
STORIES OF TOMORROW
STUDENTS' VISIONS
ON THE FUTURE
OF SPACE
EXPLORATION
LEARN MORE
PLATFORM
STORIES OF TOMORROW

1
00:00:06,789 --> 00:00:05,190
hello my name is juliana colanovakova

2
00:00:08,790 --> 00:00:06,799
i'm from the charles university in

3
00:00:09,910 --> 00:00:08,800
prague and the european astrobiology

4
00:00:12,390 --> 00:00:09,920
institute

5
00:00:13,669 --> 00:00:12,400
and today i'm presenting life beyond

6
00:00:15,990 --> 00:00:13,679
this project

7
00:00:17,189 --> 00:00:16,000
of astro belch outreach through science

8
00:00:19,910 --> 00:00:17,199
fiction

9
00:00:21,830 --> 00:00:19,920
this genre is especially well suited for

10
00:00:24,150 --> 00:00:21,840
outreach and education

11
00:00:26,550 --> 00:00:24,160
because to some extent it shapes the

12
00:00:27,830 --> 00:00:26,560
public beliefs and conceptions about

13
00:00:30,950 --> 00:00:27,840

science

14
00:00:32,150 --> 00:00:30,960
it can elicit curiosity and interest in

15
00:00:36,790 --> 00:00:32,160
stem

16
00:00:38,950 --> 00:00:36,800
provide a sandbox for new ideas so not

17
00:00:42,310 --> 00:00:38,960
just in science but also its

18
00:00:45,830 --> 00:00:42,320
social impacts or ethics and

19
00:00:49,110 --> 00:00:45,840
also using narrative and in general

20
00:00:52,389 --> 00:00:49,120
emotion uh has been shown to

21
00:00:54,950 --> 00:00:52,399
increase knowledge acquisition there

22
00:00:57,110 --> 00:00:54,960
exists uh the so-called narrative-based

23
00:00:59,510 --> 00:00:57,120
learning environments

24
00:01:01,590 --> 00:00:59,520
which can be used in both formal and

25
00:01:04,950 --> 00:01:01,600
informal education

26
00:01:05,350 --> 00:01:04,960
and many studies have shown that they

27
00:01:08,390 --> 00:01:05,360
are

28
00:01:12,149 --> 00:01:08,400
helpful for long-term memory and

29
00:01:14,230 --> 00:01:12,159
putting the facts in context

30
00:01:15,429 --> 00:01:14,240
and other studies have shown that they

31
00:01:18,230 --> 00:01:15,439
may not increase

32
00:01:19,510 --> 00:01:18,240
learning gains as opposed to traditional

33
00:01:22,070 --> 00:01:19,520
education

34
00:01:23,350 --> 00:01:22,080
but they do increase motivation for

35
00:01:26,870 --> 00:01:23,360
learning

36
00:01:27,749 --> 00:01:26,880
and the media used in nle can be audio

37
00:01:32,310 --> 00:01:27,759
visual

38
00:01:34,870 --> 00:01:32,320

literature games comics etc

39
00:01:36,550 --> 00:01:34,880
and public outreach of course can use a

40
00:01:40,469 --> 00:01:36,560
similar strategy

41
00:01:42,230 --> 00:01:40,479
for informal education and such examples

42
00:01:44,469 --> 00:01:42,240
are for instance

43
00:01:45,429 --> 00:01:44,479
special issues of science fiction

44
00:01:49,429 --> 00:01:45,439
magazines

45
00:01:52,310 --> 00:01:49,439
themed um about science such as

46
00:01:54,310 --> 00:01:52,320
the future science fiction issue about

47
00:01:58,069 --> 00:01:54,320
future medicine

48
00:02:01,270 --> 00:01:58,079
or there can be outreach

49
00:02:04,469 --> 00:02:01,280
such as andrew frankney uh

50
00:02:07,429 --> 00:02:04,479
using science fiction to teach astronomy

51
00:02:09,749 --> 00:02:07,439
or james cacalios using superhero

52
00:02:13,750 --> 00:02:09,759
stories to illustrate concepts

53
00:02:15,830 --> 00:02:13,760
in physics and in astrobiology there are

54
00:02:19,270 --> 00:02:15,840
also abundant examples

55
00:02:20,630 --> 00:02:19,280
of a similar approach for instance nasa

56
00:02:24,229 --> 00:02:20,640
releasing

57
00:02:27,510 --> 00:02:24,239
its graphic novels about astrobiology

58
00:02:31,030 --> 00:02:27,520
or the czech academy of sciences

59
00:02:34,710 --> 00:02:31,040
producing a series of comics

60
00:02:37,750 --> 00:02:34,720
about seismology magnetism and

61
00:02:38,229 --> 00:02:37,760
more upcoming topics which are in many

62
00:02:42,070 --> 00:02:38,239
ways

63
00:02:45,190 --> 00:02:42,080

related to astrobiology

64
00:02:48,309 --> 00:02:45,200
there's also theater especially

65
00:02:50,949 --> 00:02:48,319
uh the jet propulsion theater project

66
00:02:53,110 --> 00:02:50,959
which aims to teach planetary science

67
00:02:55,670 --> 00:02:53,120
and other sciences

68
00:02:58,110 --> 00:02:55,680
through augmented lectures and theater

69
00:03:00,630 --> 00:02:58,120
plays

70
00:03:03,190 --> 00:03:00,640
conferences have adopted the approach as

71
00:03:04,630 --> 00:03:03,200
well for instance last year's exoplanet

72
00:03:07,110 --> 00:03:04,640
demographics

73
00:03:08,710 --> 00:03:07,120
where each day's scientific

74
00:03:12,869 --> 00:03:08,720
contributions

75
00:03:16,630 --> 00:03:12,879
were accompanied by all science fiction

76
00:03:19,990 --> 00:03:16,640
stories and poems that were about

77
00:03:22,550 --> 00:03:20,000
the contributive topics

78
00:03:25,670 --> 00:03:22,560
and there are also many projects for

79
00:03:28,309 --> 00:03:25,680
children such as the stories of tomorrow

80
00:03:30,149 --> 00:03:28,319
where pupils and students can contribute

81
00:03:33,350 --> 00:03:30,159
their own stories

82
00:03:35,750 --> 00:03:33,360
about the future of space exploration

83
00:03:37,110 --> 00:03:35,760
including searching for life beyond

84
00:03:39,430 --> 00:03:37,120
earth

85
00:03:40,229 --> 00:03:39,440
so at the european astrobiology

86
00:03:44,390 --> 00:03:40,239
institute

87
00:03:48,229 --> 00:03:44,400
which was founded two years ago uh

88
00:03:50,470 --> 00:03:48,239

and among other things to increase our

89
00:03:52,149 --> 00:03:50,480
knowledge of astrobiology and master

90
00:03:55,190 --> 00:03:52,159
biology outreach

91
00:03:58,229 --> 00:03:55,200
we have utilized this approach

92
00:04:00,390 --> 00:03:58,239
as well and created the team science

93
00:04:01,030 --> 00:04:00,400
fiction as a tool for astrobiology

94
00:04:04,149 --> 00:04:01,040
outreach

95
00:04:08,869 --> 00:04:04,159
and education which i'm reading at the

96
00:04:11,830 --> 00:04:08,879
institute and last year we have released

97
00:04:14,789 --> 00:04:11,840
an ebook anthology strangest of all

98
00:04:17,030 --> 00:04:14,799
which was freely available for download

99
00:04:18,310 --> 00:04:17,040
and has been downloaded several thousand

100
00:04:21,909 --> 00:04:18,320
times

101
00:04:23,350 --> 00:04:21,919
and used in classrooms and astrobiology

102
00:04:25,510 --> 00:04:23,360
seminars

103
00:04:27,749 --> 00:04:25,520
it includes eight science fiction

104
00:04:29,670 --> 00:04:27,759
stories each accompanied by a

105
00:04:33,909 --> 00:04:29,680
non-fiction assign

106
00:04:37,110 --> 00:04:33,919
about the topic or present in the story

107
00:04:40,310 --> 00:04:37,120
such as life in subsurface oceans

108
00:04:43,350 --> 00:04:40,320
or dyson spheres

109
00:04:44,629 --> 00:04:43,360
as an example uh let's have a look at

110
00:04:49,110 --> 00:04:44,639
the story war

111
00:04:52,150 --> 00:04:49,120
ice universe by gerald david norbly

112
00:04:53,749 --> 00:04:52,160
which features life in a subsurface

113
00:04:57,189 --> 00:04:53,759

ocean

114
00:04:59,909 --> 00:04:57,199
of a warm europa and

115
00:05:02,390 --> 00:04:59,919
exploration of such a moon and the

116
00:05:05,990 --> 00:05:02,400
non-fiction assay which accompanies it

117
00:05:09,510 --> 00:05:06,000
explores how ubiquitous liquid water

118
00:05:10,150 --> 00:05:09,520
is in our solar system and the universe

119
00:05:13,749 --> 00:05:10,160
and

120
00:05:18,310 --> 00:05:13,759
uh what we know about uh the ocean

121
00:05:21,350 --> 00:05:18,320
of europa enceladus and other moons

122
00:05:24,790 --> 00:05:21,360
how such oceans are created and

123
00:05:27,990 --> 00:05:24,800
maintained which is especially

124
00:05:31,270 --> 00:05:28,000
tidal effects and

125
00:05:35,670 --> 00:05:31,280
finally also explores the question

126
00:05:40,150 --> 00:05:35,680
of energy and chemical gradients

127
00:05:43,749 --> 00:05:40,160
for life and how we might explore

128
00:05:46,870 --> 00:05:43,759
such oceans and even the existence of

129
00:05:50,070 --> 00:05:46,880
very exotic environments

130
00:05:52,550 --> 00:05:50,080
such as high-pressure ices on ganymede

131
00:05:54,070 --> 00:05:52,560
and other large moons and the

132
00:05:57,670 --> 00:05:54,080
possibility

133
00:06:01,909 --> 00:05:57,680
of sandwiched oceans created

134
00:06:08,469 --> 00:06:04,950
and even the uh wet success

135
00:06:11,430 --> 00:06:08,479
of this project we have decided to

136
00:06:14,070 --> 00:06:11,440
continue this approach with another

137
00:06:18,150 --> 00:06:14,080
anthology this time released in both

138
00:06:19,670 --> 00:06:18,160

print and ebook this one is titled life

139
00:06:22,710 --> 00:06:19,680
beyond us

140
00:06:25,909 --> 00:06:22,720
and plans to be released next september

141
00:06:28,790 --> 00:06:25,919
coinciding with the launch of

142
00:06:30,070 --> 00:06:28,800
european space agencies rosalind

143
00:06:32,950 --> 00:06:30,080
franklin rover

144
00:06:35,909 --> 00:06:32,960
to mars we have successfully

145
00:06:39,590 --> 00:06:35,919
kick-started this anthology

146
00:06:43,270 --> 00:06:39,600
this spring and it includes

147
00:06:45,830 --> 00:06:43,280
28 science fiction stories by

148
00:06:47,670 --> 00:06:45,840
award-winning world authors of science

149
00:06:51,749 --> 00:06:47,680
fiction

150
00:06:54,629 --> 00:06:51,759
most of whom have a stem background

151
00:06:55,270 --> 00:06:54,639
and each story will be accompanied by an

152
00:06:58,070 --> 00:06:55,280
essay

153
00:06:59,589 --> 00:06:58,080
by a professional astrobiologist

154
00:07:03,189 --> 00:06:59,599
researching the topic

155
00:07:05,990 --> 00:07:03,199
present in the story which uh

156
00:07:08,469 --> 00:07:06,000
range from the deep hot biosphere

157
00:07:11,909 --> 00:07:08,479
through exoplanet detection

158
00:07:15,749 --> 00:07:11,919
to topics such as life on titan

159
00:07:18,950 --> 00:07:15,759
or in general or the possibility of life

160
00:07:23,350 --> 00:07:18,960
in liquid hydrocarbons and other exotic

161
00:07:30,390 --> 00:07:27,029
and the author's sentiments can

162
00:07:32,070 --> 00:07:30,400
illustrate what we aim to achieve with

163
00:07:35,110 --> 00:07:32,080

this anthology

164
00:07:37,950 --> 00:07:35,120
it's especially all

165
00:07:39,270 --> 00:07:37,960
teaching people about the

166
00:07:42,950 --> 00:07:39,280
interdisciplinarity of

167
00:07:44,710 --> 00:07:42,960
astrobiology showing them the scientific

168
00:07:48,070 --> 00:07:44,720
method and the processes

169
00:07:52,309 --> 00:07:48,080
of science and eliciting more

170
00:07:53,589 --> 00:07:52,319
curiosity and as is illustrated well by

171
00:07:57,350 --> 00:07:53,599
this quote

172
00:07:58,629 --> 00:07:57,360
by stephen baxter i'm just old enough to

173
00:08:01,909 --> 00:07:58,639
remember the first

174
00:08:03,670 --> 00:08:01,919
mariner 4 pictures of mars the grainy

175
00:08:07,110 --> 00:08:03,680
so-called moonscape

176
00:08:10,790 --> 00:08:07,120
and now we can examine the sand grains

177
00:08:14,629 --> 00:08:10,800
and it shows how far we have got um

178
00:08:17,749 --> 00:08:14,639
in the past decades and

179
00:08:21,110 --> 00:08:17,759
we can in science fiction very well

180
00:08:24,390 --> 00:08:21,120
imagine what may happen

181
00:08:28,230 --> 00:08:24,400
in the next decades whether we'll find

182
00:08:32,790 --> 00:08:28,240
traces of past life on mars

183
00:08:35,829 --> 00:08:32,800
or whether we'll discover that venus

184
00:08:39,190 --> 00:08:35,839
likely had liquid water oceans for

185
00:08:41,990 --> 00:08:39,200
the larger part of its existence or

186
00:08:43,029 --> 00:08:42,000
we may detect some chemical this

187
00:08:45,829 --> 00:08:43,039
equilibria

188
00:08:46,870 --> 00:08:45,839

in exoplanet atmospheres which might

189
00:08:49,910 --> 00:08:46,880
indicate

190
00:08:53,430 --> 00:08:49,920
life presence there and

191
00:08:56,470 --> 00:08:53,440
the possibilities grow even larger

192
00:09:00,630 --> 00:08:56,480
with the passing time so

193
00:09:01,350 --> 00:09:00,640
life beyond us means to showcase to the

194
00:09:05,190 --> 00:09:01,360
public

195
00:09:07,310 --> 00:09:05,200
uh what astrobiology is and how

196
00:09:09,030 --> 00:09:07,320
rapidly growing and their

197
00:09:13,269 --> 00:09:09,040
interdisciplinary discipline

198
00:09:16,630 --> 00:09:13,279
it is and science fiction itself

199
00:09:20,630 --> 00:09:16,640
is so an interdisciplinary field

200
00:09:24,150 --> 00:09:20,640
combining art and drawing inspiration

201
00:09:24,949 --> 00:09:24,160
from sciences so it's especially well

202
00:09:27,990 --> 00:09:24,959
suited for

203
00:09:31,829 --> 00:09:28,000
outreach in this respect so

204
00:09:36,710 --> 00:09:31,839
let me conclude that using narrative

205
00:09:40,070 --> 00:09:36,720
is extremely useful in teaching uh

206
00:09:43,190 --> 00:09:40,080
and science fiction in particular uh

207
00:09:45,190 --> 00:09:43,200
lends itself to outreach because it

208
00:09:48,310 --> 00:09:45,200
shapes the public awareness

209
00:09:51,110 --> 00:09:48,320
and perception of science

210
00:09:52,150 --> 00:09:51,120
and for astrobiology it's well suited

211
00:09:55,350 --> 00:09:52,160
for

212
00:09:59,030 --> 00:09:55,360
because of its interdisciplinarity

213
00:10:00,150 --> 00:09:59,040

and because the interest in both science

214
00:10:02,829 --> 00:10:00,160
fiction

215
00:10:04,630 --> 00:10:02,839
and the search for life in the real

216
00:10:08,949 --> 00:10:04,640
world and will elicit

217
00:10:12,310 --> 00:10:08,959
in people and now it's time to

218
00:10:13,990 --> 00:10:12,320
welcome your questions so thank you for

219
00:10:17,670 --> 00:10:14,000
your attention