philo radiation bacteria

236
00:11:11,150 --> 00:11:09,660
and or do just filter them out in your

237
00:11:13,069 --> 00:11:11,160
analyzes somehow or like are there any

238
00:11:16,190 --> 00:11:13,079

interesting patterns

239
00:11:18,530 --> 00:11:16,200
well Ryan well we're finding uh also

240
00:11:20,750 --> 00:11:18,540
Archaea and bacteria well that's like

241
00:11:23,210 --> 00:11:20,760
the further that we have like now there

242
00:11:24,829 --> 00:11:23,220
is a lot still no information to to show

243
00:11:26,269 --> 00:11:24,839
up but there is there's a lot of things

244
00:11:28,550 --> 00:11:26,279
going on

245
00:11:30,230 --> 00:11:28,560
yeah I just remember like looking

246
00:11:32,569 --> 00:11:30,240
through various papers is there a lot of

247
00:11:34,970 --> 00:11:32,579
them a lot of those like Nano sized

248
00:11:37,730 --> 00:11:34,980
plays present in the hydrazone events

249
00:11:40,269 --> 00:11:37,740
like Nano arcura or yeah like nanarkio

250
00:11:46,430 --> 00:11:40,279
or yeah

251
00:11:52,910 --> 00:11:50,329
yes sorry uh just kind of curious I I'm

252
00:11:56,150 --> 00:11:52,920
um so I'm a physics kind of background

253
00:11:57,350 --> 00:11:56,160
person of mrsd and

254
00:12:00,290 --> 00:11:57,360
I was wondering about temperature

255
00:12:01,790 --> 00:12:00,300
management so like you know above above

256
00:12:03,350 --> 00:12:01,800
certain temperatures like you're gonna

257
00:12:05,090 --> 00:12:03,360
get denatured proteins and stuff like

258
00:12:07,910 --> 00:12:05,100
that and I was wondering if there's

259
00:12:10,310 --> 00:12:07,920
extremophiles that do like that cool

260
00:12:12,290 --> 00:12:10,320
themselves somehow or any anything like

261
00:12:15,590 --> 00:12:12,300
that sorry

262
00:12:18,410 --> 00:12:15,600
yes uh actually well right now um here

263
00:12:21,710 --> 00:12:18,420

I'm talking uh again as uh with

264
00:12:23,509 --> 00:12:21,720
thermophiles but actually here in the

265
00:12:25,550 --> 00:12:23,519
hierothermal bands well not the

266
00:12:27,170 --> 00:12:25,560
harothermal bands around thermal veins

267
00:12:29,750 --> 00:12:27,180
all these sediments there are different

268
00:12:31,790 --> 00:12:29,760
changes in temperature so right now I am

269
00:12:35,569 --> 00:12:31,800
talking about the highest ones that we

270
00:12:38,150 --> 00:12:35,579
have a measure but if you go further the

271
00:12:42,170 --> 00:12:38,160
hydrothermal bands it drops to 2 degrees

272
00:12:44,329 --> 00:12:42,180
Centigrades so we are studying well this

273
00:12:46,069 --> 00:12:44,339
is able to study different microbial

274
00:12:48,290 --> 00:12:46,079
communities adapted to high temperatures

275
00:12:52,190 --> 00:12:48,300
but also to call call these places

276
00:12:52,200 --> 00:13:01,129
any other questions for a minute

277
00:13:06,110 --> 00:13:03,650
hey really awesome talk this is really

278
00:13:07,430 --> 00:13:06,120
cool I worked with um hydrophone vents

279
00:13:09,110 --> 00:13:07,440
as an undergrad so this is like really

280
00:13:11,329 --> 00:13:09,120
nostalgic for me

281
00:13:13,550 --> 00:13:11,339
um I'm curious if anyone in your group

282
00:13:15,050 --> 00:13:13,560
or anyone part of the the cruise is

283
00:13:17,090 --> 00:13:15,060
doing it and

284
00:13:19,250 --> 00:13:17,100
Karen Lloyd wouldn't wouldn't like this

285
00:13:21,110 --> 00:13:19,260
but is doing any culturing

286
00:13:24,050 --> 00:13:21,120
um from these environments

287
00:13:26,329 --> 00:13:24,060
yes like specifically I'm thinking it

288
00:13:27,829 --> 00:13:26,339

high pressure because these are some of

289
00:13:29,150 --> 00:13:27,839
the like deeper events in the Pacific or

290
00:13:30,710 --> 00:13:29,160
the deepest vents in the Pacific I think

291
00:13:32,990 --> 00:13:30,720
you said and so I'm just curious if

292
00:13:35,690 --> 00:13:33,000
anyone's doing culturing and if they're

293
00:13:40,009 --> 00:13:35,700
including pressure in that

294
00:13:41,870 --> 00:13:40,019
yes uh actually one of the uh here in

295
00:13:45,110 --> 00:13:41,880
one of the collaborations that we have

296
00:13:47,750 --> 00:13:45,120
is in Caltech in Victoria orphan's lab

297
00:13:50,389 --> 00:13:47,760
yes uh the group are making some

298
00:13:52,670 --> 00:13:50,399
cultural experiments with some of the uh

299
00:13:55,310 --> 00:13:52,680
different uh sediment cores in different

300
00:13:58,190 --> 00:13:55,320
sites so they are trying to to do that

301
00:14:01,009 --> 00:13:58,200
and they have also published one paper

302
00:14:03,650 --> 00:14:01,019
about culture in archaea I think so they

303
00:14:05,870 --> 00:14:03,660
are they are doing it but of course the

304
00:14:08,870 --> 00:14:05,880
challenging things about depression so

305
00:14:11,509 --> 00:14:08,880
they have like this tank to try to

306
00:14:13,629 --> 00:14:11,519
approach that yes they are trying to do

307
00:14:17,810 --> 00:14:13,639
cultural techniques for this

308
00:14:17,820 --> 00:14:31,850
any questions here

309
00:14:35,329 --> 00:14:34,310
I thank you for the talk

310
00:14:39,710 --> 00:14:35,339
um

311
00:14:41,990 --> 00:14:39,720
I have a very trivial question uh we've

312
00:14:44,030 --> 00:14:42,000
been having issues with sediment samples

313
00:14:47,389 --> 00:14:44,040

in our lab

314
00:14:49,970 --> 00:14:47,399
um freaking out how not to contaminate

315
00:14:52,670 --> 00:14:49,980
them or not being sure if they are

316
00:14:55,850 --> 00:14:52,680
contaminated then we are taking the

317
00:14:57,889 --> 00:14:55,860
samples I wonder how you control control

318
00:15:01,910 --> 00:14:57,899
for that

319
00:15:05,150 --> 00:15:01,920
yeah that's a good question so when we

320
00:15:07,129 --> 00:15:05,160
are working on uh on the ship uh back in

321
00:15:10,550 --> 00:15:07,139
the lab there is a lot of possibilities

322
00:15:13,790 --> 00:15:10,560
that it got contaminated we will try to

323
00:15:16,310 --> 00:15:13,800
be as quick as possible and in clean

324
00:15:18,829 --> 00:15:16,320
spaces but we actually where we are

325
00:15:22,250 --> 00:15:18,839
working with sediment course

326
00:15:24,530 --> 00:15:22,260
it's muff so it gets really moved all

327
00:15:27,110 --> 00:15:24,540
around we try to clean but we just try

328
00:15:30,230 --> 00:15:27,120
to be as quick as possible one of the

329
00:15:33,050 --> 00:15:30,240
things that we rely on is a

330
00:15:35,449 --> 00:15:33,060
bioinformatic analysis so in the

331
00:15:38,030 --> 00:15:35,459
bioinformatic analysis when we are

332
00:15:40,850 --> 00:15:38,040
um processing all the 16s data the

333
00:15:44,810 --> 00:15:40,860
sequences we are filtering them so we

334
00:15:47,030 --> 00:15:44,820
have like uh we process we have also for

335
00:15:50,329 --> 00:15:47,040
the 16s sorry or the DNA extractions on

336
00:15:54,410 --> 00:15:50,339
blanks and some control samples so we

337
00:15:57,350 --> 00:15:54,420
tried like if there is a sequence uh in

338
00:16:00,050 --> 00:15:57,360

the blank on the control we delete them

339
00:16:02,030 --> 00:16:00,060
so we try to filter and to make the the

340
00:16:04,850 --> 00:16:02,040
cleanest sequence possible as possible

341
00:16:06,829 --> 00:16:04,860
but yeah of course there is uh some

342
00:16:08,509 --> 00:16:06,839
contamination and we also like sometimes

343
00:16:10,850 --> 00:16:08,519
we see like oh that's that's not from

344
00:16:13,250 --> 00:16:10,860
the deep sea but we try to see the the

345
00:16:15,829 --> 00:16:13,260
sequences and try to clean them that's

346
00:16:15,839 --> 00:16:19,910
any last questions

347
00:16:19,920 --> 00:16:25,410
okay thank you very much thank you

348
00:16:29,530 --> 00:16:28,100
[Music]