The Life Detection Forum Project: Status and Next Steps

1
00:00:04,950 --> 00:00:03,189
i think that i probably know many of you

2
00:00:07,190 --> 00:00:04,960
quite well and and you know me and yet

3
00:00:09,110 --> 00:00:07,200
you chose to come anyway which um is a

4
00:00:11,830 --> 00:00:09,120
little surprising but uh for those of

5
00:00:13,749 --> 00:00:11,840
you who don't i'm tory holler i'm part

6
00:00:16,470 --> 00:00:13,759
of a group center for life detection

7
00:00:19,750 --> 00:00:16,480
that is a collaboration between ames and

8
00:00:22,230 --> 00:00:19,760
goddard supported by psd to do basic

9
00:00:23,990 --> 00:00:22,240
research and also community service in

10
00:00:25,429 --> 00:00:24,000
the area of life detection and so we're

11
00:00:27,750 --> 00:00:25,439
talking about today the life detection

12
00:00:29,349 --> 00:00:27,760
forum project is part of our community

13
00:00:30,790 --> 00:00:29,359

service

14
00:00:32,389 --> 00:00:30,800
i'm going to introduce the folks to my

15
00:00:34,310 --> 00:00:32,399
left in just a minute here but before i

16
00:00:36,549 --> 00:00:34,320
do i want to thank the organizers for

17
00:00:38,950 --> 00:00:36,559
making time for this in what i think was

18
00:00:40,869 --> 00:00:38,960
a very over subscribed um town hall

19
00:00:42,389 --> 00:00:40,879
schedule uh i i think it's been a real

20
00:00:44,630 --> 00:00:42,399
juggling act to put this meeting

21
00:00:47,110 --> 00:00:44,640
together and and well done

22
00:00:48,630 --> 00:00:47,120
thanks also to all of you um i know i'm

23
00:00:50,389 --> 00:00:48,640
kind of exhausted at this point in the

24
00:00:52,470 --> 00:00:50,399
meeting and i look for things that i

25
00:00:54,950 --> 00:00:52,480
cannot go to if if given the chance so i

26
00:00:56,950 --> 00:00:54,960
really appreciate your being here um for

27
00:00:59,029 --> 00:00:56,960
this and i hope it will be worthwhile

28
00:01:00,790 --> 00:00:59,039
for you so here's the ground that i want

29
00:01:02,229 --> 00:01:00,800
to try to cover tonight first just a

30
00:01:04,390 --> 00:01:02,239
little bit of the motivation for the

31
00:01:05,990 --> 00:01:04,400
life detection forum project

32
00:01:07,590 --> 00:01:06,000
i'm going to focus in on something

33
00:01:09,990 --> 00:01:07,600
called the life detection knowledge base

34
00:01:11,670 --> 00:01:10,000
which is the the key and central module

35
00:01:13,429 --> 00:01:11,680
of this tool that we're developing and

36
00:01:14,630 --> 00:01:13,439
we'll do that in a few ways

37
00:01:16,950 --> 00:01:14,640
i want to talk a little bit about the

38
00:01:18,710 --> 00:01:16,960

basic idea and purpose behind it

39
00:01:20,070 --> 00:01:18,720
something about the conceptual basis for

40
00:01:22,230 --> 00:01:20,080
it and then to make it tangible and

41
00:01:23,910 --> 00:01:22,240
because it is a built system

42
00:01:25,350 --> 00:01:23,920
we're going to have a live tour or

43
00:01:27,109 --> 00:01:25,360
hopefully if we can make the technology

44
00:01:29,030 --> 00:01:27,119
work we're going to have a live tour um

45
00:01:31,109 --> 00:01:29,040
graham lau to my left is going to be the

46
00:01:32,870 --> 00:01:31,119
person giving that to her and and he's

47
00:01:35,109 --> 00:01:32,880
our best chance for surviving the

48
00:01:37,030 --> 00:01:35,119
technology of it um

49
00:01:38,870 --> 00:01:37,040
then you know one of the things that we

50
00:01:39,830 --> 00:01:38,880
really hope to do when building this

51
00:01:42,149 --> 00:01:39,840
tool

52
00:01:43,990 --> 00:01:42,159
is suit multiple purposes and serve

53
00:01:45,510 --> 00:01:44,000
multiple users and one of the key things

54
00:01:47,590 --> 00:01:45,520
for us was doing something that would

55
00:01:49,350 --> 00:01:47,600
provide an educational tool

56
00:01:51,429 --> 00:01:49,360
and a very valuable partnership for us

57
00:01:52,950 --> 00:01:51,439
for the last few years has been working

58
00:01:54,389 --> 00:01:52,960
with jen glass

59
00:01:56,789 --> 00:01:54,399
here at georgia tech

60
00:01:58,469 --> 00:01:56,799
to use the life detection knowledge base

61
00:02:00,469 --> 00:01:58,479
in the context of her course and so

62
00:02:02,230 --> 00:02:00,479
we're very fortunate to have both jen

63
00:02:04,630 --> 00:02:02,240

and claire elban

64
00:02:06,149 --> 00:02:04,640
so this is instructor and student in

65
00:02:08,070 --> 00:02:06,159
this class to talk a little bit about

66
00:02:10,550 --> 00:02:08,080
the life detection knowledge base in its

67
00:02:12,070 --> 00:02:10,560
use specifically in that class

68
00:02:13,830 --> 00:02:12,080
after we do that i'll spend a little bit

69
00:02:15,750 --> 00:02:13,840
of time on what comes next in the

70
00:02:18,710 --> 00:02:15,760
project what we're working on now how

71
00:02:20,309 --> 00:02:18,720
you can be involved this is this is part

72
00:02:22,070 --> 00:02:20,319
letting you know what's going on part

73
00:02:23,110 --> 00:02:22,080
trying to recruit you into the project a

74
00:02:24,869 --> 00:02:23,120
little bit

75
00:02:26,150 --> 00:02:24,879
so we'll talk about that and i really

76
00:02:27,750 --> 00:02:26,160
hope to leave a good bit of time at the

77
00:02:29,270 --> 00:02:27,760
end for questions that to me is the most

78
00:02:30,470 --> 00:02:29,280
important part is to know what you think

79
00:02:32,390 --> 00:02:30,480
about this

80
00:02:33,750 --> 00:02:32,400
hear your feedback so

81
00:02:37,270 --> 00:02:33,760
let me start with a little bit of

82
00:02:39,509 --> 00:02:37,280
context and motivation during the three

83
00:02:41,830 --> 00:02:39,519
years since the last abs icon kind of a

84
00:02:43,350 --> 00:02:41,840
lot has happened and and a couple of

85
00:02:45,270 --> 00:02:43,360
really big things have been the release

86
00:02:48,070 --> 00:02:45,280
of the decadal surveys in astronomy and

87
00:02:48,830 --> 00:02:48,080
astrophysics and in planetary sciences

88
00:02:51,110 --> 00:02:48,840

and

89
00:02:53,030 --> 00:02:51,120
astrobiology i think in both of those

90
00:02:55,830 --> 00:02:53,040
cases you know i hope that all of you or

91
00:02:57,750 --> 00:02:55,840
some of you had a chance to um take part

92
00:02:59,750 --> 00:02:57,760
in the in the decadal town hall earlier

93
00:03:03,670 --> 00:02:59,760
this week or have read them had a chance

94
00:03:05,350 --> 00:03:03,680
to digest them astrobiology is prominent

95
00:03:07,110 --> 00:03:05,360
in these two decadal surveys and in

96
00:03:09,430 --> 00:03:07,120
particular i think

97
00:03:11,830 --> 00:03:09,440
life detection missions uh take front

98
00:03:14,470 --> 00:03:11,840
and center in both of them it's a real

99
00:03:17,750 --> 00:03:14,480
thing in the coming decades and as much

100
00:03:19,509 --> 00:03:17,760
as that is for sure based on the amazing

101
00:03:22,630 --> 00:03:19,519
set of observations that have come back

102
00:03:24,229 --> 00:03:22,640
from spacecraft and telescopes

103
00:03:26,710 --> 00:03:24,239
it also rests very much on the

104
00:03:28,869 --> 00:03:26,720
interpretive context that this community

105
00:03:30,869 --> 00:03:28,879
has built

106
00:03:31,589 --> 00:03:30,879
and i think that's something to be proud

107
00:03:35,110 --> 00:03:31,599
of

108
00:03:37,910 --> 00:03:35,120
impetus for taking these important next

109
00:03:40,070 --> 00:03:37,920
steps so i think we can look very much

110
00:03:42,789 --> 00:03:40,080
forward to what's ahead uh i think that

111
00:03:44,630 --> 00:03:42,799
we can be proud of our role in in having

112
00:03:45,990 --> 00:03:44,640
made some of that possible

113
00:03:49,030 --> 00:03:46,000

i also think it levies a lot of

114
00:03:51,270 --> 00:03:49,040
responsibility on all of us to marshal

115
00:03:53,670 --> 00:03:51,280
our knowledge and our expertise in the

116
00:03:56,070 --> 00:03:53,680
very specific way that is required to

117
00:03:56,869 --> 00:03:56,080
parameterize and define missions

118
00:03:58,470 --> 00:03:56,879
and

119
00:04:01,110 --> 00:03:58,480
that's something i think the exoplanet

120
00:04:02,229 --> 00:04:01,120
community has done consistently and well

121
00:04:03,830 --> 00:04:02,239
and i think it's something that we

122
00:04:05,670 --> 00:04:03,840
really need to strive to do in the

123
00:04:07,030 --> 00:04:05,680
planetary science community as well

124
00:04:09,509 --> 00:04:07,040
that's a lot of what we're talking about

125
00:04:11,190 --> 00:04:09,519
tonight and and whether you

126
00:04:13,910 --> 00:04:11,200
like this particular approach to doing

127
00:04:15,429 --> 00:04:13,920
it or not i urge everyone to begin

128
00:04:17,430 --> 00:04:15,439
thinking about how we can bring our

129
00:04:19,349 --> 00:04:17,440
knowledge to bear to make these missions

130
00:04:20,390 --> 00:04:19,359
happen in the best and most rigorous way

131
00:04:21,909 --> 00:04:20,400
possible

132
00:04:24,790 --> 00:04:21,919
so really

133
00:04:27,270 --> 00:04:24,800
the life detection forum concept is

134
00:04:29,270 --> 00:04:27,280
is designed to provide a tool that

135
00:04:31,909 --> 00:04:29,280
catalyzes that process

136
00:04:33,670 --> 00:04:31,919
of looking at this really broad diffuse

137
00:04:35,350 --> 00:04:33,680
diverse body of knowledge that's been

138
00:04:37,510 --> 00:04:35,360

created by this community over the last

139
00:04:39,430 --> 00:04:37,520
few decades and distilling out the

140
00:04:42,390 --> 00:04:39,440
pieces that are specifically relevant to

141
00:04:44,230 --> 00:04:42,400
mission conceptualization and design and

142
00:04:47,110 --> 00:04:44,240
in particular to do it in a way that the

143
00:04:49,270 --> 00:04:47,120
results are accessible to everybody

144
00:04:51,430 --> 00:04:49,280
and able to be updated on a continuing

145
00:04:53,990 --> 00:04:51,440
basis and so we envision this as sort of

146
00:04:57,189 --> 00:04:54,000
a living online suite of tools that's

147
00:04:59,749 --> 00:04:57,199
community-based user-based and living

148
00:05:01,749 --> 00:04:59,759
and here's the basic idea the basic idea

149
00:05:04,150 --> 00:05:01,759
is that if we take what we have come to

150
00:05:05,830 --> 00:05:04,160
understand about biosignatures or at

151
00:05:08,310 --> 00:05:05,840
least things that might serve as

152
00:05:09,830 --> 00:05:08,320
evidence for life it gives us some

153
00:05:11,270 --> 00:05:09,840
insight into how we should design

154
00:05:13,029 --> 00:05:11,280
mission objectives

155
00:05:14,550 --> 00:05:13,039
it gives us some insight in cases where

156
00:05:16,550 --> 00:05:14,560
there are knowledge gaps into what our

157
00:05:18,070 --> 00:05:16,560
research priorities should be

158
00:05:19,590 --> 00:05:18,080
and if we then compare that with our

159
00:05:21,749 --> 00:05:19,600
understanding of the technology that's

160
00:05:23,029 --> 00:05:21,759
available in development to measure

161
00:05:24,790 --> 00:05:23,039
these things that might serve as

162
00:05:27,029 --> 00:05:24,800
evidence for life we can do two more

163
00:05:29,189 --> 00:05:27,039

important things we can try to establish

164
00:05:31,510 --> 00:05:29,199
science traceability if that's a new

165
00:05:33,749 --> 00:05:31,520
term to some of you it basically means

166
00:05:36,710 --> 00:05:33,759
the logic flow from science goal to

167
00:05:39,029 --> 00:05:36,720
proposed payload element and where that

168
00:05:40,950 --> 00:05:39,039
logic flow is incomplete or interrupted

169
00:05:42,870 --> 00:05:40,960
it identifies technology development

170
00:05:45,590 --> 00:05:42,880
priorities for us and so the idea behind

171
00:05:47,270 --> 00:05:45,600
the system has been to build these two

172
00:05:50,150 --> 00:05:47,280
components and be able to make this

173
00:05:53,270 --> 00:05:50,160
comparison on an ongoing basis

174
00:05:55,110 --> 00:05:53,280
and so the one on your left uh the part

175
00:05:56,629 --> 00:05:55,120
that has to do with biosignatures is a

176
00:05:57,990 --> 00:05:56,639
built system that we call the life

177
00:05:59,510 --> 00:05:58,000
detection knowledge base that's what

178
00:06:01,590 --> 00:05:59,520
we're going to talk about mostly here

179
00:06:04,230 --> 00:06:01,600
tonight the one on the right the

180
00:06:06,309 --> 00:06:04,240
component that has to do with technology

181
00:06:08,309 --> 00:06:06,319
existing or in development is something

182
00:06:09,830 --> 00:06:08,319
that we're trying to build now and and

183
00:06:12,710 --> 00:06:09,840
that will be interested in your feedback

184
00:06:15,430 --> 00:06:14,230
everything that we've done to this point

185
00:06:17,350 --> 00:06:15,440
everything that you're going to see

186
00:06:19,590 --> 00:06:17,360
presented tonight is a result of an

187
00:06:21,510 --> 00:06:19,600
effort to engage extensively with the

188
00:06:23,270 --> 00:06:21,520

community and that started two and a

189
00:06:25,270 --> 00:06:23,280
half or three years ago at the last

190
00:06:26,629 --> 00:06:25,280
abseicon where we introduced the basic

191
00:06:28,150 --> 00:06:26,639
concept

192
00:06:29,830 --> 00:06:28,160
tried to get people engaged and

193
00:06:31,350 --> 00:06:29,840
interested in what we were doing and

194
00:06:33,670 --> 00:06:31,360
that has commenced with a series of

195
00:06:35,749 --> 00:06:33,680
workshops over time that have vetted the

196
00:06:37,430 --> 00:06:35,759
organizing basis for the life detection

197
00:06:39,670 --> 00:06:37,440
knowledge base introduced the knowledge

198
00:06:42,469 --> 00:06:39,680
base had a content development activity

199
00:06:44,950 --> 00:06:42,479
that served also for beta testing

200
00:06:46,790 --> 00:06:44,960
and most recently we held a workshop

201
00:06:48,390 --> 00:06:46,800
called future of the

202
00:06:49,830 --> 00:06:48,400
future of the search for life workshop

203
00:06:51,670 --> 00:06:49,840
that really was about science and

204
00:06:53,430 --> 00:06:51,680
technology integration and that's going

205
00:06:56,950 --> 00:06:53,440
to inform our next steps as we begin to

206
00:06:59,029 --> 00:06:56,960
develop the technology component of this

207
00:07:01,270 --> 00:06:59,039
so let me talk a little bit about this

208
00:07:03,670 --> 00:07:01,280
life detection knowledge base really

209
00:07:05,830 --> 00:07:03,680
this is the system that is designed to

210
00:07:08,469 --> 00:07:05,840
tackle what i see as a very diverse and

211
00:07:09,909 --> 00:07:08,479
diffuse body of relevant information in

212
00:07:11,749 --> 00:07:09,919
some cases created within the

213
00:07:14,230 --> 00:07:11,759

astrobiology community in some cases

214
00:07:15,990 --> 00:07:14,240
created in communities that historically

215
00:07:18,150 --> 00:07:16,000
have had no relation to space science

216
00:07:20,469 --> 00:07:18,160
maybe haven't perceived their relevance

217
00:07:22,150 --> 00:07:20,479
to national to nasa missions or to light

218
00:07:24,629 --> 00:07:22,160
detection but nevertheless have

219
00:07:26,469 --> 00:07:24,639
something real to contribute um how do

220
00:07:28,790 --> 00:07:26,479
you manage that really diverse body of

221
00:07:30,230 --> 00:07:28,800
information and and streamline it and

222
00:07:32,390 --> 00:07:30,240
collimate it in a way that makes it

223
00:07:33,670 --> 00:07:32,400
specifically relevant to life detection

224
00:07:35,270 --> 00:07:33,680
that's what the knowledge base is

225
00:07:38,070 --> 00:07:35,280
supposed to be about so i'm going to

226
00:07:40,150 --> 00:07:38,080
talk briefly about sort of three axes of

227
00:07:42,550 --> 00:07:40,160
organization for this knowledge base one

228
00:07:44,950 --> 00:07:42,560
is a taxonomy of what we call features

229
00:07:47,189 --> 00:07:44,960
potential biosignatures a second is

230
00:07:49,510 --> 00:07:47,199
criteria for assessing those features

231
00:07:51,909 --> 00:07:49,520
and finally arguments and evidence and

232
00:07:54,469 --> 00:07:51,919
i'll explain in a minute what that means

233
00:07:56,950 --> 00:07:54,479
so briefly the feature taxonomy i think

234
00:07:59,270 --> 00:07:56,960
is pretty simple to understand

235
00:08:00,869 --> 00:07:59,280
it starts with the three categories of

236
00:08:03,350 --> 00:08:00,879
potential biosignatures that are

237
00:08:06,629 --> 00:08:03,360
identified in the decadal chemistry

238
00:08:08,469 --> 00:08:06,639

morphology or structure and activity

239
00:08:10,710 --> 00:08:08,479
and then seeks to break them down to a

240
00:08:12,550 --> 00:08:10,720
taxonomic level at which you have some

241
00:08:14,070 --> 00:08:12,560
common level of granularity among all

242
00:08:15,749 --> 00:08:14,080
the things that you're comparing and the

243
00:08:17,589 --> 00:08:15,759
idea is to be able to support an apples

244
00:08:19,749 --> 00:08:17,599
to apples comparison among all of the

245
00:08:21,350 --> 00:08:19,759
different signs of evidence that

246
00:08:22,550 --> 00:08:21,360
signs that we might seek as evidence for

247
00:08:24,710 --> 00:08:22,560
life

248
00:08:27,430 --> 00:08:24,720
we've tried as much as possible to make

249
00:08:29,670 --> 00:08:27,440
that level correspond roughly speaking

250
00:08:31,350 --> 00:08:29,680
to the level of a science investigation

251
00:08:33,029 --> 00:08:31,360
in a science traceability matrix right

252
00:08:35,029 --> 00:08:33,039
something that you can actually tangibly

253
00:08:37,350 --> 00:08:35,039
place within the context of science

254
00:08:39,750 --> 00:08:37,360
traceability

255
00:08:41,430 --> 00:08:39,760
for any of the features or potential

256
00:08:44,070 --> 00:08:41,440
biosignatures that appear within that

257
00:08:46,630 --> 00:08:44,080
taxonomy we want to ask a specific and

258
00:08:48,710 --> 00:08:46,640
standard set of questions and so we take

259
00:08:51,030 --> 00:08:48,720
as the basis for for the way that we do

260
00:08:53,750 --> 00:08:51,040
this assessment a recommendation from

261
00:08:56,630 --> 00:08:53,760
the 2018 national academies study on

262
00:08:58,070 --> 00:08:56,640
astrobiology strategy they focused on

263
00:08:59,990 --> 00:08:58,080

assessing the potential for false

264
00:09:02,310 --> 00:09:00,000
positive and false negative false

265
00:09:04,550 --> 00:09:02,320
positive being that you see a signal

266
00:09:06,310 --> 00:09:04,560
when life is actually not present false

267
00:09:08,550 --> 00:09:06,320
negative being that life is present but

268
00:09:09,990 --> 00:09:08,560
you see no signal at all both of those

269
00:09:12,389 --> 00:09:10,000
things matter to consider when you're

270
00:09:14,389 --> 00:09:12,399
designing mission objectives

271
00:09:16,310 --> 00:09:14,399
so the decadal in planetary science that

272
00:09:18,150 --> 00:09:16,320
just appeared broke this down

273
00:09:20,550 --> 00:09:18,160
one more step and they said in each of

274
00:09:22,710 --> 00:09:20,560
these cases it matters to consider a

275
00:09:25,670 --> 00:09:22,720
more probabilistic component so what is

276
00:09:27,590 --> 00:09:25,680
the likely prevalence if if life is

277
00:09:29,590 --> 00:09:27,600
there what is the chances that it

278
00:09:30,630 --> 00:09:29,600
creates at all the signal that you're

279
00:09:31,990 --> 00:09:30,640
looking for

280
00:09:33,829 --> 00:09:32,000
and if it does

281
00:09:35,350 --> 00:09:33,839
how large in magnitude is that signal

282
00:09:37,430 --> 00:09:35,360
likely to be and those are different

283
00:09:40,070 --> 00:09:37,440
things and and each worth considering

284
00:09:41,990 --> 00:09:40,080
independently you can ask that same set

285
00:09:43,750 --> 00:09:42,000
of questions both for biology and for

286
00:09:45,990 --> 00:09:43,760
abiotic processes that might produce

287
00:09:47,990 --> 00:09:46,000
mimics for what you're looking for so

288
00:09:50,389 --> 00:09:48,000

these four questions which we call

289
00:09:52,710 --> 00:09:50,399
criteria are what we ask in a standard

290
00:09:54,949 --> 00:09:52,720
way of every single thing that appears

291
00:09:58,470 --> 00:09:54,959
as a as a potential biosignature in the

292
00:10:00,470 --> 00:09:58,480
life detection knowledge base

293
00:10:02,310 --> 00:10:00,480
so what i think is new to people if if

294
00:10:03,910 --> 00:10:02,320
you look at this sort of flow diagram

295
00:10:05,269 --> 00:10:03,920
the upper two levels the measurement

296
00:10:06,870 --> 00:10:05,279
type and the criteria that's what we

297
00:10:09,670 --> 00:10:06,880
just talked about with the feature

298
00:10:11,350 --> 00:10:09,680
taxonomy and the criteria what's new

299
00:10:12,949 --> 00:10:11,360
about this and i think what will strike

300
00:10:15,190 --> 00:10:12,959
people as novel and a little difficult

301
00:10:17,430 --> 00:10:15,200
to wrap your heads around initially is

302
00:10:19,509 --> 00:10:17,440
that for any given criterion let's say

303
00:10:20,949 --> 00:10:19,519
it's it's the abiotic prevalence of a

304
00:10:23,750 --> 00:10:20,959
particular feature

305
00:10:26,150 --> 00:10:23,760
we ask users to to take the existing

306
00:10:28,389 --> 00:10:26,160
scientific literature and distill from

307
00:10:30,150 --> 00:10:28,399
it very specific arguments that bear on

308
00:10:32,069 --> 00:10:30,160
that criterion

309
00:10:34,949 --> 00:10:32,079
and we do this with a with a series of

310
00:10:36,710 --> 00:10:34,959
arguments and evidence so argument is i

311
00:10:39,350 --> 00:10:36,720
think that the abiotic prevalence is

312
00:10:41,110 --> 00:10:39,360
high for the following reason evidence

313
00:10:43,750 --> 00:10:41,120

is a piece of scientific literature that

314
00:10:46,069 --> 00:10:43,760
specifically supports that argument and

315
00:10:47,910 --> 00:10:46,079
so the idea behind this is that it

316
00:10:50,230 --> 00:10:47,920
represents a distillation of the broader

317
00:10:51,990 --> 00:10:50,240
literature into a very specific form

318
00:10:54,710 --> 00:10:52,000
that bears on the potential for false

319
00:10:56,790 --> 00:10:54,720
positive and false negative so to try to

320
00:10:58,550 --> 00:10:56,800
make that just a little bit more

321
00:10:59,990 --> 00:10:58,560
tangible to you i'll give you a specific

322
00:11:02,150 --> 00:11:00,000
example this is pulled straight out of

323
00:11:04,230 --> 00:11:02,160
the life detection knowledge base you

324
00:11:05,670 --> 00:11:04,240
could go and look for it right now

325
00:11:07,269 --> 00:11:05,680
so in this case the measurement type in

326
00:11:09,910 --> 00:11:07,279
this specific example

327
00:11:11,350 --> 00:11:09,920
is enantiomer ratios in amino acids one

328
00:11:13,430 --> 00:11:11,360
of the things that people have proposed

329
00:11:16,230 --> 00:11:13,440
as a potential sign of life and the

330
00:11:18,630 --> 00:11:16,240
criterion in this example is the abiotic

331
00:11:20,949 --> 00:11:18,640
prevalence of that signal meaning how

332
00:11:23,190 --> 00:11:20,959
often do non-biological processes

333
00:11:26,550 --> 00:11:23,200
nevertheless produce some excess in in

334
00:11:28,389 --> 00:11:26,560
the enantiomer ratios the argument that

335
00:11:30,150 --> 00:11:28,399
the creator of this thing has created

336
00:11:32,230 --> 00:11:30,160
has has put forward

337
00:11:34,230 --> 00:11:32,240
is that some abiotic amino acids that

338
00:11:36,790 --> 00:11:34,240

are found in meteorites can have

339
00:11:38,630 --> 00:11:36,800
significant enantiomeric excess despite

340
00:11:40,630 --> 00:11:38,640
being created by non-biological

341
00:11:43,190 --> 00:11:40,640
processes and the evidence for that

342
00:11:46,069 --> 00:11:43,200
specifically is that l excesses of

343
00:11:47,910 --> 00:11:46,079
aspartic acid and glutamic acid up to 60

344
00:11:49,190 --> 00:11:47,920
were measured in tigers like meteorite

345
00:11:52,150 --> 00:11:49,200
and the literature from which that's

346
00:11:54,629 --> 00:11:52,160
drawn is danny glavin's 2012 paper

347
00:11:57,269 --> 00:11:54,639
so that paper is one of three forms of

348
00:11:59,990 --> 00:11:57,279
evidence that support this particular

349
00:12:02,870 --> 00:12:00,000
argument that argument is one of four

350
00:12:05,190 --> 00:12:02,880
arguments that are relevant to um

351
00:12:07,110 --> 00:12:05,200
the pro arguments for this criterion and

352
00:12:09,590 --> 00:12:07,120
so there are 12 papers that have been

353
00:12:12,710 --> 00:12:09,600
sorted into a specific bearing

354
00:12:14,790 --> 00:12:12,720
on potential for for uh false positives

355
00:12:16,629 --> 00:12:14,800
in this case and so

356
00:12:18,629 --> 00:12:16,639
really overall the idea behind the

357
00:12:20,310 --> 00:12:18,639
knowledge base is to catalyze this

358
00:12:22,389 --> 00:12:20,320
process of distillation and it puts

359
00:12:23,910 --> 00:12:22,399
users on the hook to do it and the idea

360
00:12:26,550 --> 00:12:23,920
behind it is there's a very standard

361
00:12:28,389 --> 00:12:26,560
portion that is the the feature taxonomy

362
00:12:29,829 --> 00:12:28,399
and then the standard set of criteria

363
00:12:31,910 --> 00:12:29,839

and then a very flexible portion that

364
00:12:34,230 --> 00:12:31,920
relies on user-defined arguments to

365
00:12:35,590 --> 00:12:34,240
place things in context to acknowledge

366
00:12:37,990 --> 00:12:35,600
that different biosignatures are

367
00:12:39,670 --> 00:12:38,000
different and nevertheless find a way to

368
00:12:41,590 --> 00:12:39,680
channel that literature and distill it

369
00:12:43,030 --> 00:12:41,600
into into a form that matters for

370
00:12:43,990 --> 00:12:43,040
mission design

371
00:12:45,430 --> 00:12:44,000
so

372
00:12:47,110 --> 00:12:45,440
at this point i want to actually turn it

373
00:12:48,470 --> 00:12:47,120
over to graham uh and give us a little

374
00:12:53,910 --> 00:12:48,480
tour of the knowledge base that you can

375
00:12:59,110 --> 00:12:55,910
all right thank you tori i'm going to

376
00:13:00,550 --> 00:12:59,120
exit out of our slideshow here

377
00:13:02,069 --> 00:13:00,560
so if you do want to follow along you

378
00:13:04,790 --> 00:13:02,079
can pull out your phone or your computer

379
00:13:07,110 --> 00:13:04,800
and go to ldfknowledgebase.com

380
00:13:09,190 --> 00:13:07,120
or check it out later just a very brief

381
00:13:10,710 --> 00:13:09,200
tour of the site and how it works

382
00:13:13,430 --> 00:13:10,720
uh on the home page you have just a

383
00:13:15,350 --> 00:13:13,440
brief description of the knowledge base

384
00:13:17,509 --> 00:13:15,360
but if we click enter

385
00:13:19,190 --> 00:13:17,519
we can go into the site and immediately

386
00:13:21,829 --> 00:13:19,200
see this taxonomy tour he was talking

387
00:13:23,430 --> 00:13:21,839
about where we have our branching kind

388
00:13:25,350 --> 00:13:23,440

of tree right here showing our

389
00:13:27,509 --> 00:13:25,360
categories

390
00:13:28,949 --> 00:13:27,519
for looking in life detection so if we

391
00:13:31,590 --> 00:13:28,959
go to chemistry you can see this tree

392
00:13:33,269 --> 00:13:31,600
opens up as a branching tree

393
00:13:35,430 --> 00:13:33,279
you can see these topics down below like

394
00:13:37,990 --> 00:13:35,440
enantiomer ratios that we mentioned

395
00:13:40,550 --> 00:13:38,000
other topics within chemistry

396
00:13:42,389 --> 00:13:40,560
if i click on structure the same thing

397
00:13:44,150 --> 00:13:42,399
it brings up more of a tree with topics

398
00:13:45,990 --> 00:13:44,160
i can see down below them some of the

399
00:13:47,990 --> 00:13:46,000
entries that have material entered

400
00:13:49,750 --> 00:13:48,000
already

401
00:13:52,310 --> 00:13:49,760
now note the knowledge base is not yet

402
00:13:54,710 --> 00:13:52,320
complete there's still a lot of room for

403
00:13:56,949 --> 00:13:54,720
entries provided by yourselves and

404
00:13:59,430 --> 00:13:56,959
others and so entries that currently

405
00:14:00,949 --> 00:13:59,440
have some content are black

406
00:14:02,710 --> 00:14:00,959
in their text here there's other text

407
00:14:04,870 --> 00:14:02,720
that's gray right now

408
00:14:08,629 --> 00:14:04,880
those are places where we foresee future

409
00:14:10,790 --> 00:14:08,639
entries future content being developed

410
00:14:13,430 --> 00:14:10,800
on each of these there's some background

411
00:14:15,509 --> 00:14:13,440
information at every single level of the

412
00:14:16,790 --> 00:14:15,519
knowledge base within this taxonomy so

413
00:14:18,470 --> 00:14:16,800

within chemistry i can click on

414
00:14:19,990 --> 00:14:18,480
background and it brings up a brief

415
00:14:23,350 --> 00:14:20,000
description at the very fundamental

416
00:14:24,949 --> 00:14:23,360
level of what chemistry is

417
00:14:27,189 --> 00:14:24,959
in looking at these i can also download

418
00:14:28,949 --> 00:14:27,199
this background information as a pdf i

419
00:14:30,470 --> 00:14:28,959
won't do that on this computer but if

420
00:14:31,590 --> 00:14:30,480
you click download background anywhere

421
00:14:33,269 --> 00:14:31,600
you get

422
00:14:35,750 --> 00:14:33,279
never minded to download it

423
00:14:37,509 --> 00:14:35,760
you get a pdf document showing the

424
00:14:40,710 --> 00:14:37,519
background and if there are any images

425
00:14:43,430 --> 00:14:42,150
the same things on every topic there's

426
00:14:45,269 --> 00:14:43,440
some background information you can

427
00:14:47,189 --> 00:14:45,279
click on that see the background

428
00:14:49,750 --> 00:14:47,199
information provided to the website by

429
00:14:51,910 --> 00:14:49,760
our curators for each of these topics

430
00:14:53,350 --> 00:14:51,920
every single entry has a curator who's

431
00:14:56,230 --> 00:14:53,360
responsible for

432
00:14:57,829 --> 00:14:56,240
ensuring the accuracy of the material

433
00:15:01,269 --> 00:14:57,839
ensuring the users are appropriately

434
00:15:04,949 --> 00:15:03,509
and so i'm going to go into one of these

435
00:15:06,870 --> 00:15:04,959
from this page where you have this

436
00:15:08,870 --> 00:15:06,880
branching tree

437
00:15:10,790 --> 00:15:08,880
you can click on one of three

438
00:15:13,350 --> 00:15:10,800

biosignature categories

439
00:15:14,629 --> 00:15:13,360
click on any of these black text boxes

440
00:15:15,990 --> 00:15:14,639
to bring up bio signatures that you're

441
00:15:19,590 --> 00:15:16,000
interested in so

442
00:15:22,069 --> 00:15:19,600
i'll do a couple here in the isotopes

443
00:15:23,910 --> 00:15:22,079
and then click go

444
00:15:26,230 --> 00:15:23,920
and that brings me to another page where

445
00:15:27,910 --> 00:15:26,240
we can filter out the biosignatures of

446
00:15:29,990 --> 00:15:27,920
interest by certain environments that

447
00:15:31,749 --> 00:15:30,000
were selected by the community

448
00:15:32,790 --> 00:15:31,759
to be relevant in light detection

449
00:15:34,470 --> 00:15:32,800
searches

450
00:15:36,550 --> 00:15:34,480
so things like the surface or atmosphere

451
00:15:38,629 --> 00:15:36,560
of an exoplanet the surface or

452
00:15:41,110 --> 00:15:38,639
subsurface of mars

453
00:15:42,470 --> 00:15:41,120
or just all of those things

454
00:15:43,990 --> 00:15:42,480
allows us to search through these

455
00:15:45,910 --> 00:15:44,000
different bio signatures we've already

456
00:15:47,189 --> 00:15:45,920
selected to figure out which ones we

457
00:15:49,110 --> 00:15:47,199
want to look at

458
00:15:51,030 --> 00:15:49,120
so here we have isotope ratio patterns

459
00:15:53,030 --> 00:15:51,040
for carbon redox states

460
00:15:55,350 --> 00:15:53,040
there's some background information in

461
00:15:57,430 --> 00:15:55,360
this case it also includes a picture and

462
00:15:59,350 --> 00:15:57,440
so if i did download background here it

463
00:16:02,150 --> 00:15:59,360

would download all of the text and

464
00:16:03,829 --> 00:16:02,160
images as well for offline reading

465
00:16:06,150 --> 00:16:03,839
there's a read more button in some cases

466
00:16:07,350 --> 00:16:06,160
that allows you to expand things and see

467
00:16:10,310 --> 00:16:07,360
where we've worked really hard to

468
00:16:11,910 --> 00:16:10,320
develop these background entries um but

469
00:16:14,310 --> 00:16:11,920
the real power is in each of these

470
00:16:17,110 --> 00:16:14,320
potential biosignatures when you go into

471
00:16:18,790 --> 00:16:17,120
one of them so for carbon redox states

472
00:16:20,310 --> 00:16:18,800
we can see these different categories

473
00:16:22,470 --> 00:16:20,320
that tori mentioned things like

474
00:16:24,870 --> 00:16:22,480
prevalence and feature strength both

475
00:16:26,710 --> 00:16:24,880
biological and abiotic

476
00:16:29,910 --> 00:16:26,720
on any of these if i if i click this

477
00:16:31,749 --> 00:16:29,920
down arrow or click on the the criterion

478
00:16:34,629 --> 00:16:31,759
it then brings me to the place where i

479
00:16:38,069 --> 00:16:34,639
now have the arguments both arguments

480
00:16:40,790 --> 00:16:38,079
pro and con for biological prevalence

481
00:16:42,949 --> 00:16:40,800
or arguments pro and con for abiotic

482
00:16:44,550 --> 00:16:42,959
prevalence

483
00:16:46,870 --> 00:16:44,560
and so for each of these you can read

484
00:16:49,189 --> 00:16:46,880
the argument itself a very simple

485
00:16:50,949 --> 00:16:49,199
statement making the argument and then

486
00:16:51,829 --> 00:16:50,959
you can see where there's this evidence

487
00:16:54,150 --> 00:16:51,839
button

488
00:16:56,230 --> 00:16:54,160

that brings up the the evidence pulled

489
00:16:57,590 --> 00:16:56,240
from the literature supporting these

490
00:16:59,189 --> 00:16:57,600
arguments

491
00:17:02,790 --> 00:16:59,199
in any of those cases i can click on

492
00:17:04,789 --> 00:17:02,800
that evidence piece and it takes me to

493
00:17:05,590 --> 00:17:04,799
information that says what the evidence

494
00:17:07,909 --> 00:17:05,600
is

495
00:17:09,590 --> 00:17:07,919
describing it fully and then saying

496
00:17:11,270 --> 00:17:09,600
which piece of literature its source

497
00:17:13,110 --> 00:17:11,280
from

498
00:17:15,429 --> 00:17:13,120
and also giving me a way to download

499
00:17:17,110 --> 00:17:15,439
code for it so i can add it to my my own

500
00:17:18,390 --> 00:17:17,120
citation manager

501
00:17:20,230 --> 00:17:18,400
you also can see the citation in

502
00:17:21,429 --> 00:17:20,240
different formats as well for finding

503
00:17:23,429 --> 00:17:21,439
the article

504
00:17:25,189 --> 00:17:23,439
currently there is a link button but it

505
00:17:27,029 --> 00:17:25,199
doesn't actually link to the articles

506
00:17:28,789 --> 00:17:27,039
hopefully in the very near future you

507
00:17:33,830 --> 00:17:28,799
can also link directly to the literature

508
00:17:38,549 --> 00:17:36,789
a few more things with the website

509
00:17:39,590 --> 00:17:38,559
so for those who maybe aren't used to

510
00:17:42,870 --> 00:17:39,600
using

511
00:17:44,470 --> 00:17:42,880
websites like this there is a help page

512
00:17:46,470 --> 00:17:44,480
and an about page the about page will

513
00:17:48,950 --> 00:17:46,480

give you some more information on this

514
00:17:50,070 --> 00:17:48,960
project the development of the site in

515
00:17:51,750 --> 00:17:50,080
general

516
00:17:53,909 --> 00:17:51,760
lay out some of these categories and

517
00:17:54,950 --> 00:17:53,919
criteria that we use within the site as

518
00:17:56,230 --> 00:17:54,960
well

519
00:17:58,070 --> 00:17:56,240
so if you're interested i highly

520
00:17:59,590 --> 00:17:58,080
recommend reading all of this

521
00:18:01,270 --> 00:17:59,600
but then for those who want to use the

522
00:18:03,590 --> 00:18:01,280
site there is a help page that walks you

523
00:18:06,310 --> 00:18:03,600
through the whole process of registering

524
00:18:08,150 --> 00:18:06,320
of contributing content to the site uh

525
00:18:09,590 --> 00:18:08,160
of adding comments on the site

526
00:18:11,510 --> 00:18:09,600
everywhere throughout that taxonomy

527
00:18:13,270 --> 00:18:11,520
there's places where you can add

528
00:18:16,549 --> 00:18:13,280
comments to the site that will help us

529
00:18:18,390 --> 00:18:16,559
in our development of this material

530
00:18:20,789 --> 00:18:18,400
and so within help we have lots of ways

531
00:18:22,390 --> 00:18:20,799
of registering browsing

532
00:18:23,830 --> 00:18:22,400
eventually we'll have an faq document

533
00:18:25,190 --> 00:18:23,840
here as well

534
00:18:26,549 --> 00:18:25,200
if at any time when you're using the

535
00:18:28,950 --> 00:18:26,559
site you have any issues there's an

536
00:18:31,590 --> 00:18:28,960
email button that will allow you to send

537
00:18:33,830 --> 00:18:31,600
an email to myself as an administrator

538
00:18:35,750 --> 00:18:33,840

or to one of our curators to let us know

539
00:18:36,630 --> 00:18:35,760
what the issue is you're having

540
00:18:38,230 --> 00:18:36,640
or if you just want to have a

541
00:18:39,909 --> 00:18:38,240
conversation about the content if you

542
00:18:41,590 --> 00:18:39,919
have an argument

543
00:18:43,510 --> 00:18:41,600
to make about the content feel free to

544
00:18:44,950 --> 00:18:43,520
do that with us there

545
00:18:46,549 --> 00:18:44,960
and then finally if you do want to use

546
00:18:47,990 --> 00:18:46,559
the site we highly recommend creating

547
00:18:49,510 --> 00:18:48,000
your own account

548
00:18:51,990 --> 00:18:49,520
registering for an account will allow

549
00:18:54,390 --> 00:18:52,000
you to then make comments as well as

550
00:18:56,390 --> 00:18:54,400
contribute arguments and evidence

551
00:18:58,150 --> 00:18:56,400
towards these various potential bio

552
00:18:59,510 --> 00:18:58,160
signatures

553
00:19:00,710 --> 00:18:59,520
and then one more thing there there is a

554
00:19:03,190 --> 00:19:00,720
glossary

555
00:19:05,270 --> 00:19:03,200
we realize there's a lot of nuanced

556
00:19:07,270 --> 00:19:05,280
language within the site

557
00:19:09,190 --> 00:19:07,280
it does come from the literature but for

558
00:19:11,590 --> 00:19:09,200
those who do have any questions there's

559
00:19:13,190 --> 00:19:11,600
a very long glossary explaining

560
00:19:15,750 --> 00:19:13,200
the definitions and some background

561
00:19:18,070 --> 00:19:15,760
material for every single one of the

562
00:19:20,070 --> 00:19:18,080
criteria for all of the nuanced language

563
00:19:22,630 --> 00:19:20,080

we use in the site there's also some

564
00:19:24,710 --> 00:19:22,640
more specific

565
00:19:26,950 --> 00:19:24,720
language primarily for structures or

566
00:19:28,390 --> 00:19:26,960
morphologies since there's some language

567
00:19:29,669 --> 00:19:28,400
you know if you're not a geologist you

568
00:19:31,590 --> 00:19:29,679
might not have heard some of those terms

569
00:19:33,350 --> 00:19:31,600
before and so we have those in the

570
00:19:35,110 --> 00:19:33,360
glossary as well

571
00:19:36,390 --> 00:19:35,120
um but you know there is a lot of

572
00:19:38,950 --> 00:19:36,400
content here already i mentioned it's

573
00:19:41,430 --> 00:19:38,960
not complete yet but we've done a lot so

574
00:19:43,750 --> 00:19:41,440
far there are many entries um

575
00:19:46,710 --> 00:19:43,760
contributed by various users in the past

576
00:19:49,110 --> 00:19:46,720
we had a criteria workshop a knowledge

577
00:19:51,909 --> 00:19:49,120
base workshop this past year and we had

578
00:19:53,830 --> 00:19:51,919
several users contributing content

579
00:19:55,350 --> 00:19:53,840
and then recently we've also had jen

580
00:19:57,270 --> 00:19:55,360
glass from georgia tech

581
00:19:59,029 --> 00:19:57,280
have a class of graduate students who've

582
00:20:00,789 --> 00:19:59,039
contributed a lot of content to the site

583
00:20:02,470 --> 00:20:00,799
as well and so i'm going to have jen

584
00:20:04,710 --> 00:20:02,480
come up and explain

585
00:20:06,390 --> 00:20:04,720
what her class has done

586
00:20:16,149 --> 00:20:06,400
in developing this content for the

587
00:20:20,789 --> 00:20:17,669
all right

588
00:20:21,990 --> 00:20:20,799

great thank you graham uh

589
00:20:25,029 --> 00:20:22,000
should i

590
00:20:40,310 --> 00:20:27,909
oh i have to click through

591
00:20:46,390 --> 00:20:42,950
there we go okay i think that was it

592
00:20:47,830 --> 00:20:46,400
all right okay great uh so thanks

593
00:20:50,149 --> 00:20:47,840
everyone for being here so i'm just

594
00:20:53,430 --> 00:20:50,159
gonna talk for a few minutes about how

595
00:20:55,830 --> 00:20:53,440
our class at georgia tech has been um

596
00:20:58,870 --> 00:20:55,840
really helping to contribute to the

597
00:21:02,310 --> 00:20:58,880
knowledge base um and also just how it

598
00:21:03,669 --> 00:21:02,320
really nicely kind of blends in with

599
00:21:05,430 --> 00:21:03,679
academic work

600
00:21:08,390 --> 00:21:05,440
and scholarship so

601
00:21:10,390 --> 00:21:08,400
this is our class it's been going

602
00:21:13,350 --> 00:21:10,400
we've done it three times

603
00:21:15,190 --> 00:21:13,360
and it is a core course for our

604
00:21:17,110 --> 00:21:15,200
astrobiology certificate graduate

605
00:21:19,029 --> 00:21:17,120
program at georgia tech

606
00:21:21,110 --> 00:21:19,039
so every every student that goes through

607
00:21:21,990 --> 00:21:21,120
our program is required to take this

608
00:21:24,149 --> 00:21:22,000
course

609
00:21:26,390 --> 00:21:24,159
and as you can see a major component of

610
00:21:28,630 --> 00:21:26,400
it is the science communication project

611
00:21:30,549 --> 00:21:28,640
so this is where we contribute to the

612
00:21:35,190 --> 00:21:30,559
knowledge base but we also have these

613
00:21:37,430 --> 00:21:35,200

weekly discussions where a student

614
00:21:39,110 --> 00:21:37,440
presents on a seminal paper so you can

615
00:21:40,149 --> 00:21:39,120
see how this kind of really goes hand in

616
00:21:41,590 --> 00:21:40,159
hand

617
00:21:44,149 --> 00:21:41,600
and these are some of the papers that we

618
00:21:46,630 --> 00:21:44,159
did this past year and of course their

619
00:21:47,510 --> 00:21:46,640
seminal so you probably recognize

620
00:21:52,950 --> 00:21:47,520
um

621
00:21:55,750 --> 00:21:52,960
uh the

622
00:21:58,710 --> 00:21:55,760
stanley miller paper for instance um if

623
00:22:02,470 --> 00:21:59,909
and

624
00:22:04,310 --> 00:22:02,480
so the way this assignment went uh first

625
00:22:07,350 --> 00:22:04,320
of all we

626
00:22:09,029 --> 00:22:07,360
spoke with our wonderful nasa

627
00:22:11,430 --> 00:22:09,039
center for life detection colleagues and

628
00:22:12,710 --> 00:22:11,440
they they recommended us this time

629
00:22:14,470 --> 00:22:12,720
because if we try to kind of have a

630
00:22:17,029 --> 00:22:14,480
different theme each semester so i'm

631
00:22:19,909 --> 00:22:17,039
just going to focus on this past spring

632
00:22:21,110 --> 00:22:19,919
we had the theme of

633
00:22:24,549 --> 00:22:21,120
mars

634
00:22:26,870 --> 00:22:24,559
and so we did the mckay 1996 paper and

635
00:22:29,029 --> 00:22:26,880
then we did the the viking what is it

636
00:22:31,750 --> 00:22:29,039
1970

637
00:22:33,830 --> 00:22:31,760
whatever paper okay and so they read

638
00:22:35,430 --> 00:22:33,840

those those two seminal papers in

639
00:22:38,070 --> 00:22:35,440
addition to all the other seminal papers

640
00:22:39,830 --> 00:22:38,080
they wrote and uh and

641
00:22:41,190 --> 00:22:39,840
and this is really important i think for

642
00:22:42,549 --> 00:22:41,200
the students the reason we make them do

643
00:22:44,789 --> 00:22:42,559
all these seminal papers is so they

644
00:22:47,029 --> 00:22:44,799
really understand the history the deep

645
00:22:48,950 --> 00:22:47,039
history of this field which i think

646
00:22:50,789 --> 00:22:48,960
which i think we can agree is so

647
00:22:52,390 --> 00:22:50,799
important understanding how this field

648
00:22:54,549 --> 00:22:52,400
if you went to the event last night goes

649
00:22:58,310 --> 00:22:54,559
all the way back to

650
00:23:00,950 --> 00:22:58,320
you know to the 50s and and even before

651
00:23:03,270 --> 00:23:00,960
um and so understanding how

652
00:23:05,190 --> 00:23:03,280
to each student really seeing this how

653
00:23:06,630 --> 00:23:05,200
the scholarship has grown through time

654
00:23:07,510 --> 00:23:06,640
how they are really

655
00:23:09,270 --> 00:23:07,520
you know

656
00:23:11,190 --> 00:23:09,280
building standing on the shoulders of

657
00:23:14,070 --> 00:23:11,200
these giants and how their work just

658
00:23:16,950 --> 00:23:14,080
builds from this timeline of papers and

659
00:23:19,590 --> 00:23:16,960
who all who all their academic ancestors

660
00:23:20,870 --> 00:23:19,600
were this is kind of part and parcel of

661
00:23:23,909 --> 00:23:20,880
that process

662
00:23:25,110 --> 00:23:23,919
so these are the assignments that we go

663
00:23:26,549 --> 00:23:25,120

through so you can see we've kind of

664
00:23:29,110 --> 00:23:26,559
broken it up

665
00:23:30,870 --> 00:23:29,120
into a series of assignments

666
00:23:32,950 --> 00:23:30,880
basically they read and understand the

667
00:23:34,789 --> 00:23:32,960
seminal papers

668
00:23:36,630 --> 00:23:34,799
they they tell us which one they're most

669
00:23:39,430 --> 00:23:36,640
interested in they learn about the

670
00:23:42,789 --> 00:23:39,440
database meanwhile they're having office

671
00:23:45,190 --> 00:23:42,799
hours the whole time with every week

672
00:23:47,430 --> 00:23:45,200
four nasa scientists may and and as well

673
00:23:49,190 --> 00:23:47,440
as graham made their time available for

674
00:23:51,510 --> 00:23:49,200
an hour for these students

675
00:23:54,310 --> 00:23:51,520
they create annotated bibliographies

676
00:23:55,990 --> 00:23:54,320
with three pieces of pro and com con

677
00:23:58,630 --> 00:23:56,000
evidence as you saw

678
00:24:00,950 --> 00:23:58,640
and then they group those evidence into

679
00:24:02,870 --> 00:24:00,960
pieces of evidence into pro and con

680
00:24:04,549 --> 00:24:02,880
arguments we start learning about the

681
00:24:07,269 --> 00:24:04,559
hierarchies then between what is

682
00:24:08,630 --> 00:24:07,279
evidence what is arguments

683
00:24:10,310 --> 00:24:08,640
et cetera

684
00:24:11,830 --> 00:24:10,320
what is prevalence what is signal

685
00:24:14,310 --> 00:24:11,840
strength all these things so we talk a

686
00:24:16,789 --> 00:24:14,320
lot about that

687
00:24:18,630 --> 00:24:16,799
they write background summary compiled

688
00:24:20,390 --> 00:24:18,640

and they do peer review so this is a

689
00:24:22,630 --> 00:24:20,400
really good practice with what is peer

690
00:24:24,950 --> 00:24:22,640
review and and that whole process then

691
00:24:27,190 --> 00:24:24,960
they even do response to peer review so

692
00:24:29,669 --> 00:24:27,200
that's super good practice too they edit

693
00:24:31,750 --> 00:24:29,679
their contribution and they then they

694
00:24:33,669 --> 00:24:31,760
create an account and upload it

695
00:24:36,070 --> 00:24:33,679
and final presentation so you can see

696
00:24:37,750 --> 00:24:36,080
it's a pretty involved involved process

697
00:24:39,990 --> 00:24:37,760
and i'm happy to provide the full copy

698
00:24:41,029 --> 00:24:40,000
of the assignment if you'd like so

699
00:24:42,470 --> 00:24:41,039
here's

700
00:24:44,230 --> 00:24:42,480
some of the

701
00:24:46,789 --> 00:24:44,240
contributions that our students with

702
00:24:49,190 --> 00:24:46,799
their names and and pictures have made

703
00:24:51,669 --> 00:24:49,200
you might recognize uh so elizabeth

704
00:24:55,510 --> 00:24:51,679
corbin hank uh rainwater

705
00:24:57,430 --> 00:24:55,520
kavita matangay and um tatiana gibson

706
00:25:00,789 --> 00:24:57,440
oops

707
00:25:03,029 --> 00:25:00,799
jordan mckay ben zusman lily turner emmy

708
00:25:05,590 --> 00:25:03,039
and jay so they basically our students

709
00:25:07,750 --> 00:25:05,600
have really kind of and here is claire

710
00:25:09,590 --> 00:25:07,760
oh spelled frog i forgot the hell i'm

711
00:25:11,430 --> 00:25:09,600
sorry claire

712
00:25:14,630 --> 00:25:11,440
i can't spell my own student's name

713
00:25:16,470 --> 00:25:14,640

first name claire and katie have made um

714
00:25:17,990 --> 00:25:16,480
and so you can see our fingerprints are

715
00:25:21,350 --> 00:25:18,000
kind of all over this we're pretty proud

716
00:25:24,390 --> 00:25:21,360
of that and so every every week they had

717
00:25:28,549 --> 00:25:24,400
um office hours with andro alfonso dave

718
00:25:30,310 --> 00:25:28,559
demere and svetlana and graham uh and

719
00:25:31,430 --> 00:25:30,320
that was really special so some of them

720
00:25:32,310 --> 00:25:31,440
really

721
00:25:34,789 --> 00:25:32,320
kind of

722
00:25:37,430 --> 00:25:34,799
came every week and got just um you can

723
00:25:39,269 --> 00:25:37,440
imagine basically four and four nasa

724
00:25:40,870 --> 00:25:39,279
scientists just

725
00:25:43,110 --> 00:25:40,880
just you ask them any question and they

726
00:25:44,470 --> 00:25:43,120
just talk for an hour and that was like

727
00:25:46,390 --> 00:25:44,480
you can probably gain more knowledge

728
00:25:47,669 --> 00:25:46,400
then than than ever so it's really

729
00:25:50,310 --> 00:25:47,679
really special

730
00:25:52,230 --> 00:25:50,320
um and then this is uh this is some of

731
00:25:53,750 --> 00:25:52,240
the feedback we got this is ben said one

732
00:25:55,190 --> 00:25:53,760
of the coolest class projects i've ever

733
00:25:56,710 --> 00:25:55,200
worked on because there's a tangible

734
00:25:57,590 --> 00:25:56,720
result we got a lot of feedback like

735
00:25:59,430 --> 00:25:57,600
that

736
00:26:01,350 --> 00:25:59,440
and here's our happy students getting

737
00:26:04,230 --> 00:26:01,360
their certificates um

738
00:26:06,310 --> 00:26:04,240

so i'm happy to introduce now claire

739
00:26:08,470 --> 00:26:06,320
spelled correctly albin

740
00:26:11,110 --> 00:26:08,480
who is a georgia tech ocean science and

741
00:26:11,830 --> 00:26:11,120
engineering phd candidate

742
00:26:13,590 --> 00:26:11,840
and

743
00:26:14,950 --> 00:26:13,600
nsf grfp

744
00:26:16,950 --> 00:26:14,960
fellow

745
00:26:19,909 --> 00:26:16,960
and just got the astrobiology

746
00:26:23,350 --> 00:26:19,919
certificate and an astrobiology fellow

747
00:26:24,789 --> 00:26:23,360
so i'm very happy to introduce claire

748
00:26:32,470 --> 00:26:24,799
was going to tell you more about her

749
00:26:38,950 --> 00:26:35,350
hi everyone so um i'm claire and i got

750
00:26:40,789 --> 00:26:38,960
to participate in the spring 2022

751
00:26:43,110 --> 00:26:40,799
section of this class and so i'm just

752
00:26:46,950 --> 00:26:43,120
going to talk a little bit about my

753
00:26:50,830 --> 00:26:49,269
so i focused on the viking lander

754
00:26:52,630 --> 00:26:50,840
experiments of

755
00:26:55,510 --> 00:26:52,640
1976

756
00:26:58,230 --> 00:26:55,520
and this really focused on metabolism as

757
00:27:00,470 --> 00:26:58,240
a bio signature

758
00:27:02,390 --> 00:27:00,480
so they did four main experience

759
00:27:04,230 --> 00:27:02,400
experiments

760
00:27:06,549 --> 00:27:04,240
but what i focused on

761
00:27:08,149 --> 00:27:06,559
was the labeled release experiment which

762
00:27:10,549 --> 00:27:08,159
is essentially

763
00:27:13,750 --> 00:27:10,559

where they were able to see

764
00:27:16,149 --> 00:27:13,760
um when they were adding a radio labeled

765
00:27:18,710 --> 00:27:16,159
carbon into this martian soil they

766
00:27:21,350 --> 00:27:18,720
actually saw release of this labeled

767
00:27:23,029 --> 00:27:21,360
carbon into the above air

768
00:27:25,269 --> 00:27:23,039
which was uh

769
00:27:26,950 --> 00:27:25,279
very highly criticized and highly

770
00:27:29,350 --> 00:27:26,960
disputed whether or not it was a true

771
00:27:31,510 --> 00:27:29,360
positive

772
00:27:34,070 --> 00:27:31,520
um so the the question that i really

773
00:27:36,630 --> 00:27:34,080
focused on for this uh course was what

774
00:27:38,789 --> 00:27:36,640
is the prevalence of an abiotic ex

775
00:27:40,870 --> 00:27:38,799
signal in this experiment

776
00:27:43,990 --> 00:27:40,880
and that's just sort of an example of if

777
00:27:47,190 --> 00:27:44,000
it was a biotic signal this is uh the

778
00:27:49,430 --> 00:27:47,200
oxidation of formate so this is

779
00:27:51,269 --> 00:27:49,440
a biological signal that they were

780
00:27:54,549 --> 00:27:51,279
inferring might be happening but we're

781
00:27:57,510 --> 00:27:54,559
wondering here okay what are the abiotic

782
00:28:01,669 --> 00:27:58,549
um

783
00:28:03,990 --> 00:28:01,679
so it got cut off but essentially uh

784
00:28:06,389 --> 00:28:04,000
formulating an argument from literature

785
00:28:09,029 --> 00:28:06,399
review of a seminal paper can feel like

786
00:28:11,269 --> 00:28:09,039
you're drowning especially when you're

787
00:28:13,510 --> 00:28:11,279
looking at a paper this far back it can

788
00:28:15,669 --> 00:28:13,520

be really difficult to know

789
00:28:17,909 --> 00:28:15,679
where to get started and what to focus

790
00:28:21,830 --> 00:28:20,389
so what really helped a lot was the nasa

791
00:28:23,909 --> 00:28:21,840
office hours

792
00:28:25,750 --> 00:28:23,919
they were able to provide

793
00:28:28,230 --> 00:28:25,760
as you said you could as jen said you

794
00:28:29,669 --> 00:28:28,240
can you know mention a singular topic

795
00:28:31,750 --> 00:28:29,679
and they'll have just

796
00:28:34,389 --> 00:28:31,760
such a broad and

797
00:28:37,830 --> 00:28:34,399
depth of understanding and knowledge of

798
00:28:39,430 --> 00:28:37,840
the papers and review and just talk for

799
00:28:41,830 --> 00:28:39,440
hours it's great

800
00:28:43,909 --> 00:28:41,840
but two main points that were brought up

801
00:28:47,350 --> 00:28:43,919
to me that really helped me sort of hone

802
00:28:49,190 --> 00:28:47,360
in on this abiotic signal prevalence

803
00:28:51,990 --> 00:28:49,200
and the relevant papers for that

804
00:28:54,389 --> 00:28:52,000
criteria were perchlorate and the

805
00:28:56,230 --> 00:28:54,399
autocad autocoma desert

806
00:28:58,230 --> 00:28:56,240
so that was really really helpful

807
00:29:00,870 --> 00:28:58,240
because at that point i was able to

808
00:29:01,909 --> 00:29:00,880
start a more typical literature review

809
00:29:04,230 --> 00:29:01,919
process

810
00:29:06,789 --> 00:29:04,240
uh keeping those in mind in these highly

811
00:29:09,350 --> 00:29:06,799
relevant papers and then work on those

812
00:29:12,789 --> 00:29:09,360
pro and con arguments based on the

813
00:29:15,190 --> 00:29:12,799

evidence from literature

814
00:29:18,389 --> 00:29:15,200
so this is assignment seven so this is

815
00:29:20,389 --> 00:29:18,399
sort of towards the end of our semester

816
00:29:22,549 --> 00:29:20,399
where we started to compile our

817
00:29:24,710 --> 00:29:22,559
contributions into the correct format

818
00:29:26,389 --> 00:29:24,720
for the ldkb upload

819
00:29:27,990 --> 00:29:26,399
and this this was really helpful because

820
00:29:29,110 --> 00:29:28,000
up until this point

821
00:29:31,110 --> 00:29:29,120
um

822
00:29:33,510 --> 00:29:31,120
i hadn't even realized how much

823
00:29:34,789 --> 00:29:33,520
literature i had reviewed and how much i

824
00:29:36,710 --> 00:29:34,799
had really

825
00:29:39,029 --> 00:29:36,720
started to understand

826
00:29:40,470 --> 00:29:39,039
you know abiotic prevalence of

827
00:29:43,830 --> 00:29:40,480
metabolism

828
00:29:45,590 --> 00:29:43,840
looking at martian surfaces so that was

829
00:29:47,269 --> 00:29:45,600
really cool that

830
00:29:49,110 --> 00:29:47,279
we had done all of this back work i

831
00:29:50,710 --> 00:29:49,120
hadn't even realized it until we got to

832
00:29:52,870 --> 00:29:50,720
this assignment when it was just like

833
00:29:54,389 --> 00:29:52,880
wow i've done a lot

834
00:29:58,549 --> 00:29:54,399
and it definitely would have been

835
00:30:02,470 --> 00:30:00,789
and then the peer review process

836
00:30:05,110 --> 00:30:02,480
i really really

837
00:30:07,510 --> 00:30:05,120
appreciated having this process because

838
00:30:09,510 --> 00:30:07,520

not only did we send

839
00:30:12,230 --> 00:30:09,520
peer review as like oh you should change

840
00:30:15,269 --> 00:30:12,240
this sentence or oh maybe you should

841
00:30:18,630 --> 00:30:15,279
sort it shorten this part or expand here

842
00:30:20,630 --> 00:30:18,640
we um did really what is more a journal

843
00:30:22,470 --> 00:30:20,640
submission style peer review where you

844
00:30:24,710 --> 00:30:22,480
had paragraphs

845
00:30:26,310 --> 00:30:24,720
summarizing what you read and then a

846
00:30:30,070 --> 00:30:26,320
point by point

847
00:30:32,470 --> 00:30:30,080
um kind of a response to go through

848
00:30:34,470 --> 00:30:32,480
and then um so we sent that to each

849
00:30:37,350 --> 00:30:34,480
other and then the second half of the

850
00:30:40,549 --> 00:30:37,360
peer review was going through

851
00:30:43,190 --> 00:30:40,559
these um responses and saying what did i

852
00:30:45,510 --> 00:30:43,200
edit what did i add and then having this

853
00:30:47,750 --> 00:30:45,520
uh corresponding

854
00:30:51,909 --> 00:30:47,760
document keeping track of all of this

855
00:30:54,470 --> 00:30:53,750
and i know other students have mentioned

856
00:30:59,190 --> 00:30:54,480
it

857
00:31:00,789 --> 00:30:59,200
cool at the end of a class to not just

858
00:31:03,909 --> 00:31:00,799
turn in what you think is a good piece

859
00:31:05,350 --> 00:31:03,919
of work but to be able to upload it and

860
00:31:07,029 --> 00:31:05,360
see it and you know send it to your

861
00:31:10,070 --> 00:31:07,039
parents and be like look this is what

862
00:31:12,470 --> 00:31:10,080
i'm doing um so that was really really

863
00:31:13,269 --> 00:31:12,480

enjoyable having something so tangible

864
00:31:17,669 --> 00:31:13,279
to

865
00:31:19,269 --> 00:31:17,679
personally i worked a little bit harder

866
00:31:23,750 --> 00:31:19,279
on it knowing anyone on the internet

867
00:31:27,350 --> 00:31:25,269
and this is just kind of like how i

868
00:31:29,750 --> 00:31:27,360
thought about this class working so the

869
00:31:33,590 --> 00:31:29,760
ldkb is you know it starts off as very

870
00:31:36,070 --> 00:31:33,600
broad as this you structure

871
00:31:37,430 --> 00:31:36,080
and you go down to category and topic

872
00:31:39,590 --> 00:31:37,440
and everything

873
00:31:41,750 --> 00:31:39,600
sort of centering on arguments and

874
00:31:43,750 --> 00:31:41,760
evidence i feel like we kind of worked

875
00:31:46,470 --> 00:31:43,760
from the bottom up where there's

876
00:31:48,149 --> 00:31:46,480
so much peer-reviewed literature on

877
00:31:50,230 --> 00:31:48,159
these seminal papers

878
00:31:52,630 --> 00:31:50,240
and you just become more and more and

879
00:31:56,070 --> 00:31:52,640
more specific and kind of hone in on

880
00:32:03,830 --> 00:31:56,080
that argument and evidence as well

881
00:32:09,750 --> 00:32:04,870
thanks

882
00:32:11,430 --> 00:32:09,760
really great i i appreciate that so um

883
00:32:13,110 --> 00:32:11,440
just a few more minutes before we open

884
00:32:14,470 --> 00:32:13,120
it up for q a and i want to focus on

885
00:32:16,230 --> 00:32:14,480
what comes next

886
00:32:18,230 --> 00:32:16,240
and to do that i like to return to the

887
00:32:19,830 --> 00:32:18,240
basic idea behind the whole system which

888
00:32:22,070 --> 00:32:19,840

is that there's a lot to be gained by

889
00:32:24,149 --> 00:32:22,080
comparing and organizing our knowledge

890
00:32:26,710 --> 00:32:24,159
about potential biosignatures and about

891
00:32:28,549 --> 00:32:26,720
the technology that might be used to

892
00:32:29,990 --> 00:32:28,559
to measure them and in particular i want

893
00:32:31,990 --> 00:32:30,000
to focus on this idea that that

894
00:32:33,750 --> 00:32:32,000
comparison allows you either to

895
00:32:36,230 --> 00:32:33,760
conceptually establish science

896
00:32:38,470 --> 00:32:36,240
traceability or in the absence of of

897
00:32:40,549 --> 00:32:38,480
that link to identify technology

898
00:32:43,430 --> 00:32:40,559
development priorities and to give a

899
00:32:46,230 --> 00:32:43,440
sense of you know how this is perceived

900
00:32:49,029 --> 00:32:46,240
at at headquarters and and the fact that

901
00:32:50,389 --> 00:32:49,039
this is a sought after thing to do

902
00:32:51,909 --> 00:32:50,399
i'll point to

903
00:32:53,909 --> 00:32:51,919
the future of the search for life

904
00:32:55,110 --> 00:32:53,919
workshop i'll thank kate craft for this

905
00:32:56,950 --> 00:32:55,120
slide

906
00:32:58,630 --> 00:32:56,960
and the idea behind this workshop really

907
00:33:00,230 --> 00:32:58,640
the impetus came from headquarters in

908
00:33:02,310 --> 00:33:00,240
part from the astrobiology program

909
00:33:04,230 --> 00:33:02,320
office in part from the pleisto the

910
00:33:06,789 --> 00:33:04,240
pesto office planetary exploration

911
00:33:08,470 --> 00:33:06,799
science and technology office i think um

912
00:33:10,310 --> 00:33:08,480
so from both sides really both house the

913
00:33:12,310 --> 00:33:10,320

science and the technology represented

914
00:33:14,070 --> 00:33:12,320
with an eye toward trying to understand

915
00:33:16,310 --> 00:33:14,080
this this science traceability and the

916
00:33:18,630 --> 00:33:16,320
need for technology development so

917
00:33:20,549 --> 00:33:18,640
the appetite is really there for seeing

918
00:33:22,149 --> 00:33:20,559
this comparison made and so that drives

919
00:33:24,950 --> 00:33:22,159
our next step which is trying to build

920
00:33:26,630 --> 00:33:24,960
this second half to the system

921
00:33:28,149 --> 00:33:26,640
so what comes next is something that for

922
00:33:30,549 --> 00:33:28,159
now we call the measurement technology

923
00:33:32,149 --> 00:33:30,559
module the idea behind the technology

924
00:33:34,230 --> 00:33:32,159
module is that it will be something like

925
00:33:35,750 --> 00:33:34,240
a catalog of the methods that are

926
00:33:37,269 --> 00:33:35,760
applicable to measurement of a given

927
00:33:38,470 --> 00:33:37,279
biosignature or a given thing that

928
00:33:39,830 --> 00:33:38,480
appears

929
00:33:41,509 --> 00:33:39,840
in our system

930
00:33:43,029 --> 00:33:41,519
and that along with it you'll get

931
00:33:44,789 --> 00:33:43,039
citations to the literature that

932
00:33:46,950 --> 00:33:44,799
supports that use describes how it's

933
00:33:49,110 --> 00:33:46,960
been used in different contexts before

934
00:33:50,710 --> 00:33:49,120
and gives you links uh to web content

935
00:33:53,029 --> 00:33:50,720
that already exists that allows you to

936
00:33:54,950 --> 00:33:53,039
dig deeper into that instrumentation

937
00:33:56,870 --> 00:33:54,960
and in each case for every entry in the

938
00:33:58,389 --> 00:33:56,880

knowledge base there'll be a live link

939
00:33:59,909 --> 00:33:58,399
that you can click on that says okay

940
00:34:01,509 --> 00:33:59,919
well i really would like to understand

941
00:34:03,830 --> 00:34:01,519
the different options that are available

942
00:34:06,389 --> 00:34:03,840
to me if i want to measure for example

943
00:34:08,310 --> 00:34:06,399
an anti-american clicking on that link

944
00:34:10,230 --> 00:34:08,320
will show you everything that sits in

945
00:34:11,669 --> 00:34:10,240
the measurement technology module that

946
00:34:13,589 --> 00:34:11,679
represents a potential to do that

947
00:34:15,430 --> 00:34:13,599
measurement and the idea is to get us

948
00:34:17,349 --> 00:34:15,440
out of the specific patterns that that

949
00:34:18,790 --> 00:34:17,359
you know this is used to measure this

950
00:34:19,909 --> 00:34:18,800
and start to show us what the options

951
00:34:21,750 --> 00:34:19,919
are when we think a little bit more

952
00:34:24,230 --> 00:34:21,760
broadly and enable people to do that

953
00:34:25,750 --> 00:34:24,240
connection and along with it we hope to

954
00:34:27,430 --> 00:34:25,760
to develop something called a science

955
00:34:29,829 --> 00:34:27,440
traceability tool

956
00:34:32,149 --> 00:34:29,839
science traceability is is really the

957
00:34:34,389 --> 00:34:32,159
beating heart of conceptualizing a

958
00:34:36,629 --> 00:34:34,399
mission and defining a mission and so we

959
00:34:39,109 --> 00:34:36,639
feel like giving the community an

960
00:34:41,190 --> 00:34:39,119
ability to visualize how that process

961
00:34:43,349 --> 00:34:41,200
works is really going to be important

962
00:34:45,669 --> 00:34:43,359
and so this is a practical tool in part

963
00:34:47,030 --> 00:34:45,679

to understand how information like the

964
00:34:48,470 --> 00:34:47,040
information that's contained in the

965
00:34:50,629 --> 00:34:48,480
knowledge base and the measurement

966
00:34:52,550 --> 00:34:50,639
technology module maps into the

967
00:34:54,629 --> 00:34:52,560
different categories of a science

968
00:34:56,470 --> 00:34:54,639
traceability matrix i don't know how

969
00:34:58,390 --> 00:34:56,480
many of you have encountered this but is

970
00:34:59,990 --> 00:34:58,400
a challenging thing to do when you come

971
00:35:02,230 --> 00:35:00,000
from the science side and first

972
00:35:03,750 --> 00:35:02,240
encounter that process so this is meant

973
00:35:04,630 --> 00:35:03,760
to be an aid to understanding how to do

974
00:35:07,589 --> 00:35:04,640
that

975
00:35:09,829 --> 00:35:07,599
and secondly it it is meant to help

976
00:35:11,990 --> 00:35:09,839
people establish concept level science

977
00:35:13,990 --> 00:35:12,000
traceability so not quantitative science

978
00:35:16,150 --> 00:35:14,000
traceability but at least is there a

979
00:35:18,950 --> 00:35:16,160
consistent logic flow from goal to

980
00:35:20,310 --> 00:35:18,960
potential measurement capability

981
00:35:22,950 --> 00:35:20,320
it's not a quantitative tool for

982
00:35:25,589 --> 00:35:22,960
generating a proposal ready stm but it's

983
00:35:27,109 --> 00:35:25,599
sufficient to establish logic flow and

984
00:35:28,870 --> 00:35:27,119
that's the idea behind what's coming

985
00:35:30,630 --> 00:35:28,880
next we hope to to

986
00:35:32,550 --> 00:35:30,640
put both of these out and make them live

987
00:35:33,910 --> 00:35:32,560
within the coming year in kind of the

988
00:35:35,910 --> 00:35:33,920

same way that we did with the knowledge

989
00:35:38,390 --> 00:35:35,920
base itself introduce it in a workshop

990
00:35:40,230 --> 00:35:38,400
style format seek comment allow for some

991
00:35:42,550 --> 00:35:40,240
beta testing and then eventually have

992
00:35:45,829 --> 00:35:42,560
the working product

993
00:35:48,790 --> 00:35:45,839
um and so finally if any of this sounds

994
00:35:50,310 --> 00:35:48,800
of interest and and you'd like to follow

995
00:35:52,390 --> 00:35:50,320
up you'd like to become involved at any

996
00:35:53,589 --> 00:35:52,400
level how can you do that

997
00:35:55,670 --> 00:35:53,599
i think it can be done in both

998
00:35:57,589 --> 00:35:55,680
individual ways and as we've heard

999
00:35:59,750 --> 00:35:57,599
educational ways

1000
00:36:02,150 --> 00:35:59,760
i realize that anything like this

1001
00:36:03,990 --> 00:36:02,160
represents an ask of time and that time

1002
00:36:06,310 --> 00:36:04,000
is really precious and so i've tried to

1003
00:36:08,470 --> 00:36:06,320
put things on here that represent both

1004
00:36:10,470 --> 00:36:08,480
very modest amounts of time and effort

1005
00:36:12,790 --> 00:36:10,480
and more substantive amounts of time and

1006
00:36:15,990 --> 00:36:12,800
effort if you're interested so simply as

1007
00:36:18,069 --> 00:36:16,000
a user of existing content

1008
00:36:20,310 --> 00:36:18,079
not modifying content at all you can

1009
00:36:22,390 --> 00:36:20,320
browse you can tell us what you think

1010
00:36:24,150 --> 00:36:22,400
about how the system works you can use

1011
00:36:25,910 --> 00:36:24,160
it in a teaching capacity as jen has

1012
00:36:28,470 --> 00:36:25,920
done and actually as several other

1013
00:36:30,870 --> 00:36:28,480

instructors have done

1014
00:36:32,950 --> 00:36:30,880
if you think it's useful spread the word

1015
00:36:34,710 --> 00:36:32,960
to your colleagues cite the knowledge

1016
00:36:37,589 --> 00:36:34,720
base

1017
00:36:39,829 --> 00:36:37,599
i think the more we can gain use of the

1018
00:36:41,670 --> 00:36:39,839
system the more powerful it becomes as a

1019
00:36:43,430 --> 00:36:41,680
tool uh and becomes sort of

1020
00:36:46,150 --> 00:36:43,440
self-reinforcing

1021
00:36:47,829 --> 00:36:46,160
you also can add content so the whole

1022
00:36:50,150 --> 00:36:47,839
system is designed to be interactive

1023
00:36:51,910 --> 00:36:50,160
it's designed to grow with user input

1024
00:36:53,990 --> 00:36:51,920
and there are multiple ways that you can

1025
00:36:55,750 --> 00:36:54,000
do that you can do something as simple

1026
00:36:57,589 --> 00:36:55,760
as add a comment to an existing piece of

1027
00:36:59,910 --> 00:36:57,599
evidence i think the person who entered

1028
00:37:01,910 --> 00:36:59,920
this evidence got it wrong

1029
00:37:03,750 --> 00:37:01,920
for this reason you as a user can enter

1030
00:37:05,670 --> 00:37:03,760
a comment that gets captured in the

1031
00:37:07,750 --> 00:37:05,680
system and the whole point of this is

1032
00:37:09,109 --> 00:37:07,760
not necessarily to seek consensus but to

1033
00:37:11,190 --> 00:37:09,119
understand that there will always be

1034
00:37:12,790 --> 00:37:11,200
differences of opinion and to capture

1035
00:37:15,430 --> 00:37:12,800
all of the arguments that underlie those

1036
00:37:17,030 --> 00:37:15,440
differences so you can add an argument

1037
00:37:21,829 --> 00:37:17,040
you can add a

1038
00:37:23,910 --> 00:37:21,839

new piece of evidence to an existing

1039
00:37:26,150 --> 00:37:23,920
argument i just published a paper that i

1040
00:37:27,589 --> 00:37:26,160
think really bolsters this argument

1041
00:37:29,190 --> 00:37:27,599
this is how

1042
00:37:30,950 --> 00:37:29,200
you can create a new argument if you

1043
00:37:33,030 --> 00:37:30,960
find that there's some critical thing

1044
00:37:35,910 --> 00:37:33,040
that's missing from that you can create

1045
00:37:37,829 --> 00:37:35,920
an entire new entry and i'll note here

1046
00:37:39,510 --> 00:37:37,839
that one of the things that has happened

1047
00:37:41,829 --> 00:37:39,520
in this project is it's given us an

1048
00:37:43,990 --> 00:37:41,839
opportunity to see who raises their hand

1049
00:37:45,990 --> 00:37:44,000
and self identifies as a life detection

1050
00:37:47,910 --> 00:37:46,000
person and really missing from that

1051
00:37:50,150 --> 00:37:47,920
community at the moment

1052
00:37:52,069 --> 00:37:50,160
is the the group of people who can

1053
00:37:53,990 --> 00:37:52,079
comment in detail on the abiotic

1054
00:37:56,630 --> 00:37:54,000
background what are we trying to fish a

1055
00:37:58,630 --> 00:37:56,640
signal of life out from so for example

1056
00:38:00,230 --> 00:37:58,640
the origin of life community the astro

1057
00:38:02,150 --> 00:38:00,240
materials community that's very much

1058
00:38:04,870 --> 00:38:02,160
needed people who can comment on the

1059
00:38:07,030 --> 00:38:04,880
activity category as claire actually did

1060
00:38:08,630 --> 00:38:07,040
in here that content is very much needed

1061
00:38:10,710 --> 00:38:08,640
also and so we really would like your

1062
00:38:13,270 --> 00:38:10,720
help in any of these areas

1063
00:38:15,670 --> 00:38:13,280

you can review submitted content so

1064
00:38:17,030 --> 00:38:15,680
every single entry every single piece of

1065
00:38:18,790 --> 00:38:17,040
information that you see in the

1066
00:38:20,790 --> 00:38:18,800
knowledge base is peer-reviewed in the

1067
00:38:23,109 --> 00:38:20,800
way that a journal article would be

1068
00:38:25,430 --> 00:38:23,119
it's peer-reviewed by a naive reviewer

1069
00:38:27,430 --> 00:38:25,440
for clarity do i as a non-expert

1070
00:38:29,910 --> 00:38:27,440
understand it and it's peer-reviewed for

1071
00:38:31,910 --> 00:38:29,920
accuracy by an expert reviewer

1072
00:38:34,950 --> 00:38:31,920
we need help in that area and that's not

1073
00:38:37,190 --> 00:38:34,960
a not a lot of energy to put in

1074
00:38:38,870 --> 00:38:37,200
and finally each one of these entries as

1075
00:38:40,550 --> 00:38:38,880
graham mentioned has a curator for it

1076
00:38:42,069 --> 00:38:40,560
the curator's job is to make sure that

1077
00:38:43,910 --> 00:38:42,079
information is sorted into the right

1078
00:38:45,190 --> 00:38:43,920
place that people are being accurate in

1079
00:38:47,190 --> 00:38:45,200
their statements

1080
00:38:48,950 --> 00:38:47,200
and that kind of thing so any of these

1081
00:38:50,790 --> 00:38:48,960
represent potential ways to contribute

1082
00:38:52,550 --> 00:38:50,800
if you're interested and if you are

1083
00:38:54,470 --> 00:38:52,560
please contact fetch goliar at the

1084
00:38:55,670 --> 00:38:54,480
address that you see on the bottom of

1085
00:38:57,190 --> 00:38:55,680
the screen

1086
00:38:58,870 --> 00:38:57,200
and so with that

1087
00:39:01,109 --> 00:38:58,880
thank you so much for your attention

1088
00:39:03,510 --> 00:39:01,119

thanks for coming thanks to graham

1089
00:39:14,870 --> 00:39:03,520
claire and jen and we'll be happy to

1090
00:39:19,990 --> 00:39:17,190
go ahead please can you hear me

1091
00:39:21,910 --> 00:39:20,000
uh can you speak a little later

1092
00:39:24,950 --> 00:39:21,920
thank you for uh doing that first of all

1093
00:39:27,349 --> 00:39:24,960
i'm not english not just or not yet but

1094
00:39:28,390 --> 00:39:27,359
it's very cool to see all the pieces

1095
00:39:31,190 --> 00:39:28,400
together

1096
00:39:34,710 --> 00:39:31,200
and i i like the organization as well

1097
00:39:36,630 --> 00:39:34,720
which i think is really funny to look at

1098
00:39:38,790 --> 00:39:36,640
my first question is have you you know

1099
00:39:40,870 --> 00:39:38,800
done the primary individual publication

1100
00:39:43,750 --> 00:39:40,880
of it so that we could cite it and say

1101
00:39:46,550 --> 00:39:43,760
let me use this tool to find this paper

1102
00:39:48,470 --> 00:39:46,560
and show it yeah

1103
00:39:50,950 --> 00:39:48,480
i i think i understood correctly as have

1104
00:39:52,470 --> 00:39:50,960
we published anything about this so um

1105
00:39:54,390 --> 00:39:52,480
we are

1106
00:39:56,310 --> 00:39:54,400
we have in development a series of

1107
00:39:58,470 --> 00:39:56,320
papers that will come out in a special

1108
00:40:00,310 --> 00:39:58,480
issue of astrobiology i'm hoping later

1109
00:40:02,390 --> 00:40:00,320
this year that will

1110
00:40:04,470 --> 00:40:02,400
take each of the sort of levels of

1111
00:40:06,230 --> 00:40:04,480
organization that i talked about and

1112
00:40:08,870 --> 00:40:06,240
detail the rationale behind it in a

1113
00:40:11,109 --> 00:40:08,880

paper so there will be an ability both

1114
00:40:12,630 --> 00:40:11,119
to look at the functionality of the

1115
00:40:15,349 --> 00:40:12,640
system in the sort of help section

1116
00:40:16,630 --> 00:40:15,359
online but also to go in and understand

1117
00:40:18,309 --> 00:40:16,640
all of the

1118
00:40:19,910 --> 00:40:18,319
conversation and discussion that went

1119
00:40:21,109 --> 00:40:19,920
into choosing this particular way of

1120
00:40:22,829 --> 00:40:21,119
doing things and why we think it's

1121
00:40:25,510 --> 00:40:22,839
appropriate so

1122
00:40:27,349 --> 00:40:25,520
um my second question is have you

1123
00:40:29,829 --> 00:40:27,359
thought about making the detection of

1124
00:40:31,990 --> 00:40:29,839
any one of those signals you know some

1125
00:40:33,270 --> 00:40:32,000
sort of a quantitative metric like if i

1126
00:40:35,829 --> 00:40:33,280
see this i'm

1127
00:40:37,589 --> 00:40:35,839
90 confident it's like and if i see this

1128
00:40:40,069 --> 00:40:37,599
one and this one at 95 percent

1129
00:40:41,589 --> 00:40:40,079
confidence like you just i know you

1130
00:40:43,030 --> 00:40:41,599
might mention the uh

1131
00:40:44,870 --> 00:40:43,040
looking for where we need to put more

1132
00:40:46,710 --> 00:40:44,880
money for

1133
00:40:48,630 --> 00:40:46,720
science to understand particular

1134
00:40:51,270 --> 00:40:48,640
components but i just wanted to

1135
00:40:53,190 --> 00:40:51,280
yeah so so the quick answer is yes we've

1136
00:40:55,349 --> 00:40:53,200
thought about it

1137
00:40:56,630 --> 00:40:55,359
it is a lot to tackle and so there are a

1138
00:40:58,309 --> 00:40:56,640

few different things that you could do

1139
00:41:00,230 --> 00:40:58,319
here one one thing that's worth saying

1140
00:41:02,069 --> 00:41:00,240
is you know we've we've tried to boil

1141
00:41:03,670 --> 00:41:02,079
things down to a level of granularity

1142
00:41:05,990 --> 00:41:03,680
that as i said would sort of correspond

1143
00:41:08,069 --> 00:41:06,000
to an individual science investigation

1144
00:41:10,710 --> 00:41:08,079
um in an intermission or science

1145
00:41:12,550 --> 00:41:10,720
traceability matrix in many cases these

1146
00:41:15,430 --> 00:41:12,560
are things that people would not accept

1147
00:41:17,349 --> 00:41:15,440
as standalone evidence for life so

1148
00:41:20,069 --> 00:41:17,359
one example of where you go from here is

1149
00:41:21,990 --> 00:41:20,079
some kind of combinatorics how do you

1150
00:41:23,510 --> 00:41:22,000
use the system to recombine those

1151
00:41:25,589 --> 00:41:23,520
different elements into something that

1152
00:41:27,030 --> 00:41:25,599
might look like acceptable evidence and

1153
00:41:28,950 --> 00:41:27,040
and are they really independent and

1154
00:41:30,630 --> 00:41:28,960
orthogonal the thing that you're talking

1155
00:41:33,109 --> 00:41:30,640
about is another thing that we've talked

1156
00:41:35,670 --> 00:41:33,119
about how do you introduce some

1157
00:41:38,309 --> 00:41:35,680
probabilistic assessment

1158
00:41:40,230 --> 00:41:38,319
i think that that where we are now

1159
00:41:42,230 --> 00:41:40,240
is that it's a significant amount of

1160
00:41:45,030 --> 00:41:42,240
work to build the basis in evidence that

1161
00:41:46,470 --> 00:41:45,040
should underlie any such calculation and

1162
00:41:48,230 --> 00:41:46,480
we want to make sure that we get that

1163
00:41:51,670 --> 00:41:48,240

right before we start thinking about

1164
00:41:58,069 --> 00:41:54,390
lucas mix really cool tool i think it's

1165
00:42:02,309 --> 00:42:00,790
scientific sorry

1166
00:42:04,790 --> 00:42:02,319
a great way to teach how to do

1167
00:42:06,150 --> 00:42:04,800
experiments uh and how to justify your

1168
00:42:08,230 --> 00:42:06,160
results as well so i think that's

1169
00:42:11,030 --> 00:42:08,240
wonderful very technical question how

1170
00:42:12,790 --> 00:42:11,040
did you populate your glossary

1171
00:42:14,309 --> 00:42:12,800
how did we populate our glossary how did

1172
00:42:17,109 --> 00:42:14,319
you decide which words go in and who

1173
00:42:20,309 --> 00:42:17,119
gets to decide how they're defined

1174
00:42:22,870 --> 00:42:20,319
um we actually devoted a whole group

1175
00:42:25,109 --> 00:42:22,880
whose job it was to to go through so the

1176
00:42:26,870 --> 00:42:25,119
group included people who really hadn't

1177
00:42:29,190 --> 00:42:26,880
been part and parcel to the discussions

1178
00:42:31,270 --> 00:42:29,200
that led to all of this terminology and

1179
00:42:32,950 --> 00:42:31,280
a lot of the process really was i've got

1180
00:42:34,309 --> 00:42:32,960
no idea what that means that should be

1181
00:42:38,309 --> 00:42:34,319
in the glossary

1182
00:42:39,990 --> 00:42:38,319
and so we we had a group that first

1183
00:42:41,430 --> 00:42:40,000
developed those terms a separate group

1184
00:42:44,069 --> 00:42:41,440
that was a little bit more naive that

1185
00:42:46,230 --> 00:42:44,079
reviewed them for clarity and that was

1186
00:42:50,630 --> 00:42:46,240
our process awesome nothing nothing more

1187
00:42:54,710 --> 00:42:51,510
hi

1188
00:42:56,950 --> 00:42:54,720

um chris bravo from apl um so really

1189
00:42:58,630 --> 00:42:56,960
great thank you i really like the

1190
00:43:00,150 --> 00:42:58,640
science traceability

1191
00:43:01,349 --> 00:43:00,160
aspect of the tool

1192
00:43:02,870 --> 00:43:01,359
um i'm wondering if you could just

1193
00:43:05,109 --> 00:43:02,880
comment about how you can prompt the

1194
00:43:06,470 --> 00:43:05,119
press solution for disagreements you

1195
00:43:09,510 --> 00:43:06,480
know among

1196
00:43:10,390 --> 00:43:09,520
value particularly literature

1197
00:43:12,390 --> 00:43:10,400
yes

1198
00:43:14,630 --> 00:43:12,400
sorry could you repeat one more time how

1199
00:43:16,309 --> 00:43:14,640
do you handle conflict resolution for

1200
00:43:18,390 --> 00:43:16,319
opinions on

1201
00:43:21,670 --> 00:43:18,400
papers

1202
00:43:23,990 --> 00:43:21,680
yeah very very important question so um

1203
00:43:26,390 --> 00:43:24,000
in a sense the the

1204
00:43:29,349 --> 00:43:26,400
the system is designed to encompass

1205
00:43:31,270 --> 00:43:29,359
conflict um and lay it bare so that

1206
00:43:32,870 --> 00:43:31,280
people can see that

1207
00:43:34,230 --> 00:43:32,880
you know there there wasn't

1208
00:43:36,230 --> 00:43:34,240
you know there wasn't necessarily a

1209
00:43:38,870 --> 00:43:36,240
resolution that it can remain an open

1210
00:43:42,390 --> 00:43:38,880
argument and so the ability to do that

1211
00:43:44,309 --> 00:43:42,400
is several-fold so at the level of an

1212
00:43:47,910 --> 00:43:44,319
argument

1213
00:43:49,109 --> 00:43:47,920

you can as a user go in and create

1214
00:43:52,150 --> 00:43:49,119
a linked

1215
00:43:53,910 --> 00:43:52,160
counter argument that says this is wrong

1216
00:43:55,750 --> 00:43:53,920
because

1217
00:43:57,270 --> 00:43:55,760
so the ability to create a new argument

1218
00:43:58,390 --> 00:43:57,280
depends on citing literature that

1219
00:44:00,309 --> 00:43:58,400
supports it

1220
00:44:02,390 --> 00:44:00,319
nothing appears without a connection to

1221
00:44:04,069 --> 00:44:02,400
the literature so at that level you can

1222
00:44:05,589 --> 00:44:04,079
create a counter argument

1223
00:44:07,990 --> 00:44:05,599
you can

1224
00:44:09,190 --> 00:44:08,000
at the level of evidence enter a comment

1225
00:44:11,349 --> 00:44:09,200
that says

1226
00:44:13,670 --> 00:44:11,359
this person got it wrong

1227
00:44:15,510 --> 00:44:13,680
and and this is why i think so

1228
00:44:19,109 --> 00:44:15,520
and i'm going to cite this piece of

1229
00:44:20,550 --> 00:44:19,119
literature to to support my case so

1230
00:44:23,589 --> 00:44:20,560
the very first level at which that

1231
00:44:25,349 --> 00:44:23,599
happens is the level of review uh if if

1232
00:44:27,270 --> 00:44:25,359
you know just as in peer review you may

1233
00:44:28,870 --> 00:44:27,280
have a reviewer who comes back and says

1234
00:44:31,190 --> 00:44:28,880
i completely disagree

1235
00:44:34,710 --> 00:44:31,200
there has to be some resolution

1236
00:44:37,349 --> 00:44:34,720
and and one possible resolution is that

1237
00:44:39,910 --> 00:44:37,359
the reviewer writes a counter argument

1238
00:44:41,109 --> 00:44:39,920

right so so the initial argument gets

1239
00:44:42,950 --> 00:44:41,119
placed in the knowledge base the

1240
00:44:45,270 --> 00:44:42,960
reviewer writes a counter argument but

1241
00:44:47,109 --> 00:44:45,280
um i think that's an important

1242
00:44:49,030 --> 00:44:47,119
area that i may be

1243
00:44:51,510 --> 00:44:49,040
rushed over a little bit is is the

1244
00:44:53,829 --> 00:44:51,520
notion that you know so often we go

1245
00:44:54,790 --> 00:44:53,839
through some process emerge with an

1246
00:44:57,270 --> 00:44:54,800
answer

1247
00:44:58,950 --> 00:44:57,280
and all of the value that's left that

1248
00:45:01,190 --> 00:44:58,960
that relates to the discussion that

1249
00:45:03,190 --> 00:45:01,200
underlay that answer

1250
00:45:04,790 --> 00:45:03,200
can kind of get lost when that goes away

1251
00:45:07,030 --> 00:45:04,800
and we just take the answer at face

1252
00:45:09,510 --> 00:45:07,040
value the purpose of this is to place

1253
00:45:12,309 --> 00:45:09,520
the value on the discussion itself

1254
00:45:14,630 --> 00:45:12,319
and then leave it to a proposer say

1255
00:45:16,870 --> 00:45:14,640
to take those arguments give them some

1256
00:45:18,309 --> 00:45:16,880
weight and say this is what i think the

1257
00:45:20,790 --> 00:45:18,319
appropriate way forward is or this is

1258
00:45:23,430 --> 00:45:20,800
why this is the best thing to use um so

1259
00:45:25,910 --> 00:45:23,440
we are not trying to

1260
00:45:27,829 --> 00:45:25,920
create a way to to necessarily weigh the

1261
00:45:29,430 --> 00:45:27,839
arguments but rather to let the

1262
00:45:31,109 --> 00:45:29,440
arguments just be established and not

1263
00:45:32,550 --> 00:45:31,119

let users

1264
00:45:34,230 --> 00:45:32,560
go where they think with it

1265
00:45:36,309 --> 00:45:34,240
so it's the arguments as the arguments

1266
00:45:37,910 --> 00:45:36,319
filled up over time

1267
00:45:39,510 --> 00:45:37,920
everything laid out

1268
00:45:41,270 --> 00:45:39,520
um

1269
00:45:43,829 --> 00:45:41,280
yeah that certainly is the idea jen did

1270
00:45:46,150 --> 00:45:43,839
you want to add something

1271
00:45:47,750 --> 00:45:46,160
yeah so so that's very much the idea and

1272
00:45:49,030 --> 00:45:47,760
the other the other notion behind the

1273
00:45:50,710 --> 00:45:49,040
system is

1274
00:45:51,750 --> 00:45:50,720
you know there are many cases where for

1275
00:45:53,910 --> 00:45:51,760
a given

1276
00:45:56,069 --> 00:45:53,920
biosignature or suite of biosignatures

1277
00:45:57,750 --> 00:45:56,079
there'll be a very substantive important

1278
00:45:59,589 --> 00:45:57,760
paper that comes out and captures the

1279
00:46:01,109 --> 00:45:59,599
state of the art at that time and then

1280
00:46:03,109 --> 00:46:01,119
time passes and maybe something else

1281
00:46:05,510 --> 00:46:03,119
important happens and and you know that

1282
00:46:08,150 --> 00:46:05,520
sort of gets lost and so the idea here

1283
00:46:10,230 --> 00:46:08,160
has been to create a way

1284
00:46:12,470 --> 00:46:10,240
to track in real time on sort of a

1285
00:46:15,430 --> 00:46:12,480
living basis how our thinking about it

1286
00:46:16,630 --> 00:46:15,440
evolves and emerges

1287
00:46:22,069 --> 00:46:16,640
thank you

1288
00:46:22,079 --> 00:46:25,990

the national university in mexico

1289
00:46:29,670 --> 00:46:26,870
this is

1290
00:46:31,910 --> 00:46:29,680
a great tool thank you i i

1291
00:46:34,710 --> 00:46:31,920
learned how to write a paper

1292
00:46:37,270 --> 00:46:34,720
by doing it and it was like

1293
00:46:38,069 --> 00:46:37,280
what wasn't it though

1294
00:46:39,910 --> 00:46:38,079
so

1295
00:46:44,150 --> 00:46:39,920
it is great that you have done this but

1296
00:46:47,829 --> 00:46:44,160
i was curious about um when you use the

1297
00:46:48,950 --> 00:46:47,839
atacama dessert experiments for

1298
00:46:51,430 --> 00:46:48,960
um

1299
00:46:54,069 --> 00:46:51,440
the biking experiment i was curious

1300
00:46:56,630 --> 00:46:54,079
about how the students respond when they

1301
00:46:59,030 --> 00:46:56,640
saw the biman response which has a lot

1302
00:47:01,670 --> 00:46:59,040
of arguments but has some adjectives too

1303
00:47:03,829 --> 00:47:01,680
that doesn't seem like

1304
00:47:05,829 --> 00:47:03,839
it should be in science but i mean

1305
00:47:09,190 --> 00:47:05,839
because most of my students when they

1306
00:47:11,589 --> 00:47:09,200
read that i i made it read both papers

1307
00:47:14,150 --> 00:47:11,599
so they are very surprised about this

1308
00:47:16,470 --> 00:47:14,160
and i was wondering how the students

1309
00:47:18,150 --> 00:47:16,480
take that and what do they learn if it's

1310
00:47:21,430 --> 00:47:18,160
the same experience as

1311
00:47:23,109 --> 00:47:21,440
i have in mexico or is this different

1312
00:47:25,349 --> 00:47:23,119
we have a special relationship with that

1313
00:47:27,670 --> 00:47:25,359

paper because he was my advice also my

1314
00:47:30,150 --> 00:47:27,680
patreon party sources it's like special

1315
00:47:31,589 --> 00:47:30,160
for us but i wanted to know about people

1316
00:47:33,510 --> 00:47:31,599
who is not

1317
00:47:35,670 --> 00:47:33,520
who has not that link

1318
00:47:37,430 --> 00:47:35,680
yep um great questions and maybe i could

1319
00:47:39,430 --> 00:47:37,440
ask jen and claire to weigh in on that

1320
00:47:42,150 --> 00:47:39,440
since um that specifically was what you

1321
00:47:45,030 --> 00:47:42,160
were looking at

1322
00:47:46,390 --> 00:47:45,040
can you repeat it repeat it yeah so um

1323
00:47:48,630 --> 00:47:46,400
so to make sure that i understood

1324
00:47:51,190 --> 00:47:48,640
correctly um

1325
00:47:52,950 --> 00:47:51,200
how how did you you know the

1326
00:47:56,069 --> 00:47:52,960
the literature that came around at that

1327
00:47:58,069 --> 00:47:56,079
time was lively um as as it sometimes is

1328
00:48:00,549 --> 00:47:58,079
and when you encountered that if i'm

1329
00:48:02,549 --> 00:48:00,559
understanding the question correctly um

1330
00:48:03,910 --> 00:48:02,559
how did you feel about trying to to sort

1331
00:48:06,309 --> 00:48:03,920
of capture that in the knowledge base

1332
00:48:08,390 --> 00:48:06,319
and it was very passionate the the

1333
00:48:10,630 --> 00:48:08,400
discussion about the the banking

1334
00:48:13,670 --> 00:48:10,640
experience because they were i mean it

1335
00:48:15,030 --> 00:48:13,680
was not only the papers but it was uh a

1336
00:48:16,870 --> 00:48:15,040
huge deal

1337
00:48:18,470 --> 00:48:16,880
in the present and i think several of

1338
00:48:19,670 --> 00:48:18,480

those papers have the same thing that

1339
00:48:22,630 --> 00:48:19,680
there was things

1340
00:48:26,870 --> 00:48:22,640
in the paper so the students respond

1341
00:48:29,589 --> 00:48:26,880
when they saw that science is not only

1342
00:48:31,829 --> 00:48:29,599
these arguments but there are some

1343
00:48:34,710 --> 00:48:31,839
passions there that are that are

1344
00:48:36,549 --> 00:48:34,720
presented in papers which is

1345
00:48:41,829 --> 00:48:36,559
yeah i don't know

1346
00:48:51,670 --> 00:48:43,109
yeah

1347
00:48:53,990 --> 00:48:51,680
i think we did that even more probably

1348
00:48:55,589 --> 00:48:54,000
with we had more people focused on the

1349
00:48:58,150 --> 00:48:55,599
mckay paper

1350
00:49:02,069 --> 00:48:58,160
and we split that up into uh more

1351
00:49:05,510 --> 00:49:02,079
categories so i'm sorry to to kind of uh

1352
00:49:08,150 --> 00:49:05,520
not focus on the biking as much but um

1353
00:49:10,309 --> 00:49:08,160
but i can comment on um i think we went

1354
00:49:12,630 --> 00:49:10,319
into more detail on the mckay and

1355
00:49:14,470 --> 00:49:12,640
everybody got to read many many papers

1356
00:49:16,230 --> 00:49:14,480
so we might have represented that one a

1357
00:49:18,470 --> 00:49:16,240
little more in detail whereas i think

1358
00:49:20,309 --> 00:49:18,480
the the viking one as opposed to

1359
00:49:22,950 --> 00:49:20,319
focusing on all the literature from the

1360
00:49:24,790 --> 00:49:22,960
70s we kind of zoomed forward a little

1361
00:49:27,670 --> 00:49:24,800
bit and focused more on the

1362
00:49:35,109 --> 00:49:27,680
perforate which i don't think they knew

1363
00:49:40,230 --> 00:49:37,589

um so i

1364
00:49:42,630 --> 00:49:40,240
i think the the focus on the more recent

1365
00:49:44,150 --> 00:49:42,640
literature um

1366
00:49:46,309 --> 00:49:44,160
to a point was kind of just time

1367
00:49:49,270 --> 00:49:46,319
constraint um and

1368
00:49:51,829 --> 00:49:49,280
being in the nasa office hours it was

1369
00:49:54,390 --> 00:49:51,839
like for there's there is um even within

1370
00:49:57,030 --> 00:49:54,400
the subject of performance there is a

1371
00:49:59,190 --> 00:49:57,040
enough for me to have a substantial

1372
00:50:01,510 --> 00:49:59,200
substantial argument to add to the

1373
00:50:03,670 --> 00:50:01,520
knowledge base i think there are

1374
00:50:04,549 --> 00:50:03,680
a lot of papers that came out of the

1375
00:50:07,190 --> 00:50:04,559
vice

1376
00:50:09,829 --> 00:50:07,200
lander experiments that can definitely

1377
00:50:12,790 --> 00:50:09,839
be explored but i think the focus for

1378
00:50:15,829 --> 00:50:12,800
that was just essentially i

1379
00:50:18,950 --> 00:50:15,839
you know part of the project was to find

1380
00:50:21,829 --> 00:50:18,960
a very specific set of papers

1381
00:50:24,150 --> 00:50:21,839
um that are highly relevant to a very

1382
00:50:26,549 --> 00:50:24,160
specific argument

1383
00:50:28,790 --> 00:50:26,559
so i think there could be a multitude of

1384
00:50:31,510 --> 00:50:28,800
other arguments that could be added

1385
00:50:33,750 --> 00:50:31,520
um to that specific section of the

1386
00:50:35,270 --> 00:50:33,760
database

1387
00:50:37,109 --> 00:50:35,280
can i say one more thing

1388
00:50:39,270 --> 00:50:37,119

yeah that was great you know i will say

1389
00:50:40,790 --> 00:50:39,280
one really interesting thing that that

1390
00:50:43,750 --> 00:50:40,800
came out of these discussions in the

1391
00:50:45,349 --> 00:50:43,760
office hours um is that we went through

1392
00:50:46,950 --> 00:50:45,359
i'll just talk about the mckay one for

1393
00:50:48,870 --> 00:50:46,960
instance we went through every piece of

1394
00:50:50,950 --> 00:50:48,880
evidence which i had actually done as an

1395
00:50:52,710 --> 00:50:50,960
undergrad with roger buick at one point

1396
00:50:54,470 --> 00:50:52,720
as well and then got to go back as a

1397
00:50:56,230 --> 00:50:54,480
professor now and look through all these

1398
00:50:57,910 --> 00:50:56,240
and we went through biotic and abiotic

1399
00:51:00,950 --> 00:50:57,920
on every single one of those items and

1400
00:51:03,750 --> 00:51:00,960
the one that we i challenged someone to

1401
00:51:07,030 --> 00:51:03,760
find and emmy if emmy's here it was her

1402
00:51:08,390 --> 00:51:07,040
if it was her emmy hughes is who's a

1403
00:51:09,510 --> 00:51:08,400
one of our students and is at this

1404
00:51:12,790 --> 00:51:09,520
conference

1405
00:51:14,549 --> 00:51:12,800
we were looking for abiotic ways of

1406
00:51:18,309 --> 00:51:14,559
magnetite

1407
00:51:20,790 --> 00:51:18,319
and

1408
00:51:22,470 --> 00:51:20,800
the way it's aligned in that meteorite

1409
00:51:25,270 --> 00:51:22,480
and we could not find

1410
00:51:27,190 --> 00:51:25,280
any abiotic way to do that so far so

1411
00:51:31,589 --> 00:51:27,200
that's something it just forces you to

1412
00:51:33,750 --> 00:51:31,599
really hunt you know for these um

1413
00:51:35,589 --> 00:51:33,760

you know abiotic mechanisms so so far

1414
00:51:38,230 --> 00:51:35,599
that's the only thing that still stands

1415
00:51:41,030 --> 00:51:38,240
as far as i know from the uh

1416
00:51:42,630 --> 00:51:41,040
the k paper we still can't find a biotic

1417
00:51:43,430 --> 00:51:42,640
way of doing that

1418
00:51:47,109 --> 00:51:43,440
so

1419
00:51:50,390 --> 00:51:47,990
hi

1420
00:51:51,829 --> 00:51:50,400
my name is erica antil and i had two

1421
00:51:53,750 --> 00:51:51,839
questions the first one actually

1422
00:51:55,030 --> 00:51:53,760
dovetails on the previous question a

1423
00:51:57,670 --> 00:51:55,040
little bit where

1424
00:51:59,670 --> 00:51:57,680
i was wondering since this is a platform

1425
00:52:01,430 --> 00:51:59,680
it also really great talk by the way and

1426
00:52:02,710 --> 00:52:01,440
really great system since this is a

1427
00:52:04,309 --> 00:52:02,720
platform where it seems like you have

1428
00:52:05,910 --> 00:52:04,319
the potential for a lot of users are

1429
00:52:08,069 --> 00:52:05,920
there going to be like community

1430
00:52:09,030 --> 00:52:08,079
guidelines or some way of structuring it

1431
00:52:11,430 --> 00:52:09,040
that people

1432
00:52:13,670 --> 00:52:11,440
um you know there's not

1433
00:52:15,510 --> 00:52:13,680
unscientific uh you know kind of

1434
00:52:17,030 --> 00:52:15,520
feelings going into some of those

1435
00:52:22,710 --> 00:52:17,040
commentary in the back and forth that's

1436
00:52:25,750 --> 00:52:24,390
still hear me or should i just there we

1437
00:52:27,829 --> 00:52:25,760
go um

1438
00:52:29,750 --> 00:52:27,839

so great question i i think there are

1439
00:52:33,030 --> 00:52:29,760
two levels to that

1440
00:52:34,790 --> 00:52:33,040
one is that that each entry is curated

1441
00:52:38,150 --> 00:52:34,800
and so if you're actually adding new

1442
00:52:39,750 --> 00:52:38,160
content there is a person there who's

1443
00:52:42,150 --> 00:52:39,760
you know who who's not

1444
00:52:44,390 --> 00:52:42,160
weighing you know this is right or wrong

1445
00:52:46,870 --> 00:52:44,400
but is there to help deal with the kind

1446
00:52:48,950 --> 00:52:46,880
of thing that you're talking about right

1447
00:52:50,150 --> 00:52:48,960
i think we have something built into the

1448
00:52:53,109 --> 00:52:50,160
way that we

1449
00:53:04,150 --> 00:52:53,119
engage new users graham do we

1450
00:53:07,270 --> 00:53:05,670
um yeah so we don't actually have like

1451
00:53:09,109 --> 00:53:07,280
the community guidelines set up right

1452
00:53:10,549 --> 00:53:09,119
now for new users

1453
00:53:12,470 --> 00:53:10,559
but whenever you try to provide a

1454
00:53:13,589 --> 00:53:12,480
comment or a new argument or piece of

1455
00:53:14,950 --> 00:53:13,599
evidence

1456
00:53:16,150 --> 00:53:14,960
it doesn't actually become visible to

1457
00:53:19,510 --> 00:53:16,160
anyone else

1458
00:53:21,750 --> 00:53:19,520
until it's been vetted by our curators

1459
00:53:23,270 --> 00:53:21,760
to make sure one there's no spam but

1460
00:53:25,270 --> 00:53:23,280
also to make sure there's no you know

1461
00:53:27,190 --> 00:53:25,280
harassing language or any of those kinds

1462
00:53:28,710 --> 00:53:27,200
of issues that come up as well

1463
00:53:30,309 --> 00:53:28,720

but it is a good point we really haven't

1464
00:53:32,790 --> 00:53:30,319
addressed you know like guidelines for

1465
00:53:34,309 --> 00:53:32,800
community behavior necessarily yet but i

1466
00:53:36,790 --> 00:53:34,319
feel like at least this way we have some

1467
00:53:38,870 --> 00:53:36,800
built-in process to avoid any major

1468
00:53:40,870 --> 00:53:38,880
issues that could come up

1469
00:53:42,150 --> 00:53:40,880
awesome that makes sense thank you um

1470
00:53:44,150 --> 00:53:42,160
and the other question that i'd had is

1471
00:53:46,309 --> 00:53:44,160
that you know you mentioned um needing

1472
00:53:48,069 --> 00:53:46,319
more input on some of the abiotic

1473
00:53:50,230 --> 00:53:48,079
aspects and i wondered if you had

1474
00:53:51,589 --> 00:53:50,240
considered collaborating um further

1475
00:53:53,510 --> 00:53:51,599
outside maybe the traditional

1476
00:53:55,910 --> 00:53:53,520
astrobiology community with like you

1477
00:53:57,990 --> 00:53:55,920
know chemistry and geology societies are

1478
00:54:00,230 --> 00:53:58,000
other places to to try to draw a little

1479
00:54:04,630 --> 00:54:00,240
bit more on the non-biological knowledge

1480
00:54:07,750 --> 00:54:04,640
base yeah def definitely yes um so so we

1481
00:54:10,230 --> 00:54:07,760
have in the works um maybe for late this

1482
00:54:11,829 --> 00:54:10,240
year or early next year a workshop that

1483
00:54:14,390 --> 00:54:11,839
will kind of focus on the abiotic

1484
00:54:17,270 --> 00:54:14,400
background specifically and the the

1485
00:54:19,270 --> 00:54:17,280
purpose is not just to

1486
00:54:21,109 --> 00:54:19,280
help understand the state of the art

1487
00:54:23,510 --> 00:54:21,119
from that community's perspective but

1488
00:54:25,510 --> 00:54:23,520

it's it's to engage those communities

1489
00:54:28,069 --> 00:54:25,520
and let them know their relevance to to

1490
00:54:31,109 --> 00:54:28,079
what's going on now um abiotic

1491
00:54:33,190 --> 00:54:31,119
background is is easily half of what we

1492
00:54:36,069 --> 00:54:33,200
need to understand in order to do this

1493
00:54:38,470 --> 00:54:36,079
right and the communities that that have

1494
00:54:39,750 --> 00:54:38,480
the most relevance to doing that i think

1495
00:54:42,470 --> 00:54:39,760
haven't necessarily perceived their

1496
00:54:43,349 --> 00:54:42,480
relevance and so so a good bit of our

1497
00:54:45,349 --> 00:54:43,359
job

1498
00:54:47,829 --> 00:54:45,359
is outreach and engagement we have a

1499
00:54:50,390 --> 00:54:47,839
person who's dedicated to doing that

1500
00:54:52,950 --> 00:54:50,400
and and we try to engage through the

1501
00:54:54,950 --> 00:54:52,960
rcns through the ags

1502
00:54:56,150 --> 00:54:54,960
and even through uh conferences

1503
00:54:57,589 --> 00:54:56,160
representing some of the groups that

1504
00:54:58,870 --> 00:54:57,599
you're talking about

1505
00:55:00,789 --> 00:54:58,880
to try to let them know what we have

1506
00:55:03,670 --> 00:55:00,799
going and it is always an ask right

1507
00:55:06,150 --> 00:55:03,680
you're asking for people's time um but

1508
00:55:09,349 --> 00:55:06,160
but that is expertise that i think if we

1509
00:55:11,430 --> 00:55:09,359
as a community want to do

1510
00:55:13,190 --> 00:55:11,440
you know our missions right we'll need

1511
00:55:19,589 --> 00:55:13,200
to tap

1512
00:55:19,599 --> 00:55:23,190
any other questions