



1
00:00:09,910 --> 00:00:07,030
welcome back we are

2
00:00:12,310 --> 00:00:09,920
once again live on nasa tv

3
00:00:14,070 --> 00:00:12,320
from the asteroid initiative idea

4
00:00:17,029 --> 00:00:14,080
synthesis workshop here at the lunar and

5
00:00:20,710 --> 00:00:17,039
planetary institute it's our third and

6
00:00:22,790 --> 00:00:20,720
final day we had a really exciting set

7
00:00:25,349 --> 00:00:22,800
of presentations this morning about next

8
00:00:27,189 --> 00:00:25,359
generation engagement some fantastic

9
00:00:28,470 --> 00:00:27,199
visualizations

10
00:00:31,269 --> 00:00:28,480
and we have

11
00:00:33,670 --> 00:00:31,279
not quite a half hour now to engage in

12
00:00:35,270 --> 00:00:33,680
some discussion and thinking hopefully

13
00:00:38,790 --> 00:00:35,280

the presentations have sparked some

14

00:00:41,030 --> 00:00:38,800

ideas both within the audience here

15

00:00:43,990 --> 00:00:41,040

as well as

16

00:00:47,029 --> 00:00:44,000

out on the on the net our hashtag again

17

00:00:51,029 --> 00:00:47,039

for those that have questions it's

18

00:00:53,189 --> 00:00:51,039

hashtag asteroid gc so

19

00:00:54,869 --> 00:00:53,199

join us in this conversation

20

00:00:58,069 --> 00:00:54,879

so

21

00:01:00,950 --> 00:00:58,079

next generation engagement saw

22

00:01:03,110 --> 00:01:00,960

some fantastic visualizations

23

00:01:05,590 --> 00:01:03,120

and i think we started to get a sense

24

00:01:07,350 --> 00:01:05,600

that there there is an opportunity for

25

00:01:09,750 --> 00:01:07,360

people to build on

26

00:01:12,070 --> 00:01:09,760

and plug into those systems and play

27

00:01:13,590 --> 00:01:12,080

with those systems and i'm wondering we

28

00:01:16,630 --> 00:01:13,600

didn't really get to dig into that

29

00:01:17,670 --> 00:01:16,640

aspect as much and so

30

00:01:19,910 --> 00:01:17,680

both

31

00:01:22,230 --> 00:01:19,920

eric and david if if you might

32

00:01:23,270 --> 00:01:22,240

talk a little bit about

33

00:01:25,030 --> 00:01:23,280

how

34

00:01:26,950 --> 00:01:25,040

moving forward because

35

00:01:28,950 --> 00:01:26,960

we're going to end in about a half hour

36

00:01:31,590 --> 00:01:28,960

we're going to have a plenary session

37

00:01:33,429 --> 00:01:31,600

we're going to go home and

38

00:01:34,230 --> 00:01:33,439

i'm going to feel like we accomplished a

39

00:01:36,230 --> 00:01:34,240

lot

40

00:01:38,950 --> 00:01:36,240

but we need to keep moving and we have a

41

00:01:41,030 --> 00:01:38,960

wiki that's gathering ideas but how are

42

00:01:42,389 --> 00:01:41,040

we going to be able to keep folks

43

00:01:44,469 --> 00:01:42,399

engaged

44

00:01:46,550 --> 00:01:44,479

and utilize these systems that you've

45

00:01:47,990 --> 00:01:46,560

already got started

46

00:01:50,069 --> 00:01:48,000

so that they can feel like they can

47

00:01:53,510 --> 00:01:50,079

continue to participate once once we

48

00:01:57,830 --> 00:01:53,520

leave here so can i ask you to dig in on

49

00:02:02,149 --> 00:01:59,830

multiple mics yeah

50

00:02:05,270 --> 00:02:02,159

now i think first

51
00:02:06,310 --> 00:02:05,280
i think people don't understand quite

52
00:02:11,190 --> 00:02:06,320
that

53
00:02:13,830 --> 00:02:11,200
to them on the web from nasa and you

54
00:02:15,910 --> 00:02:13,840
know by making sure that we

55
00:02:17,589 --> 00:02:15,920
uh make people aware of that give them

56
00:02:19,190 --> 00:02:17,599
links to where they can get those things

57
00:02:20,309 --> 00:02:19,200
you know and those are images that they

58
00:02:22,229 --> 00:02:20,319
can get

59
00:02:24,470 --> 00:02:22,239
every day they're updated there's

60
00:02:26,710 --> 00:02:24,480
real-time data that comes out okay and i

61
00:02:28,869 --> 00:02:26,720
think that's important uh the second is

62
00:02:31,030 --> 00:02:28,879
that there are also videos the same way

63
00:02:33,990 --> 00:02:31,040

but probably the most important thing is

64

00:02:36,070 --> 00:02:34,000

that there are models nasa is keeping a

65

00:02:38,470 --> 00:02:36,080

set of models you know of planetary

66

00:02:40,470 --> 00:02:38,480

objects like asteroids but of spacecraft

67

00:02:43,350 --> 00:02:40,480

as well okay and those are things that

68

00:02:46,470 --> 00:02:43,360

with html5 you can actually put in your

69

00:02:49,509 --> 00:02:46,480

browser and interact with you in real

70

00:02:51,750 --> 00:02:49,519

time they're also you know open source

71

00:02:54,309 --> 00:02:51,760

software that's free where you can make

72

00:02:56,070 --> 00:02:54,319

your own videos and visualizations you

73

00:02:58,309 --> 00:02:56,080

know and then there's also things that

74

00:03:00,550 --> 00:02:58,319

come with operating systems both for the

75

00:03:03,670 --> 00:03:00,560

pc and for the mac you know that people

76

00:03:06,229 --> 00:03:03,680

can use okay and so it's not like they

77

00:03:09,270 --> 00:03:06,239

have to just to look at the images we

78

00:03:12,630 --> 00:03:09,280

have or look at the videos that nasa

79

00:03:13,589 --> 00:03:12,640

makes or that nasa and its partners make

80

00:03:16,550 --> 00:03:13,599

these are things they can make

81

00:03:19,350 --> 00:03:16,560

themselves and so to me

82

00:03:22,550 --> 00:03:19,360

a few links get them started uh and

83

00:03:25,110 --> 00:03:22,560

probably a few short tutorials you know

84

00:03:26,630 --> 00:03:25,120

even one pagers you know uh would help a

85

00:03:28,630 --> 00:03:26,640

lot and maybe we can even start that

86

00:03:30,789 --> 00:03:28,640

dialogue on your wiki page

87

00:03:33,670 --> 00:03:30,799

so that people can say oh how do i make

88

00:03:35,190 --> 00:03:33,680

a movie or how do i make a mosaic or how

89

00:03:37,110 --> 00:03:35,200

do i make a map

90

00:03:41,190 --> 00:03:37,120

and all those things are within the

91

00:03:45,350 --> 00:03:41,200

capability of anyone that has a laptop

92

00:03:46,869 --> 00:03:45,360

or a home pc or even a game box so you

93

00:03:49,190 --> 00:03:46,879

know those those are the kind of things

94

00:03:50,789 --> 00:03:49,200

people can do right now today

95

00:03:55,429 --> 00:03:50,799

so

96

00:03:57,110 --> 00:03:55,439

far is the uh distance from

97

00:03:58,869 --> 00:03:57,120

3d model to

98

00:04:00,309 --> 00:03:58,879

printing that thing out on a 3d printer

99

00:04:02,149 --> 00:04:00,319

that they've got at their local tech

100

00:04:03,910 --> 00:04:02,159

shop is it actually is the 3d model what

101

00:04:06,309 --> 00:04:03,920

they would need to take it to the

102

00:04:08,070 --> 00:04:06,319

makerbot or is there a next step between

103

00:04:09,910 --> 00:04:08,080

what you've created and actually

104

00:04:10,869 --> 00:04:09,920

creating a physical prototype of that

105

00:04:13,110 --> 00:04:10,879

object

106

00:04:15,110 --> 00:04:13,120

yeah okay

107

00:04:18,550 --> 00:04:15,120

that's a very good question and

108

00:04:21,189 --> 00:04:18,560

in theory okay i think einstein is the

109

00:04:22,870 --> 00:04:21,199

person who's famous for this quote uh in

110

00:04:24,870 --> 00:04:22,880

theory practice and theory are the same

111

00:04:27,270 --> 00:04:24,880

thing in practice they're not

112

00:04:29,670 --> 00:04:27,280

okay and uh so

113

00:04:32,150 --> 00:04:29,680

so in theory yes you could just do that

114

00:04:33,510 --> 00:04:32,160

in practice the big the only problem

115

00:04:34,390 --> 00:04:33,520

about it is

116

00:04:36,790 --> 00:04:34,400

uh

117

00:04:38,710 --> 00:04:36,800

if you have a model of something that's

118

00:04:40,310 --> 00:04:38,720

physically large if you're talking about

119

00:04:43,189 --> 00:04:40,320

a model something that's the size of the

120

00:04:45,590 --> 00:04:43,199

table or the chair no problem okay

121

00:04:47,350 --> 00:04:45,600

talking about a larger thing then

122

00:04:49,749 --> 00:04:47,360

the problem may be

123

00:04:51,670 --> 00:04:49,759

that you need to filter it down before

124

00:04:53,670 --> 00:04:51,680

you make the model and the reason is you

125

00:04:55,749 --> 00:04:53,680

may have too much detail

126
00:04:57,830 --> 00:04:55,759
and some of the the reason why too much

127
00:05:00,629 --> 00:04:57,840
detail is not your friend

128
00:05:03,270 --> 00:05:00,639
is because the ability to make a 3d

129
00:05:06,469 --> 00:05:03,280
physical model is limited by you know

130
00:05:08,870 --> 00:05:06,479
what the 3d model is the smallest volume

131
00:05:11,670 --> 00:05:08,880
element that it can do and if your model

132
00:05:13,670 --> 00:05:11,680
is much higher resolution than that some

133
00:05:15,270 --> 00:05:13,680
of the things will disappear

134
00:05:17,590 --> 00:05:15,280
so that means they won't be connected

135
00:05:21,189 --> 00:05:17,600
anymore so the hinge on the door may be

136
00:05:22,950 --> 00:05:21,199
missing okay and so so all it needs

137
00:05:25,749 --> 00:05:22,960
though is kind of a

138
00:05:27,749 --> 00:05:25,759

a thinning so you just need a thinning

139

00:05:29,830 --> 00:05:27,759

step to make sure that you're at the

140

00:05:32,230 --> 00:05:29,840

resolution that you're going to print at

141

00:05:35,350 --> 00:05:32,240

but you know but other than that yes no

142

00:05:39,430 --> 00:05:37,590

just to follow up to

143

00:05:41,749 --> 00:05:39,440

your

144

00:05:43,270 --> 00:05:41,759

answer

145

00:05:47,749 --> 00:05:43,280

is it

146

00:05:50,150 --> 00:05:47,759

a fair dream to think that we could have

147

00:05:52,870 --> 00:05:50,160

quote unquote shops people in their

148

00:05:54,150 --> 00:05:52,880

bedrooms with their laptops all over the

149

00:05:57,110 --> 00:05:54,160

world

150

00:06:00,469 --> 00:05:57,120

producing videos based on real data and

151
00:06:01,590 --> 00:06:00,479
models and designing it themselves

152
00:06:04,070 --> 00:06:01,600
like

153
00:06:06,469 --> 00:06:04,080
tomorrow if we had the right tutorials

154
00:06:10,550 --> 00:06:06,479
available we have the material for them

155
00:06:14,150 --> 00:06:13,350
absolutely yes the answer is yes and and

156
00:06:16,469 --> 00:06:14,160
uh

157
00:06:18,790 --> 00:06:16,479
the only prohibition doing is doing it

158
00:06:20,309 --> 00:06:18,800
okay but yes and

159
00:06:23,110 --> 00:06:20,319
and i would certainly think that might

160
00:06:26,390 --> 00:06:23,120
be a good thing for this grand challenge

161
00:06:30,309 --> 00:06:27,990
thank you

162
00:06:31,749 --> 00:06:30,319
dave great thanks um just in response to

163
00:06:34,950 --> 00:06:31,759

your question about what can people do

164

00:06:36,870 --> 00:06:34,960

now um i didn't mention this in the talk

165

00:06:37,909 --> 00:06:36,880

but um eyes on the solar system is part

166

00:06:41,110 --> 00:06:37,919

of a suite

167

00:06:43,749 --> 00:06:41,120

which um is a trio of of eyes on the

168

00:06:46,550 --> 00:06:43,759

earth eyes on the solar system and also

169

00:06:49,189 --> 00:06:46,560

eyes on the exoplanets and so it's it's

170

00:06:51,110 --> 00:06:49,199

really cool i encourage everyone um to

171

00:06:53,350 --> 00:06:51,120

go and just you know google either one

172

00:06:54,950 --> 00:06:53,360

of those um they'll all come up as a set

173

00:06:57,589 --> 00:06:54,960

and you can choose which one you'd like

174

00:07:00,390 --> 00:06:57,599

to see but um it's a lot of fun

175

00:07:02,309 --> 00:07:00,400

exploring and um i think one thing that

176

00:07:04,469 --> 00:07:02,319

would be nice to add to the wiki is is

177

00:07:06,070 --> 00:07:04,479

what would you do with it you know what

178

00:07:08,230 --> 00:07:06,080

would you like to add to it what would

179

00:07:10,150 --> 00:07:08,240

you like to do that you can't do how do

180

00:07:12,230 --> 00:07:10,160

you feel about the interface is it easy

181

00:07:14,469 --> 00:07:12,240

enough i mean ideally

182

00:07:15,670 --> 00:07:14,479

this is the google earth for the entire

183

00:07:17,909 --> 00:07:15,680

solar system

184

00:07:21,110 --> 00:07:17,919

it you know uh for for all of the

185

00:07:23,749 --> 00:07:21,120

exoplanets and and to be able to

186

00:07:25,909 --> 00:07:23,759

to have the ease of participation i

187

00:07:27,270 --> 00:07:25,919

think is a really interesting thing and

188

00:07:29,510 --> 00:07:27,280

it's so flexible that we can do all

189

00:07:31,110 --> 00:07:29,520

kinds of stuff just standing outside

190

00:07:32,870 --> 00:07:31,120

you know i get a lot of great ideas of

191

00:07:34,309 --> 00:07:32,880

what would be really cool to do and i

192

00:07:36,230 --> 00:07:34,319

think that

193

00:07:39,110 --> 00:07:36,240

all of those things are going to be

194

00:07:40,950 --> 00:07:39,120

a really great thing to discuss

195

00:07:42,629 --> 00:07:40,960

especially you know over the wiki and to

196

00:07:44,550 --> 00:07:42,639

think about

197

00:07:48,469 --> 00:07:44,560

because i think it's a tool that's

198

00:07:50,070 --> 00:07:48,479

waiting for um for something um

199

00:07:51,909 --> 00:07:50,080

it's already interesting it's already

200

00:07:55,189 --> 00:07:51,919

great but there's a lot of capabilities

201
00:08:00,469 --> 00:07:57,510
we have question uh

202
00:08:04,390 --> 00:08:02,869
um i was just gonna say um i know that a

203
00:08:06,390 --> 00:08:04,400
lot of the tools you use are kind of off

204
00:08:08,629 --> 00:08:06,400
the shelf and many of them may even have

205
00:08:10,869 --> 00:08:08,639
demo versions certainly did at one time

206
00:08:12,469 --> 00:08:10,879
uh getting links to those and stuff and

207
00:08:13,430 --> 00:08:12,479
maybe some easy

208
00:08:15,110 --> 00:08:13,440
uh

209
00:08:16,710 --> 00:08:15,120
you know ingest capability for your

210
00:08:18,790 --> 00:08:16,720
models might get people you know maybe

211
00:08:20,150 --> 00:08:18,800
this is the place is the wiki that

212
00:08:21,510 --> 00:08:20,160
people could immediately upload those

213
00:08:26,230 --> 00:08:21,520

models and play with them almost in the

214

00:08:26,240 --> 00:08:35,110

a question

215

00:08:40,310 --> 00:08:37,589

going forward would we be able to use

216

00:08:41,829 --> 00:08:40,320

the emerging micro satellite technology

217

00:08:44,149 --> 00:08:41,839

to try and

218

00:08:44,870 --> 00:08:44,159

physically tag some of the known objects

219

00:08:47,269 --> 00:08:44,880

so

220

00:08:49,110 --> 00:08:47,279

we could receive a more real-time

221

00:08:50,949 --> 00:08:49,120

telemetry from them without having to

222

00:08:53,190 --> 00:08:50,959

directly

223

00:08:55,509 --> 00:08:53,200

image those and plot them

224

00:08:57,190 --> 00:08:55,519

and would it be useful to use that to

225

00:08:59,030 --> 00:08:57,200

try and detect the

226

00:09:01,829 --> 00:08:59,040

gravitational tugs of the unknown

227

00:09:03,030 --> 00:09:01,839

objects to give us an idea of where

228

00:09:05,590 --> 00:09:03,040

where to look

229

00:09:06,389 --> 00:09:05,600

and to be able to use those interactions

230

00:09:09,829 --> 00:09:06,399

to

231

00:09:11,750 --> 00:09:09,839

augment the mathematical models and the

232

00:09:14,310 --> 00:09:11,760

like and and some did all the

233

00:09:16,949 --> 00:09:14,320

visualization techniques with a more

234

00:09:18,870 --> 00:09:16,959

real-time data

235

00:09:21,350 --> 00:09:18,880

i will throw that out to the crowd

236

00:09:24,070 --> 00:09:21,360

that's smarter than me all i can say is

237

00:09:26,710 --> 00:09:24,080

that i've had conversations with folks

238

00:09:27,509 --> 00:09:26,720

that have looked at

239

00:10:36,550 --> 00:09:27,519

a

240

00:10:41,910 --> 00:10:36,560

you know

241

00:10:43,910 --> 00:10:41,920

elementary schools chipset tracking this

242

00:10:45,430 --> 00:10:43,920

asteroid that got named because somebody

243

00:10:47,430 --> 00:10:45,440

was working like we talked about

244

00:10:48,870 --> 00:10:47,440

yesterday so i mean it all begins to

245

00:10:50,870 --> 00:10:48,880

flow together but i think we you know

246

00:10:52,550 --> 00:10:50,880

that kind of thing right david yes sir

247

00:10:54,310 --> 00:10:52,560

yep sir

248

00:10:57,750 --> 00:10:54,320

anyway so yeah we think that that that's

249

00:11:01,750 --> 00:11:00,389

so i have another question for the group

250

00:11:04,630 --> 00:11:01,760

when you think about what next

251
00:11:05,750 --> 00:11:04,640
generation engagement means it can mean

252
00:11:08,790 --> 00:11:05,760
things like

253
00:11:10,710 --> 00:11:08,800
really futuristic engagement methods so

254
00:11:12,310 --> 00:11:10,720
real gaming or

255
00:11:14,069 --> 00:11:12,320
some of the advanced methods that we

256
00:11:15,990 --> 00:11:14,079
heard from earlier or it can literally

257
00:11:18,630 --> 00:11:16,000
mean the next generation

258
00:11:21,350 --> 00:11:18,640
and thinking about uh education as a key

259
00:11:23,190 --> 00:11:21,360
element of uh the initiative as well so

260
00:11:26,069 --> 00:11:23,200
to pivot a little bit are there any kind

261
00:11:28,949 --> 00:11:26,079
of thoughts or comments on um the way

262
00:11:30,550 --> 00:11:28,959
engaging the next generation um is an

263
00:11:31,590 --> 00:11:30,560

important component of this effort as

264

00:11:33,350 --> 00:11:31,600

well in addition to some of the

265

00:11:35,750 --> 00:11:33,360

activities that we heard from in the

266

00:11:38,470 --> 00:11:35,760

first presentation for student

267

00:11:40,550 --> 00:11:38,480

challenges and um also engaging students

268

00:11:50,949 --> 00:11:40,560

in content creation those types of uh

269

00:11:54,470 --> 00:11:52,870

if i can go backwards and speak to the

270

00:11:57,670 --> 00:11:54,480

previous question

271

00:11:59,430 --> 00:11:57,680

as far as finding near-earth objects

272

00:12:01,509 --> 00:11:59,440

they're really only two ways to do it

273

00:12:04,310 --> 00:12:01,519

one is is visually

274

00:12:06,550 --> 00:12:04,320

infrared or visible seeing them and the

275

00:12:09,269 --> 00:12:06,560

other is if they hit the earth

276

00:12:11,110 --> 00:12:09,279

and so there's no mute they are too

277

00:12:12,550 --> 00:12:11,120

small to have mutual gravitational

278

00:12:22,230 --> 00:12:12,560

interactions that would allow you to

279

00:12:25,590 --> 00:12:23,350

well i was just going to make a

280

00:12:27,509 --> 00:12:25,600

statement that uh i think it was kevin

281

00:12:29,110 --> 00:12:27,519

that said earlier is that

282

00:12:32,150 --> 00:12:29,120

there are these programs that already

283

00:12:35,350 --> 00:12:32,160

exist that are like first uh that are

284

00:12:38,150 --> 00:12:35,360

huge and uh lunar bots and

285

00:12:39,670 --> 00:12:38,160

i think one place to start is with that

286

00:12:42,550 --> 00:12:39,680

group of people and trying to get the

287

00:12:44,949 --> 00:12:42,560

asteroid uh

288

00:12:45,829 --> 00:12:44,959

awareness up but there may be others out

289

00:12:50,230 --> 00:12:45,839

there

290

00:12:53,910 --> 00:12:50,240

things like that that we want to look at

291

00:12:55,829 --> 00:12:53,920

there's the conrad uh awards every year

292

00:12:58,150 --> 00:12:55,839

and i know that that nancy might be

293

00:13:00,550 --> 00:12:58,160

really interested in in partnering with

294

00:13:02,710 --> 00:13:00,560

us on something like this so we we

295

00:13:05,030 --> 00:13:02,720

should look at these established

296

00:13:06,710 --> 00:13:05,040

areas that are already tapping into the

297

00:13:08,629 --> 00:13:06,720

next generation

298

00:13:10,069 --> 00:13:08,639

and look at having like an asteroid

299

00:13:14,629 --> 00:13:10,079

overlay on it

300

00:13:17,829 --> 00:13:16,470

yeah it sure seems like the place to

301

00:13:19,430 --> 00:13:17,839

start with uh

302

00:13:21,030 --> 00:13:19,440

with outreach is with the programs that

303

00:13:22,550 --> 00:13:21,040

already have substantial outreach and

304

00:13:24,710 --> 00:13:22,560

just allowing them to fulfill their

305

00:13:26,069 --> 00:13:24,720

potential but you know i'm struck by the

306

00:13:27,430 --> 00:13:26,079

fact that there are these um you know

307

00:13:30,310 --> 00:13:27,440

we've got mathematical models of

308

00:13:32,949 --> 00:13:30,320

spacecrafts and uh you know um uh

309

00:13:35,110 --> 00:13:32,959

celestial bodies and um i know that

310

00:13:36,870 --> 00:13:35,120

there are these uh you know kind of

311

00:13:38,389 --> 00:13:36,880

graphical programming environments or

312

00:13:39,829 --> 00:13:38,399

creating animation environments that

313

00:13:41,430 --> 00:13:39,839

even preschoolers are not not

314

00:13:43,189 --> 00:13:41,440

preschoolers but you know elementary

315

00:13:45,829 --> 00:13:43,199

schoolers are using these days i think

316

00:13:48,550 --> 00:13:45,839

to incorporate nasa data sets into those

317

00:13:50,550 --> 00:13:48,560

or even have nasa branded you know

318

00:13:52,470 --> 00:13:50,560

build your spacecraft to explore an

319

00:13:55,350 --> 00:13:52,480

asteroid whatever seems like a good way

320

00:13:56,790 --> 00:13:55,360

to start and i think the

321

00:13:58,470 --> 00:13:56,800

opportunity for somebody out there

322

00:14:00,790 --> 00:13:58,480

whether it's an app builder or somebody

323

00:14:03,189 --> 00:14:00,800

else in the space to allow it you know

324

00:14:06,550 --> 00:14:03,199

to allow the data from jpl for instance

325

00:14:08,389 --> 00:14:06,560

to turn into a a makerbot model i mean

326

00:14:09,910 --> 00:14:08,399

if if there isn't an off-the-shelf tool

327

00:14:11,350 --> 00:14:09,920

that does that already certainly there's

328

00:14:13,189 --> 00:14:11,360

somebody listening to this who could

329

00:14:14,949 --> 00:14:13,199

probably pretty easily construct one

330

00:14:17,030 --> 00:14:14,959

yeah and just make make the stuff

331

00:14:19,030 --> 00:14:17,040

available yeah

332

00:14:20,790 --> 00:14:19,040

i i agree with that i think um one thing

333

00:14:23,189 --> 00:14:20,800

that that

334

00:14:25,750 --> 00:14:23,199

i mean to allow the to the next

335

00:14:29,509 --> 00:14:25,760

generation especially whoever it is but

336

00:14:31,189 --> 00:14:29,519

to to have them act as participants in

337

00:14:32,870 --> 00:14:31,199

working with the information rather than

338

00:14:35,110 --> 00:14:32,880

just you know listening or rather than

339

00:14:36,150 --> 00:14:35,120

it just be one way um

340

00:14:38,069 --> 00:14:36,160

you know

341

00:14:39,110 --> 00:14:38,079

that's what games do so well i mean i

342

00:14:41,750 --> 00:14:39,120

see

343

00:14:43,509 --> 00:14:41,760

my next generation and eight-year-old uh

344

00:14:45,430 --> 00:14:43,519

just obsessed with minecraft and we were

345

00:14:48,470 --> 00:14:45,440

talking about that earlier and just the

346

00:14:50,710 --> 00:14:48,480

ability to just and they learned so much

347

00:14:51,590 --> 00:14:50,720

from it too

348

00:14:55,110 --> 00:14:51,600

in

349

00:14:57,829 --> 00:14:55,120

through that but it doesn't necessarily

350

00:14:59,269 --> 00:14:57,839

have to be that format but just allowing

351
00:15:02,389 --> 00:14:59,279
um

352
00:15:05,350 --> 00:15:02,399
them to be participants to have control

353
00:15:07,509 --> 00:15:05,360
and to allow for creativity and to allow

354
00:15:09,030 --> 00:15:07,519
for problem solving to exist

355
00:15:10,310 --> 00:15:09,040
within the construct of whatever is

356
00:15:12,710 --> 00:15:10,320
presented

357
00:15:14,389 --> 00:15:12,720
is a really great way to engage them and

358
00:15:16,470 --> 00:15:14,399
have them feel like they have ownership

359
00:15:18,870 --> 00:15:16,480
in the information and that is a really

360
00:15:21,750 --> 00:15:18,880
i think a strong thing and a great way

361
00:15:23,750 --> 00:15:21,760
to get people involved because um

362
00:15:26,150 --> 00:15:23,760
they feel like it's theirs and then once

363
00:15:27,590 --> 00:15:26,160

once they're in you know then they can

364

00:15:31,590 --> 00:15:27,600

they can build up like we were talking

365

00:15:35,749 --> 00:15:33,269

just another quick comment of course i

366

00:15:37,910 --> 00:15:35,759

spoke about um six weeks ago or so now

367

00:15:39,990 --> 00:15:37,920

and um in my talk i basically said i

368

00:15:41,829 --> 00:15:40,000

can't think of a better stem oriented

369

00:15:44,949 --> 00:15:41,839

project than teaching high school

370

00:15:46,870 --> 00:15:44,959

students to observe analyze and submit

371

00:15:49,189 --> 00:15:46,880

data on asteroid light curves or other

372

00:15:51,269 --> 00:15:49,199

asteroid observing opportunities it sure

373

00:15:53,670 --> 00:15:51,279

seems like it's kind of a

374

00:15:56,310 --> 00:15:53,680

it sounds so far out but the idea that

375

00:15:58,550 --> 00:15:56,320

there would be a a high school class

376

00:16:00,550 --> 00:15:58,560

that would teach you know

377

00:16:01,509 --> 00:16:00,560

science math students how to do this

378

00:16:03,269 --> 00:16:01,519

work

379

00:16:04,629 --> 00:16:03,279

i think it's a fantastic platform for

380

00:16:09,829 --> 00:16:04,639

teaching them all the fundamentals of

381

00:16:13,749 --> 00:16:12,230

you know i've been amazed by what jpl's

382

00:16:15,189 --> 00:16:13,759

doing and especially about this

383

00:16:17,350 --> 00:16:15,199

visualization

384

00:16:19,350 --> 00:16:17,360

one of the things um i've been going to

385

00:16:20,230 --> 00:16:19,360

the maker faire every year in san mateo

386

00:16:22,310 --> 00:16:20,240

and

387

00:16:24,790 --> 00:16:22,320

it seems to me that that community is

388

00:16:26,470 --> 00:16:24,800

really interested in 3d printing

389

00:16:28,790 --> 00:16:26,480

and if you could download those

390

00:16:30,470 --> 00:16:28,800

visualizations i'm not sure

391

00:16:31,910 --> 00:16:30,480

if it's you know it would be a big draw

392

00:16:34,310 --> 00:16:31,920

but if people

393

00:16:35,990 --> 00:16:34,320

see an asteroid or see that one's coming

394

00:16:36,949 --> 00:16:36,000

and they could download it and get a 3d

395

00:16:38,870 --> 00:16:36,959

model

396

00:16:40,629 --> 00:16:38,880

and might could use it as in the

397

00:16:41,910 --> 00:16:40,639

classroom or something like that it

398

00:16:44,150 --> 00:16:41,920

might be another

399

00:16:46,629 --> 00:16:44,160

another aspect of trying to get people

400

00:16:49,829 --> 00:16:46,639

involved in that community

401
00:16:51,749 --> 00:16:49,839
not to toot our own horn but

402
00:16:53,990 --> 00:16:51,759
grand challenge did have a presence at

403
00:16:57,509 --> 00:16:54,000
at the new york city maker faire

404
00:16:59,350 --> 00:16:57,519
and ames in fact matt reyes and and some

405
00:17:02,870 --> 00:16:59,360
of his cohorts

406
00:17:05,110 --> 00:17:02,880
did an incredible job of of printing out

407
00:17:07,669 --> 00:17:05,120
a handful of missions as well as

408
00:17:10,069 --> 00:17:07,679
asteroids that are available online to

409
00:17:12,150 --> 00:17:10,079
get the data like eric's talking about

410
00:17:13,029 --> 00:17:12,160
and then we had qr codes where people

411
00:17:16,710 --> 00:17:13,039
could

412
00:17:18,789 --> 00:17:16,720
absolutely right that community there's

413
00:17:21,669 --> 00:17:18,799

such a vibrancy in

414

00:17:23,990 --> 00:17:21,679

and a real interest in getting tangible

415

00:17:26,069 --> 00:17:24,000

and hands-on with the work so

416

00:17:28,309 --> 00:17:26,079

we continue to look

417

00:17:30,630 --> 00:17:28,319

at ways of engaging there and expect

418

00:17:32,950 --> 00:17:30,640

that we will be in san mateo

419

00:17:36,150 --> 00:17:32,960

uh with a presence

420

00:17:38,710 --> 00:17:36,160

so great thanks

421

00:17:40,789 --> 00:17:38,720

please i know uh my experiences with my

422

00:17:42,789 --> 00:17:40,799

own family and friends

423

00:17:44,549 --> 00:17:42,799

there's a lot of people out there that

424

00:17:47,270 --> 00:17:44,559

have the mindset that it's either too

425

00:17:49,190 --> 00:17:47,280

far out time wise or just generally you

426

00:17:51,270 --> 00:17:49,200

know what does it do for me now

427

00:17:52,789 --> 00:17:51,280

whereas it seems that the people who get

428

00:17:54,870 --> 00:17:52,799

into these kinds of things are people

429

00:17:56,870 --> 00:17:54,880

who are already interested

430

00:17:59,669 --> 00:17:56,880

and i think the best way to get more

431

00:18:01,270 --> 00:17:59,679

people involved is to find something

432

00:18:04,390 --> 00:18:01,280

that is

433

00:18:05,990 --> 00:18:04,400

closer time wise that they can see

434

00:18:08,390 --> 00:18:06,000

will affect them

435

00:18:10,630 --> 00:18:08,400

to give them a reason to start looking

436

00:18:13,029 --> 00:18:10,640

into this and getting involved because a

437

00:18:15,270 --> 00:18:13,039

lot of my family members are in

438

00:18:16,789 --> 00:18:15,280

intelligent minds but they just are not

439

00:18:18,630 --> 00:18:16,799

interested in anything that doesn't

440

00:18:20,470 --> 00:18:18,640

directly affect them so they don't even

441

00:18:22,630 --> 00:18:20,480

want to get involved

442

00:18:24,390 --> 00:18:22,640

yeah and that that raises a question i'd

443

00:18:27,350 --> 00:18:24,400

like to throw out to

444

00:18:30,870 --> 00:18:27,360

um the audience as a whole

445

00:18:33,669 --> 00:18:30,880

and it's one of barriers because it's

446

00:18:36,950 --> 00:18:33,679

it's easy for us to sit around and talk

447

00:18:39,350 --> 00:18:36,960

about this from our perspective um and

448

00:18:41,990 --> 00:18:39,360

i'm wondering from your own experience

449

00:18:43,909 --> 00:18:42,000

of of uh whether it's a project that

450

00:18:45,190 --> 00:18:43,919

you're working on or as a citizen and

451
00:18:47,190 --> 00:18:45,200
seeing something

452
00:18:49,990 --> 00:18:47,200
do you have a sense of barriers that we

453
00:18:52,950 --> 00:18:50,000
might be facing here because

454
00:18:54,870 --> 00:18:52,960
for us it's really important uh and we

455
00:18:57,750 --> 00:18:54,880
understand and as you say we're

456
00:18:59,990 --> 00:18:57,760
connected to it but but

457
00:19:00,870 --> 00:19:00,000
the the issue of barriers is one that i

458
00:19:03,190 --> 00:19:00,880
think

459
00:19:05,190 --> 00:19:03,200
is worth looking at and so

460
00:19:08,070 --> 00:19:05,200
is there a collective experience in the

461
00:19:10,789 --> 00:19:08,080
room that we can draw upon and say yeah

462
00:19:13,590 --> 00:19:10,799
this is maybe a way that we need to go

463
00:19:16,070 --> 00:19:13,600

whether it's near a term connection

464

00:19:19,350 --> 00:19:16,080

uh or something else i i'd love to hear

465

00:19:22,950 --> 00:19:20,070

yeah

466

00:19:25,590 --> 00:19:22,960

my thought is that you know uh we have a

467

00:19:26,950 --> 00:19:25,600

lot to compete with okay there's a lot

468

00:19:28,789 --> 00:19:26,960

of other things that draw people's

469

00:19:31,430 --> 00:19:28,799

attention okay

470

00:19:35,669 --> 00:19:31,440

on a day-to-day basis okay

471

00:19:36,950 --> 00:19:35,679

but we also have some advantages and

472

00:19:39,830 --> 00:19:36,960

i look for

473

00:19:42,390 --> 00:19:39,840

educatable moments or engageable moments

474

00:19:44,789 --> 00:19:42,400

okay and places

475

00:19:47,110 --> 00:19:44,799

for example you know while people might

476

00:19:49,270 --> 00:19:47,120

not be interested in asteroids you know

477

00:19:51,190 --> 00:19:49,280

when they're attending a rock concert or

478

00:19:53,830 --> 00:19:51,200

something like that okay when they're at

479

00:19:55,510 --> 00:19:53,840

a museum you know it's a natural place

480

00:19:57,510 --> 00:19:55,520

at this natural time

481

00:20:00,230 --> 00:19:57,520

if they're at an observatory you know so

482

00:20:02,870 --> 00:20:00,240

there are lots of places that people

483

00:20:04,390 --> 00:20:02,880

visit and when they're there you know if

484

00:20:06,310 --> 00:20:04,400

we can reach them and you're saying like

485

00:20:07,510 --> 00:20:06,320

the maker faire as an example you know

486

00:20:10,870 --> 00:20:07,520

and there are other examples of that

487

00:20:13,029 --> 00:20:10,880

where you know these are environments

488

00:20:15,830 --> 00:20:13,039

where we can reach out to people because

489

00:20:17,830 --> 00:20:15,840

that's what you know they're kind of

490

00:20:18,870 --> 00:20:17,840

uh that's what they're doing at that

491

00:20:20,230 --> 00:20:18,880

time

492

00:20:21,990 --> 00:20:20,240

and then there are other moments like

493

00:20:25,110 --> 00:20:22,000

you know uh

494

00:20:27,669 --> 00:20:25,120

if comet ison flies by you know

495

00:20:30,549 --> 00:20:27,679

that's uh and it is going to fly by and

496

00:20:32,549 --> 00:20:30,559

how interesting it will be okay as it

497

00:20:34,710 --> 00:20:32,559

flies by both as it approaches the sun

498

00:20:36,870 --> 00:20:34,720

and it approaches the earth okay

499

00:20:38,070 --> 00:20:36,880

there'll be people uh increased

500

00:20:41,110 --> 00:20:38,080

awareness

501
00:20:44,310 --> 00:20:41,120
of these cosmic objects out there and

502
00:20:46,789 --> 00:20:44,320
that's a time when again we can you know

503
00:20:49,590 --> 00:20:46,799
take that and leverage that

504
00:20:51,270 --> 00:20:49,600
and the same thing with like flybys of

505
00:20:53,430 --> 00:20:51,280
spacecraft as they fly by the earth you

506
00:20:55,430 --> 00:20:53,440
know and make the analogy of you know

507
00:20:57,510 --> 00:20:55,440
that these are similar uh other objects

508
00:20:59,110 --> 00:20:57,520
so so again i think we need to look for

509
00:21:00,630 --> 00:20:59,120
those kinds of opportunities because

510
00:21:10,710 --> 00:21:00,640
really there is a lot to compete with

511
00:21:16,149 --> 00:21:13,110
i like what eric had said

512
00:21:20,230 --> 00:21:16,159
however those are like vitamin pills

513
00:21:22,630 --> 00:21:20,240

and folks need to do their homework

514

00:21:24,789 --> 00:21:22,640

i even see it within nasa nasa needs to

515

00:21:26,630 --> 00:21:24,799

do its homework complete the dam survey

516

00:21:29,190 --> 00:21:26,640

first

517

00:21:31,270 --> 00:21:29,200

and find low delta v targets to to bring

518

00:21:32,789 --> 00:21:31,280

things back uh but uh there are those

519

00:21:34,710 --> 00:21:32,799

educational moments

520

00:21:36,549 --> 00:21:34,720

uh like vitamin pills planetarium

521

00:21:39,830 --> 00:21:36,559

productions uh interesting things on

522

00:21:40,870 --> 00:21:39,840

discovery or whatever uh but uh

523

00:21:43,190 --> 00:21:40,880

uh

524

00:21:44,710 --> 00:21:43,200

do your damn homework

525

00:21:46,549 --> 00:21:44,720

a question for you

526

00:21:48,870 --> 00:21:46,559

do you remember

527

00:21:51,669 --> 00:21:48,880

what what it was that sparked your

528

00:21:53,350 --> 00:21:51,679

interest to get down this path i mean

529

00:21:56,390 --> 00:21:53,360

because that to me is an incredibly

530

00:21:57,750 --> 00:21:56,400

teachable moment like what it is that

531

00:22:00,549 --> 00:21:57,760

you found

532

00:22:01,669 --> 00:22:00,559

your passion in doing this work uh sure

533

00:22:03,590 --> 00:22:01,679

uh

534

00:22:04,950 --> 00:22:03,600

my dad was a a

535

00:22:06,710 --> 00:22:04,960

mature student at michigan state

536

00:22:10,149 --> 00:22:06,720

university he took me to abraham's

537

00:22:11,990 --> 00:22:10,159

planetarium and i was curious i was five

538

00:22:15,669 --> 00:22:12,000

five years old it was footsteps on the

539

00:22:17,909 --> 00:22:15,679

moon and uh to a child's eyes uh you're

540

00:22:20,630 --> 00:22:17,919

overwhelmed with visual density in the

541

00:22:23,750 --> 00:22:20,640

planetarium even if it was an old spitz

542

00:22:25,350 --> 00:22:23,760

stp uh projector uh i was convinced

543

00:22:27,190 --> 00:22:25,360

we're flying through space and unlike

544

00:22:29,590 --> 00:22:27,200

the apollo guys it only took us 20

545

00:22:30,870 --> 00:22:29,600

minutes to uh get to the moon and and

546

00:22:34,950 --> 00:22:30,880

back

547

00:22:37,350 --> 00:22:34,960

time frame is not like it is today with

548

00:22:38,630 --> 00:22:37,360

full dome and whatnot

549

00:22:40,470 --> 00:22:38,640

and that was the initial spark there

550

00:22:42,470 --> 00:22:40,480

were a couple other things along the way

551

00:22:44,070 --> 00:22:42,480

uh

552

00:22:46,070 --> 00:22:44,080

we moved out to missouri we lived by an

553

00:22:47,510 --> 00:22:46,080

airport i don't know how to fly so i

554

00:22:49,990 --> 00:22:47,520

learned to fly i went to the air force

555

00:22:52,630 --> 00:22:50,000

academy and so on and

556

00:22:56,470 --> 00:22:52,640

so they're moments like that but you got

557

00:22:58,549 --> 00:22:56,480

to do your homework uh so uh uh and

558

00:23:01,430 --> 00:22:58,559

the moments are less frequent now uh

559

00:23:03,190 --> 00:23:01,440

however there are adult moments uh when

560

00:23:06,950 --> 00:23:03,200

uh you're looking at an image from

561

00:23:08,390 --> 00:23:06,960

hubble uh that no one else has seen yet

562

00:23:11,430 --> 00:23:08,400

there's something new

563

00:23:13,750 --> 00:23:11,440

or you're seeing uh a new spectral line

564

00:23:16,230 --> 00:23:13,760

in a near-earth asteroid from data that

565

00:23:17,270 --> 00:23:16,240

you're collecting in real time from irtf

566

00:23:19,190 --> 00:23:17,280

uh

567

00:23:21,750 --> 00:23:19,200

those things are kind of cool and how

568

00:23:23,750 --> 00:23:21,760

you sit on it and and whatnot but what

569

00:23:25,669 --> 00:23:23,760

was that initial spark all of us had it

570

00:23:28,470 --> 00:23:25,679

but then

571

00:23:30,070 --> 00:23:28,480

how do you continue to engage i think uh

572

00:23:31,909 --> 00:23:30,080

for the citizen science stuff i kind of

573

00:23:34,310 --> 00:23:31,919

cringe every time i hear that

574

00:23:36,950 --> 00:23:34,320

i believe in a more jeffersonian way an

575

00:23:38,630 --> 00:23:36,960

informed republic or reform democratic

576
00:23:40,390 --> 00:23:38,640
republic uh

577
00:23:42,070 --> 00:23:40,400
and i think that is the greatest benefit

578
00:23:43,669 --> 00:23:42,080
uh uh

579
00:23:45,750 --> 00:23:43,679
through all these uh all these things

580
00:23:48,149 --> 00:23:45,760
and uh the visualizations that dave had

581
00:23:50,710 --> 00:23:48,159
shown uh earlier on but uh that was my

582
00:23:54,710 --> 00:23:50,720
spark was a planetarium production

583
00:23:54,720 --> 00:24:04,549
that spark a thought

584
00:24:09,269 --> 00:24:06,710
as far as engaging people would it be

585
00:24:12,070 --> 00:24:09,279
possible to create something sort of

586
00:24:15,510 --> 00:24:12,080
like an intellectual stock market where

587
00:24:18,710 --> 00:24:15,520
if somebody that does this kind of thing

588
00:24:20,710 --> 00:24:18,720

if what they do will help

589

00:24:21,990 --> 00:24:20,720

further another company's effort to the

590

00:24:23,350 --> 00:24:22,000

point where it would save them a

591

00:24:24,710 --> 00:24:23,360

development cost

592

00:24:26,710 --> 00:24:24,720

that they could

593

00:24:28,310 --> 00:24:26,720

earn a share of stock

594

00:24:29,669 --> 00:24:28,320

something so that the people who say

595

00:24:31,350 --> 00:24:29,679

what does it do for me now would

596

00:24:33,110 --> 00:24:31,360

actually have something that tangible

597

00:24:33,830 --> 00:24:33,120

that they can see that it will do for

598

00:24:38,310 --> 00:24:33,840

them

599

00:24:41,110 --> 00:24:38,320

and want to get educated and want to get

600

00:24:43,110 --> 00:24:41,120

you know keep up with the

601
00:24:44,950 --> 00:24:43,120
keep up with the tutorials and things

602
00:24:47,750 --> 00:24:44,960
because the bet would give them a better

603
00:24:50,390 --> 00:24:47,760
chance of actually earning something

604
00:24:52,230 --> 00:24:50,400
it's a really interesting idea and i i

605
00:24:54,149 --> 00:24:52,240
we're not going to have time now to dig

606
00:24:56,070 --> 00:24:54,159
into that but i'd love to see if we can

607
00:24:58,230 --> 00:24:56,080
get that going on the wiki because part

608
00:25:00,630 --> 00:24:58,240
again of the wiki is to keep this

609
00:25:02,789 --> 00:25:00,640
conversation going and so uh if you

610
00:25:04,950 --> 00:25:02,799
could throw that idea down on the wiki

611
00:25:07,590 --> 00:25:04,960
and let's see if we can get some some

612
00:25:08,549 --> 00:25:07,600
some conversation sparked around that

613
00:25:10,149 --> 00:25:08,559

thanks

614

00:25:12,870 --> 00:25:10,159

uh you know i was trying to think of

615

00:25:13,990 --> 00:25:12,880

what my first uh in inciting moment

616

00:25:16,070 --> 00:25:14,000

might be and you know there's things

617

00:25:17,430 --> 00:25:16,080

like first telescope and stuff and maybe

618

00:25:20,310 --> 00:25:17,440

getting up on saturday mornings in the

619

00:25:22,950 --> 00:25:20,320

early 60s and watching fireball xl5 on

620

00:25:25,269 --> 00:25:22,960

you know tv but the truth is during that

621

00:25:26,870 --> 00:25:25,279

time it was easier you know the space

622

00:25:28,630 --> 00:25:26,880

mission was really starting out there

623

00:25:30,870 --> 00:25:28,640

was a lot of drama and excitement in our

624

00:25:33,669 --> 00:25:30,880

society as a whole about nass and what

625

00:25:36,149 --> 00:25:33,679

was going on and what interested me in

626

00:25:38,230 --> 00:25:36,159

the asteroid initiative is

627

00:25:39,750 --> 00:25:38,240

maybe this is a chance to try to recover

628

00:25:42,070 --> 00:25:39,760

some of that same

629

00:25:44,310 --> 00:25:42,080

level of drama in our society with

630

00:25:46,549 --> 00:25:44,320

something that you know between manned

631

00:25:48,710 --> 00:25:46,559

missions and the the risk and the the

632

00:25:51,990 --> 00:25:48,720

the mining and all that other stuff but

633

00:25:57,269 --> 00:25:52,000

somebody needs to craft this into a big

634

00:26:01,430 --> 00:25:59,029

yeah i just wanted to follow up on on

635

00:26:04,070 --> 00:26:01,440

actually what all of you are saying um i

636

00:26:06,470 --> 00:26:04,080

i love the idea of of you know creating

637

00:26:08,870 --> 00:26:06,480

incentives along the way um especially

638

00:26:10,230 --> 00:26:08,880

so that we're talking about barriers and

639

00:26:12,070 --> 00:26:10,240

things

640

00:26:15,110 --> 00:26:12,080

there's a lot of young people out there

641

00:26:18,470 --> 00:26:15,120

that don't have the role models or

642

00:26:20,470 --> 00:26:18,480

the you know perceived incentives to

643

00:26:22,710 --> 00:26:20,480

keep on going and knowing that they want

644

00:26:24,789 --> 00:26:22,720

to reach you know this goal

645

00:26:28,149 --> 00:26:24,799

and so i think that's really great you

646

00:26:31,269 --> 00:26:28,159

know and and if we could um help to

647

00:26:33,830 --> 00:26:31,279

uh create those those experiences along

648

00:26:35,510 --> 00:26:33,840

the way um that will help them to to get

649

00:26:37,430 --> 00:26:35,520

them to want to do their homework you

650

00:26:39,990 --> 00:26:37,440

know then because i agree you know that

651
00:26:41,590 --> 00:26:40,000
that it's necessary and it's extremely

652
00:26:44,310 --> 00:26:41,600
important but i think one of the

653
00:26:46,630 --> 00:26:44,320
barriers is simply just access and one

654
00:26:47,909 --> 00:26:46,640
of the challenges is to i mean to reach

655
00:26:49,510 --> 00:26:47,919
high to do

656
00:26:51,430 --> 00:26:49,520
all of the things that we want to do on

657
00:26:53,190 --> 00:26:51,440
on the cutting edge of

658
00:26:54,710 --> 00:26:53,200
creating new

659
00:26:56,549 --> 00:26:54,720
interactions with technologies and

660
00:26:58,070 --> 00:26:56,559
things but still

661
00:27:00,230 --> 00:26:58,080
be aware that

662
00:27:02,470 --> 00:27:00,240
access to those things sometimes may be

663
00:27:04,470 --> 00:27:02,480

difficult and

664

00:27:07,029 --> 00:27:04,480

you know trying to

665

00:27:13,510 --> 00:27:07,039

create it in a way so that it may not be

666

00:27:19,510 --> 00:27:16,310

so a question online

667

00:27:21,190 --> 00:27:19,520

what's the best way for citizens

668

00:27:23,669 --> 00:27:21,200

people who aren't necessarily tied into

669

00:27:26,710 --> 00:27:23,679

the to the more formal nasa community to

670

00:27:28,950 --> 00:27:26,720

uh to to to stay engaged and find

671

00:27:31,350 --> 00:27:28,960

opportunities to participate there's a

672

00:27:34,310 --> 00:27:31,360

high school class in northbridge

673

00:27:36,310 --> 00:27:34,320

uh massachusetts and and the person's

674

00:27:38,070 --> 00:27:36,320

interested in how they might stay

675

00:27:40,310 --> 00:27:38,080

plugged in and find better ways to

676
00:27:42,630 --> 00:27:40,320
engage in the whole asteroid initiative

677
00:27:47,350 --> 00:27:45,029
for the overall initiative

678
00:27:49,909 --> 00:27:47,360
we're going to have a plenary session

679
00:27:51,909 --> 00:27:49,919
following this session

680
00:27:54,710 --> 00:27:51,919
thank you

681
00:27:55,430 --> 00:27:54,720
and that will deliver some findings that

682
00:27:57,909 --> 00:27:55,440
will

683
00:27:59,110 --> 00:27:57,919
enable us to have the going forward

684
00:28:01,510 --> 00:27:59,120
actions

685
00:28:03,669 --> 00:28:01,520
i can speak specifically specifically to

686
00:28:06,389 --> 00:28:03,679
the grand challenge where we have this

687
00:28:08,230 --> 00:28:06,399
wiki that we've created and it's not an

688
00:28:11,110 --> 00:28:08,240

uh nasa

689

00:28:13,909 --> 00:28:11,120

owned wiki i don't want to say that it's

690

00:28:16,230 --> 00:28:13,919

ours it's the communities and so we've

691

00:28:19,110 --> 00:28:16,240

thrown it up there we have the means to

692

00:28:20,950 --> 00:28:19,120

have it available but the purpose is to

693

00:28:23,269 --> 00:28:20,960

get comments and feedback and so that's

694

00:28:25,350 --> 00:28:23,279

the most immediate way

695

00:28:27,269 --> 00:28:25,360

we anticipate

696

00:28:29,110 --> 00:28:27,279

some virtual meetups that we're going to

697

00:28:30,549 --> 00:28:29,120

start at the beginning of next year

698

00:28:31,669 --> 00:28:30,559

where people can come together and

699

00:28:34,389 --> 00:28:31,679

hopefully

700

00:28:36,149 --> 00:28:34,399

spark in-person conversations where

701
00:28:38,310 --> 00:28:36,159
there'll be satellite groups that will

702
00:28:40,630 --> 00:28:38,320
be gathering around the topic of

703
00:28:43,110 --> 00:28:40,640
asteroids and the grand challenge we

704
00:28:45,350 --> 00:28:43,120
also anticipate getting a seminar series

705
00:28:47,110 --> 00:28:45,360
started where we can start building some

706
00:28:50,230 --> 00:28:47,120
education around the basics of what

707
00:28:55,590 --> 00:28:53,830
we'll have a presence at the maker faire

708
00:28:58,149 --> 00:28:55,600
in san mateo

709
00:29:00,870 --> 00:28:58,159
and really we need to hear ideas back

710
00:29:03,190 --> 00:29:00,880
from the community because again

711
00:29:03,990 --> 00:29:03,200
this isn't a one-way transmission this

712
00:29:09,430 --> 00:29:04,000
is

713
00:29:11,350 --> 00:29:09,440

intended to spark action

714

00:29:13,510 --> 00:29:11,360

and it's not something that we can do

715

00:29:15,669 --> 00:29:13,520

alone and so

716

00:29:17,990 --> 00:29:15,679

i would put the question back to this

717

00:29:20,230 --> 00:29:18,000

high school class and say

718

00:29:22,549 --> 00:29:20,240

what would you like to do and how do you

719

00:29:24,630 --> 00:29:22,559

think that you can contribute and

720

00:29:26,549 --> 00:29:24,640

probably the best way to to provide that

721

00:29:28,870 --> 00:29:26,559

feedback is through the wiki and then we

722

00:29:31,669 --> 00:29:28,880

can get a conversation going

723

00:29:33,990 --> 00:29:32,870

exactly

724

00:29:36,310 --> 00:29:34,000

thank you jen

725

00:29:37,909 --> 00:29:36,320

we'll have a website

726

00:29:40,549 --> 00:29:37,919

getting produced that will hopefully

727

00:29:42,549 --> 00:29:40,559

also be a community driven activity

728

00:29:43,909 --> 00:29:42,559

where it's not

729

00:29:45,990 --> 00:29:43,919

nasa owned

730

00:29:48,470 --> 00:29:46,000

and so this is this is the beginning of

731

00:29:50,149 --> 00:29:48,480

an ongoing dialogue and

732

00:29:52,149 --> 00:29:50,159

so i'll look

733

00:29:55,990 --> 00:29:52,159

for that high school's response on the

734

00:29:57,269 --> 00:29:56,000

wiki sometime within the next week

735

00:30:00,149 --> 00:29:57,279

i think we had another question yeah

736

00:30:03,269 --> 00:30:00,950

you know

737

00:30:06,230 --> 00:30:03,279

flashing back to a

738

00:30:09,590 --> 00:30:06,240

retro future 1950s

739

00:30:11,990 --> 00:30:09,600

early 60s moment where

740

00:30:13,990 --> 00:30:12,000

as a little kid and i'm talking maybe

741

00:30:15,269 --> 00:30:14,000

between four and 12 years old all right

742

00:30:17,110 --> 00:30:15,279

before

743

00:30:19,029 --> 00:30:17,120

the uh you know culture has crushed the

744

00:30:20,950 --> 00:30:19,039

imagination out of you and you know put

745

00:30:23,110 --> 00:30:20,960

you into the system too far there's a

746

00:30:24,870 --> 00:30:23,120

turning point in there of of doing

747

00:30:26,230 --> 00:30:24,880

something that's that's the kid running

748

00:30:28,310 --> 00:30:26,240

around in the batman cave going i'm

749

00:30:30,149 --> 00:30:28,320

gonna i'm gonna protect you mommy

750

00:30:31,830 --> 00:30:30,159

and and there's a moment in there where

751
00:30:34,470 --> 00:30:31,840
you could get kids into something like

752
00:30:35,909 --> 00:30:34,480
you know i'm a planetary defender

753
00:30:39,029 --> 00:30:35,919
you know i i am a member of the

754
00:30:40,789 --> 00:30:39,039
planetary defenders and it becomes

755
00:30:43,110 --> 00:30:40,799
like the cub scouts

756
00:30:44,789 --> 00:30:43,120
it's not a club it is

757
00:30:47,190 --> 00:30:44,799
it is you are defending the planet and

758
00:30:50,149 --> 00:30:47,200
then you move from there into planetary

759
00:30:51,669 --> 00:30:50,159
uh you know you become an explorer and

760
00:30:53,350 --> 00:30:51,679
that moves you up into the high school

761
00:30:55,430 --> 00:30:53,360
realm and things like that but get them

762
00:30:56,630 --> 00:30:55,440
very very young when the imagination is

763
00:30:58,470 --> 00:30:56,640

still there

764

00:31:00,470 --> 00:30:58,480

that and and you know they're going to

765

00:31:01,990 --> 00:31:00,480

get a tweet that pops up that says

766

00:31:03,190 --> 00:31:02,000

asteroids so-and-so is coming by and

767

00:31:04,870 --> 00:31:03,200

they're like mommy and they run out in

768

00:31:06,389 --> 00:31:04,880

the yard they're like look there it is

769

00:31:08,789 --> 00:31:06,399

and you know i'm going to be here in my

770

00:31:10,870 --> 00:31:08,799

life to defend the planet because there

771

00:31:12,230 --> 00:31:10,880

is something more

772

00:31:15,669 --> 00:31:12,240

immediate

773

00:31:18,310 --> 00:31:15,679

to this idea of i can do something great

774

00:31:20,230 --> 00:31:18,320

and and i can protect the planet kind of

775

00:31:21,750 --> 00:31:20,240

thing as opposed to i'm just a member of

776

00:31:23,909 --> 00:31:21,760

a club and i'm hanging out

777

00:31:26,070 --> 00:31:23,919

you know and and and little kids that's

778

00:31:27,029 --> 00:31:26,080

that's the turning point you know so i

779

00:31:27,830 --> 00:31:27,039

just want to encourage something like

780

00:31:30,389 --> 00:31:27,840

that

781

00:31:33,350 --> 00:31:30,399

uh we are approaching the end of our

782

00:31:35,269 --> 00:31:33,360

time and that touches on a topic that i

783

00:31:37,029 --> 00:31:35,279

was hoping to dig into but we we just

784

00:31:39,750 --> 00:31:37,039

didn't have the time to do so and that

785

00:31:41,830 --> 00:31:39,760

was the idea of badging

786

00:31:43,509 --> 00:31:41,840

it is an

787

00:31:44,710 --> 00:31:43,519

area that we want to

788

00:31:46,789 --> 00:31:44,720

explore

789

00:31:48,549 --> 00:31:46,799

more

790

00:31:51,269 --> 00:31:48,559

and

791

00:31:53,350 --> 00:31:51,279

so i'd like to throw that out to

792

00:31:55,350 --> 00:31:53,360

to the community for the wiki as well is

793

00:31:56,950 --> 00:31:55,360

let's let's start talking more about

794

00:31:58,549 --> 00:31:56,960

badging because i think that's the kind

795

00:32:01,430 --> 00:31:58,559

of level of engagement that you're

796

00:32:05,430 --> 00:32:01,440

talking about of um people feeling

797

00:32:11,110 --> 00:32:07,190

one more comment

798

00:32:12,870 --> 00:32:11,120

okay yeah i don't know if you recall

799

00:32:14,630 --> 00:32:12,880

but there was a period where they were

800

00:32:16,549 --> 00:32:14,640

trying to get kids engaged in space many

801
00:32:18,149 --> 00:32:16,559
years ago and it was you know do we get

802
00:32:20,630 --> 00:32:18,159
them involved in dinosaurs or do we

803
00:32:22,950 --> 00:32:20,640
create a thing called young astronauts

804
00:32:24,310 --> 00:32:22,960
and that was at the federal level um and

805
00:32:25,909 --> 00:32:24,320
they went with young astronauts and it

806
00:32:26,830 --> 00:32:25,919
ran for a while

807
00:32:28,549 --> 00:32:26,840
thank

808
00:32:31,110 --> 00:32:28,559
you

809
00:32:32,789 --> 00:32:31,120
so with that i'm sad to say our time has

810
00:32:36,149 --> 00:32:32,799
come to an end

811
00:32:37,990 --> 00:32:36,159
uh it has been a a

812
00:32:40,149 --> 00:32:38,000
broad-ranging discussion i think we've

813
00:32:42,789 --> 00:32:40,159

got some great visuals that and some

814

00:32:45,029 --> 00:32:42,799

actual work we can go and do and the

815

00:32:46,389 --> 00:32:45,039

community can actually start playing

816

00:32:48,389 --> 00:32:46,399

with

817

00:32:51,190 --> 00:32:48,399

stay tuned to the wiki look for the

818

00:32:54,149 --> 00:32:51,200

virtual meetups in the seminar series

819

00:32:55,669 --> 00:32:54,159

look for a new website coming

820

00:32:57,269 --> 00:32:55,679

this is all

821

00:32:59,350 --> 00:32:57,279

going to be done in partnership so we

822

00:33:00,549 --> 00:32:59,360

need your help as we continue down this

823

00:33:03,750 --> 00:33:00,559

path

824

00:33:06,149 --> 00:33:03,760

great big thanks to the presenters uh

825

00:33:08,310 --> 00:33:06,159

for the audience and their participation

826

00:33:11,350 --> 00:33:08,320

those that weren't in the room and and

827

00:33:13,430 --> 00:33:11,360

were with us nonetheless um

828

00:33:16,070 --> 00:33:13,440

and stay tuned we'll have a plenary

829

00:33:18,789 --> 00:33:16,080

session to wrap up the workshop

830

00:33:21,269 --> 00:33:18,799

uh in about 15 minutes or so