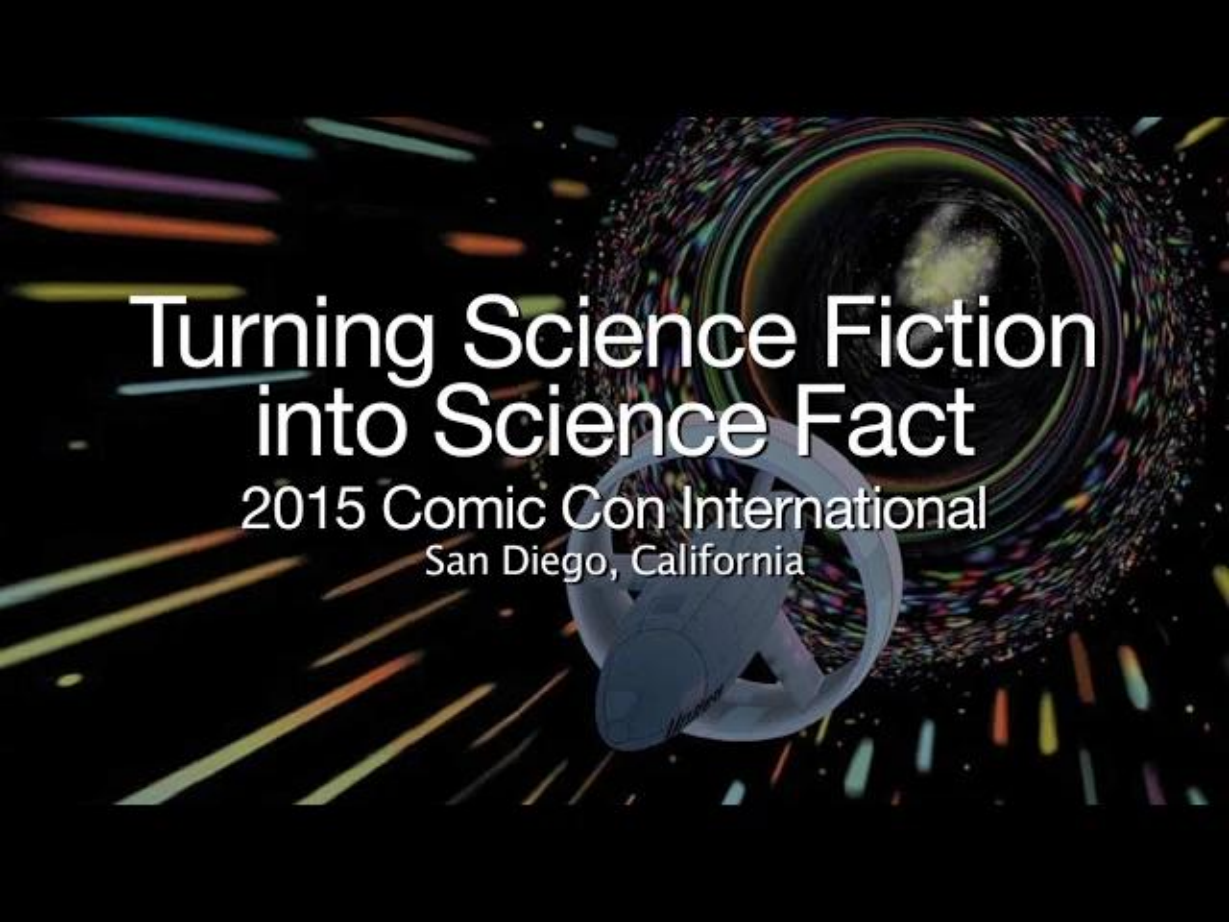
Turning Science Fiction into Science Fact
2015 Comic Con International
San Diego, California

1
00:00:10,330 --> 00:00:11,330
Wow.

2
00:00:11,330 --> 00:00:14,710
What's going on Comic-Com?

3
00:00:14,710 --> 00:00:21,800
Man, I can't tell you how pumped I am to be
here today with all you guys with this panel.

4
00:00:21,800 --> 00:00:24,340
This is a dream come true for me.

5
00:00:24,340 --> 00:00:27,960
So, what's everybody's name?

6
00:00:27,960 --> 00:00:29,500
Okay.

7
00:00:29,500 --> 00:00:30,500
Got it.

8
00:00:30,500 --> 00:00:31,500
All right.

9
00:00:31,500 --> 00:00:32,500
Good to meet you.

10
00:00:32,500 --> 00:00:33,500
My name's Jay Ferguson.

11
00:00:33,500 --> 00:00:37,070
I am--oh, thanks.

12
00:00:37,070 --> 00:00:40,420
Hey, mom.

13

00:00:40,420 --> 00:00:52,260
I am a lifelong sci-fi/all things space related
nerd, geek, fan boy, bordering on the obsessive

14
00:00:52,260 --> 00:00:57,510
at times, which I feel like a couple of you
in this room might know what I'm talking about.

15
00:00:57,510 --> 00:01:01,080
Quick story.

16
00:01:01,080 --> 00:01:04,340
I was around 33 and my wife and I were about
to be married.

17
00:01:04,340 --> 00:01:08,870
And we woke up one morning and we were having
coffee and she said to me, you know, Jay,

18
00:01:08,870 --> 00:01:13,000
I've been really tolerant, I've been really
patient, but I just cannot wake up one more

19
00:01:13,000 --> 00:01:18,690
morning opening my eyes to Darth Vader looking
down on me from your framed Empire Strikes

20
00:01:18,690 --> 00:01:21,460
Back poster on your wall.

21
00:01:21,460 --> 00:01:25,780
Conversely, there was a Star Wars poster on
all of my walls.

22
00:01:25,780 --> 00:01:31,070
But, now, I'm 40 and the Star Wars posters
aren't on my walls anymore, but they are on

23
00:01:31,070 --> 00:01:32,570
my son's.

24
00:01:32,570 --> 00:01:35,860
I am proudly raising three little nerds.

25
00:01:35,860 --> 00:01:40,240
Took them to Star Wars celebration a little
while back.

26
00:01:40,240 --> 00:01:43,150
It's pretty awesome.

27
00:01:43,150 --> 00:01:50,460
You know, the beginning of my love of space
and sci-fi really started with Star Wars.

28
00:01:50,460 --> 00:01:53,030
That was kind of the fantastical side of it.

29
00:01:53,030 --> 00:01:58,909
Then it hit on a real side for me when I saw
the right stuff and that became kind of the

30
00:01:58,909 --> 00:02:02,880
catalyst for me to follow my dream of becoming
an astronaut.

31
00:02:02,880 --> 00:02:06,659
So, I started to do all the things I thought
I needed to do to do that.

32
00:02:06,659 --> 00:02:08,670
I went to Space Camp when I was 16.

33
00:02:08,670 --> 00:02:13,380
For those of you who went to Space Camp, I
went to Aviation Challenge as well.

34
00:02:13,380 --> 00:02:14,720
Great time out there.

35
00:02:14,720 --> 00:02:15,720
Incredible experience.

36
00:02:15,720 --> 00:02:18,590
To follow that up, go into the Air Force Academy
in Colorado Springs.

37
00:02:18,590 --> 00:02:21,270
I had every intention of going there.

38
00:02:21,270 --> 00:02:22,270
All right.

39
00:02:22,270 --> 00:02:24,060
Then I took flying lessons.

40
00:02:24,060 --> 00:02:29,420
Got about two flying lessons in, and it became
quickly apparent to me that I was going to

41
00:02:29,420 --> 00:02:34,900
have a hard time piloting a shuttle or any
other spacecraft if I couldn't stop throwing

42
00:02:34,900 --> 00:02:36,209
up.

43
00:02:36,209 --> 00:02:39,620
So, those dreams were dashed.

44
00:02:39,620 --> 00:02:48,670
But, I was afforded this incredible opportunity
to become a mediocre actor and excel at that.

45
00:02:48,670 --> 00:02:51,470
But, this topic is really incredible.

46

00:02:51,470 --> 00:02:57,580
You know, turning science fiction to science
reality is a real deal now.

47
00:02:57,580 --> 00:03:03,180
I mean, you know, you think about the guy
making the video phone call to his daughter

48
00:03:03,180 --> 00:03:09,459
on her birthday in 2001 and you think about
the com links in Star Trek and then you look

49
00:03:09,459 --> 00:03:10,739
at this, you know?

50
00:03:10,739 --> 00:03:11,740
Those are just toys.

51
00:03:11,740 --> 00:03:14,740
You know, you got Lexus coming out with the
hover board.

52
00:03:14,740 --> 00:03:16,270
Unbelievable, right?

53
00:03:16,270 --> 00:03:18,070
But, these are all just fun things.

54
00:03:18,070 --> 00:03:25,070
I mean, I think that really I believe--and
it might seem a little bit silly, but, you

55
00:03:25,070 --> 00:03:32,290
know, to me, the survival of mankind depends
upon what these people on this panel are doing

56
00:03:32,290 --> 00:03:34,060
with their life's calling.

57

00:03:34,060 --> 00:03:42,100
And it is--yeah.

58
00:03:42,100 --> 00:03:49,230
And it is absolutely imparent [sic]--imperative,
excuse me, that, you know, we continue to

59
00:03:49,230 --> 00:03:53,210
raise awareness for the Space Program, we
continue to raise awareness for space travel.

60
00:03:53,210 --> 00:03:56,590
It depends heavily upon public opinion and
public support.

61
00:03:56,590 --> 00:04:00,550
And without it, it is--makes their job a lot
harder.

62
00:04:00,550 --> 00:04:03,070
So, continue to spread the word.

63
00:04:03,070 --> 00:04:07,810
Why don't we get started, huh?

64
00:04:07,810 --> 00:04:13,430
So, first thing we're going to do--man, this
is so cool.

65
00:04:13,430 --> 00:04:14,599
I don't know about you guys.

66
00:04:14,599 --> 00:04:20,489
I watched every single piece of the International
Space Station built live on NASA TV from my

67
00:04:20,489 --> 00:04:21,650
computer.

68

00:04:21,650 --> 00:04:26,009
My wife would walk in and wonder if I had
lost my mind.

69
00:04:26,009 --> 00:04:34,030
So, it is my absolute pleasure to introduce
a little video greeting from the International

70
00:04:34,030 --> 00:04:37,089
Space Station.

71
00:04:37,089 --> 00:04:46,319
And this is featuring Scott Kelly, who is
currently on the station on a year trip.

72
00:04:46,319 --> 00:04:50,400
He's about 100 and some odd days into it,
I believe.

73
00:04:50,400 --> 00:04:55,949
So, let's roll it.

74
00:04:55,949 --> 00:05:18,409
I'm Astronaut Scott Kelly of NASA aboard the
International Space Station.

75
00:05:18,409 --> 00:05:25,619
I'm flying at a speed of five miles a second,
250 miles above the earth aboard this magnificent

76
00:05:25,619 --> 00:05:32,919
laboratory where every day we turn science
fiction into science fact.

77
00:05:32,919 --> 00:05:35,580
It can't be a station adventure [sp] without
robots.

78
00:05:35,580 --> 00:05:41,279
Like the droids in Star Wars, we're testing

robotic devices to help perform autonomous

79
00:05:41,279 --> 00:05:46,910
satellite servicing in the future and other
selected tasks normally reserved for astronauts

80
00:05:46,910 --> 00:05:50,280
to conduct during space walks.

81
00:05:50,280 --> 00:05:56,449
And very much like in the movie, 2001: A Space
Odyssey, the space station is a destination

82
00:05:56,449 --> 00:06:02,300
for commercial companies to deliver cargo,
and in the not too distant future, astronauts

83
00:06:02,300 --> 00:06:03,659
as well.

84
00:06:03,659 --> 00:06:09,749
As I conduct research during my one year mission
on the station, lessons learned will pave

85
00:06:09,749 --> 00:06:17,110
the way for a journey to Mars.

86
00:06:17,110 --> 00:06:25,600
Oh my God, that's Scott Kelly.

87
00:06:25,600 --> 00:06:28,430
All right.

88
00:06:28,430 --> 00:06:30,840
Let's meet our panelists, shall we?

89
00:06:30,840 --> 00:06:34,099
To my left here, we have Amber Straughn.

90
00:06:34,099 --> 00:06:35,199
She is an astrophysicist.

91
00:06:35,199 --> 00:06:36,949
Let me tell you something.

92
00:06:36,949 --> 00:06:41,139
I don't get starstruck easily by, like, actors
or musicians, but you put an astrophysicist

93
00:06:41,139 --> 00:06:44,569
in front of me and I become like a giddy fifth
grader; okay?

94
00:06:44,569 --> 00:06:47,229
She's from NASA Goddard Space Flight Center.

95
00:06:47,229 --> 00:06:50,060
Goddard was the name of my team at Space Camp,
by the way.

96
00:06:50,060 --> 00:06:51,060
That's awesome.

97
00:06:51,060 --> 00:06:54,289
Amber works on subjects ranging from the James
Webb Telescope to exoplanets.

98
00:06:54,289 --> 00:06:56,409
Why don't you tell us a little bit more about
what's going on, Amber?

99
00:06:56,409 --> 00:06:57,409
Sure.

100
00:06:57,409 --> 00:06:58,409
Well, there's a lot going on.

101

00:06:58,409 --> 00:07:04,399
As an astrophysicist, I use the Hubble Space Telescope and telescopes on the ground to

102
00:07:04,399 --> 00:07:08,789
study how stars and black holes form in distant galaxies, which is pretty much an incredible

103
00:07:08,789 --> 00:07:09,789
job.

104
00:07:09,789 --> 00:07:10,849
So, it's a lot of fun.

105
00:07:10,849 --> 00:07:15,210
And I also work, as Jay said, on the James Webb Space Telescope that we're building right

106
00:07:15,210 --> 00:07:21,639
now and we're launching in 2018.

107
00:07:21,639 --> 00:07:22,639
And I'll talk a little bit more about that.

108
00:07:22,639 --> 00:07:23,639
Yeah, it's very exciting.

109
00:07:23,639 --> 00:07:26,679
Next, we have Kevin Hamm--Hand, excuse me, Kevin; Deputy Chief Scientist for Solar System

110
00:07:26,679 --> 00:07:29,520
Exploration from JPL.

111
00:07:29,520 --> 00:07:34,099
Kevin's an astrobiologist and planetary scientist and a National Geographic Explorer.

112
00:07:34,099 --> 00:07:35,250

Stop showing off already.

113
00:07:35,250 --> 00:07:40,169
Kev, why don't you tell us a little bit about
what's going on, buddy?

114
00:07:40,169 --> 00:07:46,080
Well, my focus is on what I like to call the
ocean worlds of the outer solar system; these

115
00:07:46,080 --> 00:07:50,069
moons that have liquid water beneath their
icy shells.

116
00:07:50,069 --> 00:07:56,190
And these are worlds where I think we might
be able to go in the coming decades and actually

117
00:07:56,190 --> 00:07:57,539
find living life.

118
00:07:57,539 --> 00:08:04,229
Life that is alive today and we can poke and
prod it and see if life has originated a second

119
00:08:04,229 --> 00:08:06,119
time in our own backyard.

120
00:08:06,119 --> 00:08:09,110
So, we'll talk more about that.

121
00:08:09,110 --> 00:08:10,599
Yeah, that's exciting.

122
00:08:10,599 --> 00:08:11,599
Hello.

123
00:08:11,599 --> 00:08:12,599
Hello, sir.

124
00:08:12,599 --> 00:08:15,800
That guy's name is Adam Nimoy.

125
00:08:15,800 --> 00:08:24,250
And he is a producer and the son of space
royalty, Leonard Nimoy.

126
00:08:24,250 --> 00:08:32,950
Adam, why don't you say hello?

127
00:08:32,950 --> 00:08:37,060
Hi, my name is Adam Nimoy.

128
00:08:37,060 --> 00:08:44,320
I'm really happy to be here and share the
stage with such a distinguished panel.

129
00:08:44,320 --> 00:08:49,870
I'm here to talk a little bit about, For the
Love of Spock, a documentary I'm now writing

130
00:08:49,870 --> 00:08:55,200
and directing based on the life of Mr. Spock
and the life and legacy of Leonard Nimoy and

131
00:08:55,200 --> 00:08:56,740
the man who brought Spock to life.

132
00:08:56,740 --> 00:09:02,370
And we'll be talking a little bit more detail
about that later, but I'm really happy to

133
00:09:02,370 --> 00:09:03,370
be here.

134
00:09:03,370 --> 00:09:05,350
And I--you know, the turnout is phenomenal.

135
00:09:05,350 --> 00:09:06,350
Yeah, it's incredible.

136
00:09:06,350 --> 00:09:08,640
So, thank you all for coming out.

137
00:09:08,640 --> 00:09:09,640
All right, cool.

138
00:09:09,640 --> 00:09:15,140
Finally, we have Aditya Sood who is the producer
of a movie I think we're all excited about,

139
00:09:15,140 --> 00:09:20,560
The Martian.

140
00:09:20,560 --> 00:09:25,060
Coming up soon from 20th Century Fox starring
Matt Damon, the man.

141
00:09:25,060 --> 00:09:29,150
Why don't you drop a little fun little thing
on us right now?

142
00:09:29,150 --> 00:09:33,940
Well, apparently--and I didn't know this until
the beginning of this panel, I'm also responsible

143
00:09:33,940 --> 00:09:36,000
for, what was it, the future of humanity?

144
00:09:36,000 --> 00:09:37,000
That's right.

145
00:09:37,000 --> 00:09:38,000
Okay.

146
00:09:40,000 --> 00:09:39,000

Yeah.

147
00:09:40,000 --> 00:09:41,000
And--.

148
00:09:41,000 --> 00:09:42,000
--No pressure.

149
00:09:42,000 --> 00:09:43,000
What?

150
00:09:43,000 --> 00:09:44,000
Sorry?

151
00:09:46,000 --> 00:09:45,000
No pressure.

152
00:09:46,000 --> 00:09:49,080
Well, I'm really excited to be here and really,
really excited about The Martian, which, you

153
00:09:49,080 --> 00:09:56,560
know, was a book that Andy Weir wrote that
I found when it was still a self published

154
00:09:56,560 --> 00:09:57,560
book on Amazon.

155
00:09:57,560 --> 00:10:01,600
And here we are two and a half years later.

156
00:10:01,600 --> 00:10:09,400
And thanks to, you know, a lot of great people
at NASA, we are about to show it to the world

157
00:10:09,400 --> 00:10:11,090
on October 2nd.

158

00:10:11,090 --> 00:10:16,810
In fact, we actually have a little something
I'd like to show you guys if you're interested.

159
00:10:16,810 --> 00:10:17,810
Huh?

160
00:10:17,810 --> 00:10:26,280
Come on, let's see it, baby.

161
00:10:26,280 --> 00:10:28,710
Every human being has a basic instinct.

162
00:10:28,710 --> 00:10:31,370
To help each other out.

163
00:10:31,370 --> 00:10:36,080
If a hiker gets lost in the mountains, people
coordinate a search.

164
00:10:36,080 --> 00:10:44,510
If an earthquake levels the city, people all
over the world send emergency supplies.

165
00:10:44,510 --> 00:10:47,380
This instinct is found in every culture.

166
00:10:47,380 --> 00:10:50,340
Without exception.

167
00:10:50,340 --> 00:10:58,910
At around 4:30am our satellites detected a
storm approaching the ARES 3 mission side

168
00:10:58,910 --> 00:10:59,910
on Mars.

169
00:10:59,910 --> 00:11:11,290
The storm had escalated to severe and we had

no choice but to abort the mission.

170
00:11:11,290 --> 00:11:24,570
But, during the evacuation, astronaut Marc
Watney was killed.

171
00:11:24,570 --> 00:11:26,610
I'm entering this log for the record.

172
00:11:26,610 --> 00:11:33,780
This is Marc Watney, and I'm still alive,
obviously.

173
00:11:33,780 --> 00:11:38,230
I have no way to contact NASA or my crewmates.

174
00:11:38,230 --> 00:11:43,520
But, even if I could, it would take four years
for another manned mission to reach me, and

175
00:11:43,520 --> 00:11:46,250
I'm in a Hab designed to last 31 days.

176
00:11:46,250 --> 00:11:50,210
So, in the face of overwhelming odds, I'm
left with only one option.

177
00:11:50,210 --> 00:11:53,550
I'm gonna have to science the **** out of
this.

178
00:11:53,550 --> 00:11:56,190
Okay, let's do the math.

179
00:11:56,190 --> 00:12:01,620
I got to figure out how to grow four years
worth of food, here, on a planet where nothing

180
00:12:01,620 --> 00:12:02,620

grows.

181
00:12:02,620 --> 00:12:07,130
But, if I can't figure out a way to make contact
with NASA, none of this matters anyway.

182
00:12:07,130 --> 00:12:09,200
Houston be advised.

183
00:12:09,200 --> 00:12:12,670
We've got a video message.

184
00:12:12,670 --> 00:12:17,870
It's directed to the whole crew.

185
00:12:17,870 --> 00:12:19,800
Play it.

186
00:12:19,800 --> 00:12:24,630
Mark Watney is still alive.

187
00:12:24,630 --> 00:12:26,140
In your face, Neil Armstrong.

188
00:12:26,140 --> 00:12:27,940
We left him behind.

189
00:12:27,940 --> 00:12:30,180
Let's go get our boy.

190
00:12:30,180 --> 00:12:32,400
This is something NASA rejected.

191
00:12:32,400 --> 00:12:34,350
So, we're talking mutiny.

192
00:12:34,350 --> 00:12:38,170
And if we mess up the supply rendez-vous,

we die.

193
00:12:38,170 --> 00:12:44,750
If we mess-up the earth gravity assist, we
die.

194
00:12:44,750 --> 00:12:52,230
It's space, it doesn't cooperate.

195
00:12:52,230 --> 00:13:04,360
I guarantee you, that at some point, everything
is gonna go south on you.

196
00:13:04,360 --> 00:13:08,430
And you're gonna say "this is it".

197
00:13:08,430 --> 00:13:12,040
"This is how I end."

198
00:13:12,040 --> 00:13:38,710
Is it possible that he's still alive?

199
00:13:38,710 --> 00:13:41,070
That guy really has it all, doesn't he?

200
00:13:41,070 --> 00:13:44,170
He's the bad guy in Interstellar; he's the
good guy in The Martian.

201
00:13:44,170 --> 00:13:46,650
I mean, good Lord.

202
00:13:46,650 --> 00:13:49,130
Well, that looks incredible.

203
00:13:49,130 --> 00:13:50,130
Really excited.

204

00:13:50,130 --> 00:13:51,630
All right.

205
00:13:51,630 --> 00:13:54,040
Let's get started with our first part here.

206
00:13:54,040 --> 00:14:01,170
Really just talking about the relationship
between space science and science fiction.

207
00:14:01,170 --> 00:14:08,430
Really throughout NASA's history, it's been
inspired by science fiction and it's conversely

208
00:14:08,430 --> 00:14:10,290
influenced it.

209
00:14:10,290 --> 00:14:14,380
So, I guess I'll pose it to you guys first.

210
00:14:14,380 --> 00:14:18,279
Amber, you can go first, you know?

211
00:14:18,279 --> 00:14:26,140
How were you directly influenced by pop culture
and sci-fi and everything under the sun there?

212
00:14:26,140 --> 00:14:27,140
Yeah, I definitely was.

213
00:14:27,140 --> 00:14:30,310
I think pop culture, science fiction all along
the way has had a big influence on me.

214
00:14:30,310 --> 00:14:35,070
I mean, yeah, movies like that and Star Trek,
the whole thing.

215
00:14:35,070 --> 00:14:37,750

It's just--yeah, it's awesome.

216
00:14:37,750 --> 00:14:42,650
I also--I grew up in rural Arkansas on a farm
in the middle of nowhere.

217
00:14:42,650 --> 00:14:46,460
And so, the beauty of the universe itself
has also been a big inspiration to me from

218
00:14:46,460 --> 00:14:48,770
the time I was a little kid.

219
00:14:48,770 --> 00:14:50,690
But, I think--I don't know.

220
00:14:50,690 --> 00:14:58,240
I think that the way that NASA and science
fiction sort of mutually influence each other

221
00:14:58,240 --> 00:14:59,240
is really cool.

222
00:14:59,240 --> 00:15:02,910
It's a really fun thing that happens.

223
00:15:02,910 --> 00:15:05,710
And I don't really think it's surprising.

224
00:15:05,710 --> 00:15:11,960
You know, I think both of these realms, science
fiction and NASA, they sort of strive for

225
00:15:11,960 --> 00:15:12,960
great things.

226
00:15:12,960 --> 00:15:18,529
You know, they're all about imaging a better
future, imagining things that is just barely

227
00:15:18,529 --> 00:15:20,990
beyond a reach of what we can do now.

228
00:15:20,990 --> 00:15:27,220
And I think that's why that they're so related
and they influence each other and why so many

229
00:15:27,220 --> 00:15:30,760
of us find those common interests of science
and science fiction.

230
00:15:30,760 --> 00:15:33,410
Kev, what about you, buddy?

231
00:15:33,410 --> 00:15:34,480
Similar influences.

232
00:15:34,480 --> 00:15:37,980
Yeah, I wanted to be Elliott in E.T.

233
00:15:37,980 --> 00:15:38,980
Mm-hmm.

234
00:15:38,980 --> 00:15:45,941
Grew up in Vermont and was always looking
for that spaceship in the woods.

235
00:15:45,941 --> 00:15:46,941
Sadly, it never came.

236
00:15:46,941 --> 00:15:48,100
Would you not be here anymore had it had?

237
00:15:48,100 --> 00:15:52,000
Think about where I would be.

238
00:15:52,000 --> 00:15:59,170

But, that sort of lifecycle of science fiction,
feeding into science fact, and then that continuous

239
00:15:59,170 --> 00:16:00,860
loop is so important.

240
00:16:00,860 --> 00:16:11,230
And just watching Aditya's great video here,
it makes me think of how long Mars has been

241
00:16:11,230 --> 00:16:15,960
in our sort of social consciousness.

242
00:16:15,960 --> 00:16:21,790
And I'd like to sort of put forth a challenge
to this community, such a creative community,

243
00:16:21,790 --> 00:16:28,010
that there are other worlds that really kind
of need your help to get imbedded into the

244
00:16:28,010 --> 00:16:29,270
social framework.

245
00:16:29,270 --> 00:16:33,450
These are worlds like Jupiter's moon, Europa;
Saturn's moon, Enceladus.

246
00:16:33,450 --> 00:16:37,500
These are not moons where we're necessarily
going to put astronauts down on the surface,

247
00:16:37,500 --> 00:16:42,300
although I did help out with the Europa report,
which I think did a really nice job with that.

248
00:16:42,300 --> 00:16:44,900
You know, we're going to be sending robots
there.

249
00:16:44,900 --> 00:16:51,870
And our ability as NASA to send robots to
these worlds is greatly helped by the degree

250
00:16:51,870 --> 00:17:01,300
to which the public identifies with and gets
the profound scientific potential and imagination

251
00:17:01,300 --> 00:17:04,529
of new worlds and new life forms that could
exist.

252
00:17:04,529 --> 00:17:07,270
So, please, you know, don't just think about
Mars.

253
00:17:07,270 --> 00:17:13,850
Think about all these other fascinating worlds
out there in our solar system.

254
00:17:13,850 --> 00:17:14,860
Amen.

255
00:17:14,860 --> 00:17:19,869
Also, I want to echo that because we need
a sequel to The Martian.

256
00:17:19,869 --> 00:17:21,559
Hey.

257
00:17:21,559 --> 00:17:24,409
Matt Damon on Europa or Kristen Wiig?

258
00:17:24,409 --> 00:17:25,669
That would be hilarious.

259
00:17:25,669 --> 00:17:28,350
Aditya, I'll throw it down to you?

260
00:17:28,350 --> 00:17:34,779
What do you think in the film and TV world
how NASA and the space program's been a heavy

261
00:17:34,779 --> 00:17:35,779
inspiration?

262
00:17:35,779 --> 00:17:37,999
Well, I--you know, I can just sort of speak
personally.

263
00:17:37,999 --> 00:17:42,919
I'm--you know, I'm, I think, roughly the same
age as you, Jay, and I kind of came of age,

264
00:17:42,919 --> 00:17:48,840
you know, definitely on Star Wars and definitely
on--actually, my personal guilty pleasure

265
00:17:48,840 --> 00:17:51,080
is 2010, the year we made contact.

266
00:17:51,080 --> 00:17:52,080
That's okay.

267
00:17:52,080 --> 00:17:53,080
Don't go to Europa.

268
00:17:53,080 --> 00:17:54,080
I feel the Europa love.

269
00:17:54,080 --> 00:17:55,559
Yeah, attempt no landings there.

270
00:17:55,559 --> 00:17:57,820
Oh, but we must.

271
00:17:57,820 --> 00:18:05,070

But, you know, equally important for me, actually,
my first real sort of memories or, you know,

272
00:18:05,070 --> 00:18:09,789
the first time I really thought about space
was a little program called 3-2-1 Contact,

273
00:18:09,789 --> 00:18:11,510
which, you know--.

274
00:18:11,510 --> 00:18:12,510
--Yep.

275
00:18:12,510 --> 00:18:18,789
I remember at the time, it was just when Voyager
2 was going by--was doing its flyby of Saturn.

276
00:18:18,789 --> 00:18:19,789
Mm-hmm.

277
00:18:19,789 --> 00:18:23,350
And I remember that just capturing my imagination
in such a profound way.

278
00:18:23,350 --> 00:18:29,399
And I also remember on a school field trip,
I think in kindergarten, listening on an AM

279
00:18:29,399 --> 00:18:33,990
radio to the landing of the first space shuttle
mission, the Columbia.

280
00:18:33,990 --> 00:18:40,820
And by the way, AM radio is what we used to
use to learn things before the internet, but

281
00:18:40,820 --> 00:18:44,290
after the telegraph.

282

00:18:44,290 --> 00:18:50,390
Adam, let's take it to you.

283
00:18:50,390 --> 00:18:55,871
What do you think the reason is that your
dad and Star Trek touched so many people and

284
00:18:55,871 --> 00:19:04,619
inspired a number of NASA scientists, astronauts,
engineers to pursue careers in their fields?

285
00:19:04,619 --> 00:19:10,070
Well, there's been a lot of commentary from
scientists about how they were inspired by

286
00:19:10,070 --> 00:19:11,070
Star Trek.

287
00:19:11,070 --> 00:19:15,299
It kind of--it does go hand in hand because
there was a lot of space program going on

288
00:19:15,299 --> 00:19:18,409
in the '60s when Star Trek came around.

289
00:19:18,409 --> 00:19:21,330
One of the things that we've heard--you know,
I've been doing a lot of interviewing for

290
00:19:21,330 --> 00:19:24,950
this film, For the Love of Spock and talking
to a lot of people about Star Trek and really

291
00:19:24,950 --> 00:19:29,230
kind of getting into the milieu of what people
are thinking and why it resonates--Star Trek

292
00:19:29,230 --> 00:19:30,230
resonates so much.

293
00:19:30,230 --> 00:19:34,980
And one of the things that people have commented
on repeatedly is the fact that Star Trek takes

294
00:19:34,980 --> 00:19:38,020
place in the 23rd century and the world is
good.

295
00:19:38,020 --> 00:19:43,080
You know, the future is good, which was particularly
interesting for the time period in which Star

296
00:19:43,080 --> 00:19:48,529
Trek was first premiered because we're dealing
with the '60s where there's all this social

297
00:19:48,529 --> 00:19:55,649
unrest and there's--the Cold War is still
kind of permeating society.

298
00:19:55,649 --> 00:19:58,929
There's anti-war demonstration going on.

299
00:19:58,929 --> 00:20:04,450
So, in the midst of all that kind of turmoil
of the '60s, this positive message that people

300
00:20:04,450 --> 00:20:09,370
can come together from all different backgrounds,
races, and nationalities, including, you know,

301
00:20:09,370 --> 00:20:13,580
a gentlemen who happens to be half alien and
work together for one common goal, which is

302
00:20:13,580 --> 00:20:15,130
space exploration.

303
00:20:15,130 --> 00:20:20,270

And the good of mankind is something that has, I think, inspired a lot of people.

304
00:20:20,270 --> 00:20:27,759
That just--yeah, I think that general message that Gene Roddenberry was trying to portray

305
00:20:27,759 --> 00:20:32,580
which is that the future is good; it's going to be good was a great inspiration to people.

306
00:20:32,580 --> 00:20:37,830
But, the other thing that is so interesting about Star Trek is that it really inspired

307
00:20:37,830 --> 00:20:39,970
a lot of creativity in the scientific community.

308
00:20:39,970 --> 00:20:42,259
There's so much technology in Star Trek.

309
00:20:42,259 --> 00:20:49,760
A lot of it just by--invented by necessity for the show to function that has come into

310
00:20:49,760 --> 00:20:50,760
reality.

311
00:20:50,760 --> 00:20:54,249
We're talking about communicators looking like--well, the old cell phone, you know?

312
00:20:54,249 --> 00:20:55,249
The flip--.

313
00:20:55,249 --> 00:20:56,249
--Yeah, the flip phone, yeah--.

314
00:20:56,249 --> 00:20:57,249

--Phone that we used to have, right?

315
00:20:57,249 --> 00:20:58,659
We're already past the communicator now.

316
00:20:58,659 --> 00:21:02,370
But, the whole idea of the personal computer.

317
00:21:02,370 --> 00:21:06,249
I mean, there's computers all over all--you know, on board the Starship Enterprise, which

318
00:21:06,249 --> 00:21:10,169
they interact with on a daily basis, which was not--there were no personal computers

319
00:21:10,169 --> 00:21:11,169
back then.

320
00:21:11,169 --> 00:21:14,480
So, that was something that was a challenge that inspired people.

321
00:21:14,480 --> 00:21:22,850
The whole idea of a space exploration--we haven't quite gotten the traveling faster

322
00:21:22,850 --> 00:21:26,110
than the speed of light, you know, quite under our belts yet.

323
00:21:26,110 --> 00:21:30,409
This idea of warping space so that we can get from one end of the galaxy to another

324
00:21:30,409 --> 00:21:33,769
within that one hour timeframe of network TV.

325

00:21:33,769 --> 00:21:38,919
You know, I mean, apparently the galaxy--I
just learned this from [unintelligible], the

326
00:21:38,919 --> 00:21:41,710
galaxy is 100,000 light years in diameter,
right?

327
00:21:41,710 --> 00:21:42,710
Okay.

328
00:21:42,710 --> 00:21:46,149
So, it would take a while for him to get one
to the other.

329
00:21:46,149 --> 00:21:50,070
So, there are all these--and then the whole
thing about beaming down the planet surface

330
00:21:50,070 --> 00:21:54,159
was something that is also inspired people
to try to figure out a way to strive for these

331
00:21:54,159 --> 00:21:55,159
things.

332
00:21:55,159 --> 00:21:59,429
We don't have the physics for it yet, necessarily,
but these are all things that have kind of

333
00:21:59,429 --> 00:22:04,840
driven the imagination of the scientific and
technological community to make into reality

334
00:22:04,840 --> 00:22:07,549
things that we were just dreaming about back
in the '60s.

335
00:22:07,549 --> 00:22:08,549
That's great.

336
00:22:08,549 --> 00:22:09,600
Can I just add something?

337
00:22:09,600 --> 00:22:10,600
Yeah, please.

338
00:22:10,600 --> 00:22:15,230
You were talking about the various devices
and it reminded one of the mythical things

339
00:22:15,230 --> 00:22:19,809
that we would love to create in the astrobiology
community that evades us is the tri-quarter.

340
00:22:19,809 --> 00:22:27,350
You know, we have meetings about what payload,
what instruments could help us definitively

341
00:22:27,350 --> 00:22:32,860
say whether or not we have found life and
we don't have the magical tri-quarter yet.

342
00:22:32,860 --> 00:22:36,909
We have various instruments can--that can
triangulate on the question.

343
00:22:36,909 --> 00:22:39,450
But, boy, I would love to have that little
thing that just tells me, oh, this is based

344
00:22:39,450 --> 00:22:41,999
on this kind of compound and such and such.

345
00:22:41,999 --> 00:22:44,179
This is the biochemistry.

346
00:22:44,179 --> 00:22:50,080
We're not there, but it's--the tri-quarter

is referenced constantly in the astrobiology

347
00:22:50,080 --> 00:22:51,379
world because we want one.

348
00:22:51,379 --> 00:22:52,379
We're getting close.

349
00:22:52,379 --> 00:22:56,690
Some of the rovers--some of those instruments
on the rovers, they're doing a smaller version

350
00:22:56,690 --> 00:22:57,760
of that.

351
00:22:59,760 --> 00:22:58,760
Yeah.

352
00:22:59,760 --> 00:23:00,760
Right.

353
00:23:00,760 --> 00:23:02,080
And one other thing, if--.

354
00:23:02,080 --> 00:23:03,159
--Oh, please.

355
00:23:03,159 --> 00:23:09,570
You know, you touched on creativity and I
think a lot of times when people think of

356
00:23:09,570 --> 00:23:10,570
science, they think of, you know, cut and
dry sort of cold facts.

357
00:23:10,570 --> 00:23:11,570
It's sort of separative from creativity.

358

00:23:11,570 --> 00:23:15,549
But, there is so much creativity that is required
to do all these awesome things that NASA does.

359
00:23:15,549 --> 00:23:20,130
You know, rovers on Mars and sending people
to Mars in the future and building these huge

360
00:23:20,130 --> 00:23:23,019
telescopes that we send out to space.

361
00:23:23,019 --> 00:23:27,350
Amazing amounts of creativity that are required
to make these things a reality.

362
00:23:27,350 --> 00:23:28,350
Absolutely.

363
00:23:28,350 --> 00:23:34,749
I mean, we would never go anywhere if anybody
didn't have the creativity.

364
00:23:34,749 --> 00:23:35,749
Okay.

365
00:23:35,749 --> 00:23:43,580
Aditya, you talked a little bit about how
you found the book and optioned it, but maybe

366
00:23:43,580 --> 00:23:47,279
you wanted to touch a little bit about, you
know, how you had to work so closely with

367
00:23:47,279 --> 00:23:48,279
NASA and--.

368
00:23:48,279 --> 00:23:49,279
--Yeah--.

369

00:23:49,279 --> 00:23:50,279
--They were there day after day on the set,
right?

370
00:23:50,279 --> 00:23:51,279
I imagine.

371
00:23:51,279 --> 00:23:59,369
They--NASA was, it turns out, very excited
about movies that make NASA look awesome,

372
00:23:59,369 --> 00:24:01,759
and deservedly so because NASA is awesome.

373
00:24:01,759 --> 00:24:06,419
I just want to be--you know, they really just
rolled out the red carpet for us.

374
00:24:06,419 --> 00:24:12,980
And, you know, Jim Green and his whole team,
you know, answered every question that we

375
00:24:12,980 --> 00:24:17,840
could possibly have about, you know, would
this thing, you know, really work.

376
00:24:17,840 --> 00:24:21,330
And I think that's one of the really--for
me, one of the really wonderful things about

377
00:24:21,330 --> 00:24:27,769
The Martian is--and it started from Andy's
book, you know, is really the commitment to

378
00:24:27,769 --> 00:24:30,289
reality, you know?

379
00:24:30,289 --> 00:24:34,879
I think there's--you know, science fiction
is great and I love science fiction that,

380
00:24:34,879 --> 00:24:39,389
you know, goes very far off-field from what
our, you know, day to day experience is.

381
00:24:39,389 --> 00:24:46,049
But, there is so much drama in what actually
exists and I think that this is a rare opportunity

382
00:24:46,049 --> 00:24:49,429
for us to make a movie that really takes advantage
of that.

383
00:24:49,429 --> 00:24:56,200
And I think NASA, you know, every--you know,
every person that we've talked to, I think

384
00:24:56,200 --> 00:24:58,909
it's something that they've echoed to us,
too.

385
00:24:58,909 --> 00:25:04,299
That, you know, we want people to actually
get a feeling of what it's going to be like

386
00:25:04,299 --> 00:25:05,489
to go to Mars.

387
00:25:05,489 --> 00:25:11,249
And I mean, we kind of got a hint of it from
the trailer, but what would you say is the

388
00:25:11,249 --> 00:25:15,799
bigger human message that The Martian wants
to deliver to the masses?

389
00:25:15,799 --> 00:25:18,370
You know, it's a really interesting thing.

390

00:25:18,370 --> 00:25:23,169
I think one of the wonderful--one of the other
wonderful things about The Martian, it actually

391
00:25:23,169 --> 00:25:28,510
reminded me a lot of--I don't know if you
guys ever read the book, Watership Down, you

392
00:25:28,510 --> 00:25:29,510
know?

393
00:25:29,510 --> 00:25:30,510
Mm-hmm.

394
00:25:30,510 --> 00:25:31,700
That--it's a book--that book's about rabbits,
right, on an adventure.

395
00:25:31,700 --> 00:25:35,509
But, I think everybody who read that book
and was touched by that book found their own

396
00:25:35,509 --> 00:25:37,739
sort of message and their own sort of meaning
in it.

397
00:25:37,739 --> 00:25:41,220
And I actually think The Martian kind of did
a similar thing, for me.

398
00:25:41,220 --> 00:25:46,140
And I knew--you know, I read the book overnight
and it's one of the things that we do in this

399
00:25:46,140 --> 00:25:50,519
business is you want to read for pleasure,
but sometimes you just have to read things

400
00:25:50,519 --> 00:25:55,649
really quickly because, you know, other people

are also reading at the same time and chasing

401
00:25:55,649 --> 00:25:56,649
the same things.

402
00:25:56,649 --> 00:26:02,840
But, I read the book and Fox optioned it and
that weekend, I gave it to my wife.

403
00:26:02,840 --> 00:26:06,929
And I will tell you, you could not pay my
wife enough money to read a science fiction

404
00:26:06,929 --> 00:26:07,929
book.

405
00:26:07,929 --> 00:26:10,590
Like, it's just--it's not something that she's
remotely interested in.

406
00:26:10,590 --> 00:26:15,230
And she took that book and she read it, I
think, faster than I did.

407
00:26:15,230 --> 00:26:19,289
And she just found something in there that
really just spoke to her as well and I think

408
00:26:19,289 --> 00:26:22,350
it's a combination of optimism.

409
00:26:22,350 --> 00:26:26,519
It's a love letter to NASA, it's a love letter
to science, it's a love letter to, you know,

410
00:26:26,519 --> 00:26:27,519
stick-to-itiveness.

411
00:26:27,519 --> 00:26:33,730

And, you know, I just--I think it's a really just fantastic.

412
00:26:33,730 --> 00:26:36,269
We're all very excited.

413
00:26:36,269 --> 00:26:37,549
All right.

414
00:26:37,549 --> 00:26:39,899
Let's switch gears a little bit here.

415
00:26:39,899 --> 00:26:48,289
So, Kevin, there's hundreds of billions of solar systems in the Milky Way.

416
00:26:48,289 --> 00:26:49,289
Correct.

417
00:26:51,289 --> 00:26:50,289
Roughly?

418
00:26:53,289 --> 00:26:52,289
There's a lot.

419
00:26:53,289 --> 00:26:54,289
Mm-hmm.

420
00:26:54,289 --> 00:26:57,929
And there's 100 billion, give or take a billion or two, galaxies in the universe.

421
00:26:57,929 --> 00:26:59,890
It's in that range.

422
00:26:59,890 --> 00:27:00,890
Okay.

423

00:27:00,890 --> 00:27:04,549
Do you think maybe there's another planet
out there that has life on it?

424
00:27:04,549 --> 00:27:10,950
Well, the Kepler Spacecraft and JWST will
do a nice job.

425
00:27:10,950 --> 00:27:17,950
Well, the Kepler Spacecraft has already discovered
many of these planets that have given us some

426
00:27:17,950 --> 00:27:25,990
confidence that Earth-like planets do exist
out there beyond our sun.

427
00:27:25,990 --> 00:27:28,169
And those worlds are fantastic.

428
00:27:28,169 --> 00:27:31,249
It's a little frustrating, though, because
we don't yet have warp drives.

429
00:27:31,249 --> 00:27:36,610
So, once we find an Earth-like planet, it's
going to take us a long time to get there.

430
00:27:36,610 --> 00:27:42,710
And in the meantime, I hope that we can really
push forward with our robotic exploration

431
00:27:42,710 --> 00:27:45,770
of these worlds that have liquid water today.

432
00:27:45,770 --> 00:27:51,360
You know, Europa has got two to three times
the volume of all the liquid water that we

433
00:27:51,360 --> 00:27:52,360
have here on Earth.

434
00:27:52,360 --> 00:27:53,940
It's good old fashioned H2O.

435
00:27:53,940 --> 00:27:55,379
It's a little bit salty.

436
00:27:55,379 --> 00:27:56,919
You probably wouldn't want to drink it.

437
00:27:56,919 --> 00:28:00,879
But, it's there today and it's been there
for the history of the solar system.

438
00:28:00,879 --> 00:28:07,139
And so, this little geochemistry experiment
that might've yielded biology is out there

439
00:28:07,139 --> 00:28:09,700
orbiting Jupiter waiting for us to explore
it.

440
00:28:09,700 --> 00:28:16,820
And recently, NASA gave the green light to
a mission that was formally known as Europa

441
00:28:16,820 --> 00:28:17,820
Clipper.

442
00:28:17,820 --> 00:28:21,030
It'll be renamed something soon.

443
00:28:21,030 --> 00:28:25,990
And that mission will be fantastic for revealing
lots of secrets about Europa.

444
00:28:25,990 --> 00:28:27,690
But, that's just the beginning.

445
00:28:27,690 --> 00:28:29,350
We need to put things down on the surface.

446
00:28:29,350 --> 00:28:34,049
We need to melt through that ice and we need
to explore that ocean in great detail.

447
00:28:34,049 --> 00:28:40,429
And what's great about that is as we develop
those tools and technologies, we need to test

448
00:28:40,429 --> 00:28:41,429
them someplace.

449
00:28:41,429 --> 00:28:46,139
And my hope is that we can test them here
on Earth and explore our own ocean and better

450
00:28:46,139 --> 00:28:51,659
understand the ocean that is so precious and
necessary for life here on Earth.

451
00:28:51,659 --> 00:28:56,659
So, it's a win-win when NASA decides to explore
something and to dare mighty things.

452
00:28:56,659 --> 00:29:02,450
We'll learn more about our home planet, how
to protect it, and we might find life elsewhere.

453
00:29:02,450 --> 00:29:11,059
By the way, Kevin has made nine dives to the
bottom of the ocean, just so you know.

454
00:29:11,059 --> 00:29:13,249
Just curious what you were just talking about,
though.

455
00:29:13,249 --> 00:29:18,650

Where would you--what would be your first
choice to go to try out those landers and

456
00:29:18,650 --> 00:29:20,379
that drilling equipment and whatnot?

457
00:29:20,379 --> 00:29:22,539
Would it be just, you know, northern Cali?

458
00:29:22,539 --> 00:29:23,620
Or where we going?

459
00:29:23,620 --> 00:29:24,620
No.

460
00:29:24,620 --> 00:29:28,200
We'd go down to Antarctica to Lake Vostok
and some of the lakes that are underneath

461
00:29:28,200 --> 00:29:29,960
the Antarctic ice sheet.

462
00:29:29,960 --> 00:29:30,960
Nice.

463
00:29:30,960 --> 00:29:31,960
Yeah.

464
00:29:31,960 --> 00:29:32,960
That'll be fun.

465
00:29:32,960 --> 00:29:34,090
Can I come?

466
00:29:34,090 --> 00:29:35,090
Yeah.

467
00:29:35,090 --> 00:29:37,190

If we can get funding.

468
00:29:39,190 --> 00:29:38,190
Okay.

469
00:29:39,190 --> 00:29:43,940
So, let's talk about exoplanets and the James Webb Telescope, shall we, Amber?

470
00:29:43,940 --> 00:29:45,490
Let's do it.

471
00:29:45,490 --> 00:29:50,409
So, while we've discovered many extra solar planet systems and exoplanets, we have yet

472
00:29:50,409 --> 00:29:53,100
to confirm a true Earth-like planet.

473
00:29:53,100 --> 00:29:56,970
So, what's the future for NASA and the search for life outside our solar system?

474
00:29:56,970 --> 00:29:59,919
What are these discoveries teaching us?

475
00:29:59,919 --> 00:30:06,869
Well, I think it's really important to recognize just how far NASA missions have taken us in

476
00:30:06,869 --> 00:30:10,549
this sort of search for life.

477
00:30:10,549 --> 00:30:14,979
And I mean, what--as an astronomer, one of the things I love most about my job is that

478
00:30:14,979 --> 00:30:18,220
astronomy sort of gets to the heart of our

big questions.

479
00:30:18,220 --> 00:30:21,600
You know, they're not just big questions for scientists.

480
00:30:21,600 --> 00:30:23,309
They're big questions for humanity.

481
00:30:23,309 --> 00:30:28,070
You know, where did we come from and how did we get here?

482
00:30:28,070 --> 00:30:29,070
And then the one we're talking about today.

483
00:30:29,070 --> 00:30:30,070
Are we alone?

484
00:30:30,070 --> 00:30:32,940
And those are questions that people have been asking forever.

485
00:30:32,940 --> 00:30:36,970
And I think that's one of the cool things about being a scientist.

486
00:30:36,970 --> 00:30:43,380
And NASA's Kepler Telescope has completely revolutionalized our understanding of planetary

487
00:30:43,380 --> 00:30:44,380
systems.

488
00:30:44,380 --> 00:30:49,380
You know, when I was a kid, we knew of nine planets; the ones in our own solar system.

489
00:30:49,380 --> 00:30:50,380

Didn't know of any others.

490
00:30:50,380 --> 00:30:55,289
And in just my lifetime, you know, now we
know that planets are everywhere.

491
00:30:55,289 --> 00:30:58,879
There are probably more planets in our galaxy
than there are stars.

492
00:30:58,879 --> 00:31:03,990
So, if you go outside at night, point up at
a star, it probably has a planet around it,

493
00:31:03,990 --> 00:31:04,990
right?

494
00:31:04,990 --> 00:31:05,990
That's paradigm shifting.

495
00:31:05,990 --> 00:31:09,039
We didn't know that, even just 15 years ago.

496
00:31:09,039 --> 00:31:14,479
So, the fact that this, you know, relatively
small telescope, Kepler, has changed the way

497
00:31:14,479 --> 00:31:19,869
we think about planets is amazing and really
it speaks to the amazing things that NASA

498
00:31:19,869 --> 00:31:22,029
missions do.

499
00:31:22,029 --> 00:31:23,029
So--.

500
00:31:23,029 --> 00:31:24,029
--I'm sorry.

501
00:31:24,029 --> 00:31:25,029
Let me interrupt you just real quick.

502
00:31:25,029 --> 00:31:26,029
Yep.

503
00:31:26,029 --> 00:31:27,029
What's the count at right now, by the way,
of all the planets?

504
00:31:27,029 --> 00:31:34,240
So, there are just over 4,000 candidates and
a little over 1,000--we just surpassed 1,000

505
00:31:34,240 --> 00:31:35,240
planets confirmed this year.

506
00:31:35,240 --> 00:31:36,240
Wow.

507
00:31:36,240 --> 00:31:37,240
Yeah, it's amazing.

508
00:31:37,240 --> 00:31:46,140
And about--I think we're at about a dozen
of those that are in the habitable--.

509
00:31:46,140 --> 00:31:47,240
--Habitable zone--.

510
00:31:47,240 --> 00:31:49,600
--Zone; potentially Earth-like planets.

511
00:31:49,600 --> 00:31:51,669
So, yeah.

512
00:31:51,669 --> 00:31:54,369

It's remarkable what Kepler has done.

513
00:31:54,369 --> 00:31:59,139
So--and that's--also, all of those planets
that Kepler has found is in a relatively small

514
00:31:59,139 --> 00:32:00,240
part of the sky.

515
00:32:00,240 --> 00:32:04,200
So, Kepler just stares at one small part of
the sky to find these exoplanets.

516
00:32:04,200 --> 00:32:08,809
And so, by, you know, imaging what else is
out there and the parts of the sky that Kepler's

517
00:32:08,809 --> 00:32:13,580
not looking at, that's how we can kind of
estimate the fact that there are billions

518
00:32:13,580 --> 00:32:15,960
and billions of planets in our galaxy alone.

519
00:32:15,960 --> 00:32:21,580
And you've already mentioned, you know, in
addition to our galaxy that has a couple hundred

520
00:32:21,580 --> 00:32:27,039
billion stars, there are a couple hundred
billion other galaxies outside of our Milky

521
00:32:27,039 --> 00:32:30,109
Way that, you know, certainly have planets,
too.

522
00:32:30,109 --> 00:32:31,879
So, the universe is vast.

523

00:32:31,879 --> 00:32:34,330
So, you're saying there's a chance.

524
00:32:34,330 --> 00:32:36,200
There's--there is absolutely a chance.

525
00:32:36,200 --> 00:32:38,690
I think there's a really good chance.

526
00:32:38,690 --> 00:32:44,429
But, thinking about the future--so, the way
Kepler finds exoplanets is it stares at these

527
00:32:44,429 --> 00:32:48,769
stars, it watches for a little dip of light,
which means that a planet's passed in front

528
00:32:48,769 --> 00:32:49,769
of a star.

529
00:32:49,769 --> 00:32:55,029
And so, by using Kepler, we're able to find
planets that are out there and determine some

530
00:32:55,029 --> 00:32:57,379
very basic properties about them.

531
00:32:57,379 --> 00:33:01,129
But, we can't learn a lot of detail about
those planets.

532
00:33:01,129 --> 00:33:04,749
And so, we're--we have a couple of missions
at NASA coming up.

533
00:33:04,749 --> 00:33:06,869
One is called the TESS Telescope.

534
00:33:06,869 --> 00:33:08,799

And that's going to launch in 2017.

535
00:33:08,799 --> 00:33:11,789
And so, what that's going to do is a similar thing.

536
00:33:11,789 --> 00:33:16,220
It's going to look for transiting exoplanets, but relatively nearby.

537
00:33:16,220 --> 00:33:20,630
So, planets that are orbiting stars that are a lot brighter.

538
00:33:20,630 --> 00:33:22,879
And so, there'd be a lot closer to us.

539
00:33:22,879 --> 00:33:27,470
So, a lot of the planets we've discovered with Kepler are relatively far away within

540
00:33:27,470 --> 00:33:28,940
our own galaxy.

541
00:33:28,940 --> 00:33:35,099
And then, of course, the James Webb Space Telescope, which launches in 2018, I believe,

542
00:33:35,099 --> 00:33:42,320
is really the next huge step in our understanding of these exoplanets because what JWST will

543
00:33:42,320 --> 00:33:49,830
be able to do that Kepler is not able to do is to study in detail the atmospheres of these

544
00:33:49,830 --> 00:33:50,830
exoplanets, right?

545

00:33:50,830 --> 00:33:57,049
So, when those planets cross in front of their
star, Webb is going to take detailed spectra

546
00:33:57,049 --> 00:33:59,970
of the atmospheres of these exoplanets.

547
00:33:59,970 --> 00:34:02,279
And that is incredibly hard to do.

548
00:34:02,279 --> 00:34:03,830
Really hard to do, right?

549
00:34:03,830 --> 00:34:07,200
Because stars are huge and bright and planets
are tiny and their atmospheres are really,

550
00:34:07,200 --> 00:34:08,200
really thin.

551
00:34:08,200 --> 00:34:13,090
But, we are building this awesome technology
to launch on these telescopes to be able to

552
00:34:13,090 --> 00:34:19,800
do this really, really hard science that will
enable us to learn about these exoplanets

553
00:34:19,800 --> 00:34:24,420
and find potentially planets that are capable
of supporting life.

554
00:34:24,420 --> 00:34:29,909
So, Webb will be able to, for example, detect
water vapor in exoplanet atmospheres, right?

555
00:34:29,909 --> 00:34:35,880
So, we could easily find a water world with
JWST.

556
00:34:35,880 --> 00:34:37,610
Wow.

557
00:34:37,610 --> 00:34:44,570
I'm just going to go off book here for a second
here.

558
00:34:44,570 --> 00:34:48,880
Kev, I want to ask you and Amber both; all
four of you really.

559
00:34:48,880 --> 00:34:53,419
Have you guys seen the pictures of Ceres,
the dwarf planet?

560
00:34:53,419 --> 00:34:54,419
Yeah.

561
00:34:54,419 --> 00:34:59,820
What are our opinions on the tiny little reflective
spots on it?

562
00:34:59,820 --> 00:35:01,280
I'm just curious.

563
00:35:01,280 --> 00:35:02,280
Go ahead, Amber.

564
00:35:02,280 --> 00:35:03,390
You can start it off.

565
00:35:03,390 --> 00:35:05,600
I have no idea.

566
00:35:05,600 --> 00:35:09,470
Probably some type of ice.

567
00:35:09,470 --> 00:35:10,470

I don't know.

568
00:35:10,470 --> 00:35:12,000
Planetary scientist; let him tell you.

569
00:35:12,000 --> 00:35:16,780
Yeah, we'll have to wait until the data comes
back so I don't have to speculate.

570
00:35:16,780 --> 00:35:17,850
But, stay tuned.

571
00:35:17,850 --> 00:35:25,680
I think it's potentially some salt evaporite
deposits upweld from below.

572
00:35:25,680 --> 00:35:27,700
But, it's too early to tell.

573
00:35:27,700 --> 00:35:31,170
But, the Dawn Spacecraft will give us a lot
more data.

574
00:35:31,170 --> 00:35:32,170
It's going to get closer, right?

575
00:35:32,170 --> 00:35:33,170
It's going to get closer shots?

576
00:35:33,170 --> 00:35:34,170
Or is that as close as it's going to get?

577
00:35:34,170 --> 00:35:35,170
It's about as close as it's going to get.

578
00:35:35,170 --> 00:35:39,670
I think it gets a little bit closer later
this summer.

579
00:35:39,670 --> 00:35:40,670
Okay.

580
00:35:40,670 --> 00:35:46,730
But, you know, Ceres is a very interesting
object in that once upon a time, it likely

581
00:35:46,730 --> 00:35:50,050
did have an ocean beneath its outer shell.

582
00:35:50,050 --> 00:35:56,430
And so, even if Ceres doesn't have an ocean
today, it's still a very interesting world

583
00:35:56,430 --> 00:35:59,360
in terms of having water at some point in
its past.

584
00:35:59,360 --> 00:36:03,960
Whether or not it had water long enough to
give rise to life, whether or not it had the

585
00:36:03,960 --> 00:36:08,110
right chemistry, the mixture of water and
rocks that would be needed for life to originate,

586
00:36:08,110 --> 00:36:09,230
that's an open question.

587
00:36:09,230 --> 00:36:14,880
But, it's a fascinating world and we're--what
that big old pyramid is and what those bright

588
00:36:14,880 --> 00:36:16,960
spots are, I don't know.

589
00:36:16,960 --> 00:36:18,990
I'll let these guys speculate.

590
00:36:18,990 --> 00:36:19,990
Go ahead.

591
00:36:19,990 --> 00:36:20,990
Speculate away.

592
00:36:20,990 --> 00:36:26,810
I'm going to go for definitive proof of an
ancient hybrid alien civilization.

593
00:36:26,810 --> 00:36:33,300
That's what I was looking for, baby.

594
00:36:33,300 --> 00:36:34,470
Yeah.

595
00:36:34,470 --> 00:36:39,690
I suffer no professional penalty if I'm wrong.

596
00:36:39,690 --> 00:36:41,580
Adam, thoughts?

597
00:36:41,580 --> 00:36:44,420
No, I pass.

598
00:36:44,420 --> 00:36:46,280
I can't follow up on that one.

599
00:36:46,280 --> 00:36:47,280
Okay.

600
00:36:47,280 --> 00:36:51,370
I will just say that they did put a picture
of Vegas from the International Space Station,

601
00:36:51,370 --> 00:36:54,460
which would've been a little too close to
compare, but they did put it up next to it

602
00:36:54,460 --> 00:36:55,460
and it did look very similar.

603
00:36:55,460 --> 00:37:01,770
So, they were thinking maybe there was some
gambling going on down there.

604
00:37:01,770 --> 00:37:02,770
Okay.

605
00:37:02,770 --> 00:37:05,340
So, we're onto our last little section here.

606
00:37:05,340 --> 00:37:08,410
How are we doing on our time?

607
00:37:08,410 --> 00:37:09,410
We're good.

608
00:37:09,410 --> 00:37:19,210
So, two words, guys: Leonard Nimoy.

609
00:37:19,210 --> 00:37:27,820
Or as he was better known as, Mr. Spock; an
alien from the planet Vulcan.

610
00:37:27,820 --> 00:37:33,560
I just want to switch gears a little bit and
talk about your dad and his life, his legacy,

611
00:37:33,560 --> 00:37:39,680
how he was such an inspiration to so many
people.

612
00:37:39,680 --> 00:37:47,740
Why don't you--I mean, he's been an icon for
generations; people that weren't even born

613
00:37:47,740 --> 00:37:50,130
when Star Trek was on TV.

614
00:37:50,130 --> 00:37:56,350
And you know, that's something that continues
to resonate so intensely for so many people.

615
00:37:56,350 --> 00:38:00,400
Obviously, his loss was a loss for the world.

616
00:38:00,400 --> 00:38:09,170
And I was just curious what about Spock do
you think touched such curiosity for his character?

617
00:38:09,170 --> 00:38:12,570
Why did he become an icon in our pop culture?

618
00:38:12,570 --> 00:38:17,450
It's kind of a long question.

619
00:38:17,450 --> 00:38:18,450
But--.

620
00:38:18,450 --> 00:38:21,530
--It's a tough one.

621
00:38:21,530 --> 00:38:27,360
It's interesting to me that after my dad passed
away, there had been so much outpouring of

622
00:38:27,360 --> 00:38:35,940
emotion about, you know, oddly enough, that
a man who tried to wrestle with his emotions,

623
00:38:35,940 --> 00:38:41,080
about the loss of Spock and what he had meant
to so many people.

624

00:38:41,080 --> 00:38:44,530
And for a number of reasons, which I can kind
of talk a little bit about.

625
00:38:44,530 --> 00:38:48,130
The other thing that was kind of interesting
I want to mention now is that not only were

626
00:38:48,130 --> 00:38:53,680
people kind of grieving for the loss of this
pop culture icon, but there were a number

627
00:38:53,680 --> 00:38:59,230
of people who expressed their grief about
losing Leonard Nimoy, the artist, as well.

628
00:38:59,230 --> 00:39:04,480
But, the two have become so entwined with
one another.

629
00:39:04,480 --> 00:39:09,680
And I've discovered, interestingly enough,
it was kind of a surprise to me that a part

630
00:39:09,680 --> 00:39:14,940
of the longevity of Spock was the various
things that people were--that resonated with

631
00:39:14,940 --> 00:39:18,570
different people throughout all of society,
including scientists.

632
00:39:18,570 --> 00:39:23,120
But, another factor that I didn't really quite
understand was that people generally liked

633
00:39:23,120 --> 00:39:31,030
Leonard Nimoy as an artist, as a humanitarian,
and that he resonated with a number of people

634

00:39:31,030 --> 00:39:32,720
across the planet.

635
00:39:32,720 --> 00:39:37,980
And the--you know, the kind of symbiotic relationship
between the two kept them both going, interestingly

636
00:39:37,980 --> 00:39:38,980
enough.

637
00:39:38,980 --> 00:39:42,340
I didn't really fully understand this because
I thought it was going to just be a big, you

638
00:39:42,340 --> 00:39:44,800
know--the whole thing was going to be Spock,
Spock, Spock.

639
00:39:44,800 --> 00:39:48,110
But, it was--there was a lot of Leonard--a
lot of love for Leonard in there, which was

640
00:39:48,110 --> 00:39:52,800
very surprising and, you know, heartwarming
to me, frankly, and the rest of the family

641
00:39:52,800 --> 00:39:54,680
during the grieving process.

642
00:39:54,680 --> 00:39:59,360
But, the thing about Spock that's so interesting
is that there's so many different segments

643
00:39:59,360 --> 00:40:03,550
of society that have claimed him as their
own, you know?

644
00:40:03,550 --> 00:40:09,330
And certainly the science community repeatedly
has come out in support of Spock as kind of,

645
00:40:09,330 --> 00:40:15,800
you know, an iconic image for them or as an
ideal for scientists, scientific study in

646
00:40:15,800 --> 00:40:19,070
large part because he was logical.

647
00:40:19,070 --> 00:40:22,620
He was the cool head, you know, on the bridge
of the Enterprise.

648
00:40:22,620 --> 00:40:26,960
He was not the mad scientist in--you know,
in some laboratory basement somewhere on the

649
00:40:26,960 --> 00:40:28,000
Enterprise.

650
00:40:28,000 --> 00:40:31,220
He was right there with the rest of the crew.

651
00:40:31,220 --> 00:40:35,470
And, you know--and the other thing that was
interesting to me is that Spock was also in

652
00:40:35,470 --> 00:40:36,470
a command position.

653
00:40:36,470 --> 00:40:37,960
I mean, he's the first officer.

654
00:40:37,960 --> 00:40:41,430
When Kirk is on the planet, the scientist
takes over the ship.

655
00:40:41,430 --> 00:40:44,160
And I'm sure most scientists just love that,
you know?

656
00:40:44,160 --> 00:40:47,970
That's the way it should be.

657
00:40:47,970 --> 00:40:54,930
So, that really, you know, resonated with
the science community and that he was cool.

658
00:40:54,930 --> 00:41:00,160
You know, that the nerd, the geek could be
the outsider, could be somebody who was cool

659
00:41:00,160 --> 00:41:03,870
and logical and thoughtful and interesting
to, obviously, to look at.

660
00:41:03,870 --> 00:41:09,050
There was a lot, you know, in terms of--the
other way of looking at this is kind of, which

661
00:41:09,050 --> 00:41:13,060
I really want to talk about very briefly but
it's important to cover, is that, you know,

662
00:41:13,060 --> 00:41:16,230
this idea of Spock resonated with Leonard.

663
00:41:16,230 --> 00:41:21,850
You see, the whole idea of bringing life to
the character that my dad would use as his

664
00:41:21,850 --> 00:41:28,120
method was to bring something of his own personal
life to each of the characters that he was

665
00:41:28,120 --> 00:41:31,570
creating or trying to give life to.

666
00:41:31,570 --> 00:41:36,330

My dad reminded me not long before he died
that Spock was the only alien on the crew

667
00:41:36,330 --> 00:41:37,400
of the Enterprise.

668
00:41:37,400 --> 00:41:42,160
On the bridge, on the core crew of the Enterprise,
he is the only alien.

669
00:41:42,160 --> 00:41:48,630
And that as such, his objective, that his
issue was how to integrate himself into the

670
00:41:48,630 --> 00:41:51,820
human society of his colleagues on that ship.

671
00:41:51,820 --> 00:41:55,530
How to give the best that he had to give.

672
00:41:55,530 --> 00:42:00,340
How to use his scientific knowledge that he
had to offer for the benefit of his shipmates

673
00:42:00,340 --> 00:42:01,960
and his crew.

674
00:42:01,960 --> 00:42:06,590
And that was sort of, you know, his overall
objective, to stay a part of the group, a

675
00:42:06,590 --> 00:42:08,120
part of the team.

676
00:42:08,120 --> 00:42:13,080
This happened to be the exact same issue that
my father was confronted with as a young man

677
00:42:13,080 --> 00:42:14,780

growing up in the west end of Boston.

678
00:42:14,780 --> 00:42:19,390
He was the son of Russian immigrant parents,
living in a heavy immigrant neighborhood in

679
00:42:19,390 --> 00:42:20,510
the west end.

680
00:42:20,510 --> 00:42:26,550
It was Irish and Italian Catholics and Russian
and European Jews.

681
00:42:26,550 --> 00:42:28,370
Very heavy immigrant environment.

682
00:42:28,370 --> 00:42:32,880
And his--and the whole issue for his life
was how to be able to transcend that and give

683
00:42:32,880 --> 00:42:36,720
the best that he had to give to society as
a whole.

684
00:42:36,720 --> 00:42:42,380
So, it was his ability to bring his own personal
experience into the life of Spock, which enabled

685
00:42:42,380 --> 00:42:50,260
him to create this incredibly complex and
dynamic inter-life for Mr. Spock because there's

686
00:42:50,260 --> 00:42:52,100
not--you know, there's not a bunch of emotion.

687
00:42:52,100 --> 00:42:54,730
There's not a whole lot of dialogue for Spock.

688
00:42:54,730 --> 00:42:55,730

He's very introspective.

689
00:42:55,730 --> 00:43:00,150
Yet, when he raises his eyebrow, you know
that he's thinking something.

690
00:43:00,150 --> 00:43:01,910
He's commenting on something.

691
00:43:01,910 --> 00:43:04,030
There's something going on internally for
him.

692
00:43:04,030 --> 00:43:07,760
So, being the outsider has also resonated
with people.

693
00:43:07,760 --> 00:43:12,160
Trying to integrate with the whole of the
group has resonated with people.

694
00:43:12,160 --> 00:43:15,610
Being a minority on that crew has resonated
with people.

695
00:43:15,610 --> 00:43:18,660
And the other thing that's been very interesting
in the research I've been doing for this film,

696
00:43:18,660 --> 00:43:25,140
For the Love of Spock, is that early on--within
the first month of Star Trek airing, it became

697
00:43:25,140 --> 00:43:35,360
very apparent that Spock was very much loved
by the female fan base.

698
00:43:35,360 --> 00:43:39,740
That by the time they aired the "Naked Time",
in which he had that scene with, you know,

699
00:43:39,740 --> 00:43:46,970
Nurse Chappell in, you know, sick bay, and
she expressed her love for him, that unleashed

700
00:43:46,970 --> 00:43:52,570
this incredible letter writing campaign of
women fans out there who wanted to echo that

701
00:43:52,570 --> 00:43:58,080
and make sure that they knew that Spock was
very much loved, not only by Nurse Chappell.

702
00:43:58,080 --> 00:44:01,660
So, this whole idea of being unattainable.

703
00:44:01,660 --> 00:44:06,860
And in fact, there was an article written
by Isaac Asimov for TV Guide entitled, "Spock

704
00:44:06,860 --> 00:44:12,470
is Dreamy," which was--which is a title that
his daughter came up with this idea because

705
00:44:12,470 --> 00:44:13,510
he is a scientist.

706
00:44:13,510 --> 00:44:14,910
You know, he said that he's an open book.

707
00:44:14,910 --> 00:44:17,710
He just loved women and they didn't show that
much interest for him.

708
00:44:17,710 --> 00:44:22,980
But, to be a scientist who was no quite attainable
was something else, that was a challenge to

709
00:44:22,980 --> 00:44:26,840

women, and it was also resonating with that whole other segment of society.

710
00:44:26,840 --> 00:44:28,210
So, all these things.

711
00:44:28,210 --> 00:44:33,730
All--there was so much of Spock that people could relate to on so many different levels.

712
00:44:33,730 --> 00:44:37,220
And then we have the syndication market which kept Star Trek alive.

713
00:44:37,220 --> 00:44:38,230
Yes.

714
00:44:38,230 --> 00:44:42,170
Five nights a week, you know, 5:00, marathons on the weekend.

715
00:44:42,170 --> 00:44:47,820
During the '70s, when I was in college, everybody was in the TV room watching Star Trek.

716
00:44:47,820 --> 00:44:48,960
That has kept him alive.

717
00:44:48,960 --> 00:44:54,060
And then we have the movie franchise, which has kept Spock and the Enterprise and Star

718
00:44:54,060 --> 00:44:56,240
Trek and the franchise alive.

719
00:44:56,240 --> 00:44:57,590
And then we have the internet.

720
00:44:57,590 --> 00:45:01,330

We have--you know, and we have pop, you know,
culture and pop art.

721
00:45:01,330 --> 00:45:05,370
We see the image of Spock just keep showing
up everywhere in the most unexpected places;

722
00:45:05,370 --> 00:45:07,590
on TV shows, in movies, in art.

723
00:45:07,590 --> 00:45:13,180
And it's just--it's so interesting that all
he was trying to do was create an interesting

724
00:45:13,180 --> 00:45:15,050
and dynamic character.

725
00:45:15,050 --> 00:45:19,840
He never set out to create this pop culture
icon, but the end result is what we've come

726
00:45:19,840 --> 00:45:23,840
to know and love as Mr. Spock.

727
00:45:23,840 --> 00:45:25,320
That's great.

728
00:45:25,320 --> 00:45:26,800
I'm curious.

729
00:45:26,800 --> 00:45:33,300
We were talking to--back there about this
a little bit, but did he always have an interest

730
00:45:33,300 --> 00:45:34,300
in space exploration?

731
00:45:34,300 --> 00:45:38,980
I mean, did you guys, you know, sit around

the dinner table and talk about the Apollo

732
00:45:38,980 --> 00:45:39,980
program?

733
00:45:39,980 --> 00:45:40,980
Or how did that work out?

734
00:45:40,980 --> 00:45:44,220
That would be logical, but that is not what
went down.

735
00:45:44,220 --> 00:45:49,260
It's so interesting that, you know, in the
'60s, there's this space race to the moon,

736
00:45:49,260 --> 00:45:51,350
you know, because of Sputnik.

737
00:45:51,350 --> 00:45:56,800
We have, you know, all this launching of all
these, you know--of these probes that are

738
00:45:56,800 --> 00:46:02,890
going out, of the telecommunication satellites,
of navigation satellites, of space exploration

739
00:46:02,890 --> 00:46:03,890
satellites.

740
00:46:03,890 --> 00:46:04,890
This is all in the '60s.

741
00:46:04,890 --> 00:46:06,500
And then we have the manned space program.

742
00:46:06,500 --> 00:46:08,340
You know, we have the Gemini program.

743
00:46:08,340 --> 00:46:09,770
We have the Apollo program.

744
00:46:09,770 --> 00:46:15,380
All space exploration going on while Star
Trek starts airing in September of '66, but

745
00:46:15,380 --> 00:46:18,610
it was not something that we necessarily discussed.

746
00:46:18,610 --> 00:46:22,370
In large part because we never had family
dinners and discussed anything because, as

747
00:46:22,370 --> 00:46:27,420
you know, these shows are so incredibly difficult
to make, my dad was on a sound stage for 12

748
00:46:27,420 --> 00:46:29,810
to 14 hours a day for three years.

749
00:46:29,810 --> 00:46:32,340
We never even saw him, really.

750
00:46:32,340 --> 00:46:35,620
And science was not necessarily his forte.

751
00:46:35,620 --> 00:46:40,970
Remember, you know, although my father had
a very fine mind, he was not really--didn't

752
00:46:40,970 --> 00:46:45,820
have that much formal education, which was
something that dismayed his parents I can

753
00:46:45,820 --> 00:46:49,720
tell you right away because they were looking
for doctors and lawyers.

754
00:46:49,720 --> 00:46:54,550
And my Uncle Mel, whose oldest son is in the audience tonight, my cousin, Paul--hey, Paul--my

755
00:46:54,550 --> 00:46:59,150
Uncle Mel went to MIT and became a chemical engineer for Johnson & Johnson for 30 years.

756
00:46:59,150 --> 00:47:04,450
That's what my grandparents wanted, but that is not what they got.

757
00:47:04,450 --> 00:47:07,360
And we're blessed by that difference, as my dad would say.

758
00:47:07,360 --> 00:47:11,990
So, that--you know, although the science, you know, space exploration was of interest

759
00:47:11,990 --> 00:47:14,780
to me, that was not something that we were discussing at that time.

760
00:47:14,780 --> 00:47:19,150
And it was not necessarily something that was of interest, you know, to him initially.

761
00:47:19,150 --> 00:47:23,310
But, since he's had so much interaction with the scientific community, he's constantly

762
00:47:23,310 --> 00:47:28,300
being shown research by all these scientists who he has inspired to do the research.

763
00:47:28,300 --> 00:47:32,150
And they want commentary from him about their research.

764
00:47:32,150 --> 00:47:37,340
And he would always use his top phrase, which
was you're on the right track.

765
00:47:37,340 --> 00:47:39,880
That's great.

766
00:47:39,880 --> 00:47:42,420
All right.

767
00:47:42,420 --> 00:47:49,130
Well, Adam, I think it's time for you to show
us some footage.

768
00:47:49,130 --> 00:47:54,140
If you'd like to see it, we have a very short
sizzle reel that we put together.

769
00:47:54,140 --> 00:47:56,920
Yes now?

770
00:47:56,920 --> 00:48:04,550
This was put together early on in the early
stages of making this film, which we're still

771
00:48:04,550 --> 00:48:09,360
in the process of making, which is expanded
to include not only--I got this disclaimer.

772
00:48:09,360 --> 00:48:10,380
It's not just Spock.

773
00:48:10,380 --> 00:48:15,791
It is going to be more about the life of Leonard
Nimoy, his process, his artistic career, his

774
00:48:15,791 --> 00:48:18,330
humanitarianism, really.

775
00:48:18,330 --> 00:48:23,010
But, this little reel that we put together
very early on to try to generate interest

776
00:48:23,010 --> 00:48:26,280
in the project is very Spock centric.

777
00:48:26,280 --> 00:48:36,360
So, let's just take a look.

778
00:48:36,360 --> 00:48:41,230
As you may or not--may or may not have heard,
that was the current Spock, Zachary Quinto,

779
00:48:41,230 --> 00:48:43,050
narrating that trailer there.

780
00:48:43,050 --> 00:48:44,900
And he narrates the whole film?

781
00:48:44,900 --> 00:48:46,840
He will be narrating the whole.

782
00:48:48,840 --> 00:48:47,840
Yeah.

783
00:48:48,840 --> 00:48:49,840
Lucky for me, yeah.

784
00:48:49,840 --> 00:48:50,840
So, we're pretty much out of time.

785
00:48:50,840 --> 00:48:53,010
I guess--I don't know.

786
00:48:53,010 --> 00:48:56,250
What's the over-under on when we come up with
a teleportation device?

787
00:48:56,250 --> 00:48:57,250
Kevin?

788
00:48:57,250 --> 00:48:58,250
We have--.

789
00:48:58,250 --> 00:48:59,250
--Amber--?

790
00:48:59,250 --> 00:49:00,580
--A little work to do, yeah.

791
00:49:00,580 --> 00:49:09,270
I don't know about the teleportation device,
but it is really important to appreciate the

792
00:49:09,270 --> 00:49:19,460
timing of when you're alive, be it exoplanets,
be it the search for life on Mars, be it the

793
00:49:19,460 --> 00:49:24,660
exploration of these oceans worlds out there
in our solar system.

794
00:49:24,660 --> 00:49:31,010
Appreciate that for the first time in the
history of humanity, we have the tools and

795
00:49:31,010 --> 00:49:32,610
technology.

796
00:49:32,610 --> 00:49:39,270
We know how to do the experiments to go out
there and see whether or not life does exist

797
00:49:39,270 --> 00:49:40,900
beyond Earth.

798
00:49:40,900 --> 00:49:45,340
Never before has humanity been able to do
this kind of exploration.

799
00:49:45,340 --> 00:49:51,540
And so, you know, in this life cycle of science
and science fiction, it's important that we

800
00:49:51,540 --> 00:49:57,700
help buoy each other because we can do it,
but we need the public to be engaged in it.

801
00:49:57,700 --> 00:49:59,800
We need the public to be excited about it.

802
00:49:59,800 --> 00:50:01,770
We need schools to be teaching it.

803
00:50:01,770 --> 00:50:07,550
We need the next generation to be coming up
through making the films, developing the instruments,

804
00:50:07,550 --> 00:50:11,510
building the missions so that we can actually
make these great discoveries be they within

805
00:50:11,510 --> 00:50:14,120
our solar system or beyond.

806
00:50:14,120 --> 00:50:24,010
Math, science, math, science, encourage the
kids to go that direction.

807
00:50:24,010 --> 00:50:25,740
Thanks, everybody, for coming out.

808
00:50:25,740 --> 00:50:29,350
This has been a blast and a dream come true
for me.

809
00:50:29,350 --> 00:50:32,920
Thanks our panel.

810
00:50:32,920 --> 00:50:36,810
Amber Straughn, Kevin Hand, Adam Nimoy, Aditya Sood, thanks, guys.

811
00:50:36,810 --> 00:50:38,420
This was a blast.