



1
00:00:16,015 --> 00:00:18,051
>> GOOD AFTERNOON, WELCOME TO

2
00:00:18,051 --> 00:00:20,620
THE WATCH ON BOARD BRIEFING FROM

3
00:00:20,620 --> 00:00:23,690
NASA'S KENNEDY SPACE CENTER IN

4
00:00:23,690 --> 00:00:25,425
FLORIDA.

5
00:00:25,425 --> 00:00:29,062
I'M TABITHA THOMPSON.

6
00:00:29,062 --> 00:00:31,498
TO HELP US RECOGNIZE PARTICLES

7
00:00:31,498 --> 00:00:33,233
TO RESEARCH THAT COULD LEAD TO

8
00:00:33,233 --> 00:00:34,701
DRUG THERAPIES.

9
00:00:34,701 --> 00:00:38,772
WE'LL HIT A FEW HIGHLIGHTS WITH

10
00:00:38,772 --> 00:00:39,906
THE RESEARCH INVESTIGATIONS

11
00:00:39,906 --> 00:00:42,442
HEADED TO NASA SPACE EXPLORATION

12
00:00:42,442 --> 00:00:44,544
TO THE CARGO MISSION TO THE

13
00:00:44,544 --> 00:00:46,179

INTERNATIONAL SPACE STATION.

14

00:00:46,179 --> 00:00:48,615
FIRST IP, FOR AN INTERVIEW,

15

00:00:48,615 --> 00:00:51,151
WE'LL HEAR FROM KEN FIELDS AND

16

00:00:51,151 --> 00:00:53,620
PETE HASBROOK, ASSOCIATE

17

00:00:53,620 --> 00:00:55,688
SCIENTISTS FOR THE INTERNATIONAL

18

00:00:55,688 --> 00:00:56,623
SPACE PROGRAM.

19

00:00:56,623 --> 00:01:00,360
AND KEN IS A THE, FOR THE

20

00:01:00,360 --> 00:01:02,328
SCIENCE IN SPACE.

21

00:01:02,328 --> 00:01:04,431
>> THANK YOU, TABITHA.

22

00:01:04,431 --> 00:01:07,033
>> THANK YOU FOR BEING HERE

23

00:01:07,033 --> 00:01:07,434
TODAY.

24

00:01:07,434 --> 00:01:09,002
THANKS TO THE PEOPLE, WATCHING

25

00:01:09,002 --> 00:01:11,337
ON LINE, NASA TV AND SOCIAL

26

00:01:11,337 --> 00:01:11,671

MEDIA.

27

00:01:11,671 --> 00:01:13,239

THESE BRIEFINGS ARE REALLY FUN

28

00:01:13,239 --> 00:01:14,541

FOR US TO DO.

29

00:01:14,541 --> 00:01:17,277

I'M GLAD TO HAVE AN OPPORTUNITY,

30

00:01:17,277 --> 00:01:19,679

TO TELL YOU THE COOL STUFF NOT

31

00:01:19,679 --> 00:01:21,848

ONLY IN THE SPACE X DRAGON

32

00:01:21,848 --> 00:01:22,615

LAUNCH, BUT SOMETHING WE'RE

33

00:01:22,615 --> 00:01:25,618

DOING ON THE ISS IN PARTICULAR.

34

00:01:25,618 --> 00:01:28,354

THE DRAGON VEHICLE AND FALCON

35

00:01:28,354 --> 00:01:29,556

LAUNCHER ARE VERY IMPORTANT.

36

00:01:29,556 --> 00:01:31,925

THE DRAGON GIVES US PRESSURIZED

37

00:01:31,925 --> 00:01:32,258

CARGO.

38

00:01:32,258 --> 00:01:34,561

IT BRINGS US EXTERNAL CARGO,

39

00:01:34,561 --> 00:01:37,363

WHAT WE CALL UNPRESSURIZED

40

00:01:37,363 --> 00:01:37,697

CARGO.

41

00:01:37,697 --> 00:01:39,365

ALMOST MORE IMPORTANTLY,

42

00:01:39,365 --> 00:01:41,234

BRINGING HOME SCIENCE SAMPLES.

43

00:01:41,234 --> 00:01:43,036

THAT'S A KEY CAPABILITY FOR US

44

00:01:43,036 --> 00:01:44,537

TO STUDY THINGS INTO SPACE AND

45

00:01:44,537 --> 00:01:47,407

BRING THEM HOME AND STUDY THEM

46

00:01:47,407 --> 00:01:50,076

MORE THOROUGHLY ON THE EARTH.

47

00:01:50,076 --> 00:01:51,711

TOMORROW'S DRAGON LAUNCH WILL

48

00:01:51,711 --> 00:01:54,848

HAVE ON THE ORDER OF 2200

49

00:01:54,848 --> 00:01:56,249

KILOGRAMS OF CARGO GOING UP.

50

00:01:56,249 --> 00:02:00,320

THAT INCLUDES THE EXTERNAL

51
00:02:00,320 --> 00:02:00,687
PAYLOAD.

52
00:02:00,687 --> 00:02:01,988
YOU'LL HEAR MORE ON THAT LATER

53
00:02:01,988 --> 00:02:05,558
FROM THE PROJECT MANAGER.

54
00:02:05,558 --> 00:02:08,027
AND WE'VE GOT OVER 2 TONS OF

55
00:02:08,027 --> 00:02:09,896
SCIENTIFIC EXPERIMENTS LAUNCHING

56
00:02:09,896 --> 00:02:10,263
TOMORROW.

57
00:02:10,263 --> 00:02:13,233
AND 30 DAYS LATER, SEPTEMBER

58
00:02:13,233 --> 00:02:15,268
17TH, IS THE UNBIRTHING DATE.

59
00:02:15,268 --> 00:02:18,404
THE DRAGON WILL BRING HOME 1200

60
00:02:18,404 --> 00:02:19,472
KILOGRAMS OF SCIENTIFIC CARGO

61
00:02:19,472 --> 00:02:21,774
FOR US, IN ADDITION TO THE OTHER

62
00:02:21,774 --> 00:02:23,243
CARGO IT WILL BE BRINGING HOME.

63
00:02:23,243 --> 00:02:27,247

THE ISS IN SPACE IS A

64

00:02:27,247 --> 00:02:28,381

MULTIDISCIPLINARY LABORATORY.

65

00:02:28,381 --> 00:02:30,149

IT'S A NATIONAL LABORATORY FOR

66

00:02:30,149 --> 00:02:30,750

THE U.S.

67

00:02:30,750 --> 00:02:33,386

IT'S AN INTERNATIONAL LABORATORY

68

00:02:33,386 --> 00:02:35,755

MADE UP OF THE FIVE PARTNER

69

00:02:35,755 --> 00:02:37,690

AGENCIES, 15 PARTNERS

70

00:02:37,690 --> 00:02:38,191

PARTICIPATING.

71

00:02:38,191 --> 00:02:40,026

IN ANY ONE TIME WE HAVE HUNDREDS

72

00:02:40,026 --> 00:02:41,427

OF EXPERIMENTS.

73

00:02:41,427 --> 00:02:44,230

RIGHT NOW IT'S IN THE ORDER OF

74

00:02:44,230 --> 00:02:45,965

250 DIFFERENT EXPERIMENTS.

75

00:02:45,965 --> 00:02:49,135

OUT OF THOSE, THE CREW DOESN'T

76

00:02:49,135 --> 00:02:49,702

OPERATE ALL.

77

00:02:49,702 --> 00:02:51,304

MANY ARE COMMANDED FROM THE

78

00:02:51,304 --> 00:02:51,638

GROUND.

79

00:02:51,638 --> 00:02:53,840

IN SOME CASES, THE CREW IS THE

80

00:02:53,840 --> 00:02:58,144

SUBJECT OF THE BIOMED CAL

81

00:02:58,144 --> 00:02:58,545

RESEARCH.

82

00:02:58,545 --> 00:03:00,079

A VERY BROAD SPECTRUM OF

83

00:03:00,079 --> 00:03:01,180

RESEARCH WE DO.

84

00:03:01,180 --> 00:03:03,149

UNLIKE A LAB ON THE GROUND THAT

85

00:03:03,149 --> 00:03:05,952

MAY FOCUS ON ONE TYPE OF SCIENCE

86

00:03:05,952 --> 00:03:08,454

AND MAYBE SPECIFICALLY ON A

87

00:03:08,454 --> 00:03:09,589

DISCIPLINE IN ONE PART OF THE

88

00:03:09,589 --> 00:03:09,956

SCIENCE.

89

00:03:09,956 --> 00:03:11,758
WE GO ACROSS THE BOARD.

90

00:03:11,758 --> 00:03:14,060
WE CATEGORIZE IT IN DIFFERENT

91

00:03:14,060 --> 00:03:16,796
AREAS, BIO TECHNOLOGY, BIOLOGY,

92

00:03:16,796 --> 00:03:19,766
EARTH AND SPACE SCIENCE, HUMAN

93

00:03:19,766 --> 00:03:22,302
RESEARCH, FUNDAMENTAL PHYSICAL

94

00:03:22,302 --> 00:03:22,669
SCIENCES.

95

00:03:22,669 --> 00:03:23,570
WE HAVE TECHNOLOGY

96

00:03:23,570 --> 00:03:24,237
DEMONSTRATION, TAKE YOUR

97

00:03:24,237 --> 00:03:26,272
HARDWARE TO SPACE AND SEE HOW IT

98

00:03:26,272 --> 00:03:28,374
OPERATES IN MICRO GRAVITY.

99

00:03:28,374 --> 00:03:30,209
FINALLY, WE DO EDUCATION AND

100

00:03:30,209 --> 00:03:30,610
OUTREACH.

101
00:03:30,610 --> 00:03:31,844
IN THE COURSE OF THE HISTORY OF

102
00:03:31,844 --> 00:03:36,249
THE ISS, WE WILL BE ABOUT 17

103
00:03:36,249 --> 00:03:38,384
YEARS CONTINUOUSLY INHABITED

104
00:03:38,384 --> 00:03:39,052
COMING THIS NOVEMBER.

105
00:03:39,052 --> 00:03:42,021
BY THE WAY, THERE'S A WHOLE

106
00:03:42,021 --> 00:03:42,822
GENERATION OUT THERE OF YOUNG

107
00:03:42,822 --> 00:03:44,123
PEOPLE WHO HAVE BEEN ALIVE AND

108
00:03:44,123 --> 00:03:45,658
NEVER KNOWN A TIME WHEN WE

109
00:03:45,658 --> 00:03:47,860
DIDN'T HAVE ASTRONAUTS LIVING

110
00:03:47,860 --> 00:03:49,162
PERMANENTLY IN SPACE.

111
00:03:49,162 --> 00:03:51,364
OVER THE COURSE OF THE 17-PLUS

112
00:03:51,364 --> 00:03:53,633
YEARS, WE'VE DONE OVER 2300

113
00:03:53,633 --> 00:03:55,835

DIFFERENT EXPERIMENTS ON THE

114

00:03:55,835 --> 00:03:56,135

ISS.

115

00:03:56,135 --> 00:03:59,539

THAT'S ACROSS THE PARTNERSHIP.

116

00:03:59,539 --> 00:04:01,507

WE'VE SERVED OVER 33 HUNDRED

117

00:04:01,507 --> 00:04:04,110

SCIENTISTS WHO ARE THE LEAD

118

00:04:04,110 --> 00:04:07,246

PRINCIPAL OR COINVESTIGATOR FOR

119

00:04:07,246 --> 00:04:08,181

RESEARCH AND SOMEWHERE AROUND

120

00:04:08,181 --> 00:04:11,651

100 COUNTRIES THAT PARTICIPATED

121

00:04:11,651 --> 00:04:12,318

OVER THE TIME.

122

00:04:12,318 --> 00:04:16,022

OUR GOALS FOR THE ISS TO

123

00:04:16,022 --> 00:04:16,823

ACKNOWLEDGE THE NATURAL WORLD

124

00:04:16,823 --> 00:04:17,357

AROUND US.

125

00:04:17,357 --> 00:04:20,960

WE'RE PAVING THE WAY FOR FUTURE

126
00:04:20,960 --> 00:04:22,795
SPACE EXPLORATION, NOT JUST WITH

127
00:04:22,795 --> 00:04:25,365
HUMANS BUT THE INTERNATIONAL

128
00:04:25,365 --> 00:04:27,834
PARTNERSHIP AS WELL AM WE ARE

129
00:04:27,834 --> 00:04:30,203
EXPANDING THE COMMERCIAL MARKET,

130
00:04:30,203 --> 00:04:31,437
SPACE STATION RUN BY THE

131
00:04:31,437 --> 00:04:33,539
GOVERNMENTS IS NOT GOING TO BE

132
00:04:33,539 --> 00:04:34,407
THERE FOREVER.

133
00:04:34,407 --> 00:04:36,376
WE KNOW THERE'S A GREAT DESIRE

134
00:04:36,376 --> 00:04:37,510
FOR COMMERCIAL PRESENCE IN

135
00:04:37,510 --> 00:04:37,844
SPACE.

136
00:04:37,844 --> 00:04:39,412
WE'RE WAIVING THE WAY NOT JUST

137
00:04:39,412 --> 00:04:46,185
FOR ROCKETS AND CARGO, BUT WITH

138
00:04:46,185 --> 00:04:48,221

THE HARDWARE WORKING WITH THE

139

00:04:48,221 --> 00:04:48,655

SCIENTISTS.

140

00:04:48,655 --> 00:04:50,490

WE'RE LOOKING TO IMPROVE LIFE ON

141

00:04:50,490 --> 00:04:52,158

EARTH BY WORKING OFF THE EARTH.

142

00:04:52,158 --> 00:04:53,726

KEN WILL TELL YOU MORE ABOUT THE

143

00:04:53,726 --> 00:04:54,127

SCIENCE.

144

00:04:54,127 --> 00:04:56,029

I'LL TELL YOU MORE ON WHAT'S

145

00:04:56,029 --> 00:04:57,830

GOING ON IN THE SPACE STATION

146

00:04:57,830 --> 00:04:58,197

PROGRAM.

147

00:04:58,197 --> 00:05:02,835

WE HAVE EXTENDED PEGGY WISTON,

148

00:05:02,835 --> 00:05:05,104

ON BOARD, WHO WAS EXTENDED ABOUT

149

00:05:05,104 --> 00:05:05,738

THREE MONTHS.

150

00:05:05,738 --> 00:05:07,940

THAT PUTS HER IN THE SAME

151
00:05:07,940 --> 00:05:09,909
DURATION, ALMOST AS LONG AS

152
00:05:09,909 --> 00:05:15,081
SCOTT KELLY, AND KYLE COENGO.

153
00:05:15,081 --> 00:05:17,583
PEGGY WAS ALREADY PARTICIPATING

154
00:05:17,583 --> 00:05:19,686
IN THE FLUIDSHIP EXPERIMENT.

155
00:05:19,686 --> 00:05:21,154
AND NOW BY CONTINUING TO DO

156
00:05:21,154 --> 00:05:23,589
THAT, SHE'S NOW A DATA POINT IN

157
00:05:23,589 --> 00:05:26,793
THE YEAR LONG-TYPE OF STUDY.

158
00:05:26,793 --> 00:05:29,095
SHE'S CONTINUING THE BIOMED CAL

159
00:05:29,095 --> 00:05:29,462
RESEARCH.

160
00:05:29,462 --> 00:05:31,531
AND AFTER SHE LAND IN EARLY

161
00:05:31,531 --> 00:05:33,199
SEPTEMBER, WE HAVE A NEW CREW

162
00:05:33,199 --> 00:05:36,069
LAUNCHING IN A SOYUZ IN MIDDLE

163
00:05:36,069 --> 00:05:39,338

SEPTEMBER, THAT WILL KEEP US

164

00:05:39,338 --> 00:05:42,675

WITH FOUR USSO CREW MEMBERS.

165

00:05:42,675 --> 00:05:44,911

YOU MAY REMEMBER, WE'VE BEEN

166

00:05:44,911 --> 00:05:46,512

WITH THREE, WITH EUROPEAN AND

167

00:05:46,512 --> 00:05:47,747

JAPANESE PARTNERS.

168

00:05:47,747 --> 00:05:49,348

WITH THE CHANGE IN THE RUSSIAN

169

00:05:49,348 --> 00:05:51,417

CREW PLANNING, WE HAVE THE

170

00:05:51,417 --> 00:05:53,853

OPPORTUNITY TO HAVE FOUR CREW

171

00:05:53,853 --> 00:05:54,554

MEMBERS.

172

00:05:54,554 --> 00:05:56,723

WE'VE BEEN LOOKING FORWARD WITH

173

00:05:56,723 --> 00:06:00,493

THIS FOR A LONG TIME WITH MORE

174

00:06:00,493 --> 00:06:01,561

CREW LAUNCHING WITH FOUR MEMBERS

175

00:06:01,561 --> 00:06:04,831

MUCH AND WITH PEGGY'S LEADERSHIP

176
00:06:04,831 --> 00:06:06,365
AND IT'S REALLY HARD TO KEEP UP

177
00:06:06,365 --> 00:06:08,267
WITH PEGGY, IF YOU FOLLOW PEGGY

178
00:06:08,267 --> 00:06:08,634
AT ALL.

179
00:06:08,634 --> 00:06:10,837
AND AM COULDING IN SEPTEMBER,

180
00:06:10,837 --> 00:06:12,238
WITH THE NEXT SOYUZ LAUNCHES IN

181
00:06:12,238 --> 00:06:14,207
THE NEXT YEAR, WE'LL BE AT FOUR

182
00:06:14,207 --> 00:06:14,507
CREW.

183
00:06:14,507 --> 00:06:16,442
WHAT IT DOES, IT DOUBLES THE

184
00:06:16,442 --> 00:06:18,711
CREW TIME THAT WE CAN DEVOTE TO

185
00:06:18,711 --> 00:06:19,078
SCIENCE.

186
00:06:19,078 --> 00:06:21,614
WE'VE GOT EVERYTHING COVERED,

187
00:06:21,614 --> 00:06:22,749
MEDICAL, STOYAGE AND THE SCIENCE

188
00:06:22,749 --> 00:06:24,183

WE DO TODAY.

189

00:06:24,183 --> 00:06:27,587

THAT CREW MEMBER'S TIME WILL GO

190

00:06:27,587 --> 00:06:28,821

DISTRIBUTED TOTALLY TO SCIENCE

191

00:06:28,821 --> 00:06:31,057

FOR US, WHICH IS A GREAT THING.

192

00:06:31,057 --> 00:06:32,625

PART OF THE MESSAGE THAT WE HAVE

193

00:06:32,625 --> 00:06:34,494

HERE IS THAT IF YOU ARE A

194

00:06:34,494 --> 00:06:36,229

RESEARCHER AND YOU EVER THOUGHT

195

00:06:36,229 --> 00:06:38,664

SPACE IS TOO COMPLICATED, KEN

196

00:06:38,664 --> 00:06:40,566

WILL TAKE CARE OF THE

197

00:06:40,566 --> 00:06:41,234

COMPLICATIONS FOR YOU.

198

00:06:41,234 --> 00:06:42,201

WE HAVE THE TIME.

199

00:06:42,201 --> 00:06:44,203

IT'S A GREAT TIME TO DO THE

200

00:06:44,203 --> 00:06:45,705

RESEARCH ON SPACE STATION.

201
00:06:45,705 --> 00:06:47,774
SOME OF THE OTHER THINGS GOING

202
00:06:47,774 --> 00:06:51,077
ON SCIENTIFICALLY IN NASA, HAS

203
00:06:51,077 --> 00:06:53,279
ANYONE HEARD THERE WILL BE AN

204
00:06:53,279 --> 00:06:57,116
ECLIPSE A WEEK FROM MONDAY?

205
00:06:57,116 --> 00:06:57,517
GOOD.

206
00:06:57,517 --> 00:06:59,685
YOU ARE PLUGGED IN.

207
00:06:59,685 --> 00:07:01,087
ISS CREW WILL BE ABLE TO SEE IT

208
00:07:01,087 --> 00:07:02,054
AS WELL.

209
00:07:02,054 --> 00:07:04,257
THE FIRST PASS WILL BE OVER THE

210
00:07:04,257 --> 00:07:04,857
PACIFIC NORTHWEST.

211
00:07:04,857 --> 00:07:06,425
THEY WILL BE ABLE TO SEE THE

212
00:07:06,425 --> 00:07:07,860
ECLIPSE, THE MOON IN FRONT OF

213
00:07:07,860 --> 00:07:08,361

THE SUN.

214

00:07:08,361 --> 00:07:11,197

THE SHADOW WILL NOT HAVE HIT THE

215

00:07:11,197 --> 00:07:13,232

NORTH AMERICAN PART OF THE EARTH

216

00:07:13,232 --> 00:07:13,533

YET.

217

00:07:13,533 --> 00:07:14,934

IN THE SECOND PASS, THEY WILL BE

218

00:07:14,934 --> 00:07:15,868

OVER CANADA.

219

00:07:15,868 --> 00:07:17,770

IF THEY LOOK TO THE SOUTH IN THE

220

00:07:17,770 --> 00:07:18,938

HORIZON, THEY WILL BE ABLE TO

221

00:07:18,938 --> 00:07:21,674

SEE THE SHADOW, DOWN IN

222

00:07:21,674 --> 00:07:22,575

KENTUCKY, TENNESSEE.

223

00:07:22,575 --> 00:07:24,911

IN THE 3RD PASS, THE SHADOW MAY

224

00:07:24,911 --> 00:07:26,245

HAVE SHIFTED TO THE EARTH.

225

00:07:26,245 --> 00:07:27,814

THEY WILL SEE THE MOST FULL OF

226

00:07:27,814 --> 00:07:29,482

THE ECLIPSE THEY'LL SEE.

227

00:07:29,482 --> 00:07:31,384

IT WILL BE ABOUT 85 PERCENT.

228

00:07:31,384 --> 00:07:33,486

THE CREW HAS SPECIAL FILTERS AND

229

00:07:33,486 --> 00:07:34,620

CAMERAS THEY WILL BE USING.

230

00:07:34,620 --> 00:07:38,758

I KNOW A LOT OF PEOPLE WILL DO

231

00:07:38,758 --> 00:07:39,158

THAT.

232

00:07:39,158 --> 00:07:43,596

FOR TIPS, GO TO THE NASA

233

00:07:43,596 --> 00:07:44,030

WEBSITE.

234

00:07:44,030 --> 00:07:48,301

TIPS 2017.NASA.GOV.

235

00:07:48,301 --> 00:07:51,804

AND ONE THING WE'RE PREPARING

236

00:07:51,804 --> 00:07:55,575

FOR YOU ALL A CLEAR PASS IN

237

00:07:55,575 --> 00:07:56,175

KENNEDY.

238

00:07:56,175 --> 00:07:57,810

AND LOOK FOR SOMETHING THAT'S

239

00:07:57,810 --> 00:07:59,478

LIKE AN AIRPLANE IN THE HORIZON.

240

00:07:59,478 --> 00:08:01,981

AS YOU WATCH IT, IT WILL GO

241

00:08:01,981 --> 00:08:06,452

RIGHT OVERHEAD AND DISAPPEAR AND

242

00:08:06,452 --> 00:08:09,722

RIGHT OVERHEAD, GOING TO THE

243

00:08:09,722 --> 00:08:10,556

STATION'S SUNSET.

244

00:08:10,556 --> 00:08:13,960

IF YOU MISS THE TIME, 9:33 LOCAL

245

00:08:13,960 --> 00:08:16,062

NORTHWEST OR LOOK AT IT FROM

246

00:08:16,062 --> 00:08:20,499

ANOTHER CITY, GO TO THE NASA

247

00:08:20,499 --> 00:08:23,836

WEBSITE, SPOT STATION NASA.ORG.

248

00:08:23,836 --> 00:08:24,704

YOU COULD LOOK UP ANY CITY YOU

249

00:08:24,704 --> 00:08:25,104

WANT TO GO.

250

00:08:25,104 --> 00:08:27,106

WITH THAT, BACK TO THE REGULAR

251
00:08:27,106 --> 00:08:27,607
PROGRAM.

252
00:08:27,607 --> 00:08:29,876
WE'RE EXCITED WITH THE SCIENCE

253
00:08:29,876 --> 00:08:33,479
TOMORROW, AND IT WILL ENABLE US

254
00:08:33,479 --> 00:08:35,248
WHEN IT'S UP THERE AND BRING IT

255
00:08:35,248 --> 00:08:36,148
HOME FOR US.

256
00:08:36,148 --> 00:08:39,285
LET'S INTS DUES TO KEN SHIELDS.

257
00:08:39,285 --> 00:08:40,920
>> AND THANK YOU, PETE.

258
00:08:40,920 --> 00:08:42,388
IT'S GOING TO BE TOUGH TO FOLLOW

259
00:08:42,388 --> 00:08:43,055
THAT ACT.

260
00:08:43,055 --> 00:08:44,257
I HAVE TO BE HONEST.

261
00:08:44,257 --> 00:08:45,958
WHEN YOU HEAR PETE RUN DOWN THE

262
00:08:45,958 --> 00:08:48,561
LIST OF ACTIVITIES THAT ARE

263
00:08:48,561 --> 00:08:52,365

GOING ON WITH THE ISS, NASA,

264

00:08:52,365 --> 00:08:53,332

INTERNATIONAL PARTNERSHIP AND

265

00:08:53,332 --> 00:08:56,836

WHERE WE ARE TODAY AND WHAT WE

266

00:08:56,836 --> 00:09:00,306

CONTINUE TO.

267

00:09:00,306 --> 00:09:03,442

AND MY NAME IS KEN SHIELDS,

268

00:09:03,442 --> 00:09:04,543

CENTER FOR ADVANCEMENT OF

269

00:09:04,543 --> 00:09:05,244

SCIENCE AND SPACE.

270

00:09:05,244 --> 00:09:07,179

ALSO KNOWN AS CASES.

271

00:09:07,179 --> 00:09:09,782

WE'RE A NON-PROFIT ORGANIZATION

272

00:09:09,782 --> 00:09:11,384

THAT MANAGES THE LABORATORY ON

273

00:09:11,384 --> 00:09:12,618

BOARD THE ISS.

274

00:09:12,618 --> 00:09:14,787

WHAT DOES IT MEAN TO HAVE A

275

00:09:14,787 --> 00:09:17,056

NATIONAL LABORATORY ON BOARD THE

276
00:09:17,056 --> 00:09:17,490
ISS?

277
00:09:17,490 --> 00:09:20,426
WHAT IT MEANS, IT AFFORDS

278
00:09:20,426 --> 00:09:22,228
ESSENTIALLY ANYONE WITH ACCESS,

279
00:09:22,228 --> 00:09:23,195
PARTICULARLY IN THE UNITED

280
00:09:23,195 --> 00:09:25,498
STATES, TO ACCESS THE ISS.

281
00:09:25,498 --> 00:09:27,600
FOR WHATEVER PURPOSE YOU DEEM

282
00:09:27,600 --> 00:09:28,234
NECESSARY APPROPRIATE.

283
00:09:28,234 --> 00:09:31,103
YOU COULD BE TESTING OUT A

284
00:09:31,103 --> 00:09:32,605
TECHNOLOGY, ADVANCING SOME MAYBE

285
00:09:32,605 --> 00:09:35,308
RESEARCH OR DISCOVERY IN VACCINE

286
00:09:35,308 --> 00:09:36,976
DEVELOPMENT, IMPROVING A

287
00:09:36,976 --> 00:09:37,610
CONSUMER PRODUCT.

288
00:09:37,610 --> 00:09:39,545

IT GOES ON AND ON.

289

00:09:39,545 --> 00:09:41,280

IT'S ALMOST INFINITE WHAT YOU

290

00:09:41,280 --> 00:09:43,916

WANT TO DO IN THE ENVIRONMENT OF

291

00:09:43,916 --> 00:09:46,519

MICRO GRAVITY OR EXTREME

292

00:09:46,519 --> 00:09:47,954

ENVIRONMENT OF SPACE.

293

00:09:47,954 --> 00:09:49,255

TODAY, IN A FEW MINUTES, WE HAVE

294

00:09:49,255 --> 00:09:51,757

A VIDEO, WHERE I WILL LET THE

295

00:09:51,757 --> 00:09:53,025

RESEARCHERS TELL YOU ON THEIR

296

00:09:53,025 --> 00:09:54,527

VOICE, WHAT THEY ARE DOING ON

297

00:09:54,527 --> 00:09:56,362

THEIR MISSION, SPACE X 12.

298

00:09:56,362 --> 00:09:57,897

EVERY MISSION WE COME TO, IT

299

00:09:57,897 --> 00:10:00,599

SEEMS LIKE THE PORTFOLIO,

300

00:10:00,599 --> 00:10:01,968

PROJECTS IN THE PIPELINE GETS

301
00:10:01,968 --> 00:10:03,502
MORE AND MORE DIVERSE AND MORE

302
00:10:03,502 --> 00:10:03,970
INTERESTING.

303
00:10:03,970 --> 00:10:05,371
THIS ONE IS NO DIFFERENT

304
00:10:05,371 --> 00:10:06,405
I WOULD LIKE TO TAKE A FEW

305
00:10:06,405 --> 00:10:08,641
MINUTES TO TELL YOU ABOUT THE

306
00:10:08,641 --> 00:10:10,910
ACTUAL CONSTRUCT OF THE NATIONAL

307
00:10:10,910 --> 00:10:12,044
LABORATORY AND HOW THAT INVOLVED

308
00:10:12,044 --> 00:10:13,679
OVER THE YEARS. AND SOME OF THE

309
00:10:13,679 --> 00:10:16,282
THINGS THAT IT IS ENABLING.

310
00:10:16,282 --> 00:10:18,284
FIRST OF ALL, FROM THE NATIONAL

311
00:10:18,284 --> 00:10:19,819
PERSPECTIVE, WE REPRESENT

312
00:10:19,819 --> 00:10:22,021
ORGANIZATION FROM A VERY DIVERSE

313
00:10:22,021 --> 00:10:22,421

BACKGROUND.

314

00:10:22,421 --> 00:10:24,590

WE HAVE RESEARCHERS FROM

315

00:10:24,590 --> 00:10:25,825

INSTITUTIONS, UNIVERSITIES,

316

00:10:25,825 --> 00:10:34,433

PRIVATE SECTOR COMPANIES.

317

00:10:47,847 --> 00:10:49,949

AND SO, ON THE SUPPLY SIDE, NOT

318

00:10:49,949 --> 00:10:51,784

JUST ON THE USER SIDE, THE

319

00:10:51,784 --> 00:10:53,719

SUPPLY SIDE, WE'RE ENABLING

320

00:10:53,719 --> 00:10:55,521

PRIVATE BUSINESSES TO RUN THEIR

321

00:10:55,521 --> 00:10:57,390

COMPANY ON THE INTERNATIONAL

322

00:10:57,390 --> 00:10:58,958

SPACE STATION.

323

00:10:58,958 --> 00:11:00,559

AND THIS LAUNCH REPRESENTS GREAT

324

00:11:00,559 --> 00:11:01,360

EXAMPLES OF SEVERAL COMPANIES

325

00:11:01,360 --> 00:11:03,262

THAT ARE SUPPORTING SOME

326

00:11:03,262 --> 00:11:03,863

INVESTIGATIONS.

327

00:11:03,863 --> 00:11:06,198

I WILL NAME A FEW EXAMPLES.

328

00:11:06,198 --> 00:11:09,235

YOU WILL SEE MORE IN THE VIDEO.

329

00:11:09,235 --> 00:11:10,936

ONE IS TECH SHOT.

330

00:11:10,936 --> 00:11:13,639

SOME OF THE FOLKS SUPPORT TECH

331

00:11:13,639 --> 00:11:13,939

SHOT.

332

00:11:13,939 --> 00:11:16,075

THEY'VE ALREADY BEEN ON THE

333

00:11:16,075 --> 00:11:21,547

STATION, WITH A BONE DENSITOM

334

00:11:21,547 --> 00:11:22,214

ETTER.

335

00:11:22,214 --> 00:11:24,383

THEY HAVE DONE 108 SCANS.

336

00:11:24,383 --> 00:11:26,585

THIS IS SOME YEARS AGO, EXPERTS

337

00:11:26,585 --> 00:11:27,787

SAID YOU COULDN'T DO.

338

00:11:27,787 --> 00:11:29,655

IT'S AVAILABLE RIGHT NOW.

339

00:11:29,655 --> 00:11:31,891

WE HAVE NANOACTS.

340

00:11:31,891 --> 00:11:33,659

THEY'VE FLOWN HUNDREDS OF

341

00:11:33,659 --> 00:11:36,695

EXPERIMENTS ON THE ISS AND THEY

342

00:11:36,695 --> 00:11:38,230

HAVE DOZENS ON THE FLIGHT AS

343

00:11:38,230 --> 00:11:38,531

WELL.

344

00:11:38,531 --> 00:11:39,799

WE HAVE BOEING.

345

00:11:39,799 --> 00:11:43,369

BOEING IS A FANTASTIC PARTNER

346

00:11:43,369 --> 00:11:45,738

FOR A WONDERFUL STEM SITUATION,

347

00:11:45,738 --> 00:11:49,008

KNOWN AS GENES ON SPACE.

348

00:11:49,008 --> 00:11:51,744

THEY ARE FLYING THEIR THIRD

349

00:11:51,744 --> 00:11:52,945

SPACE ON MISSION.

350

00:11:52,945 --> 00:11:54,814

THEY ARE FLYING A SECOND

351
00:11:54,814 --> 00:11:56,982
FACILITY IN SPACE X 13 COMING UP

352
00:11:56,982 --> 00:11:59,185
ALSO, FURTHERING GREAT RESEARCH.

353
00:11:59,185 --> 00:12:01,854
LAST AND NOT LEAST, A NEW

354
00:12:01,854 --> 00:12:04,090
FACILITY, LAUNCHING ON SPACE X

355
00:12:04,090 --> 00:12:05,157
10.

356
00:12:05,157 --> 00:12:09,095
IT'S CALLED SPACE TECHNOLOGY.

357
00:12:09,095 --> 00:12:12,031
ACRONYM FOR THEM IS STARS.

358
00:12:12,031 --> 00:12:14,233
AND THE NATIONAL LABORATORY AND

359
00:12:14,233 --> 00:12:16,669
THE PARTNERSHIP WE HAVE WITH

360
00:12:16,669 --> 00:12:19,672
NASA IN CASES, IS NOT ONLY

361
00:12:19,672 --> 00:12:22,174
ENABLING CUTTING-EDGE RESEARCH,

362
00:12:22,174 --> 00:12:23,342
IT IS ALSO INVOLVING THE

363
00:12:23,342 --> 00:12:24,577

LABORATORY, SO WE HAVE THE

364

00:12:24,577 --> 00:12:25,811

LATEST AND GREATEST,

365

00:12:25,811 --> 00:12:27,980

CUTTING-EDGE FACILITIES, THAT

366

00:12:27,980 --> 00:12:30,182

MODERN DAY RESEARCH COULD

367

00:12:30,182 --> 00:12:30,616

ACCOMMODATE.

368

00:12:30,616 --> 00:12:32,585

WE'RE FACILITATING BUSINESS IN

369

00:12:32,585 --> 00:12:34,820

SPACE AND FURTHERING THIS GOAL

370

00:12:34,820 --> 00:12:36,188

OF HAVING A LEO COMMERCIAL

371

00:12:36,188 --> 00:12:36,555

MARKET.

372

00:12:36,555 --> 00:12:37,957

SO WITH THAT, WE'LL CUT TO THE

373

00:12:37,957 --> 00:12:39,158

VIDEO RIGHT NOW.

374

00:12:39,158 --> 00:12:40,793

YOU COULD LEARN MORE OF THE

375

00:12:40,793 --> 00:12:42,995

RESEARCH OF THE NATIONAL LAB IS

376
00:12:42,995 --> 00:12:47,733
SPONSORING ON SPACE X 12.

377
00:12:47,733 --> 00:12:48,033
.

378
00:12:48,033 --> 00:12:50,369
I'M GREG JOHNSON IN THE

379
00:12:50,369 --> 00:12:51,103
INTERNATIONAL SPACE STATION

380
00:12:51,103 --> 00:12:51,770
MISSION CONTROL CENTER.

381
00:12:51,770 --> 00:12:53,339
WE'RE HERE TO HIGHLIGHT THE

382
00:12:53,339 --> 00:12:54,707
INCREDIBLE RESEARCH HEADED TO

383
00:12:54,707 --> 00:12:59,111
THE ISS NATIONAL LAB ABOARD THE

384
00:12:59,111 --> 00:13:02,948
CARGO RESUPPLY MISSION.

385
00:13:02,948 --> 00:13:05,484
THE MICHAEL J. FOX FOUNDATION,

386
00:13:05,484 --> 00:13:12,958
WILL ATTEMPT TO GROW LARGER IN

387
00:13:12,958 --> 00:13:13,526
LAB.

388
00:13:13,526 --> 00:13:15,995

HOUSTON METHODIST RESEARCH

389

00:13:15,995 --> 00:13:19,031

INSTITUTE WILL SEND A STEM CELL,

390

00:13:19,031 --> 00:13:22,801

LOOKING FOR NEW WAYS TO GROW

391

00:13:22,801 --> 00:13:25,171

MICRO TISSUE.

392

00:13:25,171 --> 00:13:31,010

AND PHARMACEUTICAL GIANT, ELI

393

00:13:31,010 --> 00:13:32,178

LILLY, PRODUCE STABILITY IN THE

394

00:13:32,178 --> 00:13:33,345

DRUG PRODUCT.

395

00:13:33,345 --> 00:13:36,148

NEW RESEARCH FACILITY, STARS 1,

396

00:13:36,148 --> 00:13:37,917

WILL MAKE ITS WAY TO THE SPACE

397

00:13:37,917 --> 00:13:39,818

STATION, TO SUPPORT PAYLOADS,

398

00:13:39,818 --> 00:13:42,521

LIFE SCIENCE RESEARCH AND

399

00:13:42,521 --> 00:13:44,156

PHYSICAL SCIENCE INVESTIGATION.

400

00:13:44,156 --> 00:13:46,392

FROM FORTUNE 500 COMPANIES TO

401
00:13:46,392 --> 00:13:49,395
INNOVATIVE START-UPS, TO ESTEEM

402
00:13:49,395 --> 00:13:52,431
NON-PROFIT AND ACADEMIC RESEARCH

403
00:13:52,431 --> 00:13:54,800
INSTITUTIONS, THIS MISSION

404
00:13:54,800 --> 00:13:58,737
EXEMPLIFIES THE WIDE RANGING

405
00:13:58,737 --> 00:14:02,508
INSTITUTION IN THE LAB AS AN

406
00:14:02,508 --> 00:14:05,511
INNOVATIVE PLATFORM.

407
00:14:05,511 --> 00:14:07,980
>> SO REALLY TO SUM IT UP, MY

408
00:14:07,980 --> 00:14:10,015
TAKE HOME MESSAGE FOR TODAY'S

409
00:14:10,015 --> 00:14:11,283
TALK, THERE'S NEVER BEEN A

410
00:14:11,283 --> 00:14:12,952
BETTER TIME TO GO AND HAVE

411
00:14:12,952 --> 00:14:14,820
ACCESS TO SPACE AND DO RESEARCH

412
00:14:14,820 --> 00:14:16,288
IN SPACE THAN WHAT WE HAVE

413
00:14:16,288 --> 00:14:16,622

TODAY.

414

00:14:16,622 --> 00:14:19,758

PETE MENTIONED IT IN HIS TALK

415

00:14:19,758 --> 00:14:20,125

EARLIER.

416

00:14:20,125 --> 00:14:22,628

WE'VE GOT UNEQUALED CREW TIME

417

00:14:22,628 --> 00:14:23,395

HONEST HORIZON.

418

00:14:23,395 --> 00:14:25,331

WE HAVE THE TECHNICIANS,

419

00:14:25,331 --> 00:14:26,265

ASTRONAUTS, PEOPLE UP THERE

420

00:14:26,265 --> 00:14:29,835

READY AND WILLING TO GO AND

421

00:14:29,835 --> 00:14:33,672

EXECUTE AND OPERATE

422

00:14:33,672 --> 00:14:35,407

AND WE HAVE EQUAL ACCESS TO THE

423

00:14:35,407 --> 00:14:35,708

ISS.

424

00:14:35,708 --> 00:14:36,942

WE HAVE CUTTING-EDGE FACILITIES

425

00:14:36,942 --> 00:14:39,111

THAT ARE COMING ON LIKE GANG

426

00:14:39,111 --> 00:14:40,779

BUSTERS FROM THE PRIVATE SECTOR.

427

00:14:40,779 --> 00:14:43,382

NOW IS THE TIME TO GO AND TAKE

428

00:14:43,382 --> 00:14:44,717

ADVANTAGE OF THE OPPORTUNITY

429

00:14:44,717 --> 00:14:46,852

ACCESS THIS AWESOME PLATFORM AND

430

00:14:46,852 --> 00:14:48,687

ACCOMPLISH WHAT YOU NEED TO IN

431

00:14:48,687 --> 00:14:51,423

YOUR RESEARCH OBJECTIVES.

432

00:14:51,423 --> 00:14:51,824

THANK YOU.

433

00:14:51,824 --> 00:14:54,526

>> THANK YOU, PETE AND KEN.

434

00:14:54,526 --> 00:14:56,362

THEY WILL STAY HERE IN A COUPLE

435

00:14:56,362 --> 00:14:58,864

OF MINUTES, TO TAKE QUESTIONS.

436

00:14:58,864 --> 00:15:02,101

IF YOU'RE FOLLOWING ALONG WITH

437

00:15:02,101 --> 00:15:05,104

SOCIAL MEDIA.

438

00:15:05,104 --> 00:15:08,907

DO WE HAVE ANY QUESTIONS FOR KEN

439

00:15:08,907 --> 00:15:09,575

OR PETE?

440

00:15:20,386 --> 00:15:18,150

>>

441

00:15:20,386 --> 00:15:21,887

BIOMED CAL RESEARCH?

442

00:15:21,887 --> 00:15:24,857

WHY CAN'T WE DO THAT STUFF ON

443

00:15:24,857 --> 00:15:25,190

EARTH?

444

00:15:25,190 --> 00:15:27,126

>> MAYBE ME AND PETE COULD TAG

445

00:15:27,126 --> 00:15:27,793

TEAM IT.

446

00:15:27,793 --> 00:15:29,595

WHEN YOU THINK ABOUT GRAVITY,

447

00:15:29,595 --> 00:15:30,863

IT'S THE DOMINANT FORCE.

448

00:15:30,863 --> 00:15:36,769

YOU COULD THINK OF IT AS A

449

00:15:36,769 --> 00:15:37,169

VARIABLE.

450

00:15:37,169 --> 00:15:39,505

AND THERE'S THINGS YOU COULD DO

451
00:15:39,505 --> 00:15:41,774
IN THE MICRO GRAVITY THAT YOU

452
00:15:41,774 --> 00:15:43,475
WILL OBSERVE THAT THERE'S NO WAY

453
00:15:43,475 --> 00:15:44,877
YOU COULD ACCOMPLISH ON THE

454
00:15:44,877 --> 00:15:45,210
GROUND.

455
00:15:45,210 --> 00:15:48,414
>> THINGS LIKE GROWING PROTEIN

456
00:15:48,414 --> 00:15:50,015
CRYSTALS, THEY WILL GROW LARGE

457
00:15:50,015 --> 00:15:53,385
NER MICRO GRAVITY.

458
00:15:53,385 --> 00:15:55,654
THEY WILL GROW IN THREE

459
00:15:55,654 --> 00:15:56,055
DIMENSIONS.

460
00:15:56,055 --> 00:15:58,590
YOU COULD GET AN IDEA WHAT THE

461
00:15:58,590 --> 00:16:00,859
CRYSTAL IS MADE OF.

462
00:16:00,859 --> 00:16:02,594
ANOTHER THING, YOU COULD STUDY

463
00:16:02,594 --> 00:16:05,864

SPES MINUTES THAT HAVE A SHORTER

464

00:16:05,864 --> 00:16:07,032

LIFE CYCLE.

465

00:16:07,032 --> 00:16:09,268

THEY'VE BEEN STUDIED A LONG TIME

466

00:16:09,268 --> 00:16:09,835

ON THE GROUND.

467

00:16:09,835 --> 00:16:13,038

WE STUDY THEM IN SPACE TO SEE

468

00:16:13,038 --> 00:16:13,872

WHAT WE'VE LEARNED ABOUT THEM IN

469

00:16:13,872 --> 00:16:14,373

THE PAST.

470

00:16:14,373 --> 00:16:15,674

>> DO WE HAVE ANOTHER QUESTION

471

00:16:15,674 --> 00:16:16,875

FROM THE AUDIENCE?

472

00:16:16,875 --> 00:16:19,244

YOU HAVE A QUESTION IN THE BACK.

473

00:16:19,244 --> 00:16:23,649

PLEASE HOLD YOUR QUESTION UNTIL

474

00:16:23,649 --> 00:16:29,488

THE MIKE GOES TO YOU.

475

00:16:29,488 --> 00:16:31,156

>> HOW OFTEN DO YOU HAVE TO

476
00:16:31,156 --> 00:16:33,792
RESUPPLY THE ISS WITH MATERIALS?

477
00:16:33,792 --> 00:16:34,927
>> WE HAVE A RHYTHM GOING WITH

478
00:16:34,927 --> 00:16:35,928
THE TWO.

479
00:16:35,928 --> 00:16:39,531
SPACE X AND ORBITAL A 2 K.

480
00:16:39,531 --> 00:16:40,966
WE SPREAD THE CARGO VEHICLES

481
00:16:40,966 --> 00:16:42,301
WHERE WE NEED THEM.

482
00:16:42,301 --> 00:16:44,069
SO WE WORK THEM AROUND THINGS

483
00:16:44,069 --> 00:16:47,106
LIKE THE SOYUZ LAUNCH AND

484
00:16:47,106 --> 00:16:48,741
LANDING, WHERE WE ARE ROTATING

485
00:16:48,741 --> 00:16:50,109
CREW MEMBERS.

486
00:16:50,109 --> 00:16:52,211
WE WORK THEM AROUND THINGS LIKE

487
00:16:52,211 --> 00:16:54,613
THERMAL CONSTRAINTS AND SPACE

488
00:16:54,613 --> 00:16:56,115

WALKS, LIKE WE HAVE LATER THIS

489

00:16:56,115 --> 00:16:56,415

WEEK.

490

00:16:56,415 --> 00:16:58,617

I THINK IT'S IN THE ORDER OF

491

00:16:58,617 --> 00:17:00,386

MAYBE SIX TO EIGHT FLIGHTS PER

492

00:17:00,386 --> 00:17:00,686

YEAR.

493

00:17:00,686 --> 00:17:02,321

SPREAD THEM ON THE TWO.

494

00:17:02,321 --> 00:17:05,257

BOTH OF THEM BRING A LOT OF

495

00:17:05,257 --> 00:17:06,191

CARGO TO THE SPACE STATION.

496

00:17:06,191 --> 00:17:08,527

SPACE X IS THE ONE THAT BRINGS

497

00:17:08,527 --> 00:17:10,796

HOME THE CARGO HOME TO US.

498

00:17:10,796 --> 00:17:13,298

WE ROTATE BETWEEN THE TWO.

499

00:17:13,298 --> 00:17:17,302

IT GIVES US REDUNDANCY AND

500

00:17:17,302 --> 00:17:18,103

FLEXIBILITY AS WELL.

501
00:17:18,103 --> 00:17:21,440
>> WE HAVE TIME FOR ONE MORE

502
00:17:21,440 --> 00:17:24,176
QUESTION FROM THE AUDIENCE.

503
00:17:24,176 --> 00:17:25,444
PLEASE HOLD YOUR QUESTION UNTIL

504
00:17:25,444 --> 00:17:26,812
THE MICROPHONE IS WITH YOU?

505
00:17:26,812 --> 00:17:29,181
>> IT'S MORE OF A GENERAL

506
00:17:29,181 --> 00:17:29,548
QUESTION.

507
00:17:29,548 --> 00:17:32,384
I'M CURIOUS ON THE EARTH

508
00:17:32,384 --> 00:17:34,286
SCIENCES THAT HAS GONE UP.

509
00:17:34,286 --> 00:17:36,455
DO YOU RECALL WHAT THE PROJECTS

510
00:17:36,455 --> 00:17:38,023
WERE AND WHAT THEY ARE

511
00:17:38,023 --> 00:17:39,458
REGARDING?

512
00:17:39,458 --> 00:17:41,393
I'M CURIOUS WHAT THE EARTH

513
00:17:41,393 --> 00:17:43,262

SCIENCE PROJECTS ARE LIKE IN THE

514

00:17:43,262 --> 00:17:43,562

ISS?

515

00:17:43,562 --> 00:17:46,432

>> I COULD GIVE YOU A COUPLE OF

516

00:17:46,432 --> 00:17:48,133

EXAMPLES AND PETE DOES ALSO.

517

00:17:48,133 --> 00:17:49,902

IN THE LAST YEAR AND A HALF,

518

00:17:49,902 --> 00:17:52,204

WE'VE SPONSORED AN INVESTIGATION

519

00:17:52,204 --> 00:17:55,174

CALLED TROPICAL CYCLONE.

520

00:17:55,174 --> 00:17:58,510

TROPICAL CYCLONE IS A TEAM OUT

521

00:17:58,510 --> 00:17:59,478

OF THE AREA.

522

00:17:59,478 --> 00:18:01,280

AND LOOKING AT THE TOP CLOUDS OF

523

00:18:01,280 --> 00:18:04,016

CYCLONES AND HURRICANES AND

524

00:18:04,016 --> 00:18:06,084

APPLYING DIFFERENT ALGORITHMS TO

525

00:18:06,084 --> 00:18:09,021

LEARN MORE HOW TO FORECAST,

526
00:18:09,021 --> 00:18:10,656
PARTICULARLY IN REMOTE AREAS OF

527
00:18:10,656 --> 00:18:13,992
THE PLANET THAT DON'T HAVE THE

528
00:18:13,992 --> 00:18:15,661
FORECASTING TOOLS IN THE UNITED

529
00:18:15,661 --> 00:18:15,994
STATES.

530
00:18:15,994 --> 00:18:19,064
AND ONCE AGAIN, WE HAVE A

531
00:18:19,064 --> 00:18:21,800
PRIVATE BOARD ON STATION, CALLED

532
00:18:21,800 --> 00:18:25,337
MUSES, IT'S A FACILITY CLASS

533
00:18:25,337 --> 00:18:28,373
PAYLOAD THAT COULD HAVE EARTH

534
00:18:28,373 --> 00:18:30,309
SENSING PAYLOADS OR PROJECTS

535
00:18:30,309 --> 00:18:33,178
THAT COULD SERVE A NUMBER OF

536
00:18:33,178 --> 00:18:34,646
EARTH SCIENCE DISCIPLINESES.

537
00:18:34,646 --> 00:18:37,883
>> ANOTHER THING THAT CAME TO MY

538
00:18:37,883 --> 00:18:39,985

MIND, ONE IS PSYCH CLOWE, WHEN

539

00:18:39,985 --> 00:18:42,454

YOU TAKE A PICTURE HERE, YOU ARE

540

00:18:42,454 --> 00:18:44,656

PROBABLY GETTING RED, BLUE,

541

00:18:44,656 --> 00:18:46,125

GREEN PICTURES.

542

00:18:46,125 --> 00:18:49,795

HYPER SPECTRUM, OR MANY OF THE

543

00:18:49,795 --> 00:18:52,297

SPECTRA TAKES OVER 100 DIFFERENT

544

00:18:52,297 --> 00:18:52,598

BANS.

545

00:18:52,598 --> 00:18:55,868

FOR EVERY PIXEL YOU SEE, WE SEE

546

00:18:55,868 --> 00:18:56,435

100 COLORS.

547

00:18:56,435 --> 00:18:58,504

WE HAD THAT MOUNTED IN THE

548

00:18:58,504 --> 00:19:01,073

EXTERIOR VIA ISS.

549

00:19:01,073 --> 00:19:06,512

ANOTHER ONE, RAPID SCAT, RAPID

550

00:19:06,512 --> 00:19:06,945

SCATOMETER.

551
00:19:06,945 --> 00:19:12,017
IT SHOT A RAY IN THE OCEAN.

552
00:19:12,017 --> 00:19:13,385
THEY CAN TELL WHICH WAY THE

553
00:19:13,385 --> 00:19:15,254
DIRECTION IS GOING OR HOW FAST

554
00:19:15,254 --> 00:19:17,923
THE WIND WAS GOING ON THE

555
00:19:17,923 --> 00:19:18,257
GROUND.

556
00:19:18,257 --> 00:19:20,292
THE OTHER NEAT THING, AS IT WAS

557
00:19:20,292 --> 00:19:23,362
TAKING DATA, THE DATA

558
00:19:23,362 --> 00:19:25,731
DISTRIBUTION GOT IT BACK TO

559
00:19:25,731 --> 00:19:29,001
PEOPLE LIKE NOAH, AND WEATHER

560
00:19:29,001 --> 00:19:31,770
FORECAST WITHIN TWO OR THREE

561
00:19:31,770 --> 00:19:35,407
HOURS FROM THE ISS OVERHEAD.

562
00:19:35,407 --> 00:19:35,908
>> THANK YOU.

563
00:19:35,908 --> 00:19:41,513

>> GOOD LOOK TO MARV, BUDDY.

564

00:19:41,513 --> 00:19:43,715

>> PETE TALKED A LITTLE BIT

565

00:19:43,715 --> 00:19:48,854

ABOUT THE STATION, NASA.NET

566

00:19:48,854 --> 00:19:49,221

WEBSITE.

567

00:19:49,221 --> 00:19:50,522

NOT ONLY IS IT A GREAT WAY TO

568

00:19:50,522 --> 00:19:51,823

TRACK THE STATION, BUT ALSO A

569

00:19:51,823 --> 00:19:53,926

GREAT WAY TO IMPRESS YOUR

570

00:19:53,926 --> 00:19:55,160

FRIENDS, WHEN YOU KNOW IT'S

571

00:19:55,160 --> 00:19:56,428

GOING UP OVERHEAD.

572

00:19:56,428 --> 00:19:58,130

THE OTHER THING I LIKE TO DO,

573

00:19:58,130 --> 00:20:00,499

WHEN I SEE THE STATION OR THE

574

00:20:00,499 --> 00:20:01,700

NOTIFICATION, IS THINK ABOUT WHO

575

00:20:01,700 --> 00:20:03,435

IS FLYING OVERHEAD.

576
00:20:03,435 --> 00:20:05,270
IT'S ALWAYS GOOD TO LOOK AT THE

577
00:20:05,270 --> 00:20:06,972
CREW LAUNCHING AT THAT POINT OR

578
00:20:06,972 --> 00:20:08,373
ON BOARD THE SPACE STATION AT

579
00:20:08,373 --> 00:20:09,675
THAT POINT AND KNOW WHO IS IN

580
00:20:09,675 --> 00:20:11,710
THE SPACE STATION AS IT FLIES

581
00:20:11,710 --> 00:20:12,077
OVERHEAD.

582
00:20:12,077 --> 00:20:16,448
THE OTHER THING, KEN MENTIONED,

583
00:20:16,448 --> 00:20:17,916
PRECRYSTALLIZATION AS A BENEFIT

584
00:20:17,916 --> 00:20:20,953
OF MICRO BIOLOGY.

585
00:20:20,953 --> 00:20:25,357
WE HAVE MICHAEL BATISTA,

586
00:20:25,357 --> 00:20:26,091
DIRECTOR OF THE PROGRAMS FOR

587
00:20:26,091 --> 00:20:31,196
MICHAEL J. FOX PROGRAM, AND

588
00:20:31,196 --> 00:20:34,900

MARCO, WHO IS LEADER OF GRAV 2.

589

00:20:34,900 --> 00:20:37,235

>> FROM THE MICHAEL J. FOX

590

00:20:37,235 --> 00:20:37,736

FOUNDATION.

591

00:20:37,736 --> 00:20:39,471

JUST BEFORE I TALK ABOUT

592

00:20:39,471 --> 00:20:41,473

PARKINSON'S DISEASE AND WHY

593

00:20:41,473 --> 00:20:44,676

WE'RE DOING THE EXPERIMENT, WE

594

00:20:44,676 --> 00:20:46,645

HAVE A BRIEF VIDEO I WOULD LIKE

595

00:20:46,645 --> 00:20:47,679

TO SHOW YOU

596

00:20:47,679 --> 00:20:49,414

>> I WANT TO THANK THE CENTER

597

00:20:49,414 --> 00:20:52,851

FOR THE ADVANCEMENT OF SCIENCE

598

00:20:52,851 --> 00:20:56,021

AND SPACE, FOR HELPING OUR

599

00:20:56,021 --> 00:20:57,322

MISSION BEYOND THE ADVANCEMENTS

600

00:20:57,322 --> 00:21:04,096

OF GRAVITY AND PULL.

601
00:21:06,598 --> 00:21:09,701
>> AS ONE OF THE COMMON GENETIC

602
00:21:09,701 --> 00:21:12,004
CONTRIBUTORS TO PARKINSON'S,

603
00:21:12,004 --> 00:21:15,073
LURK 2 IS THE FOCUS ON THE

604
00:21:15,073 --> 00:21:17,109
PARKINSON'S INVESTIGATION

605
00:21:17,109 --> 00:21:17,509
RESEARCH.

606
00:21:17,509 --> 00:21:19,645
>> AND LURK 2 IS ONE OF THE

607
00:21:19,645 --> 00:21:22,648
COMMON CAUSES OF THE DISEASE.

608
00:21:22,648 --> 00:21:26,118
FOR OVER 10 YEARS, NO ONE HAS

609
00:21:26,118 --> 00:21:32,824
BEEN ABLE TO CRYSTALLIZE LURK 2.

610
00:21:32,824 --> 00:21:40,098
>> IT'S BEEN PROVEN THAT

611
00:21:40,098 --> 00:21:41,366
CRYSTALLIZATION, IN THE

612
00:21:41,366 --> 00:21:42,034
CONDITION.

613
00:21:42,034 --> 00:21:44,936

AND WE HOPE LURK 2 WILL AS WELL.

614

00:21:44,936 --> 00:21:49,074

HAVING THE ATOMIC STRUCTURE WILL

615

00:21:49,074 --> 00:21:53,912

ALLOW US TO -- AND THOSE LURK 2

616

00:21:53,912 --> 00:21:55,714

CONTRIBUTORS COULD BE DEVELOPED.

617

00:21:55,714 --> 00:21:57,983

>> AND WE'RE INCREDIBLY EXCITED

618

00:21:57,983 --> 00:21:59,551

TO WORK WITH THE CASE.

619

00:21:59,551 --> 00:22:01,853

WE'RE WILLING TO GO TO THE END'S

620

00:22:01,853 --> 00:22:03,388

OF THE EARTH TO TRY THE

621

00:22:03,388 --> 00:22:05,257

STRUCTURE OF LURK 2.

622

00:22:05,257 --> 00:22:09,161

>> AND THE RESEARCH IS SELECTED

623

00:22:09,161 --> 00:22:15,167

TO TRAVEL TO THE INTERNATIONAL

624

00:22:15,167 --> 00:22:16,968

SPACE STATION.

625

00:22:16,968 --> 00:22:17,202

.

626
00:22:17,202 --> 00:22:20,439
>> GREAT, SO I WANT TO MAKE SOME

627
00:22:20,439 --> 00:22:22,407
BRIEF REMARKS ABOUT PARKINSON'S

628
00:22:22,407 --> 00:22:24,676
DISEASE AND THEN WE'LL SWITCH

629
00:22:24,676 --> 00:22:27,713
TO -- SEBASTIAN WILL LET YOU

630
00:22:27,713 --> 00:22:30,649
KNOW MORE WHY WE'RE DOING THE

631
00:22:30,649 --> 00:22:31,083
EXPERIMENT.

632
00:22:31,083 --> 00:22:34,052
PARKINSON'S DISEASE IS A NEAR

633
00:22:34,052 --> 00:22:36,188
GENETIC CRONTIVE DISORDER.

634
00:22:36,188 --> 00:22:39,157
IT AFFECTS PEOPLE AGES 1-60.

635
00:22:39,157 --> 00:22:41,626
WE'RE ESTIMATING THAT 1 MILLION

636
00:22:41,626 --> 00:22:42,494
PEOPLE IN THE UNITED STATES TO

637
00:22:42,494 --> 00:22:44,129
HAVE PARKINSON'S AND POSSIBLY 5

638
00:22:44,129 --> 00:22:45,197

MILLION PEOPLE IN THE WORLD.

639

00:22:45,197 --> 00:22:47,733

THE DISEASE IS CHARACTERIZED BY

640

00:22:47,733 --> 00:22:55,841

BOTH MOTOR SYMPTOMS, SUCH AS

641

00:22:55,841 --> 00:22:57,843

REJILLITY, ABNORMAL GATE, AND

642

00:22:57,843 --> 00:23:00,912

COGNITIVE, SUCH AS DEFICIT,

643

00:23:00,912 --> 00:23:02,714

AUTOMOTIVE DYSFUNCTION AND

644

00:23:02,714 --> 00:23:03,148

DEPRESSION.

645

00:23:03,148 --> 00:23:05,150

THERE'S TREATMENTS THAT

646

00:23:05,150 --> 00:23:06,818

AMELIORATE THE SYSTEMS. HOWEVER,

647

00:23:06,818 --> 00:23:08,253

WE DON'T HAVE ANYTHING THAT'S

648

00:23:08,253 --> 00:23:10,388

DISEASE MODIFYING THAT WILL

649

00:23:10,388 --> 00:23:12,190

REVERSE, STOP OR SLOW DOWN THE

650

00:23:12,190 --> 00:23:13,859

PROGRESSION OF THE DISEASE.

651
00:23:13,859 --> 00:23:16,194
THAT'S WHY IN THE MICHAEL J. FOX

652
00:23:16,194 --> 00:23:17,729
FOUNDATION, WE'RE INTERESTED IN

653
00:23:17,729 --> 00:23:21,733
THE GENE, LOSIN RICH, LARK 2, AS

654
00:23:21,733 --> 00:23:24,069
WE LIKE TO CALL IT.

655
00:23:24,069 --> 00:23:26,104
THE REASON WHY WE'RE INTERESTED

656
00:23:26,104 --> 00:23:28,106
AND INVESTED ALREADY \$100

657
00:23:28,106 --> 00:23:30,008
MILLION IN THE POTENTIAL DRUG

658
00:23:30,008 --> 00:23:31,910
TARGET OR FOR THE FOLLOWING

659
00:23:31,910 --> 00:23:34,012
REASONS, FIRST MUTATIONS IN THE

660
00:23:34,012 --> 00:23:36,148
GENE HAVE BEEN SHOWN TO BE ONE

661
00:23:36,148 --> 00:23:37,949
OF THE MOST COMMON GENETIC

662
00:23:37,949 --> 00:23:39,584
CAUSES OF THE DISEASE.

663
00:23:39,584 --> 00:23:41,586

SECOND, THE CLINICAL

664

00:23:41,586 --> 00:23:44,956

MANIFESTATIONS OF THE DISEASE IS

665

00:23:44,956 --> 00:23:46,958

ACTUALLY SIMILAR TO THE

666

00:23:46,958 --> 00:23:49,394

NONGENETIC MORE COMMON FORMS OF

667

00:23:49,394 --> 00:23:49,861

PARKINSON'S.

668

00:23:49,861 --> 00:23:53,298

THE POSSIBILITY THAT THERAPEUTIC

669

00:23:53,298 --> 00:23:55,167

TREATS LARK-MUTATION CARRIERS,

670

00:23:55,167 --> 00:23:56,535

COULD POSSIBLY TREAT EVERYBODY

671

00:23:56,535 --> 00:23:58,970

WHO HAS PARKINSON'S DISEASE.

672

00:23:58,970 --> 00:24:00,438

ALSO, IT'S VERY DRUGABLE.

673

00:24:00,438 --> 00:24:03,642

THAT TERM IS USED WHEN THE

674

00:24:03,642 --> 00:24:05,110

PHARMACEUTICAL COMMUNITY HAS

675

00:24:05,110 --> 00:24:06,878

EXPERTISE, TO TARGET THE

676
00:24:06,878 --> 00:24:09,147
PARTICULAR PROTEIN.

677
00:24:09,147 --> 00:24:11,550
THERE'S A CLASS OF INHIBITERS

678
00:24:11,550 --> 00:24:13,552
AND PHARMACEUTICAL INDUSTRY IS

679
00:24:13,552 --> 00:24:16,121
VERY GOOD IN MAKING THAT CLASS

680
00:24:16,121 --> 00:24:17,122
OF DRUG.

681
00:24:17,122 --> 00:24:20,258
AND IT'S STILL HANGING FRUIT TO

682
00:24:20,258 --> 00:24:22,227
GO AFTER LARK 2.

683
00:24:22,227 --> 00:24:24,863
FINALLY, CONVERGING BIOLOGY THAT

684
00:24:24,863 --> 00:24:27,165
SHOWS LARK 2 IS PLAYING AN

685
00:24:27,165 --> 00:24:29,668
IMPORTANT OR IF NOT CENTRAL ROLE

686
00:24:29,668 --> 00:24:33,405
IN PARKINSON'S DISEASE.

687
00:24:33,405 --> 00:24:36,374
THE BREAKTHROUGH RECENTLY, WE'RE

688
00:24:36,374 --> 00:24:38,543

ABLE TO IDENTIFY THE SUB

689

00:24:38,543 --> 00:24:39,578

STRAIGHTS.

690

00:24:39,578 --> 00:24:42,214

SUBSTRAIGHTS IS TURNED ON OR

691

00:24:42,214 --> 00:24:43,448

TURNED OFF BY LARK 2.

692

00:24:43,448 --> 00:24:45,150

WE'RE DOING QUITE A BIT OF WORK

693

00:24:45,150 --> 00:24:47,152

IN CLINICAL SAFETY, WHICH IS

694

00:24:47,152 --> 00:24:48,220

SHOWING US THAT IT IS POSSIBLE

695

00:24:48,220 --> 00:24:50,922

TO BE ABLE TO MOVE AND DO

696

00:24:50,922 --> 00:24:54,059

CLINICAL DEVELOPMENT OF THE LARK

697

00:24:54,059 --> 00:24:56,595

2 INHIBITERS IN PEOPLE.

698

00:24:56,595 --> 00:24:58,697

WE STILL NEED MORE

699

00:24:58,697 --> 00:24:59,197

BREAKTHROUGHS.

700

00:24:59,197 --> 00:25:01,066

WHAT ONE THING WE FULLY DON'T

701
00:25:01,066 --> 00:25:03,034
UNDERSTAND WHAT LARK 2 LOOKS

702
00:25:03,034 --> 00:25:05,604
LIKE, WHAT IT'S ATOMIC STRUCTURE

703
00:25:05,604 --> 00:25:05,904
IS.

704
00:25:05,904 --> 00:25:08,139
WE HAVE A WORLD CLASS TEAM

705
00:25:08,139 --> 00:25:10,642
WORKING ON THE PROBLEM ON EARTH

706
00:25:10,642 --> 00:25:11,877
WITH DIFFERENT TECHNIQUES.

707
00:25:11,877 --> 00:25:13,378
ONE PARTICULAR TECHNIQUE, THAT

708
00:25:13,378 --> 00:25:16,248
IT APPEARS THAT WE MAY HAVE

709
00:25:16,248 --> 00:25:19,117
BETTER LUCK IF WE WERE TO DO IT

710
00:25:19,117 --> 00:25:20,685
IN THE INTERNATIONAL SPACE

711
00:25:20,685 --> 00:25:21,086
STATION.

712
00:25:21,086 --> 00:25:27,859
THAT'S LOOKING AT X-RAY, CRYSTAL

713
00:25:27,859 --> 00:25:29,160

CRYSTALOGY RALPHY.

714

00:25:29,160 --> 00:25:31,529

YOU ARE ABLE TO UNDERSTAND WHAT

715

00:25:31,529 --> 00:25:33,465

A PROTEIN COULD LOOK LIKE.

716

00:25:33,465 --> 00:25:35,033

WITH THAT, YOU COULD BETTER

717

00:25:35,033 --> 00:25:35,800

UNDERSTAND THE FUNCTION.

718

00:25:35,800 --> 00:25:37,535

YOU WANT TO TAKE THE PROTEIN,

719

00:25:37,535 --> 00:25:40,238

MAKE IT INTO A CRYSTAL, SYMBOL

720

00:25:40,238 --> 00:25:42,007

AMPLIFIES THE PROTEIN.

721

00:25:42,007 --> 00:25:45,277

YOU BOMBARD IT WITH X-RAYS, AND

722

00:25:45,277 --> 00:25:46,978

YOU'RE ABLE TO BETTER UNDERSTAND

723

00:25:46,978 --> 00:25:48,413

WHAT THE PROTEIN LOOKS LIKE.

724

00:25:48,413 --> 00:25:52,083

THIS WILL HELP IN TWO WAYS.

725

00:25:52,083 --> 00:25:53,485

FIRST, IT WILL HELP YOU

726
00:25:53,485 --> 00:25:55,553
UNDERSTAND THE BIOLOGY,

727
00:25:55,553 --> 00:25:57,022
UNDERSTAND STRUCTURE.

728
00:25:57,022 --> 00:25:58,890
SECONDLY, ALTHOUGH THE

729
00:25:58,890 --> 00:26:00,191
PHARMACEUTICAL INDUSTRY IS VERY

730
00:26:00,191 --> 00:26:04,095
GOOD IN MAKING LARK 2

731
00:26:04,095 --> 00:26:06,131
INHIBITERS, THEY HAVE BEEN DOING

732
00:26:06,131 --> 00:26:07,866
IT PRETTY MUCH BLIND.

733
00:26:07,866 --> 00:26:10,135
THEY ARE USING OTHER PROTEINS

734
00:26:10,135 --> 00:26:11,803
THAT HAVE BEEN SOLVED, USING

735
00:26:11,803 --> 00:26:14,205
THAT TO MAKE ASSUMPTIONS WHAT

736
00:26:14,205 --> 00:26:15,273
LARK 2 LOOKS LIKE.

737
00:26:15,273 --> 00:26:18,176
THEY ARE DOING A GOOD JOB BUT WE

738
00:26:18,176 --> 00:26:21,212

WON'T KNOW IF WE CAN HAVE THE

739

00:26:21,212 --> 00:26:26,451

MOST OPTIMAL LARK 2 INHIBITER

740

00:26:26,451 --> 00:26:28,353

WITHOUT IT.

741

00:26:28,353 --> 00:26:31,523

I WANT TO PASS IT TO SEBASTIAN

742

00:26:31,523 --> 00:26:34,125

WHO COULD EXPLAIN MORE ABOUT THE

743

00:26:34,125 --> 00:26:34,426

ISS.

744

00:26:34,426 --> 00:26:36,661

>> AND I'M PART OF THE TEAM THAT

745

00:26:36,661 --> 00:26:43,168

IS PLAYING THE TECHNIQUE, IN

746

00:26:43,168 --> 00:26:46,771

ORDER TO SUPPORT THE 3-D

747

00:26:46,771 --> 00:26:49,908

DIMENSION OF LARK 2.

748

00:26:49,908 --> 00:26:51,876

AND GENERAL WORKFLOW IS LIKE,

749

00:26:51,876 --> 00:26:54,012

FIRST, WE MAKE A LOT OF THE

750

00:26:54,012 --> 00:26:54,379

PROTEIN.

751
00:26:54,379 --> 00:26:56,982
THEN WE PUT CRYSTALS OF THE

752
00:26:56,982 --> 00:26:57,382
PROTEIN.

753
00:26:57,382 --> 00:27:01,786
THEN WE ANALYZE BOTH CRYSTALS

754
00:27:01,786 --> 00:27:05,457
USING FOCUSED X-RAY BEAMS AND

755
00:27:05,457 --> 00:27:07,292
FINALLY CALCULATE THE THREE

756
00:27:07,292 --> 00:27:10,495
DIMENSIONAL STRUCTURE OF THE

757
00:27:10,495 --> 00:27:12,230
COLLECTIVE DATA.

758
00:27:12,230 --> 00:27:14,232
YEAH, AND OUR EXPERIMENT ON

759
00:27:14,232 --> 00:27:19,471
BOARD THE ISS, IS AIMED TO

760
00:27:19,471 --> 00:27:22,140
GENERATE HIGH QUALITY CRYSTALS.

761
00:27:22,140 --> 00:27:25,410
AND OUR TWO PROTEINS IS USED AS

762
00:27:25,410 --> 00:27:30,415
A METHOD OF PROTEIN, AND IT

763
00:27:30,415 --> 00:27:32,183

COMPROMISES OF HAVING DOMAINS.

764

00:27:32,183 --> 00:27:41,826

THERE'S A LOT OF POLYPEPTIDE

765

00:27:41,826 --> 00:27:42,227

CHAINS.

766

00:27:42,227 --> 00:27:46,031

WE BELIEVE IT'S -- LARK 2 COULD.

767

00:27:46,031 --> 00:27:49,701

AND ALL OF THIS MAKES IT A

768

00:27:49,701 --> 00:27:52,437

CHALLENGING TARGET TO WORK ON.

769

00:27:52,437 --> 00:27:54,906

AND WE MANAGE TO PRODUCE A

770

00:27:54,906 --> 00:27:56,408

SHORTER VERSION OF THE PROTEIN

771

00:27:56,408 --> 00:27:58,209

THAT'S BETTER BEHAVED THAN THE

772

00:27:58,209 --> 00:28:00,245

FULL LENGTH PROTEIN.

773

00:28:00,245 --> 00:28:03,515

AND YEAH, THIS PROTEIN IS

774

00:28:03,515 --> 00:28:08,053

CRYSTALLIZED AND THEN FOCUSED.

775

00:28:08,053 --> 00:28:09,888

THIS TOOL THAT'S THE CHIP

776
00:28:09,888 --> 00:28:13,191
MANUFACTURER BY THE COMPANY, AND

777
00:28:13,191 --> 00:28:16,428
ITS CHIP, THERE'S 16 TINY

778
00:28:16,428 --> 00:28:16,828
CHANNELS.

779
00:28:16,828 --> 00:28:18,663
WE FILL THE FIRST HALF OF THE

780
00:28:18,663 --> 00:28:20,832
CHANNEL WITH THE LARK 2 PROTEIN.

781
00:28:20,832 --> 00:28:24,335
AND THEN WE FILL THE SECOND HALF

782
00:28:24,335 --> 00:28:27,205
OF EACH CHANNEL WITH AN ADDITIVE

783
00:28:27,205 --> 00:28:27,572
SOLUTION.

784
00:28:27,572 --> 00:28:31,443
AFTER STOPPING THE EXPERIMENT,

785
00:28:31,443 --> 00:28:34,045
THE PROTEIN DIFFUSES INTO AN

786
00:28:34,045 --> 00:28:36,881
ADDITIVE SOLUTION AND THE

787
00:28:36,881 --> 00:28:39,050
COMPONENTS OF THE ADDITIVE

788
00:28:39,050 --> 00:28:41,152

SOLUTION, AND EVENTUALLY AT SOME

789

00:28:41,152 --> 00:28:46,524

POINT, THE PROTEIN CRYSTALLIZES.

790

00:28:46,524 --> 00:28:51,529

THE EXPERIMENT IS LIKE, WE SAID,

791

00:28:51,529 --> 00:28:52,297

CHANNELS ON EARTH.

792

00:28:52,297 --> 00:28:54,032

AND IMMEDIATELY AFTER SETTING

793

00:28:54,032 --> 00:28:54,299

UP.

794

00:28:54,299 --> 00:28:56,601

THIS IS HOW THEY ARE TRANSPORTED

795

00:28:56,601 --> 00:28:59,938

TO ISS, HOPEFULLY TOMORROW.

796

00:28:59,938 --> 00:29:06,611

AND THE ABSOLUTE, HAS TO PLACE

797

00:29:06,611 --> 00:29:08,546

AMGWEN TEMPERATURE.

798

00:29:08,546 --> 00:29:11,149

WHERE CRYSTALLIZATION IS GOING

799

00:29:11,149 --> 00:29:11,516

TO OCCUR.

800

00:29:11,516 --> 00:29:13,084

AND AFTER A FEW WEEKS, IT'S

801
00:29:13,084 --> 00:29:14,752
TRANSPORTEDED BACK TO EARTH AND

802
00:29:14,752 --> 00:29:17,021
THAT'S WHEN WE ANALYZE THE

803
00:29:17,021 --> 00:29:20,458
CRYSTALS AND HOPEFULLY ARE GOING

804
00:29:20,458 --> 00:29:21,926
THROUGH THE FIRST.

805
00:29:21,926 --> 00:29:26,664
AND WE DID THIS QUITE OFTEN ON

806
00:29:26,664 --> 00:29:30,101
EARTH AND WE MANAGED TO MAKE

807
00:29:30,101 --> 00:29:32,971
CRYSTALS RELIABLITY, AND SO WE

808
00:29:32,971 --> 00:29:36,141
CAN MAKE AS MANY CRYSTALS AS WE

809
00:29:36,141 --> 00:29:40,245
LIKE, SO WHY DO WE SEND SAMPLES

810
00:29:40,245 --> 00:29:41,579
TO SPACE THEN.

811
00:29:41,579 --> 00:29:43,348
THIS IS SIMPLY BECAUSE OF THE

812
00:29:43,348 --> 00:29:47,285
QUALITY OF OUR CRYSTALS IS NOT

813
00:29:47,285 --> 00:29:47,919

HIGH ENOUGH.

814

00:29:47,919 --> 00:29:50,021

THIS ADJUSTMENT IS NOT GOOD

815

00:29:50,021 --> 00:29:51,956

ENOUGH IF WE MAKE THEM ON EARTH.

816

00:29:51,956 --> 00:29:55,660

YOU SEE IT THERE, THE EDGES ARE

817

00:29:55,660 --> 00:29:56,694

NOT TOO SHARP.

818

00:29:56,694 --> 00:29:59,797

YOU COULD SEE THE CRYSTALS ARE

819

00:29:59,797 --> 00:30:00,131

TRICKY.

820

00:30:00,131 --> 00:30:02,400

ONE REASON FOR THIS, MAYBE ON

821

00:30:02,400 --> 00:30:04,936

EARTH, WE HAVE GRAVITY.

822

00:30:04,936 --> 00:30:08,072

YOU ASK THE QUESTION, ON EARTH,

823

00:30:08,072 --> 00:30:10,675

WE HAVE GRAVITY.

824

00:30:10,675 --> 00:30:13,044

THAT MEANS DENSE PARTICLES WILL

825

00:30:13,044 --> 00:30:15,380

SINK TO THE BOTTOM OF OUR

826

00:30:15,380 --> 00:30:17,882

SAMPLE, FORMING UNWANTED

827

00:30:17,882 --> 00:30:18,283

GRADIENTS.

828

00:30:18,283 --> 00:30:19,717

AND OTHER THING, THERE'S CHANGES

829

00:30:19,717 --> 00:30:26,958

IN TEMPERATURE, WE NEED -- LEAD

830

00:30:26,958 --> 00:30:32,263

TO CONVECTION.

831

00:30:32,263 --> 00:30:36,067

BECAUSE OF THE MICRO GRAVITY

832

00:30:36,067 --> 00:30:38,303

CONDITIONS, AS IF THERE WERE NO

833

00:30:38,303 --> 00:30:41,039

GRAVITY AND WE DON'T HAVE

834

00:30:41,039 --> 00:30:45,843

UNWANTED GRADIENT AND WE DON'T

835

00:30:45,843 --> 00:30:49,214

HAVE CONVECTION THERE.

836

00:30:49,214 --> 00:30:51,749

THIS RESULTS IN MORE CRYSTAL

837

00:30:51,749 --> 00:30:52,116

GROWTH.

838

00:30:52,116 --> 00:30:53,952

AND THIS ULTIMATELY WILL LEAD TO

839

00:30:53,952 --> 00:30:59,624

HIGHER DATA QUALITY.

840

00:30:59,624 --> 00:31:04,229

IF WE GET, TWO PROTEINS AT 6

841

00:31:04,229 --> 00:31:05,997

OUNCE RESOLUTION, WE WILL SEE

842

00:31:05,997 --> 00:31:08,533

THE DOMAIN ARCHITECTURAL.

843

00:31:08,533 --> 00:31:11,402

WE WILL SEE SECONDARY ELEMENTS

844

00:31:11,402 --> 00:31:13,271

AND IT WILL HELP US UNDERSTAND

845

00:31:13,271 --> 00:31:15,106

THE MECHANISM OF THE PROTEIN.

846

00:31:15,106 --> 00:31:17,642

WE'LL SEE HOW IT IS REGULATED.

847

00:31:17,642 --> 00:31:21,112

WE WILL UNDERSTAND PARKINSON'S

848

00:31:21,112 --> 00:31:22,614

DISEASE BETTER.

849

00:31:22,614 --> 00:31:25,016

GET THE DATA SET, WITH THE

850

00:31:25,016 --> 00:31:28,052

RESOLUTION OF 3, ATOMIC

851
00:31:28,052 --> 00:31:31,723
RESOLUTION AND WITH THE DATA, WE

852
00:31:31,723 --> 00:31:35,727
CAN DO -- SOMETHING THAT MARK

853
00:31:35,727 --> 00:31:37,662
HAS MENTIONED ALREADY.

854
00:31:37,662 --> 00:31:40,465
SAY IT AGAIN, WE WILL SEE THE --

855
00:31:40,465 --> 00:31:44,636
AND IT'S BETTER AND 3 OUNCE,

856
00:31:44,636 --> 00:31:47,572
ATOMIC RESOLUTION.

857
00:31:47,572 --> 00:31:56,080
WE'RE NOT FAR AWAY FROM THE 6

858
00:31:57,348 --> 00:31:56,614
ANG

859
00:31:57,348 --> 00:31:58,182
AND JUSTIFIED HOPE.

860
00:31:58,182 --> 00:31:58,750
THANK YOU VERY MUCH.

861
00:32:03,488 --> 00:32:03,988
[APPLAUSE]

862
00:32:07,191 --> 00:32:09,327
>> THANK YOU TO BOTH DR. BATISTA

863
00:32:09,327 --> 00:32:12,063

AND DOCTOR MATTHEW.

864

00:32:12,063 --> 00:32:14,432

THEY WILL STAY, TO ANSWER YOUR

865

00:32:14,432 --> 00:32:14,832

QUESTIONS.

866

00:32:14,832 --> 00:32:15,600

IF YOU HAVE A QUESTION, PLEASE

867

00:32:15,600 --> 00:32:17,201

RAISE YOUR HAND AND WAIT FOR THE

868

00:32:17,201 --> 00:32:18,870

MICROPHONE TO GET TO YOU.

869

00:32:18,870 --> 00:32:22,040

IF YOU ARE FOLLOWING ALONG

870

00:32:22,040 --> 00:32:26,411

ON-LINE, SUBMIT YOUR QUESTIONS

871

00:32:26,411 --> 00:32:26,744

#NASA.

872

00:32:26,744 --> 00:32:28,646

THE FRONT ROW

873

00:32:28,646 --> 00:32:31,215

>> DARRA.

874

00:32:31,215 --> 00:32:35,320

YOU MENTIONED, MUTATION, AND AS

875

00:34:09,213 --> 00:34:08,546

WE

876

00:34:09,213 --> 00:34:10,047

QUESTIONS IN THE ROOM?

877

00:34:10,047 --> 00:34:11,516

PLEASE WAIT FOR THE MICROPHONE

878

00:34:11,516 --> 00:34:19,724

TO REACH YOU IN THE BAC .

879

00:34:19,724 --> 00:34:21,392

>> I'M JUST CURIOUS WITH THE

880

00:34:21,392 --> 00:34:22,727

RESULTS THAT YOU GUYS ARE GOING

881

00:34:22,727 --> 00:34:26,063

TO END UP WITH, HOPEFULLY WITH

882

00:34:26,063 --> 00:34:27,532

SOME POSITIVE STUFF.

883

00:34:27,532 --> 00:34:29,600

ARE THERE OTHER DISEASE

884

00:34:29,600 --> 00:34:31,102

ORGANIZATIONS THAT WILL BENEFIT

885

00:34:31,102 --> 00:34:32,703

FROM THIS THAT ARE KIND OF

886

00:34:32,703 --> 00:34:36,107

WATCHING YOU GUYS, TO SEE WHAT

887

00:34:36,107 --> 00:34:38,209

YOUR RESULTS ARE?

888

00:34:38,209 --> 00:34:41,179

>> SO IN CASE WE WILL GET THE

889

00:34:41,179 --> 00:34:42,847

STRUCTURE, WE WILL OF COURSE,

890

00:34:42,847 --> 00:34:44,148

PUBLISH IT AS SOON AS POSSIBLE,

891

00:34:44,148 --> 00:34:47,218

MAKE IT AVAILABLE FOR THE

892

00:34:47,218 --> 00:34:47,585

PUBLIC.

893

00:34:47,585 --> 00:34:50,488

>> YEAH, DEFINITELY, EVERYBODY

894

00:34:50,488 --> 00:34:52,390

IN THE PARKINSON'S FIELD LOOKS

895

00:34:52,390 --> 00:34:54,959

AT OTHER NEURO GENERATION FIELD.

896

00:34:54,959 --> 00:34:57,462

WE MONITOR WHAT'S GOING ON IN

897

00:34:57,462 --> 00:34:58,162

ALZHEIMER'S.

898

00:34:58,162 --> 00:34:59,997

THEY ARE MONITORING WHAT WE ARE

899

00:34:59,997 --> 00:35:00,898

DOING ALSO.

900

00:35:00,898 --> 00:35:03,734

AT THE HIGHEST LEVEL, THAT'S THE

901
00:35:03,734 --> 00:35:04,836
MONITORING WE DO.

902
00:35:04,836 --> 00:35:06,671
AND SPECIFICALLY WITH THE

903
00:35:06,671 --> 00:35:08,406
EXPERIMENT, I'M NOT SURE HOW IT

904
00:35:08,406 --> 00:35:11,476
WILL BE AFFECTING OTHER DISEASE

905
00:35:11,476 --> 00:35:12,977
INDICATIONS BUT AS SEBASTIAN

906
00:35:12,977 --> 00:35:14,445
SAID, WE TRY TO GET THE

907
00:35:14,445 --> 00:35:15,947
INFORMATION OUT AND PEOPLE COULD

908
00:35:15,947 --> 00:35:19,984
ACCESS AND SEE WHAT WE FOUND.

909
00:35:19,984 --> 00:35:22,253
>> THANK YOU BOTH FOR YOUR TIME.

910
00:35:22,253 --> 00:35:28,092
[APPLAUSE]

911
00:35:28,092 --> 00:35:30,795
>> OUR NEXT HIGHLIGHTS IS THE

912
00:35:30,795 --> 00:35:35,766
EFFECT OF MICRO GRAVITY ON STEM

913
00:35:41,272 --> 00:35:40,805

CELLARIZATION

914

00:35:41,272 --> 00:35:42,039

FOR THAT, WE HAVE A VIDEO FOR

915

00:35:42,039 --> 00:35:50,147

YOU.

916

00:35:50,147 --> 00:35:52,817

>> WE'VE CREATED A MODEL OF THE

917

00:35:52,817 --> 00:35:55,386

HUMAN LUNG, THAT HAS MOST OF THE

918

00:35:55,386 --> 00:35:57,388

CELLS, WILL HAVE.

919

00:35:57,388 --> 00:35:59,924

WE WILL USE THE MODEL TO

920

00:35:59,924 --> 00:36:02,193

EVALUATE WHAT HAPPENS TO YOUR

921

00:36:02,193 --> 00:36:05,062

LUNGS IN LONG-TERM SPACE FLIGHT.

922

00:36:05,062 --> 00:36:10,268

WE'RE USING STEM JENRATIVE

923

00:36:10,268 --> 00:36:10,601

CELLS.

924

00:36:10,601 --> 00:36:12,603

THEY ARE THE CELLS THAT ALLOWS

925

00:36:12,603 --> 00:36:18,342

YOU TO HAVE THE GAS TO BREATH.

926
00:36:18,342 --> 00:36:21,045
THE LARGER MISSION, EVENTUALLY

927
00:36:21,045 --> 00:36:24,715
SOME DAY TO MAKE PIECES, TO MAKE

928
00:36:24,715 --> 00:36:28,452
IT LONG EXISTING FOR

929
00:36:28,452 --> 00:36:32,256
TRANSPORTATION FOR SOMEBODY.

930
00:36:32,256 --> 00:36:35,192
IF YOU LOOK WHAT ATOMS DO, WILL

931
00:36:35,192 --> 00:36:38,296
AFFECT THE MOLECULE, CHANGES THE

932
00:36:38,296 --> 00:36:41,299
WAY THE TISSUE RESPONDS, THAT

933
00:36:41,299 --> 00:36:43,000
CHANGES HOW YOU FUNCTION.

934
00:36:43,000 --> 00:36:45,102
YOU HAVE TO WALK BACK AND SAY, I

935
00:36:45,102 --> 00:36:47,171
COULD LOOK AT IT AT A SMALL

936
00:36:47,171 --> 00:36:48,973
LEVEL AND BUILD A PICTURE ON

937
00:36:48,973 --> 00:36:49,974
WHAT'S HAPPENING.

938
00:36:49,974 --> 00:36:51,776

THAT MAY BE RAISED DIFFERENTLY

939

00:36:51,776 --> 00:36:54,712

IN SPACE, SINCE MICRO GRAVITY

940

00:36:54,712 --> 00:36:57,014

INFLUENCES EVERYTHING A CELL

941

00:36:57,014 --> 00:36:57,415

DOES.

942

00:36:57,415 --> 00:37:01,185

OPPORTUNITY TO HAVE THAT, TO

943

00:37:01,185 --> 00:37:03,621

EXPAND IN SPACE IS HUGE.

944

00:37:03,621 --> 00:37:06,958

IT HAPPENS ONCE IN YOUR

945

00:37:06,958 --> 00:37:10,795

LIFETIME.

946

00:37:10,795 --> 00:37:12,830

>> AND UNFORTUNATELY,

947

00:37:12,830 --> 00:37:14,732

DR. NICHOLS WAS UNABLE TO BE

948

00:37:14,732 --> 00:37:15,733

WITH US.

949

00:37:15,733 --> 00:37:18,002

WE HAVE KEN SHIELDS, WILL BRING

950

00:37:18,002 --> 00:37:19,637

HIM BACK UP FROM CASES, TO

951
00:37:19,637 --> 00:37:23,274
ANSWER A FEW QUESTIONS ABOUT THE

952
00:37:23,274 --> 00:37:25,343
LUNG-TISSUE INVESTIGATION.

953
00:37:25,343 --> 00:37:29,880
>> QUESTIONS ARE NOT REQUIRED

954
00:37:29,880 --> 00:37:30,348
[LAUGHING]

955
00:37:30,348 --> 00:37:33,050
>> DO WE HAVE ANY QUESTIONS IN

956
00:37:33,050 --> 00:37:33,884
THE ROOM?

957
00:37:33,884 --> 00:37:35,152
DO WE HAVE ANY QUESTIONS ON

958
00:37:35,152 --> 00:37:36,053
SOCIAL MEDIA?

959
00:37:36,053 --> 00:37:38,222
ONCE AGAIN, YOU COULD SUBMIT

960
00:37:38,222 --> 00:37:41,425
YOUR QUESTIONS, USING THE #ASK

961
00:37:41,425 --> 00:37:46,897
NASA.

962
00:37:46,897 --> 00:37:47,999
ANY QUESTIONS?

963
00:37:47,999 --> 00:37:53,070

>> YOU'RE WELCOME.

964

00:37:53,070 --> 00:37:53,537

[LAUGHTER]

965

00:37:53,537 --> 00:37:56,407

>> THANK YOU.

966

00:37:56,407 --> 00:37:59,510

>> OUR NEXT INVESTIGATION IS THE

967

00:37:59,510 --> 00:38:01,879

COSMIC RAY INTERJENNICS AND MASS

968

00:38:01,879 --> 00:38:02,346

INVESTIGATION.

969

00:38:02,346 --> 00:38:04,682

WE HEARD EARLIER IN THE PRENEWS

970

00:38:04,682 --> 00:38:06,951

CONFERENCE, ASTRONAUTS WILL BE

971

00:38:06,951 --> 00:38:08,252

GETTING ICE CREAM IN THE

972

00:38:08,252 --> 00:38:08,653

DELIVERY.

973

00:38:08,653 --> 00:38:13,090

THEY WILL ALSO BE GETTING ISS

974

00:38:13,090 --> 00:38:14,525

CREAM.

975

00:38:14,525 --> 00:38:16,260

DICKEY SMITH FROM THE UNIVERSITY

976

00:38:16,260 --> 00:38:17,294

OF MARYLAND.

977

00:38:17,294 --> 00:38:20,931

>> NAME OF MY EXPERIMENT IS

978

00:38:20,931 --> 00:38:23,367

COSMIC RAY GENERATION MASS.

979

00:38:23,367 --> 00:38:25,670

WE NICKNAMED IT ICE CREAM.

980

00:38:25,670 --> 00:38:27,972

THE GOAL OF THE ICE CREAM

981

00:38:27,972 --> 00:38:29,840

EXPERIMENT IS TO EXTEND THE

982

00:38:29,840 --> 00:38:30,975

ENERGY REACH OF DIRECT

983

00:38:30,975 --> 00:38:33,177

MEASUREMENTS OF COSMIC RAYS TO

984

00:38:33,177 --> 00:38:35,479

THE HIGHEST ENERGIES POSSIBLE SO

985

00:38:35,479 --> 00:38:38,115

THAT WE CAN STUDY THE COSMIC RAY

986

00:38:38,115 --> 00:38:41,318

ORIGINS, WHERE THEY COME FROM.

987

00:38:41,318 --> 00:38:42,286

THEIR ACCELERATION MECHANISMS,

988

00:38:42,286 --> 00:38:44,388

HOW THEY GOT THE ENERGIES THEY

989

00:38:44,388 --> 00:38:46,657

HAVE, AND HOW THEY PROPAGATE AND

990

00:38:46,657 --> 00:38:47,892

WHAT'S THEIR HISTORY IN THE

991

00:38:47,892 --> 00:38:50,194

GALAXY AND HOW THEY INTERACT

992

00:38:50,194 --> 00:38:51,162

WITH THE STUFF THAT'S BETWEEN

993

00:38:51,162 --> 00:38:53,297

THE SOLAR SYSTEMS.

994

00:38:53,297 --> 00:38:54,598

AND SO I'D LIKE TO TELL YOU

995

00:38:54,598 --> 00:38:55,833

ABOUT THE INSTRUMENT A LITTLE

996

00:38:55,833 --> 00:38:56,133

BIT.

997

00:38:56,133 --> 00:38:58,436

WE HAVE A VIDEO, IF WE CAN START

998

00:38:58,436 --> 00:38:58,803

THAT.

999

00:38:58,803 --> 00:38:59,870

YOU COULD SEE WHAT THE

1000

00:38:59,870 --> 00:39:00,938

INSTRUMENT LOOKS LIKE.

1001
00:39:00,938 --> 00:39:03,374
THERE IT IS ROTATING, ICE CREAM.

1002
00:39:03,374 --> 00:39:06,977
IT'S ABOUT THE SIZE OF A LARGE

1003
00:39:06,977 --> 00:39:07,445
REFRIGERATOR.

1004
00:39:07,445 --> 00:39:09,714
THE TOP PIECE IS THE GRAPPLE

1005
00:39:09,714 --> 00:39:11,916
FIXTURE THE ROBOT ARMS USE TO

1006
00:39:11,916 --> 00:39:12,717
MOVE IT AROUND.

1007
00:39:12,717 --> 00:39:17,488
IT WILL BE LOCATED IN JACK'S

1008
00:39:17,488 --> 00:39:19,957
EXPERIMENTAL MODULE EXPERIMENT

1009
00:39:19,957 --> 00:39:20,357
FACILITY.

1010
00:39:20,357 --> 00:39:22,493
THERE YOU SEE IN THE INSIDE, ON

1011
00:39:22,493 --> 00:39:23,861
THE RIGHT, THE SPACE WHERE THE

1012
00:39:23,861 --> 00:39:24,361
ELECTRONICS GO.

1013
00:39:24,361 --> 00:39:26,263

THE BIGGER AREA, THAT'S WHERE

1014

00:39:26,263 --> 00:39:27,465

THE DETECTORS GO.

1015

00:39:27,465 --> 00:39:29,867

WE STACK THEM UP SO WE CAN

1016

00:39:29,867 --> 00:39:31,802

MAXIMIZE THE FIELD OF VIEW.

1017

00:39:31,802 --> 00:39:33,971

AT THE BOTTOM, WE HAVE DETECTORS

1018

00:39:33,971 --> 00:39:36,107

THAT HELP US SEPARATE ELECTRONS

1019

00:39:36,107 --> 00:39:38,142

FROM PROTONS.

1020

00:39:38,142 --> 00:39:42,513

WE MEASURE HYDROGEN, HELIUM, TO

1021

00:39:42,513 --> 00:39:45,449

IRON, BASICALLY THE PERIODIC

1022

00:39:45,449 --> 00:39:45,783

TABLE.

1023

00:39:45,783 --> 00:39:47,184

AND THAT'S SURROUNDED BY THE

1024

00:39:47,184 --> 00:39:50,054

DETECTORS USED TO TRIGGER WHEN

1025

00:39:50,054 --> 00:39:51,489

COSMIC RAYS PASS THROUGH.

1026
00:39:51,489 --> 00:39:54,458
WE HAVE A TARGET SO THESE HIGH

1027
00:39:54,458 --> 00:40:01,065
ENERGY HYDROGEN ATOMS COULD

1028
00:40:01,065 --> 00:40:01,599
DESIGN GREAT.

1029
00:40:01,599 --> 00:40:03,501
WE ALSO MEASURE THE CHARGE,

1030
00:40:03,501 --> 00:40:07,905
CHARGE DETECTOR AT THE TOP.

1031
00:40:07,905 --> 00:40:11,375
IN OTHER WORDS, IT'S AN

1032
00:40:11,375 --> 00:40:14,478
ACCOUNTING EXPERIMENTING AM BY

1033
00:40:14,478 --> 00:40:16,514
SIMPLY COUNTING THE RAYS, YOU

1034
00:40:16,514 --> 00:40:18,249
COULD TELL WHERE THEY CAME FROM

1035
00:40:18,249 --> 00:40:19,650
AND WHAT HAPPENED TO THEM ALONG

1036
00:40:19,650 --> 00:40:20,351
THE WAY.

1037
00:40:20,351 --> 00:40:23,120
ONE OF BENEFITS FOR BEING ON THE

1038
00:40:23,120 --> 00:40:24,555

SPACE STATION, THERE'S TWO

1039

00:40:24,555 --> 00:40:25,523

REASONS.

1040

00:40:25,523 --> 00:40:27,658

ONE, DUE TO THE ALTITUDE AND THE

1041

00:40:27,658 --> 00:40:29,927

OTHER IS DUE TO DURATION.

1042

00:40:29,927 --> 00:40:33,931

CREAM START AS A BALLOON

1043

00:40:33,931 --> 00:40:34,365

EXPERIMENT.

1044

00:40:34,365 --> 00:40:36,901

WE FLEW 7 FLIGHTS, FOR A TOTAL

1045

00:40:36,901 --> 00:40:39,670

OVER 190 DAYS, OVER THE 7

1046

00:40:39,670 --> 00:40:40,137

FLIGHTS.

1047

00:40:40,137 --> 00:40:43,440

THAT ALTITUDE IS ABOUT 40

1048

00:40:43,440 --> 00:40:44,074

KILOMETERS.

1049

00:40:44,074 --> 00:40:45,509

IN THE SPACE STATION WE'RE AT

1050

00:40:45,509 --> 00:40:47,344

400 KILOMETERS.

1051
00:40:47,344 --> 00:40:48,546
BEING AT THE ALTITUDE, YOU DON'T

1052
00:40:48,546 --> 00:40:50,981
HAVE TO WORRY ABOUT THE

1053
00:40:50,981 --> 00:40:51,415
ATMOSPHERE.

1054
00:40:51,415 --> 00:40:53,784
THE PROBLEMS WITH THE ATMOSPHERE

1055
00:40:53,784 --> 00:40:58,355
WITH DIRECT RAYS, THEY CAN

1056
00:40:58,355 --> 00:40:59,223
IDENTIFY WITH THE WAY WE HAVE

1057
00:40:59,223 --> 00:40:59,657
THE CHARGE.

1058
00:40:59,657 --> 00:41:01,492
THE IDENTIFICATION OF THE

1059
00:41:01,492 --> 00:41:03,360
CHARGE, HELPS US UNDERSTAND THE

1060
00:41:03,360 --> 00:41:05,396
PROPAGATION MECHANISMS.

1061
00:41:05,396 --> 00:41:07,565
SOME OF THE COSMIC RAYS SUCH AS

1062
00:41:07,565 --> 00:41:09,867
BORON, ARE INTRODUCED THROUGH

1063
00:41:09,867 --> 00:41:11,268

INTERACTIONS OF CARBON, AND

1064

00:41:11,268 --> 00:41:12,636

THAT'S THE STUFF BETWEEN THE

1065

00:41:12,636 --> 00:41:17,174

SYSTEMS AND OUR GALAXY.

1066

00:41:17,174 --> 00:41:19,343

YES, SO THE OTHER REASON IS DUE

1067

00:41:19,343 --> 00:41:21,011

TO THE TIME DURATION.

1068

00:41:21,011 --> 00:41:23,380

SO A SINGLE BALLOON FLIGHT LASTS

1069

00:41:23,380 --> 00:41:24,381

ABOUT 30 DAYS.

1070

00:41:24,381 --> 00:41:27,251

ON A SPACE STATION, WE HAVE A

1071

00:41:27,251 --> 00:41:28,452

GOAL OF THREE YEARS.

1072

00:41:28,452 --> 00:41:29,820

BUT WE PLAN TO BE ON FOR THE

1073

00:41:29,820 --> 00:41:32,089

LIFE OF THE STATION.

1074

00:41:32,089 --> 00:41:34,491

SO GOING FROM 30 DAYS TO THREE

1075

00:41:34,491 --> 00:41:36,961

YEARS OR TO THE LIFE OF THE

1076
00:41:36,961 --> 00:41:39,296
STATION, THAT EXTENDS OUR

1077
00:41:39,296 --> 00:41:41,398
EXPOSURE TIME BY AN ORDER AND

1078
00:41:41,398 --> 00:41:41,799
MAGNITUDE.

1079
00:41:41,799 --> 00:41:45,102
AND BY DOING THIS, WE GET, WE

1080
00:41:45,102 --> 00:41:47,271
IMPROVE THE STATISTICS SO THAT

1081
00:41:47,271 --> 00:41:51,141
THE UNCERTAINTIES THAT ARE COME

1082
00:41:51,141 --> 00:41:54,979
OUT OF THE MEASUREMENTS ARE

1083
00:41:54,979 --> 00:41:55,546
REDUCED.

1084
00:41:55,546 --> 00:41:57,414
WE MAXIMIZE THE ENERGY REACH

1085
00:41:57,414 --> 00:41:59,583
BECAUSE COSMIC RAYS, THERE'S

1086
00:41:59,583 --> 00:42:05,356
LESS OF THEM AT HIGHER ENERGIES.

1087
00:42:05,356 --> 00:42:06,590
EXPEDITIONARY LESS.

1088
00:42:06,590 --> 00:42:09,760

YOU NEED TO STAY UP AT A HIGH

1089

00:42:09,760 --> 00:42:14,531

TIME SO YOU COULD MEASURE THE

1090

00:42:14,531 --> 00:42:15,766

COSMIC LEVELS.

1091

00:42:15,766 --> 00:42:17,668

YOU COULD USE THIS TO

1092

00:42:17,668 --> 00:42:20,304

DISTINGUISH THE MODELS AND THE

1093

00:42:20,304 --> 00:42:20,638

THEORY.

1094

00:42:20,638 --> 00:42:22,573

SO ICE CREAM IS NOT THE ONLY

1095

00:42:22,573 --> 00:42:25,442

COSMIC RAY EXPERIMENT IN SPACE.

1096

00:42:25,442 --> 00:42:26,477

THERE'S MANY OTHERS.

1097

00:42:26,477 --> 00:42:29,680

JUST A FEW EXAMPLES IS PAMELA

1098

00:42:29,680 --> 00:42:33,017

MLS, CALLETTE, DAMPY, THESE ARE

1099

00:42:33,017 --> 00:42:35,185

ALSO DIRECT COSMIC RAY

1100

00:42:35,185 --> 00:42:35,619

EXPERIMENTS.

1101

00:42:35,619 --> 00:42:40,958

THEY MEASURE IN A LOWER ENERGY.

1102

00:42:40,958 --> 00:42:43,661

HOWEVER, HIGH ENERGY INTERLAPS.

1103

00:42:43,661 --> 00:42:45,729

THE DATA THAT COMES FROM ICE

1104

00:42:45,729 --> 00:42:47,731

CREAM, WILL NOT ONLY COMPLIMENT

1105

00:42:47,731 --> 00:42:50,701

THE MEASUREMENTS BUT ALSO ADD TO

1106

00:42:50,701 --> 00:42:51,101

THEM.

1107

00:42:51,101 --> 00:42:52,102

THERE'S ALSO INDIRECT MEASURES

1108

00:42:52,102 --> 00:42:54,738

OF COSMIC RAYS.

1109

00:42:54,738 --> 00:42:56,941

YOU COULD MEASURE AFTER THEY

1110

00:42:56,941 --> 00:42:59,543

INTERACT IN THE ATMOSPHERE.

1111

00:42:59,543 --> 00:43:02,146

THE EXPERIMENTS ALLOW TO YOU

1112

00:43:02,146 --> 00:43:03,781

REACH HIGHER ENERGIES BUT YOU

1113

00:43:03,781 --> 00:43:07,251

CAN'T TELL THE SOURCE AS WELL.

1114

00:43:07,251 --> 00:43:09,887

SO OUR HIGH ENERGY REACH

1115

00:43:09,887 --> 00:43:11,488

OUTLASTED THEIR LOW ENERGY

1116

00:43:11,488 --> 00:43:11,822

REACH.

1117

00:43:11,822 --> 00:43:15,192

WITH THE INSTRUMENTS AND

1118

00:43:15,192 --> 00:43:15,960

PRODUCTS, YOU COULD DEVELOP A

1119

00:43:15,960 --> 00:43:17,995

FULL UNDERSTANDING OF THE COSMIC

1120

00:43:17,995 --> 00:43:21,332

RAYS IN OUR GALAXY.

1121

00:43:21,332 --> 00:43:22,466

AND I THINK THAT'S IT.

1122

00:43:22,466 --> 00:43:24,435

>> IF YOU WILL STAY FOR A

1123

00:43:24,435 --> 00:43:26,437

MOMENT, FOR A COUPLE MORE

1124

00:43:26,437 --> 00:43:26,837

QUESTIONS.

1125

00:43:26,837 --> 00:43:28,105

DO WE HAVE ANY QUESTIONS IN THE

1126
00:43:28,105 --> 00:43:28,539
AUDIENCE.

1127
00:43:28,539 --> 00:43:30,641
IF YOU HAVE A QUESTION, PLEASE

1128
00:43:30,641 --> 00:43:33,310
RAISE YOUR HAND AND WAIT FOR THE

1129
00:43:33,310 --> 00:43:34,878
MICROPHONE TO GET TO YOU.

1130
00:43:34,878 --> 00:43:36,647
>> WHAT DO YOU NEED THE

1131
00:43:36,647 --> 00:43:37,881
INFORMATION FOR?

1132
00:43:37,881 --> 00:43:39,383
IS IT JUST TO UNDERSTAND THEM

1133
00:43:39,383 --> 00:43:41,952
AND KNOWING MORE ABOUT IT?

1134
00:43:41,952 --> 00:43:45,589
OR IS IT TO MEASURE HOW IT

1135
00:43:45,589 --> 00:43:47,124
AFFECTS HUMAN BIOLOGY?

1136
00:43:47,124 --> 00:43:51,095
>> WELL COSMIC RAY SERVICE FOR

1137
00:43:51,095 --> 00:43:54,198
US IS A FUNDAMENTAL SCIENCE.

1138
00:43:54,198 --> 00:43:55,933

AT THIS POINT, WE'VE IDENTIFIED

1139

00:43:55,933 --> 00:43:57,501

WHAT THEY ARE, HOW THEY COME

1140

00:43:57,501 --> 00:43:58,969

FROM OUTER SPACE.

1141

00:43:58,969 --> 00:44:03,440

WE WANT TO PINPOINT THE SOURCES,

1142

00:44:03,440 --> 00:44:06,744

WHERE THEY COME FROM, HOW THE

1143

00:44:06,744 --> 00:44:08,312

OBJECTS IN THE UNIVERSE CREATE

1144

00:44:08,312 --> 00:44:08,612

THEM?

1145

00:44:08,612 --> 00:44:11,081

WHAT KIND OF MECHANISMS COULD

1146

00:44:11,081 --> 00:44:13,417

ACCELERATE THEM TO THE ENERGIES

1147

00:44:13,417 --> 00:44:13,851

THEY HAVE.

1148

00:44:13,851 --> 00:44:15,719

THE ENERGY RANGE WE MEASURE, ARE

1149

00:44:15,719 --> 00:44:18,288

HIGHER THAN WHAT WE CAN MAKE ON

1150

00:44:18,288 --> 00:44:18,622

EARTH.

1151
00:44:18,622 --> 00:44:21,158
WE WANT TO UNDERSTAND THESE

1152
00:44:21,158 --> 00:44:21,558
PROCESSES.

1153
00:44:21,558 --> 00:44:24,028
AND YEAH, SO IT'S A FUNDAMENTAL

1154
00:44:24,028 --> 00:44:24,395
SCIENCE.

1155
00:44:24,395 --> 00:44:27,865
THE ENERGIES ARE TOO HIGH TO

1156
00:44:27,865 --> 00:44:31,168
AFFECT THE ONES WE MEASURE,

1157
00:44:31,168 --> 00:44:32,669
BIOLOGY AND SPACE SCIENCE.

1158
00:44:32,669 --> 00:44:35,973
THERE'S LOWER ENERGY ONES THAT

1159
00:44:35,973 --> 00:44:37,574
HAVE THESE EFFECTS.

1160
00:44:37,574 --> 00:44:40,177
>> DO WE HAVE ANY OTHER

1161
00:44:40,177 --> 00:44:42,913
QUESTIONS IN THE ROOM?

1162
00:44:42,913 --> 00:44:45,983
THANK YOU, DR. SMITH.

1163
00:44:45,983 --> 00:44:46,583

>> THANK YOU.

1164

00:44:46,583 --> 00:44:48,986

[APPLAUSE]

1165

00:44:48,986 --> 00:44:51,822

>> OUR NEXT SPEAKER IS MICHAEL

1166

00:44:51,822 --> 00:44:54,558

DELL, PRINCIPLE INVESTIGATORS

1167

00:44:54,558 --> 00:44:57,995

FOR THE ROGUE RESEARCH 9 IN

1168

00:44:57,995 --> 00:45:01,331

UNIVERSITY OF FLORIDA,

1169

00:45:01,331 --> 00:45:01,765

TALLAHASSEE.

1170

00:45:01,765 --> 00:45:03,467

>> GOOD AFTERNOON.

1171

00:45:03,467 --> 00:45:05,169

IT'S GOOD TO BE WITH YOU.

1172

00:45:05,169 --> 00:45:06,703

I'M PART OF THE ROGGE RESEARCH,

1173

00:45:06,703 --> 00:45:10,407

A NASA SPONSORED BY BIOLOGY.

1174

00:45:10,407 --> 00:45:14,011

IT FUNDAMENTALLY LOOKS AT THE

1175

00:45:14,011 --> 00:45:14,978

BIOLOGICAL PROBLEMS THAT OCCUR

1176
00:45:14,978 --> 00:45:16,647
IN HUMANS WITH SPACE FLIGHT.

1177
00:45:16,647 --> 00:45:19,083
WE USE RODENTS TO BETTER

1178
00:45:19,083 --> 00:45:22,052
UNDERSTAND SOME OF THE PROBLEMS

1179
00:45:22,052 --> 00:45:24,922
AND REALLY TO, WITH BETTER

1180
00:45:24,922 --> 00:45:28,525
UNDERSTANDING TO BETTER PROPOSE

1181
00:45:28,525 --> 00:45:29,827
MORE EFFECTIVE COUNTER MEASURES

1182
00:45:29,827 --> 00:45:32,229
ON WHAT WE CAN DO IN SPACE OR

1183
00:45:32,229 --> 00:45:35,866
EVEN AFTER SPACE FLIGHT TO

1184
00:45:35,866 --> 00:45:37,301
COUNTERACT THAT.

1185
00:45:37,301 --> 00:45:40,671
THE MISSION I AM PART OF IS

1186
00:45:40,671 --> 00:45:42,139
ROGGE MISSION 9.

1187
00:45:42,139 --> 00:45:45,509
WE'RE LOOKING AT 2 BIOLOGICAL

1188
00:45:45,509 --> 00:45:45,843

ISSUES.

1189

00:45:45,843 --> 00:45:48,946

THE FIRST, VISUAL IMPAIRMENTS,

1190

00:45:48,946 --> 00:45:50,581

THAT OCCURS TO SOME OF THE

1191

00:45:50,581 --> 00:45:51,448

ASTRONAUTS.

1192

00:45:51,448 --> 00:45:54,651

TO DATE, IT ONLY KIRS IN MALE

1193

00:45:54,651 --> 00:45:55,085

ASTRONAUTS.

1194

00:45:55,085 --> 00:45:57,488

SO WE'RE LOOKING AT A COUPLE OF

1195

00:45:57,488 --> 00:46:00,457

DIFFERENT ASPECTS ON HOW VISUAL

1196

00:46:00,457 --> 00:46:01,658

IMPAIRMENT MAY OCCUR.

1197

00:46:01,658 --> 00:46:05,129

THE FIRST THING, IS THE VASCULAR

1198

00:46:05,129 --> 00:46:06,330

TUR AND PRESSURE IN THE EYE.

1199

00:46:06,330 --> 00:46:09,433

IF I COULD HAVE THE FIRST SLIDE,

1200

00:46:09,433 --> 00:46:10,467

PLEASE.

1201
00:46:10,467 --> 00:46:12,636
YOU COULD SEE IN THE EYE THAT

1202
00:46:12,636 --> 00:46:17,040
THERE'S A PRETTY DENSE VASCULAR

1203
00:46:17,040 --> 00:46:17,407
NETWORK.

1204
00:46:17,407 --> 00:46:21,378
THIS VASCULAR NETWORK CONTROLS

1205
00:46:21,378 --> 00:46:23,046
SOMETHING CALLED THE BLOOD

1206
00:46:23,046 --> 00:46:24,781
RETINOL BARRIER.

1207
00:46:24,781 --> 00:46:26,283
MANY HAVE HEARD OF BLOOD

1208
00:46:26,283 --> 00:46:27,217
BARRIER, WHICH IS A TIGHT

1209
00:46:27,217 --> 00:46:30,420
CONTROL OF FLUIDS, OTHER

1210
00:46:30,420 --> 00:46:32,689
MOLECULES THAT CROSS INTO THE

1211
00:46:32,689 --> 00:46:33,357
EYE AND INTO THE BRAIN.

1212
00:46:33,357 --> 00:46:35,292
THIS IS THE PICTURE OF THE

1213
00:46:35,292 --> 00:46:35,926

BLOOD.

1214

00:46:35,926 --> 00:46:38,762

RETINOL BARRIER WILL LOOK AT THE

1215

00:46:38,762 --> 00:46:40,097

BLOOD BRAIN BARRIER IN THE BRAIN

1216

00:46:40,097 --> 00:46:42,166

AND LOOKING AT DIFFERENT WAYS

1217

00:46:42,166 --> 00:46:48,906

THAT FLUIDS PASS FROM THE

1218

00:46:48,906 --> 00:46:50,641

VASCULARTOUR, AND HOW IT COULD

1219

00:46:50,641 --> 00:46:54,611

AFFECT INTERCRANIAL OR

1220

00:46:54,611 --> 00:46:56,980

INTERRETINOL PRESSURE.

1221

00:46:56,980 --> 00:46:58,649

AND THE SECOND THING, IS REALLY

1222

00:46:58,649 --> 00:47:00,250

LOOKING ON HOW THE BRAIN

1223

00:47:00,250 --> 00:47:00,684

CIRCULATION.

1224

00:47:00,684 --> 00:47:04,354

HOW IT AFFECTS THE BLOOD

1225

00:47:04,354 --> 00:47:06,990

PRESSURE IN THE SKULL.

1226

00:47:06,990 --> 00:47:08,592

AS PART OF THE CIRCULATION,

1227

00:47:08,592 --> 00:47:10,694

THERE'S THREE ASPECTS MOVING IN

1228

00:47:10,694 --> 00:47:11,628

AND OUT OF THE BRAIN.

1229

00:47:11,628 --> 00:47:13,797

ONE ARE THE ARTERIES AND THE

1230

00:47:13,797 --> 00:47:15,432

BLOOD GOING INTO THE BRAIN OR

1231

00:47:15,432 --> 00:47:17,668

SKULL CAVITY.

1232

00:47:17,668 --> 00:47:20,404

AND TWO OF THE VEINS THAT BRING

1233

00:47:20,404 --> 00:47:23,207

BLOOD AND FLUID OUT, IN A LESSER

1234

00:47:23,207 --> 00:47:24,875

KNOWN VASCULAR SYSTEM THAT'S IN

1235

00:47:24,875 --> 00:47:26,777

THE NECK THAT DRAINS THE HEAD

1236

00:47:26,777 --> 00:47:29,146

AND BRAIN IS THE LYMPATIC

1237

00:47:29,146 --> 00:47:29,513

SYSTEM.

1238

00:47:29,513 --> 00:47:31,148

I HAVE A SHORT VIDEO THAT SHOWS

1239

00:47:31,148 --> 00:47:33,116

SOME OF THE ACTION OF THE

1240

00:47:33,116 --> 00:47:37,187

LYMPATIC VESSELS THAT REISOLATE

1241

00:47:37,187 --> 00:47:38,522

AND STUDY.

1242

00:47:38,522 --> 00:47:41,525

SO THIS IS AN ISOLATED LYMPATIC

1243

00:47:41,525 --> 00:47:41,959

VESSEL.

1244

00:47:41,959 --> 00:47:44,962

WHEN YOU THINK ABOUT THE PUMPING

1245

00:47:44,962 --> 00:47:46,530

THAT OCCURS IN THE

1246

00:47:46,530 --> 00:47:47,564

CARDIOVASCULAR SYSTEM, YOU

1247

00:47:47,564 --> 00:47:49,132

USUALLY THINK ABOUT THE HEART.

1248

00:47:49,132 --> 00:47:54,004

THE HEART HAS ARHYTHMIC PUMPING.

1249

00:47:54,004 --> 00:47:55,973

IT HAS VALVES THAT KEEP BLOOD OR

1250

00:47:55,973 --> 00:47:57,641

FLUID MOVING IN ONE DIRECTION.

1251
00:47:57,641 --> 00:47:59,476
IF YOU SEE AMISS IN THE MIDDLE

1252
00:47:59,476 --> 00:48:02,412
OF THE PICTURE, YOU WILL SEE A

1253
00:48:02,412 --> 00:48:04,147
SET OF SMALL VALVES.

1254
00:48:04,147 --> 00:48:07,618
THOSE VALVES KEEP FLUID MOVING

1255
00:48:07,618 --> 00:48:09,820
ONE WAY TOWARD THE HEART.

1256
00:48:09,820 --> 00:48:12,889
THE LYMPATIC VESSELS ARE

1257
00:48:12,889 --> 00:48:14,691
THROUGHOUT THE BODY.

1258
00:48:14,691 --> 00:48:17,628
IT IS REALLY THE LYMPATIC IN THE

1259
00:48:17,628 --> 00:48:19,796
NECK, THAT DETERMINES THE BLOOD

1260
00:48:19,796 --> 00:48:21,832
PRESSURE OR FLUID PRESSURE IN

1261
00:48:21,832 --> 00:48:23,367
THE BRAIN AS WELL AS THE EYES.

1262
00:48:23,367 --> 00:48:25,469
WE WILL BE LOOKING AT THIS.

1263
00:48:25,469 --> 00:48:27,604

WE'RE WORKING WITH SEVERAL

1264

00:48:27,604 --> 00:48:30,207

SCIENTISTS IN THE INTEROKAY CULL

1265

00:48:30,207 --> 00:48:33,277

LAR AND CRANIAL.

1266

00:48:33,277 --> 00:48:41,418

DR. VIVIAN MAL, AND DR. DAVID

1267

00:48:41,418 --> 00:48:43,553

DEVEJAS WILL BE LOOKING AT THE

1268

00:48:43,553 --> 00:48:45,489

LYMPATIC AND MY LAB WILL BE

1269

00:48:45,489 --> 00:48:48,325

STUDYING THE ARTERIES AND THE

1270

00:48:48,325 --> 00:48:48,659

VEINS.

1271

00:48:48,659 --> 00:48:51,128

THE OTHER ISSUE THAT'S STUDY

1272

00:48:51,128 --> 00:48:53,430

WITH THE ANIMALS IS LOCO MOTION.

1273

00:48:53,430 --> 00:48:56,566

BECAUSE MICRO GRAVITY, YOU HAVE

1274

00:48:56,566 --> 00:49:01,004

A FAIRLY SEVERE PHYSICAL

1275

00:49:01,004 --> 00:49:02,272

INACTIVITY, THAT COULD AFFECT A

1276
00:49:02,272 --> 00:49:04,875
NUMBER OF ORGAN SYSTEM, SUCH AS

1277
00:49:04,875 --> 00:49:06,376
MUSCLE AND BONE LOSS THAT YOU

1278
00:49:06,376 --> 00:49:07,110
HEARD ABOUT.

1279
00:49:07,110 --> 00:49:10,514
WE'RE IN THE PROJECT, IT'S

1280
00:49:10,514 --> 00:49:13,650
REALLY DR. JEFF WILLY, FROM LAKE

1281
00:49:13,650 --> 00:49:15,118
FOREST COLLEGE OF MEDICINE.

1282
00:49:15,118 --> 00:49:19,189
HE WILL BE LOOKING AT HOW THE

1283
00:49:19,189 --> 00:49:21,325
ANIMALS, LOCO MOTE, BEFORE THEY

1284
00:49:21,325 --> 00:49:23,093
GO INTO SPACE.

1285
00:49:23,093 --> 00:49:25,062
ONCE THEY GET BACK, HOW THEIR

1286
00:49:25,062 --> 00:49:28,665
LOCO MOTION HAS CHANGED.

1287
00:49:28,665 --> 00:49:36,773
SPECIFICALLY HE'S LOOKING AT THE

1288
00:49:36,773 --> 00:49:46,416

CARTILAGE IN THE JOINTS.

1289

00:49:46,416 --> 00:49:49,353

AGAIN, RODEO RESEARCH IS GEARED

1290

00:49:49,353 --> 00:49:52,856

TOWARD HELPING US MAINTAIN AND

1291

00:49:52,856 --> 00:49:56,560

UNDERSTAND HEALTH ISSUES,

1292

00:50:00,097 --> 00:49:59,663

ASTRONAUT

1293

00:50:00,097 --> 00:50:03,300

IN BEING IN SPACE IN MONTHS AND

1294

00:50:03,300 --> 00:50:03,633

YEARS.

1295

00:50:03,633 --> 00:50:14,778

SO THANK YOU.

1296

00:50:14,778 --> 00:50:21,184

AND PLEASE HOLD UP YOUR HAND TO

1297

00:50:21,184 --> 00:50:21,618

MICROPHONE.

1298

00:50:21,618 --> 00:50:23,854

>> WHAT MAKES RODENT CANDIDATES

1299

00:50:23,854 --> 00:50:27,357

TO THE RESEARCH IN TERMS OF

1300

00:50:27,357 --> 00:50:28,558

OTHER ANIMALS.

1301

00:50:28,558 --> 00:50:31,027

>> THERE'S BETTER ANIMALS,

1302

00:50:31,027 --> 00:50:33,330

NONHUMAN PRIMATE WILL BE IDEAL.

1303

00:50:33,330 --> 00:50:36,433

WITH RODENTS, YOU COULD FLY A

1304

00:50:36,433 --> 00:50:41,071

LARGER NUMBER OF THE ANIMALS.

1305

00:50:41,071 --> 00:50:46,309

OTHER THING, RODENTS AND RATS,

1306

00:50:46,309 --> 00:50:49,713

THEY HAVE -- THEIR LIFESTYLE IS

1307

00:50:49,713 --> 00:50:50,313

SHORTER.

1308

00:50:50,313 --> 00:50:53,383

CHANGES THAT OCCUR IN WEEKS,

1309

00:50:53,383 --> 00:50:54,918

MICE AND RATS TAKES MONTHS TO

1310

00:50:54,918 --> 00:50:55,185

DO.

1311

00:50:55,185 --> 00:50:59,222

30 DAYS, OF A MOUSE BEING IN

1312

00:50:59,222 --> 00:51:01,858

SPACE, IS ROUGHLY THE EQUIVALENT

1313

00:51:01,858 --> 00:51:04,394

OF 3 YEARS OF A HUMAN.

1314

00:51:04,394 --> 00:51:07,531

WE CAN GET A GOOD LOOK AT WHAT

1315

00:51:07,531 --> 00:51:11,601

LONG DURATION SPACE FLIGHT WILL

1316

00:51:11,601 --> 00:51:14,204

BE LIKE, PARTICULARLY AS WE

1317

00:51:14,204 --> 00:51:16,740

THINK ABOUT MAN MISSIONS TO MOON

1318

00:51:16,740 --> 00:51:17,507

AND MARS.

1319

00:51:17,507 --> 00:51:19,309

>> AND I BELIEVE WE HAVE ANOTHER

1320

00:51:19,309 --> 00:51:20,243

QUESTION IN THE ROOM.

1321

00:51:20,243 --> 00:51:25,649

PLEASE WAIT FOR THE MICROPHONE

1322

00:51:25,649 --> 00:51:27,284

>> DO YOU EXPECT TO HAVE

1323

00:51:27,284 --> 00:51:29,319

DIFFERENT GENERATIONS, OR JUST

1324

00:51:29,319 --> 00:51:30,353

ONE GENERATION.

1325

00:51:30,353 --> 00:51:31,721

>> JUST ONE.

1326
00:51:31,721 --> 00:51:34,191
20 MICE THAT WE'LL BE SENDING.

1327
00:51:34,191 --> 00:51:37,761
THEY WILL BE GOING UP AT 6 WEEKS

1328
00:51:37,761 --> 00:51:48,505
OF AGE.

1329
00:51:48,505 --> 00:51:50,640
DO WE HAVE OTHER QUESTIONS IN

1330
00:51:50,640 --> 00:51:51,074
THE ROOM.

1331
00:51:51,074 --> 00:51:53,477
PLEASE WAIT FOR THE MICROPHONE?

1332
00:51:53,477 --> 00:51:55,846
>> IS THE VISION TEMPORARY OR

1333
00:51:55,846 --> 00:51:56,279
PERMANENT?

1334
00:51:56,279 --> 00:51:59,049
>> THERE WERE VISIONS SEEN IN

1335
00:51:59,049 --> 00:52:00,550
ACUTITY THAT WAS SEEN IN THE

1336
00:52:00,550 --> 00:52:00,984
ASTRONAUTS.

1337
00:52:00,984 --> 00:52:03,653
IT WAS NOT UNTIL THE ASTRONAUTS

1338
00:52:03,653 --> 00:52:06,623

WERE IN SPACE FOUR MONTHS AND

1339

00:52:06,623 --> 00:52:09,559

LONGER, THAT STARTED TO HAVE

1340

00:52:09,559 --> 00:52:11,161

VISUAL CHANGES THAT WERE

1341

00:52:11,161 --> 00:52:11,561

PERMANENT.

1342

00:52:11,561 --> 00:52:13,263

WITH THE PERMANENT CHANGES,

1343

00:52:13,263 --> 00:52:15,432

THAT'S WHEN YOU START TO BE MORE

1344

00:52:15,432 --> 00:52:15,832

CONCERNED.

1345

00:52:15,832 --> 00:52:17,968

IN 2010, NASA HELD A CONFERENCE,

1346

00:52:17,968 --> 00:52:19,703

TO BRING OUT THE PROBLEM, TO

1347

00:52:19,703 --> 00:52:21,104

BRING EXPERTS TOGETHER, TO TRY

1348

00:52:21,104 --> 00:52:23,607

TO LOOK AT WHAT MAY BE THE

1349

00:52:23,607 --> 00:52:25,976

UNDERLYING CAUSES FOR THIS.

1350

00:52:25,976 --> 00:52:29,012

THIS IS REALLY A CONTINUATION OF

1351
00:52:29,012 --> 00:52:38,722
THAT EFFOR .

1352
00:52:38,722 --> 00:52:41,424
>> HOW IS THE RESEARCH SH TO BE

1353
00:52:41,424 --> 00:52:45,328
APPLIED IN OTHER ASPECTS OF

1354
00:52:45,328 --> 00:52:45,629
BODY.

1355
00:52:45,629 --> 00:52:47,264
>> DO THE MICE MIND BEING IN

1356
00:52:47,264 --> 00:52:47,731
SPACE?

1357
00:52:47,731 --> 00:52:49,232
WELL, IT'S HARD TO KNOW EXACTLY

1358
00:52:49,232 --> 00:52:54,371
WHAT A HAPPY MOUSE LOOKS LIKES.

1359
00:52:54,371 --> 00:52:56,907
ONE OF THE THINGS THAT IS

1360
00:52:56,907 --> 00:52:58,675
AMAZING TO ME, THE MICE, WHEN

1361
00:52:58,675 --> 00:53:00,844
THEY ARE UP IN SPACE AND THE

1362
00:53:00,844 --> 00:53:02,145
CAGE CONFIGURATION THAT THEY

1363
00:53:02,145 --> 00:53:04,714

ARE, THEY ACTUALLY USE THE CAGE

1364

00:53:04,714 --> 00:53:06,950

AS A RUNNING WHEEL.

1365

00:53:06,950 --> 00:53:08,752

THEY WILL RUN AROUND THE CAGE.

1366

00:53:08,752 --> 00:53:10,520

YOU MIGHT THINK THEY WOULD FLOAT

1367

00:53:10,520 --> 00:53:12,822

AROUND THERE, BUT THEY LEARN

1368

00:53:12,822 --> 00:53:14,891

AFTER A COUPLE OF DAYS, AND ONE

1369

00:53:14,891 --> 00:53:16,760

OF THEM WILL START DOING IT.

1370

00:53:16,760 --> 00:53:19,563

THEN SEVERAL AND BEFORE YOU KNOW

1371

00:53:19,563 --> 00:53:20,830

IT, THE WHOLE CAGE.

1372

00:53:20,830 --> 00:53:23,700

IF ONE CAGE IS DOING, THERE'S AN

1373

00:53:23,700 --> 00:53:27,137

ADJACENT CAGE IN A DAY OR SO

1374

00:53:27,137 --> 00:53:27,470

LATER.

1375

00:53:27,470 --> 00:53:29,573

THE ADJACENT CAGE WILL START

1376

00:53:29,573 --> 00:53:29,906

DOING.

1377

00:53:29,906 --> 00:53:31,908

THERE'S STUDY, IF YOU PUT A

1378

00:53:31,908 --> 00:53:33,843

RUNNING WHEEL IN THE MIDDLE OF

1379

00:53:33,843 --> 00:53:35,679

THE FIELD, WILD MICE WILL COME

1380

00:53:35,679 --> 00:53:38,648

ON AND GET ON THE RUNNING WHEEL

1381

00:53:38,648 --> 00:53:40,417

AND START RUNNING.

1382

00:53:40,417 --> 00:53:41,885

THEY DON'T HAVE TO.

1383

00:53:41,885 --> 00:53:43,320

THEY HAVE EXERCISED FOR OTHER

1384

00:53:43,320 --> 00:53:43,687

REASONS.

1385

00:53:43,687 --> 00:53:45,488

I WILL SAY, THERE'S INDICATIONS,

1386

00:53:45,488 --> 00:53:46,556

THEY DEAL WITH.

1387

00:53:46,556 --> 00:53:48,658

IT'S A STRESSFUL ENVIRONMENT.

1388

00:53:48,658 --> 00:53:50,093

IT'S STRESSFUL FOR HUMANS.

1389

00:53:50,093 --> 00:53:52,295

THEY HAVE WAYS THAT SHOW THAT

1390

00:53:52,295 --> 00:54:02,339

THEY COPE WITH IT PRETTY WELL.

1391

00:54:02,339 --> 00:54:04,040

>> WE HAVE ONE MORE QUESTION.

1392

00:54:04,040 --> 00:54:12,582

PLEASE WAIT FOR THE MICROPHONE.

1393

00:54:12,582 --> 00:54:15,352

>> RESEARCH, IDENTIFY OTHER

1394

00:54:15,352 --> 00:54:17,587

SORTS OF EYE DISEASES, PEOPLE

1395

00:54:17,587 --> 00:54:19,055

SUFFER HERE ON EARTH.

1396

00:54:19,055 --> 00:54:22,092

>> IT'S POSSIBLE.

1397

00:54:22,092 --> 00:54:26,730

ANYTIME YOU ARE ABLE TO

1398

00:54:26,730 --> 00:54:28,598

ALOSDATE FACTORS, SAY THAT

1399

00:54:28,598 --> 00:54:29,599

COULD AFFECT VISION, AND IT

1400

00:54:29,599 --> 00:54:31,301

COULD HAVE THE, THE POSSIBILITY

1401
00:54:31,301 --> 00:54:33,703
OF THE SAME AFFECTS, IN WAYS YOU

1402
00:54:33,703 --> 00:54:36,206
DIDN'T THINK ABOUT.

1403
00:54:36,206 --> 00:54:39,843
SO I THINK FROM EVEN IF IT'S NOT

1404
00:54:39,843 --> 00:54:42,145
DIRECTLY APPLICABLE, THE BIOLOGY

1405
00:54:42,145 --> 00:54:44,014
OF UNDERSTANDING THE VARIOUS

1406
00:54:44,014 --> 00:54:47,917
FACTORS, THAT COULD PLAY A ROLE

1407
00:54:47,917 --> 00:54:50,987
IN VISUAL ACUTITY AND HOW IT

1408
00:54:50,987 --> 00:54:53,390
WILL CHANGE, AND I THINK THAT

1409
00:54:53,390 --> 00:54:56,092
HELPS US UNDERSTAND BETTER OUR

1410
00:54:56,092 --> 00:54:57,894
ORGANISM AS A WHOLE AND HOW IT

1411
00:54:57,894 --> 00:55:00,030
ADAPTS TO SITUATIONS OF

1412
00:55:00,030 --> 00:55:01,498
DIFFERENT ENVIRONMENTAL

1413
00:55:01,498 --> 00:55:04,668

CONDITIONS AND GRAVITY BEING ONE

1414

00:55:04,668 --> 00:55:08,805
OF THE CONDITION .

1415

00:55:08,805 --> 00:55:12,242
>> THANK YOU, DR. DAL.

1416

00:55:12,242 --> 00:55:13,510
>> THANK YOU VERY MUCH.

1417

00:55:13,510 --> 00:55:13,943
[APPLAUSE]

1418

00:55:13,943 --> 00:55:15,779
>> JUST A REMINDER FOR THOSE WHO

1419

00:55:15,779 --> 00:55:18,014
ARE FOLLOWING ALONG, EITHER ON

1420

00:55:18,014 --> 00:55:20,216
SOCIAL MEDIA OR IN THE ROOM, YOU

1421

00:55:20,216 --> 00:55:22,752
COULD USE THE #ASK NASA TO

1422

00:55:22,752 --> 00:55:24,988
COMMENT ON THE BRIEFING OR ASK A

1423

00:55:24,988 --> 00:55:25,355
QUESTION.

1424

00:55:25,355 --> 00:55:28,324
>>> THE NEXT PRESENTERS ARE JOHN

1425

00:55:28,324 --> 00:55:30,326
BONDIN, CHIEF ENGINEER FOR THE

1426
00:55:30,326 --> 00:55:33,430
ARMY, CHIEFS, MISSILE COMMAND.

1427
00:55:33,430 --> 00:55:36,666
WHEELER CHET PARTY, FOR THE U.S.

1428
00:55:36,666 --> 00:55:40,870
ARMY SPACE OF THE U.S. COMMAND.

1429
00:55:40,870 --> 00:55:43,106
PLEASE JOIN US.

1430
00:55:43,106 --> 00:55:45,875
>> THANK YOU, TABITHA.

1431
00:55:45,875 --> 00:55:47,777
GOOD AFTERNOON, EVERYBODY.

1432
00:55:47,777 --> 00:55:49,312
WE'RE VERY HAPPY TO BE HERE.

1433
00:55:49,312 --> 00:55:51,781
WE'RE GOING TO TALK TO YOU ABOUT

1434
00:55:51,781 --> 00:55:55,218
A PROGRAM CALLED KESTERLY.

1435
00:55:55,218 --> 00:55:57,754
KESTERLY, IS A SATELLITE, UNLIKE

1436
00:55:57,754 --> 00:56:01,157
THE RESEARCH AND TECHNOLOGY YOU

1437
00:56:01,157 --> 00:56:03,059
HEARD ABOUT.

1438
00:56:03,059 --> 00:56:05,195

KESTERLY, IS A SATELLITE

1439

00:56:05,195 --> 00:56:06,496

DEPLOYED FROM THE SPACE STATION.

1440

00:56:06,496 --> 00:56:08,164

IT'S A PROGRAM WE'VE BEEN

1441

00:56:08,164 --> 00:56:11,034

WORKING ON FOR FIVE YEARS

1442

00:56:11,034 --> 00:56:12,669

IN FACT, I HAVE THE FIRST SLIDE,

1443

00:56:12,669 --> 00:56:13,002

PLEASE.

1444

00:56:13,002 --> 00:56:16,973

YOU COULD SEE A PICTURE OF IT

1445

00:56:16,973 --> 00:56:17,307

THERE.

1446

00:56:17,307 --> 00:56:21,077

IT'S ABOUT A SIZE OF A DORM ROOM

1447

00:56:21,077 --> 00:56:21,511

REFRIGERATOR.

1448

00:56:21,511 --> 00:56:24,781

AND COMPARED TO MANY SATELLITES

1449

00:56:24,781 --> 00:56:27,584

IN SPACE TODAY, THAT'S

1450

00:56:27,584 --> 00:56:28,985

RELATIVELY SMALL, BUT IT IS A

1451
00:56:28,985 --> 00:56:31,588
TESTIMONY OF THE TECHNOLOGY, THE

1452
00:56:31,588 --> 00:56:33,389
REVOLUTION IN ELECTRONICS

1453
00:56:33,389 --> 00:56:34,858
REVOLUTION TAKING PLACE IN THE

1454
00:56:34,858 --> 00:56:36,159
LAST 20 YEARS.

1455
00:56:36,159 --> 00:56:37,660
CERTAINLY, THERE'S NO BETTER

1456
00:56:37,660 --> 00:56:39,963
EXAMPLE OF THAT, THAN HOLDING

1457
00:56:39,963 --> 00:56:43,199
THE SMART PHONE IN YOUR HAND AND

1458
00:56:43,199 --> 00:56:47,570
REALIZING THE CONFRONTATIONAL

1459
00:56:47,570 --> 00:56:48,938
PROBLEM.

1460
00:56:48,938 --> 00:56:50,907
AND THERE'S A LOT OF PEOPLE

1461
00:56:50,907 --> 00:56:52,275
DOING IT IN THE GOVERNMENT AS

1462
00:56:52,275 --> 00:56:55,178
WELL AS THE COMMERCIAL SECTOR,

1463
00:56:55,178 --> 00:56:56,346

TAKING ADVANTAGE OF THE

1464

00:56:56,346 --> 00:56:57,714

INCREDIBLE POWER YOU COULD PACK

1465

00:56:57,714 --> 00:56:58,948

IN A SMALL SPACE.

1466

00:56:58,948 --> 00:57:00,984

THE PARTICULAR SATELLITE IS

1467

00:57:00,984 --> 00:57:03,686

DESIGNED AS AN IMAGING

1468

00:57:03,686 --> 00:57:04,087

SATELLITE.

1469

00:57:04,087 --> 00:57:05,321

IT'S IMPORTANT FOR THE ARMY TO

1470

00:57:05,321 --> 00:57:10,460

BE ABLE TO DO IMAGERY.

1471

00:57:10,460 --> 00:57:12,929

WHAT SETS IT APART FROM OTHER IN

1472

00:57:12,929 --> 00:57:15,298

THE PAST, IT HAS THE CAPABILITY

1473

00:57:15,298 --> 00:57:18,434

TO SEND THE IMAGE FROM THE USER

1474

00:57:18,434 --> 00:57:19,402

ON THE GROUND.

1475

00:57:19,402 --> 00:57:21,137

THE TIME IS ASKED TO TAKE THE

1476
00:57:21,137 --> 00:57:24,274
PICTURE TO THE TIME IT SENDS THE

1477
00:57:24,274 --> 00:57:25,708
PICTURE ON THE GROUND, APPEARS

1478
00:57:25,708 --> 00:57:27,877
ON THE GROUND, VERY, VERY SHORT

1479
00:57:27,877 --> 00:57:28,912
PERIOD OF TIME.

1480
00:57:28,912 --> 00:57:30,547
MEASURED IN 1-2 MINUTES.

1481
00:57:30,547 --> 00:57:33,716
I WILL TURN IT OVER TO MY

1482
00:57:33,716 --> 00:57:36,186
COLLEAGUE, CHIP HARD YES.

1483
00:57:36,186 --> 00:57:37,887
LET ME HAVE ONE MORE SLIDE,

1484
00:57:37,887 --> 00:57:38,221
PLEASE.

1485
00:57:38,221 --> 00:57:40,924
I'LL TURN IT OVER TO CHIP, THE

1486
00:57:40,924 --> 00:57:42,892
NEXT SLIDE, PLEASE.

1487
00:57:42,892 --> 00:57:45,762
THAT TELLS YOU THE THREE KEY

1488
00:57:45,762 --> 00:57:46,162

TENANTS.

1489

00:57:46,162 --> 00:57:47,931

THE FIRST ONE IS LOW COST.

1490

00:57:47,931 --> 00:57:49,866

IT'S NOT ONLY SMALL, BUT IT

1491

00:57:49,866 --> 00:57:51,568

DOESN'T COST MUCH.

1492

00:57:51,568 --> 00:57:52,702

THAT'S IMPORTANT FOR ANYBODY

1493

00:57:52,702 --> 00:57:55,438

THAT'S DEVELOPING THE SPACE

1494

00:57:55,438 --> 00:57:55,805

SYSTEMS.

1495

00:57:55,805 --> 00:57:58,107

IT'S REALLY REMARKABLE, HOW LOW

1496

00:57:58,107 --> 00:57:59,809

COST SYSTEMS THEY HAVE TODAY.

1497

00:57:59,809 --> 00:58:04,047

THE SECOND, IS SURVIVABILITY.

1498

00:58:04,047 --> 00:58:06,883

THEY ARE INHERENT SURVIVABLE

1499

00:58:06,883 --> 00:58:07,951

OPERATING.

1500

00:58:07,951 --> 00:58:09,919

ABOUT, THE RESPONSIVE ASPECT,

1501
00:58:09,919 --> 00:58:12,121
THE ABILITY TO GET IT TO THE

1502
00:58:12,121 --> 00:58:13,356
GROUND RAPIDLY.

1503
00:58:13,356 --> 00:58:14,891
LET YOU TALK ABOUT THE SPECIFICS

1504
00:58:14,891 --> 00:58:16,092
OF THE SPACECRAFT.

1505
00:58:16,092 --> 00:58:17,427
CHIP, TAKE AWAY.

1506
00:58:17,427 --> 00:58:19,229
>>> AS JOHN SAID, MY NAME IS

1507
00:58:19,229 --> 00:58:20,663
CHIP HARDEY.

1508
00:58:20,663 --> 00:58:23,700
THE PROGRAM DEVELOPMENT MANAGER.

1509
00:58:23,700 --> 00:58:29,505
JOHN INDICATED, KESTERLY IS A

1510
00:58:29,505 --> 00:58:32,609
MICRO CLASS SATELLITE, THAT IS

1511
00:58:32,609 --> 00:58:35,144
DESIGNED TO PROVIDE TACTICAL

1512
00:58:35,144 --> 00:58:37,981
USEFUL IMAGES, AT A TACTICAL

1513
00:58:37,981 --> 00:58:39,849

LEVEL TO THE USER ON THE GROUND.

1514

00:58:39,849 --> 00:58:41,284

WHAT WE'RE DOING IN THE SPACE

1515

00:58:41,284 --> 00:58:44,354

STATION, IS EXPERIMENT.

1516

00:58:44,354 --> 00:58:48,358

IF SUCCESSFUL COULD LEAD TO AN

1517

00:58:48,358 --> 00:58:50,093

OBJECTIVE SYSTEM.

1518

00:58:50,093 --> 00:58:52,762

THE MAIN PURPOSE -- THE MAIN

1519

00:58:52,762 --> 00:58:54,297

BENEFIT IS NOT TO PROVIDE HIGH

1520

00:58:54,297 --> 00:58:58,334

QUALITY IMAGES, BUT RATHER BEING

1521

00:58:58,334 --> 00:58:59,269

LOW COST.

1522

00:58:59,269 --> 00:59:01,504

YOU COULD HAVE MANY SATELLITES,

1523

00:59:01,504 --> 00:59:03,706

TO POPULATE A CONSTELLATION, IN

1524

00:59:03,706 --> 00:59:08,211

ORDER TO HAVE ONE PERSISTENTLY,

1525

00:59:08,211 --> 00:59:10,280

FREQUENTLY OVERHEAD TO PROVIDE

1526
00:59:10,280 --> 00:59:12,849
SOME PERSISTENT PRESENCE.

1527
00:59:12,849 --> 00:59:15,652
AND THEN THE FINAL POINT TO

1528
00:59:15,652 --> 00:59:20,657
MAKE, IS THAT BEING LOW COST AND

1529
00:59:20,657 --> 00:59:23,626
HAVING MANY SATELLITES.

1530
00:59:23,626 --> 00:59:25,828
WHEN YOU LAUNCH OR HAVE A

1531
00:59:25,828 --> 00:59:27,997
FAILURE WHEN YOU LAUNCH OR

1532
00:59:27,997 --> 00:59:29,966
ANOMALY WITH A SINGLE SATELLITE,

1533
00:59:29,966 --> 00:59:31,634
DOESN'T LEAD TO A LOSS OF

1534
00:59:31,634 --> 00:59:33,069
SERVICE.

1535
00:59:33,069 --> 00:59:36,940
THEREFORE, YOU HAVE GRACEFUL

1536
00:59:36,940 --> 00:59:37,407
DEGRADATION.

1537
00:59:37,407 --> 00:59:39,442
IT IS A JOINT CAPABILITY

1538
00:59:39,442 --> 00:59:40,410

TECHNOLOGY PROGRAM.

1539

00:59:40,410 --> 00:59:42,211

THIS IS A SPECIAL PROGRAM,

1540

00:59:42,211 --> 00:59:44,580

THAT'S OFF THE SECRETARY OF

1541

00:59:44,580 --> 00:59:44,948

DEFENSE.

1542

00:59:44,948 --> 00:59:51,487

AND AS SUCH, WE HAVE A COCON

1543

00:59:51,487 --> 00:59:52,889

SPONSOR, COMBATIVE COMMAND

1544

00:59:52,889 --> 00:59:53,289

RESPONSER.

1545

00:59:53,289 --> 00:59:54,290

A SPECIFIC COMMAND.

1546

00:59:54,290 --> 00:59:58,628

ONCE WE'RE IN ORBIT, THE LARGE

1547

00:59:58,628 --> 01:00:06,636

PART IS TO EVALUATE.

1548

01:00:06,636 --> 01:00:09,472

COCON WILL DO AN ASSESSMENT OF

1549

01:00:09,472 --> 01:00:09,772

THAT.

1550

01:00:09,772 --> 01:00:13,276

>> TOUGH DUTY TO DOING THE

1551

01:00:13,276 --> 01:00:15,778

EXPERIMENT IN OAHU.

1552

01:00:15,778 --> 01:00:18,147

HE HAD TO SPEND A MONTH OVER

1553

01:00:18,147 --> 01:00:18,481

THERE.

1554

01:00:18,481 --> 01:00:19,849

BUT HAD HE TO DO IT.

1555

01:00:19,849 --> 01:00:22,285

>> AND SUBJECT TO THE QUESTIONS,

1556

01:00:22,285 --> 01:00:23,519

TABITHA, THAT'S ALL WE HAVE.

1557

01:00:23,519 --> 01:00:25,722

>>> IF WE HAVE QUESTIONS IN THE

1558

01:00:25,722 --> 01:00:27,190

ROOM, PLEASE RAISE YOUR HAND.

1559

01:00:27,190 --> 01:00:29,525

WAIT FOR THE MICROPHONE TO MAKE

1560

01:00:29,525 --> 01:00:30,493

ITS WAY TO YOU.

1561

01:00:30,493 --> 01:00:31,894

IF YOU HAVE QUESTIONS AND YOU'RE

1562

01:00:31,894 --> 01:00:40,370

FOLLOWING ON-LINE, SUBMIT THAT,

1563

01:00:42,605 --> 01:00:40,903

VIA

1564

01:00:42,605 --> 01:00:45,408

>> WHAT KIND OF DEVICES ON THE

1565

01:00:45,408 --> 01:00:46,843

GROUND, RECEIVING IMAGES FROM

1566

01:00:46,843 --> 01:00:49,078

THE SATELLITE?

1567

01:00:49,078 --> 01:00:52,682

>> SO WE HAVE, FOR THE JCTD, WE

1568

01:00:52,682 --> 01:00:54,250

HAVE THE EXPERIMENT.

1569

01:00:54,250 --> 01:00:56,552

WE HAVE TWO GROUND STATIONS.

1570

01:00:56,552 --> 01:01:00,923

ONE IS IN OUR PLACE OF BUSINESS,

1571

01:01:00,923 --> 01:01:02,125

REDSTONE, ALBA MA.

1572

01:01:02,125 --> 01:01:04,927

AND THE OTHER ONE, IS THE

1573

01:01:04,927 --> 01:01:07,130

PACIFIC DEMAND IN HONOLULU.

1574

01:01:07,130 --> 01:01:09,999

THE ONE IN RED STONE IS A FIX

1575

01:01:09,999 --> 01:01:11,701

SITE ANTENNA.

1576

01:01:11,701 --> 01:01:15,238

THE ONE IN THE OTHER DEMAND IS A

1577

01:01:15,238 --> 01:01:18,841

HIGHLY MOTOR ANTENNA, CALLED THE

1578

01:01:18,841 --> 01:01:19,742

GATOR.

1579

01:01:19,742 --> 01:01:22,311

IT'S AN INFLATABLE ANTENNA, THAT

1580

01:01:22,311 --> 01:01:25,314

HAS GREAT LOGISTICS.

1581

01:01:25,314 --> 01:01:28,551

IT IS LIGHT WEIGHT COMPARED TO A

1582

01:01:28,551 --> 01:01:31,487

TRADITIONAL ANTENNA.

1583

01:01:31,487 --> 01:01:33,489

THEY HAVE A GREATER MAGNITUDE IN

1584

01:01:33,489 --> 01:01:33,823

WEIGHT.

1585

01:01:33,823 --> 01:01:37,393

>> THE ANTENNA, IF CHIP IS

1586

01:01:37,393 --> 01:01:40,263

TALKING ABOUT, COULD ADD TO

1587

01:01:40,263 --> 01:01:40,630

THAT.

1588

01:01:40,630 --> 01:01:42,198

IT IS VERY LIGHT WEIGHT AND IT

1589

01:01:42,198 --> 01:01:42,598

COULD BE.

1590

01:01:42,598 --> 01:01:45,401

YOU COULD TAKE THE ENTIRE

1591

01:01:45,401 --> 01:01:47,570

ANTENNA SYSTEM.

1592

01:01:47,570 --> 01:01:49,605

2.1 METER, ANTENNA.

1593

01:01:49,605 --> 01:01:50,840

IT'S INFLATABLE.

1594

01:01:50,840 --> 01:01:53,209

YOU COULD ACTUALLY PACK IT ON

1595

01:01:53,209 --> 01:01:56,446

CHECKED BAGGAGE ON A NORMAL

1596

01:01:56,446 --> 01:01:57,980

COMMERCIAL AIRLINER.

1597

01:01:57,980 --> 01:01:59,682

TAKE IT WHEREVER YOU NEED TO GO.

1598

01:01:59,682 --> 01:02:02,385

IT'S REALLY GREAT FROM THE

1599

01:02:02,385 --> 01:02:02,785

STANDPOINT.

1600

01:02:02,785 --> 01:02:05,555

AND TO UNDER SCORE WHAT CHIP IS

1601
01:02:05,555 --> 01:02:06,923
SAYING, THE GROUND STATION

1602
01:02:06,923 --> 01:02:10,359
CONSISTS OF THE ANTENNA AND A

1603
01:02:10,359 --> 01:02:15,832
TRANSMIT AND RECEIVE RADIO AND A

1604
01:02:15,832 --> 01:02:16,165
LAPTOP.

1605
01:02:16,165 --> 01:02:17,033
THAT'S IT

1606
01:02:17,033 --> 01:02:17,967
>> WE HAVE ONE QUESTION FROM

1607
01:02:17,967 --> 01:02:19,635
SOCIAL MEDIA AND WE'LL TAKE THE

1608
01:02:19,635 --> 01:02:21,003
NEXT QUESTION IN THE ROOM.

1609
01:02:21,003 --> 01:02:23,039
>> THIS QUESTION COMES FROM

1610
01:02:23,039 --> 01:02:23,439
TWITTER.

1611
01:02:23,439 --> 01:02:25,208
YOU COULD TELL US ABOUT ANY

1612
01:02:25,208 --> 01:02:27,009
CIVILIAN OR EMERGENCY USES FOR

1613
01:02:27,009 --> 01:02:29,212

THE RESPONSE TO NATIONAL

1614

01:02:29,212 --> 01:02:29,645

DISASTERS?

1615

01:02:29,645 --> 01:02:31,948

>> FIRST OF ALL, ONE OF KEY

1616

01:02:31,948 --> 01:02:33,683

ROLES THAT THE MILITARY HAS

1617

01:02:33,683 --> 01:02:36,486

TODAY IS IN HUMANITARIAN

1618

01:02:36,486 --> 01:02:36,919

ASSISTANCE.

1619

01:02:36,919 --> 01:02:38,955

WHEN THERE'S A HURRICANE

1620

01:02:38,955 --> 01:02:40,990

DISASTER, FOR EXAMPLE IN THE

1621

01:02:40,990 --> 01:02:42,625

CARIBBEAN, UNITED STATES

1622

01:02:42,625 --> 01:02:45,361

MILITARY WILL BE CALLED TO HELP

1623

01:02:45,361 --> 01:02:48,097

IN THE SYSTEM THAT OFTEN TIMES

1624

01:02:48,097 --> 01:02:49,565

COMMUNICATIONS AND IMAGERY

1625

01:02:49,565 --> 01:02:51,067

INFORMATION ARE LACKING IN THOSE

1626
01:02:51,067 --> 01:02:54,237
KINDS OF SITUATIONS IS.

1627
01:02:54,237 --> 01:02:57,840
THIS COULD PROVIDE TREMENDOUS

1628
01:02:57,840 --> 01:02:58,774
CAPABILITY FOR THAT.

1629
01:02:58,774 --> 01:03:01,210
IT COULD BE AVAILABLE FOR OTHER

1630
01:03:01,210 --> 01:03:03,346
GOVERNMENT AGENCIES, INCLUDING

1631
01:03:03,346 --> 01:03:05,882
CIVIL AGENCIES LIKE NASA.

1632
01:03:05,882 --> 01:03:08,918
AND IT HAS MULTIPLE APPLICATIONS

1633
01:03:08,918 --> 01:03:09,318
POTENTIAL.

1634
01:03:09,318 --> 01:03:10,987
>> WE HAVE ANOTHER QUESTION IN

1635
01:03:10,987 --> 01:03:13,356
THE ROOM.

1636
01:03:13,356 --> 01:03:14,757
>> LISA GONZALEZ, FROM THE VICE.

1637
01:03:14,757 --> 01:03:16,559
I HAVE A QUESTION, ONCE YOU HAVE

1638
01:03:16,559 --> 01:03:18,194

THE INFORMATION, AND SAY IN

1639

01:03:18,194 --> 01:03:21,030

NATURAL DISASTER, WHAT ARE YOU

1640

01:03:21,030 --> 01:03:22,298

LOOKING FOR?

1641

01:03:22,298 --> 01:03:23,399

HOW DOES THE INFORMATION HELP

1642

01:03:23,399 --> 01:03:26,469

YOU, HELP THE ARMY, HELP ANYONE

1643

01:03:26,469 --> 01:03:28,437

MAKE CHANGE OR DO SOMETHING

1644

01:03:28,437 --> 01:03:28,771

GOOD?

1645

01:03:28,771 --> 01:03:30,673

>> ONE ASPECT WOULD BE, IF YOU

1646

01:03:30,673 --> 01:03:33,709

HAVE AN OBJECTIVE SYSTEM, AND

1647

01:03:33,709 --> 01:03:35,511

HAD A CONSTELLATION.

1648

01:03:35,511 --> 01:03:39,749

AND YOU COULD MONITOR THE --

1649

01:03:39,749 --> 01:03:41,450

MONITOR THE SITUATION AND

1650

01:03:41,450 --> 01:03:44,654

PROVIDE CHANGES TO THE PEOPLE

1651
01:03:44,654 --> 01:03:47,857
TRYING TO ADDRESS IT MORE

1652
01:03:47,857 --> 01:03:48,758
RAPIDLY

1653
01:03:48,758 --> 01:03:50,660
>> YOU KNOW, YOU'VE PROBABLY

1654
01:03:50,660 --> 01:03:51,761
HEARD OF THE COMMERCIAL

1655
01:03:51,761 --> 01:03:54,130
APPLICATIONS IMAGERY, WHERE THEY

1656
01:03:54,130 --> 01:03:57,333
WILL MONITOR A PARKING LOT IN A

1657
01:03:57,333 --> 01:03:58,234
COMMERCIAL COMPANY.

1658
01:03:58,234 --> 01:04:00,169
USE THE PROGRESSION OF THE

1659
01:04:00,169 --> 01:04:02,038
PARKING LOT OVER A PERIOD OF

1660
01:04:02,038 --> 01:04:04,740
DAYS, MONTHS AND EVEN YEARS TO

1661
01:04:04,740 --> 01:04:06,342
DETERMINE, THE BUSINESS GROWING,

1662
01:04:06,342 --> 01:04:07,276
IS IT SHRINKING.

1663
01:04:07,276 --> 01:04:08,878

THERE'S LOTS OF APPLICATIONS

1664

01:04:08,878 --> 01:04:09,478

LIKE THAT.

1665

01:04:09,478 --> 01:04:11,480

FROM A MILITARY STANDPOINT,

1666

01:04:11,480 --> 01:04:12,615

CERTAINLY TRYING TO UNDERSTAND

1667

01:04:12,615 --> 01:04:14,417

WHAT THE CONDITION IS IN AN AREA

1668

01:04:14,417 --> 01:04:16,552

WHERE THE ARMY MIGHT BE

1669

01:04:16,552 --> 01:04:18,487

OPERATING AND BEING ABLE TO KNOW

1670

01:04:18,487 --> 01:04:18,921

FREQUENTLY.

1671

01:04:18,921 --> 01:04:23,426

THE KEY IS TO HAVE RAPID REFRESH

1672

01:04:23,426 --> 01:04:26,295

OF THE INFORMATION IS HE IT'S

1673

01:04:26,295 --> 01:04:26,729

NOT STALE.

1674

01:04:26,729 --> 01:04:30,166

>> ANY OTHER QUESTIONS IN THE

1675

01:04:30,166 --> 01:04:31,400

ROOM?

1676
01:04:31,400 --> 01:04:32,435
ALL RIGHT.

1677
01:04:32,435 --> 01:04:35,271
THANK YOU, GENTLEMEN.

1678
01:04:35,271 --> 01:04:35,705
>> THANK YOU.

1679
01:04:35,705 --> 01:04:39,008
[APPLAUSE]

1680
01:04:39,008 --> 01:04:40,977
>> AND LAST BUT CERTAINLY NOT

1681
01:04:40,977 --> 01:04:42,712
LEAST, WE HAVE A GROUP HERE TO

1682
01:04:42,712 --> 01:04:44,180
TALK TO US FROM THE BOY SCOUTS

1683
01:04:44,180 --> 01:04:44,947
OF AMERICA.

1684
01:04:44,947 --> 01:04:47,016
WE HAVE ELLIOT LEE, WHO WAS A

1685
01:04:47,016 --> 01:04:49,719
SCOUT WITH TROOP 209, ANDREW

1686
01:04:49,719 --> 01:04:53,289
FRANK, SCOUT WITH TROOP 209, AND

1687
01:04:53,289 --> 01:04:57,393
NORMAN McFARLAND, TEAM LEADER

1688
01:04:57,393 --> 01:05:09,138

ALSO WITH BOY SCOUTS OF AMERICA.

1689

01:05:09,138 --> 01:05:13,509

>> HELLO, MY NAME IS ELLIOT LEE.

1690

01:05:13,509 --> 01:05:15,311

FIRST SLIDE PLEASE.

1691

01:05:15,311 --> 01:05:16,712

I'M GOING TO BE TALKING TO YOU

1692

01:05:16,712 --> 01:05:18,281

ABOUT THE EXPERIMENT.

1693

01:05:18,281 --> 01:05:22,285

I WILL INTRODUCE YOU TO WHAT WE

1694

01:05:22,285 --> 01:05:23,653

ARE ABOUT TO DO.

1695

01:05:23,653 --> 01:05:25,855

COULD WE HAVE THE FIRST SLIDE?

1696

01:05:25,855 --> 01:05:28,557

SO OUR EXPERIMENT IS WE'RE GOING

1697

01:05:28,557 --> 01:05:32,528

TO USE AN ORGANISM,

1698

01:05:32,528 --> 01:05:33,562

NONCANCER-CAUSING SUBSTANCE AND

1699

01:05:33,562 --> 01:05:35,798

WE'RE GOING TO USE THAT TO

1700

01:05:35,798 --> 01:05:37,733

MEASURE THE TIME, MUTATION RATE

1701
01:05:37,733 --> 01:05:40,202
ON THE MICRO GRAVITY, VERSUS

1702
01:05:40,202 --> 01:05:41,304
GRAVITY ON EARTH.

1703
01:05:41,304 --> 01:05:43,806
THIS COULD BE ACTUALLY A HUGE

1704
01:05:43,806 --> 01:05:48,144
IMPACT ON HUMAN TISSUE

1705
01:05:48,144 --> 01:05:49,612
GROWTH/CANCER RESEARCH.

1706
01:05:49,612 --> 01:05:51,981
THE AIMS TEST IS ORIGINALLY USED

1707
01:05:51,981 --> 01:05:57,053
WITH AN ORGANISM AND A SUSPECTED

1708
01:05:57,053 --> 01:05:59,188
CANCER-CAUSING SUBSTANCE AND --

1709
01:05:59,188 --> 01:06:01,324
BUT OUR, WE USED THE DIRECT

1710
01:06:01,324 --> 01:06:02,191
OPPOSITE OF THAT.

1711
01:06:02,191 --> 01:06:04,360
WE USE ADD KNOWN CANCER CAUSING

1712
01:06:04,360 --> 01:06:06,996
SUBSTANCE TO MEASURE THE RATE

1713
01:06:06,996 --> 01:06:09,165

BETWEEN EARTH'S GRAVITY AND

1714

01:06:09,165 --> 01:06:11,100
SPACE GRAVITY.

1715

01:06:11,100 --> 01:06:12,034
NEXT SLIDE, PLEASE.

1716

01:06:12,034 --> 01:06:15,338
SO AS YOU COULD SEE, WE HAVE

1717

01:06:15,338 --> 01:06:18,174
DIFFERENT CONCENTRATIONS AND

1718

01:06:18,174 --> 01:06:23,479
EACH CONCENTRATION HAS DIFFERENT

1719

01:06:23,479 --> 01:06:28,184
MUTATION RATES.

1720

01:06:28,184 --> 01:06:30,553
ALSO, SOME OF THE AIMS TEST

1721

01:06:30,553 --> 01:06:32,788
COULD ORIGINALLY BE USED AND

1722

01:06:32,788 --> 01:06:35,157
SOME OF THE CONCENTRATIONS THAT

1723

01:06:35,157 --> 01:06:42,298
IT USES, IS 4 NQU ALSO KNOWN AS

1724

01:06:42,298 --> 01:06:54,777
NITRO CHROMIUM OXIDE.

1725

01:06:54,777 --> 01:06:56,579
AND OUR ACCOUNT -- NO, NOT

1726
01:06:56,579 --> 01:06:56,979
ACCOUNT.

1727
01:06:59,849 --> 01:07:02,118
YEAH, WE USED, OUR

1728
01:07:02,118 --> 01:07:06,689
CONCENTRATIONS ARE 1-2, 1-4,

1729
01:07:06,689 --> 01:07:09,091
1-8, AND SO ON, UNTIL 164.

1730
01:07:09,091 --> 01:07:12,628
SOME OF THE ORIGINAL DESIGNS, WE

1731
01:07:12,628 --> 01:07:15,231
WERE GOING TO USE ENTIRELY A

1732
01:07:15,231 --> 01:07:17,066
WALL PLATE BUT THAT WAS TOO

1733
01:07:17,066 --> 01:07:17,400
HARD.

1734
01:07:17,400 --> 01:07:19,468
WE WERE GOING TO MAKE IT

1735
01:07:19,468 --> 01:07:21,570
CIRCULAR, BUT THAT WAS ALSO TOO

1736
01:07:21,570 --> 01:07:22,171
HARD.

1737
01:07:22,171 --> 01:07:26,242
WE MADE AN OCTAGON, AND WE MADE

1738
01:07:26,242 --> 01:07:28,677

A 5 X 14 PLATE.

1739

01:07:28,677 --> 01:07:32,515
AND NEXT SLIDE, PLEASE.

1740

01:07:32,515 --> 01:07:36,752
YES, SO IN THIS SLIDE, AFTER THE

1741

01:07:36,752 --> 01:07:38,621
TEST, WE ARE GOING TO BE

1742

01:07:38,621 --> 01:07:40,389
REVIEWING THE PICTURES AND ONCE

1743

01:07:40,389 --> 01:07:42,158
WE REVIEW THE PICTURES, WE WILL

1744

01:07:42,158 --> 01:07:44,226
LOG THEM BY HOURS AND WE WILL

1745

01:07:44,226 --> 01:07:46,095
COUNT BY HOW MANY MUTATION CELLS

1746

01:07:46,095 --> 01:07:46,996
HAVE HAPPENED.

1747

01:07:46,996 --> 01:07:51,133
WE HAVE TO TAKE NOTE OF THE

1748

01:07:51,133 --> 01:07:52,868
ENVIRONMENTAL EFFECT AROUND IT.

1749

01:07:52,868 --> 01:07:55,805
HERE'S THE THREE SENSORS,

1750

01:07:55,805 --> 01:07:57,540
HUMIDITY SENSOR AND THEN THE

1751
01:07:57,540 --> 01:07:59,875
LIGHT SENSOR AND THEN THE

1752
01:07:59,875 --> 01:08:00,709
RADIATION SENSOR.

1753
01:08:00,709 --> 01:08:03,012
WE HAVE TO TAKE NOTE OF EACH

1754
01:08:03,012 --> 01:08:04,613
ENVIRONMENTAL EFFECT, TO SEE HOW

1755
01:08:04,613 --> 01:08:06,415
EACH AFFECTS THE MUTATION RATE.

1756
01:08:06,415 --> 01:08:10,786
THEY WILL BE LOGGED TO OUR SD

1757
01:08:10,786 --> 01:08:11,587
CARD.

1758
01:08:11,587 --> 01:08:12,855
SC BOARD.

1759
01:08:12,855 --> 01:08:15,124
ONCE THESE ARE LOGGED.

1760
01:08:15,124 --> 01:08:17,560
WE WILL TEST OUR HYPOTHESIS.

1761
01:08:17,560 --> 01:08:25,100
OUR HYPE -- HYPOTHESIS.

1762
01:08:25,100 --> 01:08:29,238
AND I WILL PASS IT ON TO ANDREW.

1763
01:08:29,238 --> 01:08:33,542

>> AND BASICALLY, WE HAVE THE

1764

01:08:33,542 --> 01:08:34,176

SENSORS

1765

01:08:34,176 --> 01:08:36,512

WE ARE TRYING TO GET THE DATA

1766

01:08:36,512 --> 01:08:39,114

BACK TO WE CAN RUN A TEST ON

1767

01:08:39,114 --> 01:08:40,382

EARTH AS CLOSE AS POSSIBLE

1768

01:08:40,382 --> 01:08:42,151

RUNNING IN THE INTERNATIONAL

1769

01:08:42,151 --> 01:08:44,420

SPACE STATION, IN TERMS OF

1770

01:08:44,420 --> 01:08:44,787

GRAVITY.

1771

01:08:44,787 --> 01:08:47,289

THAT'S WHY WE HAD SO MANY

1772

01:08:47,289 --> 01:08:47,857

SENSORS.

1773

01:08:47,857 --> 01:08:49,525

WE HAD SO MANY SENSORS WE HAD TO

1774

01:08:49,525 --> 01:08:51,927

USE IN INTEGRATED INFORMATION

1775

01:08:51,927 --> 01:08:54,997

SYSTEM, BECAUSE WE DIDN'T HAVE

1776

01:08:54,997 --> 01:09:01,203

ENOUGH INPUT FROM THE NASA

1777

01:09:01,203 --> 01:09:03,272

BOARD.

1778

01:09:03,272 --> 01:09:07,810

NEXT SLIDE, PLEASE.

1779

01:09:07,810 --> 01:09:11,547

THE ORGANISM WE'RE USING, WE

1780

01:09:11,547 --> 01:09:16,185

FROZE IT TO NEGATIVE 20 CELSIUS

1781

01:09:16,185 --> 01:09:16,552

FREEZER.

1782

01:09:16,552 --> 01:09:19,588

THAT'S TO INSURE THE EXPERIMENT

1783

01:09:19,588 --> 01:09:22,925

DOESN'T BEGIN BEFORE IT GETS TO

1784

01:09:22,925 --> 01:09:23,759

THE SPACE STATION.

1785

01:09:23,759 --> 01:09:30,499

AND AS YOU COULD SEE, THAT'S OUR

1786

01:09:30,499 --> 01:09:30,933

NESSIE BOARD.

1787

01:09:30,933 --> 01:09:33,836

AND WE'RE SOUGHTERING, IT AND

1788

01:09:33,836 --> 01:09:35,938

THAT'S CAUSING A THE LO OF

1789

01:09:35,938 --> 01:09:36,272

DAMAGE.

1790

01:09:36,272 --> 01:09:38,274

WE HAVE A CIRCUIT BOARD THAT

1791

01:09:38,274 --> 01:09:39,909

HOLDS TWO CAMERAS AND THE

1792

01:09:39,909 --> 01:09:42,945

SENSORS TO MONITOR ENVIRONMENTAL

1793

01:09:42,945 --> 01:09:45,781

VARIABLES WITHIN THE CHAMBER, AS

1794

01:09:45,781 --> 01:09:47,082

YOU COULD SEE HERE.

1795

01:09:47,082 --> 01:09:49,418

IF YOU GOED TO NEXT SLIDE, YOU

1796

01:09:49,418 --> 01:09:51,153

COULD ALSO SEE THIS OTHER CUSTOM

1797

01:09:51,153 --> 01:09:54,356

BOARD THAT WE'VE CREATED.

1798

01:09:54,356 --> 01:09:56,058

AND THAT CONNECTS EVERYTHING.

1799

01:09:56,058 --> 01:09:58,394

IT REALLY CLEANED UP THE WIRES

1800

01:09:58,394 --> 01:09:59,028

FOR US.

1801
01:09:59,028 --> 01:10:02,431
IF YOU GO TO THE NEXT SLIDE, YOU

1802
01:10:02,431 --> 01:10:04,233
COULD SEE -- THIS IS A SKETCH.

1803
01:10:04,233 --> 01:10:08,203
WE TESTED A BUNCH OF MOTORS TO

1804
01:10:08,203 --> 01:10:09,772
FIND THE PERFECT ONE THAT WORKED

1805
01:10:09,772 --> 01:10:10,506
WITH THE TEST.

1806
01:10:10,506 --> 01:10:12,241
THIS IS JUST A SKETCH OF ONE OF

1807
01:10:12,241 --> 01:10:14,543
THE ASSEMBLIES WE USE FOR

1808
01:10:14,543 --> 01:10:15,477
TESTING IT.

1809
01:10:15,477 --> 01:10:17,479
IF YOU GO TO THE NEXT SLIDE, YOU

1810
01:10:17,479 --> 01:10:18,948
COULD SEE THAT WE'RE NOT THE

1811
01:10:18,948 --> 01:10:20,349
ONLY PEOPLE WORKING ON THIS.

1812
01:10:20,349 --> 01:10:22,484
THERE'S A WHOLE TEAM BEHIND IT.

1813
01:10:22,484 --> 01:10:23,485

YOU COULD SEE US.

1814

01:10:23,485 --> 01:10:33,095

WE TOOK A PICTURE WITH MARK POLL

1815

01:10:33,095 --> 01:10:33,495

POLLENSKI.

1816

01:10:33,495 --> 01:10:35,331

IF YOU GO TO THE FINAL SLIDE,

1817

01:10:35,331 --> 01:10:38,267

YOU COULD SEE OUR SPONSORS,

1818

01:10:38,267 --> 01:10:40,436

LINKED TO THE LINK, FOR HELPING

1819

01:10:40,436 --> 01:10:41,370

US OUT.

1820

01:10:41,370 --> 01:10:45,040

AND NOW PASSING IT TO OUR ADULT

1821

01:10:45,040 --> 01:10:48,410

LEADER, MR. McFARLAND.

1822

01:10:51,413 --> 01:10:53,782

>> AS PROJECT LEADER, I COULDN'T

1823

01:10:53,782 --> 01:10:55,384

BE MORE PROUD OF THE BOYS.

1824

01:10:55,384 --> 01:10:59,288

THEY STARTED OFF AS A BUNCH OF

1825

01:10:59,288 --> 01:11:01,123

BRIGHT EYED SCHOOL STUDENTS.

1826

01:11:01,123 --> 01:11:05,427

NOW THEY ARE SELF-STARTING,

1827

01:11:05,427 --> 01:11:07,696

PROBLEM SOLVING, YOUNG

1828

01:11:07,696 --> 01:11:08,097

ENGINEERS.

1829

01:11:08,097 --> 01:11:11,934

THEY'VE DONE A PHENOMENAL JOB.

1830

01:11:11,934 --> 01:11:13,636

FOR THOSE THAT THINK SCOUTING IS

1831

01:11:13,636 --> 01:11:18,107

ALL ABOUT CAMPING, OR CAMPFIRES

1832

01:11:18,107 --> 01:11:21,777

OR KNOT TYING OR WHATEVER ELSE

1833

01:11:21,777 --> 01:11:24,513

YOUR PRECONCEIVED NOTION, AND

1834

01:11:24,513 --> 01:11:27,282

MAYBE YOU COULD SEE NOW WE DO

1835

01:11:27,282 --> 01:11:29,251

SOME STEM STUFF ONCE IN A WHILE.

1836

01:11:29,251 --> 01:11:32,287

WE ACTUALLY OFFER OVER 60 BADGES

1837

01:11:32,287 --> 01:11:34,823

IN THE SCIENCE OF SCIENCE,

1838

01:11:34,823 --> 01:11:36,091

ENGINEERING, MATH AREA.

1839

01:11:36,091 --> 01:11:43,799

IN ADDITION, WE HAVE SEVERAL

1840

01:11:43,799 --> 01:11:45,167

NOVICE AWARDS.

1841

01:11:45,167 --> 01:11:47,069

AND BEYOND THAT, ONCE YOU HAVE

1842

01:11:47,069 --> 01:11:50,839

NOVO AWARDS, YOU COULD WIN SUPER

1843

01:11:50,839 --> 01:11:52,841

NOVO AWARDS, THAT BELONGS TO

1844

01:11:52,841 --> 01:11:55,110

YOUR COLLEGE RESUME, AS A

1845

01:11:55,110 --> 01:11:57,079

SIGNIFICANT EVENT THERE.

1846

01:11:57,079 --> 01:12:00,149

SO OUR TEAM WOULD LIKE TO THANK

1847

01:12:00,149 --> 01:12:03,719

NASA FOR THE TV TIME.

1848

01:12:03,719 --> 01:12:07,322

CASES, TEXAS A&M, UNIVERSITY FOR

1849

01:12:07,322 --> 01:12:09,958

SPONSORING THIS TEAM.

1850

01:12:09,958 --> 01:12:14,697

AND GENERAL CONNECTICS, EBPI WAS

1851
01:12:14,697 --> 01:12:17,466
OUR BIOLOGY SOURCE AND SPARK

1852
01:12:17,466 --> 01:12:19,401
FUND FOR MANY OF THE SENSORS YOU

1853
01:12:19,401 --> 01:12:20,869
SAW HERE.

1854
01:12:20,869 --> 01:12:21,970
FINALLY, WE HAVE A SPECIAL

1855
01:12:21,970 --> 01:12:30,245
THANKS GOING OUT TO TWO PEOPLE,

1856
01:12:30,245 --> 01:12:35,951
MAN ELDER AND LISA EARLY, WHO

1857
01:12:35,951 --> 01:12:39,121
WERE NASA COUNSELORS.

1858
01:12:39,121 --> 01:12:45,728
WE WANT TO THANK OUR SPONSORING,

1859
01:12:45,728 --> 01:12:49,364
FIRST METHODIST CHURCH IN

1860
01:12:49,364 --> 01:12:49,765
ILLINOIS.

1861
01:12:49,765 --> 01:12:50,899
THANK YOU FOR YOUR TIME.

1862
01:12:50,899 --> 01:12:53,268
>> THANK YOU FOR YOUR

1863
01:12:53,268 --> 01:12:54,503

PRESENTATION.

1864

01:12:54,503 --> 01:12:56,438

DO WE HAVE ANY QUESTIONS FROM

1865

01:12:56,438 --> 01:13:00,342

THE AUDIENCE FROM THE BOYS

1866

01:13:00,342 --> 01:13:01,009

SCOUTS.

1867

01:13:01,009 --> 01:13:02,644

DO WE HAVE ANY QUESTIONS FROM

1868

01:13:02,644 --> 01:13:03,779

SOCIAL MEDIA?

1869

01:13:03,779 --> 01:13:04,713

WE HAVE ONE QUESTION.

1870

01:13:04,713 --> 01:13:06,482

WAIT FOR THE MICROPHONE?

1871

01:13:06,482 --> 01:13:09,718

>> I'M CURIOUS, HOW LONG DOES IT

1872

01:13:09,718 --> 01:13:11,954

TAKE YOU GUYS FROM THE IDEA, TO

1873

01:13:11,954 --> 01:13:15,090

DO THIS, TO WHY YOU ARE NOW?

1874

01:13:15,090 --> 01:13:16,492

>> IT'S BEEN ABOUT 2 1/2 YEARS

1875

01:13:16,492 --> 01:13:18,594

SINCE WE STARTED.

1876

01:13:18,594 --> 01:13:21,964

>> JUST BEYOND THAT, SOME OF

1877

01:13:21,964 --> 01:13:24,900

THAT WAS -- WE WERE GOING TO FLY

1878

01:13:24,900 --> 01:13:27,803

OUR UNIT TO SPACE FROZEN AND WE

1879

01:13:27,803 --> 01:13:30,806

HAD A COUPLE OF LAUNCHES THAT

1880

01:13:30,806 --> 01:13:32,241

DIDN'T -- THAT WOULDN'T HAVE A

1881

01:13:32,241 --> 01:13:34,643

FREEZER OF THE PROPER

1882

01:13:34,643 --> 01:13:35,811

TEMPERATURES.

1883

01:13:35,811 --> 01:13:37,446

SO THAT WASN'T ALL JUST TAKING

1884

01:13:37,446 --> 01:13:41,350

THAT LONG, BUT WE USED THE TIME

1885

01:13:41,350 --> 01:13:42,751

WHEN WE GOT IT.

1886

01:13:42,751 --> 01:13:44,620

>> ANY OTHER QUESTIONS IN THE

1887

01:13:44,620 --> 01:13:44,953

ROOM?

1888

01:13:44,953 --> 01:13:48,490

>> HI, MY NAME IS MURRIAL.

1889

01:13:48,490 --> 01:13:51,627

I WAS WONDERING WHAT INSPIRED

1890

01:13:51,627 --> 01:13:54,930

YOU TO CHOOSING YOUR PRODUCT?

1891

01:13:54,930 --> 01:13:57,666

>> SO I HAVE A CAREER PATH THAT

1892

01:13:57,666 --> 01:14:01,270

I WANT TO SHARE WITH YOU.

1893

01:14:01,270 --> 01:14:04,907

ACTUALLY, I KIND OF WANTED TO BE

1894

01:14:04,907 --> 01:14:07,276

AN ENGINEER IN THE U.S. ARMY.

1895

01:14:07,276 --> 01:14:09,378

THIS PROJECT REALLY INSPIRED ME

1896

01:14:09,378 --> 01:14:11,213

TO DO THAT SORT OF CAREER PATH.

1897

01:14:11,213 --> 01:14:13,749

SO I JUST WANTED TO LEARN MORE

1898

01:14:13,749 --> 01:14:15,551

ABOUT SUCH THINGS AND IT REALLY

1899

01:14:15,551 --> 01:14:20,722

HELPED ME OUT AS A LIFE LESSON.

1900

01:14:20,722 --> 01:14:22,491

>> I'M SORRY, WERE YOU ASKING

1901
01:14:22,491 --> 01:14:24,726
HOW EACH OF THE BOYS CHOSE TO BE

1902
01:14:24,726 --> 01:14:26,295
ON THE TEAM OR WERE YOU ASKING

1903
01:14:26,295 --> 01:14:30,432
HOW WE CHOSE THIS PARTICULAR

1904
01:14:30,432 --> 01:14:33,535
EXPERIMENT TO RUN?

1905
01:14:33,535 --> 01:14:36,672
>> WE WENT TO THE TROOP.

1906
01:14:36,672 --> 01:14:37,973
>> I'M SORRY

1907
01:14:37,973 --> 01:14:40,075
>> YES, WE WENT TO THE TROOP.

1908
01:14:40,075 --> 01:14:42,778
IT'S A PRETTY BIG TROOP, AROUND

1909
01:14:42,778 --> 01:14:44,179
100 KIDS IN IT.

1910
01:14:44,179 --> 01:14:46,448
WE ASKED THEM TO SUBMIT THEIR

1911
01:14:46,448 --> 01:14:48,584
IDEAS, AND SO, WE SPENT A LOT OF

1912
01:14:48,584 --> 01:14:50,652
TIME JUST FILTERING THROUGH ALL

1913
01:14:50,652 --> 01:14:51,720

THE IDEAS.

1914

01:14:51,720 --> 01:14:55,591

WE ENDED UP WITH ABOUT 4 AT THE

1915

01:14:55,591 --> 01:14:57,993

END; RIGHT? AND THEN WE ACTUALLY

1916

01:14:57,993 --> 01:14:59,461

COMBINED TWO OF THE SUGGESTIONS

1917

01:14:59,461 --> 01:15:04,132

TO GET OUR EXPERIMENT AS IT IS

1918

01:15:04,132 --> 01:15:04,433

NOW.

1919

01:15:04,433 --> 01:15:06,335

>> WE STARTED WITH 84

1920

01:15:06,335 --> 01:15:08,203

SUGGESTIONS BETWEEN BOYS AND

1921

01:15:08,203 --> 01:15:09,872

ADULTS IN A NIGHT.

1922

01:15:09,872 --> 01:15:12,040

AND IT TOOK US ABOUT TWO MORE

1923

01:15:12,040 --> 01:15:14,176

NIGHTS TO FILTER THROUGH THOSE.

1924

01:15:14,176 --> 01:15:17,846

WE DID SOME RATHER TRICKY, GET

1925

01:15:17,846 --> 01:15:19,514

THEM THROUGH QUICK FILTERING.

1926

01:15:19,514 --> 01:15:23,785

THIS IS WHAT CAME OUT OF IT

1927

01:15:23,785 --> 01:15:26,521

>> WE HAVE A QUESTION FROM

1928

01:15:26,521 --> 01:15:27,789

SOCIAL MEDIA

1929

01:15:27,789 --> 01:15:30,626

>> YEAH, THIS QUESTION ASKED,

1930

01:15:30,626 --> 01:15:32,327

WHAT IS THE SUSPECTED CANCER

1931

01:15:32,327 --> 01:15:33,829

CAUSING SUBSTANCE THAT YOU WILL

1932

01:15:33,829 --> 01:15:37,499

USE FOR THE EXPERIMENT?

1933

01:15:37,499 --> 01:15:45,307

>> 4 NITRO QUINNOLIN OXIDE.

1934

01:15:45,307 --> 01:15:48,477

>> WE WERE FORTUNATE TO HAVE AN

1935

01:15:48,477 --> 01:15:50,879

AVID MICROBIOLOGIST ON THE TEAM.

1936

01:15:50,879 --> 01:15:53,382

WE STARTED WITH SALMONELLA.

1937

01:15:53,382 --> 01:15:56,051

WE REALIZED ANY SCOUT THAT GOT

1938

01:15:56,051 --> 01:15:58,220

SICK IN THE NEXT SIX MONTHS, IT

1939

01:15:58,220 --> 01:16:00,555

WOULD BE OUR FAULT.

1940

01:16:00,555 --> 01:16:03,058

WE SWITCHED TO THE E.COLI AND

1941

01:16:03,058 --> 01:16:05,060

THAT BROUGHT US BACK TO THE

1942

01:16:05,060 --> 01:16:06,128

PARTICULAR SUBSTANCE.

1943

01:16:06,128 --> 01:16:11,266

>> ANY OTHER QUESTIONS IN THE

1944

01:16:11,266 --> 01:16:13,502

ROOM?

1945

01:16:13,502 --> 01:16:18,440

OKAY. THANK YOU, GENTLEMEN.

1946

01:16:18,440 --> 01:16:18,941

[APPLAUSE]

1947

01:16:18,941 --> 01:16:20,709

>> THANK YOU TO EVERYBODY WHO

1948

01:16:20,709 --> 01:16:22,444

JOINED US, IF YOU'RE FOLLOWING

1949

01:16:22,444 --> 01:16:23,845

ON LINE, OR IN THE ROOM.

1950

01:16:23,845 --> 01:16:24,279

THANK YOU.

1951

01:16:24,279 --> 01:16:26,915

WE'RE EXCITED TO GET READY FOR

1952

01:16:26,915 --> 01:16:29,584

TOMORROW'S TARGETED LAUNCH AT

1953

01:16:29,584 --> 01:16:32,087

12:31 P.M. EASTERN DAYLIGHT

1954

01:16:32,087 --> 01:16:32,788

TIME.

1955

01:16:32,788 --> 01:16:35,958

DON'T FORGET, 9:33 THIS EVENING,

1956

01:16:35,958 --> 01:16:38,193

IF YOU ARE HERE IN FLORIDA SPACE

1957

01:16:38,193 --> 01:16:38,527

COAST.

1958

01:16:38,527 --> 01:16:40,562

LOOK OUT FOR THE STATION TO GO

1959

01:16:40,562 --> 01:16:40,963

OVERHEAD.