
NASA
STAFF

1
00:00:05,749 --> 00:00:03,590
our next speaker is michael neufeld from

2
00:00:10,709 --> 00:00:05,759
the air and space museum to talk about

3
00:00:14,470 --> 00:00:12,310
so while we're waiting for this to come

4
00:00:16,870 --> 00:00:14,480
up i should just say many of you or at

5
00:00:18,870 --> 00:00:16,880
least some of you know me as fun brown

6
00:00:21,109 --> 00:00:18,880
v2 penimenda

7
00:00:23,670 --> 00:00:21,119
and after 20 years of doing that i said

8
00:00:25,429 --> 00:00:23,680
i have to find something else to do

9
00:00:27,349 --> 00:00:25,439
i have kind of exhausted that line of

10
00:00:28,630 --> 00:00:27,359
attack and

11
00:00:31,109 --> 00:00:28,640
i had

12
00:00:33,670 --> 00:00:31,119
begun thinking about several topics and

13
00:00:34,870 --> 00:00:33,680

what i've hit upon at least for uh for

14
00:00:37,430 --> 00:00:34,880
the moment

15
00:00:39,270 --> 00:00:37,440
uh was an interest in the entry of the

16
00:00:41,110 --> 00:00:39,280
applied physics laboratory johns hopkins

17
00:00:43,030 --> 00:00:41,120
applied physics laboratory which most of

18
00:00:44,470 --> 00:00:43,040
you in this room an insider audience

19
00:00:46,950 --> 00:00:44,480
know is only

20
00:00:49,350 --> 00:00:46,960
30 miles or 40 miles away maybe less

21
00:00:51,430 --> 00:00:49,360
than that on the way to baltimore

22
00:00:53,830 --> 00:00:51,440
uh the fact that i was a johns hopkins

23
00:00:55,350 --> 00:00:53,840
phd had a minor influence on my interest

24
00:00:57,830 --> 00:00:55,360
in the apl

25
00:01:00,389 --> 00:00:57,840
but uh it was mostly because bob

26
00:01:03,670 --> 00:01:00,399
farquhar couldn't be here today uh was

27
00:01:06,310 --> 00:01:03,680
in our department and wrote his memoir

28
00:01:07,350 --> 00:01:06,320
uh well at least after he was in our

29
00:01:08,710 --> 00:01:07,360
department he was supposed to do it

30
00:01:10,310 --> 00:01:08,720
while he was in our department but

31
00:01:12,710 --> 00:01:10,320
that's another story bob always does

32
00:01:15,350 --> 00:01:12,720
what he wants to do so

33
00:01:18,550 --> 00:01:15,360
what this project actually has moved

34
00:01:20,870 --> 00:01:18,560
into is two projects one is on this

35
00:01:22,950 --> 00:01:20,880
origins of the discovery program

36
00:01:25,670 --> 00:01:22,960
and the other is on the origins of the

37
00:01:28,070 --> 00:01:25,680
new horizons mission to pluto which is

38
00:01:29,670 --> 00:01:28,080

entirely separate topic uh which i'll be

39
00:01:31,990 --> 00:01:29,680
we're talking about next year i guess

40
00:01:33,429 --> 00:01:32,000
when again go back to it

41
00:01:35,429 --> 00:01:33,439
well of course you already had some

42
00:01:38,950 --> 00:01:35,439
background here uh

43
00:01:41,030 --> 00:01:38,960
in previous talks notably uh mr

44
00:01:43,270 --> 00:01:41,040
callahan's talk yesterday with all those

45
00:01:46,469 --> 00:01:43,280
uh budget graphs and he talked about the

46
00:01:48,710 --> 00:01:46,479
la lost decade of the 1980s and today

47
00:01:51,030 --> 00:01:48,720
arturo russo mentioned some of the

48
00:01:52,950 --> 00:01:51,040
crisis and changes precisely in this

49
00:01:55,590 --> 00:01:52,960
narrow window of time that i'm going to

50
00:01:58,310 --> 00:01:55,600
talk about today

51
00:01:59,990 --> 00:01:58,320
the you know of course it is almost a

52
00:02:01,749 --> 00:02:00,000
a standard narrative in the planetary

53
00:02:04,550 --> 00:02:01,759
scientists i've talked to

54
00:02:06,310 --> 00:02:04,560
about this topic that there was a moment

55
00:02:08,949 --> 00:02:06,320
that there was a real sense of crisis at

56
00:02:11,430 --> 00:02:08,959
the end of the 1980s about this of

57
00:02:12,470 --> 00:02:11,440
course you saw from the graph from

58
00:02:15,110 --> 00:02:12,480
uh

59
00:02:17,190 --> 00:02:15,120
callahan's graph the lack of launches

60
00:02:19,990 --> 00:02:17,200
until 1989 although i should note that

61
00:02:21,430 --> 00:02:20,000
was partly an artifact of the shuttle

62
00:02:23,910 --> 00:02:21,440
disaster and there might have been

63
00:02:26,550 --> 00:02:23,920

launches at 86 87

64
00:02:28,390 --> 00:02:26,560
but at any rate there was certainly a

65
00:02:31,430 --> 00:02:28,400
period of uh

66
00:02:33,270 --> 00:02:31,440
decline or decrease in funding

67
00:02:36,309 --> 00:02:33,280
what i found very interesting was when i

68
00:02:37,750 --> 00:02:36,319
phoned up leonard fisk who was the

69
00:02:40,470 --> 00:02:37,760
associate administrator for space

70
00:02:43,750 --> 00:02:40,480
science from i think 87 i'm not quite

71
00:02:45,430 --> 00:02:43,760
sure exactly 87 to 1992. he gave a

72
00:02:46,949 --> 00:02:45,440
completely different picture than what

73
00:02:49,270 --> 00:02:46,959
the planetary scientist notably was

74
00:02:51,190 --> 00:02:49,280
hunters who i've talked to and one of my

75
00:02:54,070 --> 00:02:51,200
chara my chief characters tom cremiges

76
00:02:57,589 --> 00:02:54,080
of apl he said this was a great period

77
00:02:59,589 --> 00:02:57,599
of expansion he came in the budget of

78
00:03:01,750 --> 00:02:59,599
nasa started going up as a result of

79
00:03:03,589 --> 00:03:01,760
reagan and then a bush

80
00:03:04,869 --> 00:03:03,599
first bush at least in the late 80s and

81
00:03:06,070 --> 00:03:04,879
the 90s

82
00:03:15,910 --> 00:03:06,080
he

83
00:03:18,869 --> 00:03:15,920
to space science this agreement was made

84
00:03:20,710 --> 00:03:18,879
in 1984 it was a result of the near

85
00:03:22,229 --> 00:03:20,720
death which was described the planetary

86
00:03:23,910 --> 00:03:22,239
program and the general reduction in the

87
00:03:25,990 --> 00:03:23,920
space science program at the beginning

88
00:03:28,789 --> 00:03:26,000

of the 80s and after nasa had survived

89
00:03:30,710 --> 00:03:28,799
that ssb was promised a 20 budget so

90
00:03:32,149 --> 00:03:30,720
nasa's budget was going up and therefore

91
00:03:34,390 --> 00:03:32,159
the office of space science and

92
00:03:37,190 --> 00:03:34,400
applications as it then was that budget

93
00:03:38,550 --> 00:03:37,200
was going up uh uh uh very quickly at

94
00:03:40,070 --> 00:03:38,560
that time and there were a number of

95
00:03:42,869 --> 00:03:40,080
missions in the queue delayed by the

96
00:03:45,350 --> 00:03:42,879
shuttle disaster which were on the

97
00:03:46,390 --> 00:03:45,360
imminently going to be launched notably

98
00:03:49,270 --> 00:03:46,400
uh

99
00:03:51,430 --> 00:03:49,280
hubble space telescope galileo magellan

100
00:03:53,429 --> 00:03:51,440
ulysses all were going to be launched

101
00:03:55,429 --> 00:03:53,439
and so as far as len fisk was concerned

102
00:03:57,350 --> 00:03:55,439
this was not a period of gloom and doom

103
00:03:58,710 --> 00:03:57,360
at all this was a great period of course

104
00:04:00,710 --> 00:03:58,720
he was the period coincident with him

105
00:04:02,550 --> 00:04:00,720
being a a but so this is not this is a

106
00:04:03,910 --> 00:04:02,560
period actually when things were going

107
00:04:05,990 --> 00:04:03,920
started going really well and there was

108
00:04:08,390 --> 00:04:06,000
an expansive budget certainly this

109
00:04:09,670 --> 00:04:08,400
wasn't the feeling that the planetary

110
00:04:11,030 --> 00:04:09,680
science

111
00:04:13,030 --> 00:04:11,040
community

112
00:04:15,110 --> 00:04:13,040
felt at the time because of the lack of

113
00:04:17,909 --> 00:04:15,120

launches because of the gap and one of

114
00:04:20,069 --> 00:04:17,919
the responses to this was do we need a

115
00:04:23,189 --> 00:04:20,079
small spacecraft program

116
00:04:25,990 --> 00:04:23,199
particularly in view of the failure of

117
00:04:28,230 --> 00:04:26,000
the observer line and mars observer in

118
00:04:29,990 --> 00:04:28,240
particular to live up to its budget

119
00:04:32,390 --> 00:04:30,000
requirements now i know that there's a

120
00:04:34,230 --> 00:04:32,400
little argument actually about whether

121
00:04:36,150 --> 00:04:34,240
the mars observer narrative that we

122
00:04:38,390 --> 00:04:36,160
usually hear namely that it was just a

123
00:04:40,390 --> 00:04:38,400
program out of control and too expensive

124
00:04:42,950 --> 00:04:40,400
was really the case i mean eric conway

125
00:04:44,790 --> 00:04:42,960
among others has noted that part of the

126
00:04:46,870 --> 00:04:44,800
big budget increase for mars observer

127
00:04:50,070 --> 00:04:46,880
was that it had to be delayed an entire

128
00:04:51,510 --> 00:04:50,080
uh uh mars launch opportunity from 90 to

129
00:04:53,670 --> 00:04:51,520
92 and that

130
00:04:55,749 --> 00:04:53,680
greatly added to its cost but at any

131
00:04:56,469 --> 00:04:55,759
rate there was certainly a sense then

132
00:04:59,909 --> 00:04:56,479
that

133
00:05:02,390 --> 00:04:59,919
there was a need for some other

134
00:05:04,550 --> 00:05:02,400
smaller missions to increase the flight

135
00:05:07,189 --> 00:05:04,560
rate to increase the amount of data

136
00:05:09,430 --> 00:05:07,199
coming back to deal with the problem

137
00:05:11,350 --> 00:05:09,440
with these gigantic expensive flagship

138
00:05:12,230 --> 00:05:11,360

missions which were eating up the entire

139
00:05:14,230 --> 00:05:12,240
budget

140
00:05:16,070 --> 00:05:14,240
now as far as i can tell from the

141
00:05:17,990 --> 00:05:16,080
documents that i've been able to so far

142
00:05:20,310 --> 00:05:18,000
find

143
00:05:22,230 --> 00:05:20,320
the initiative for a small a new small

144
00:05:24,469 --> 00:05:22,240
spacecraft program started with jeff

145
00:05:26,469 --> 00:05:24,479
briggs who was the division director for

146
00:05:29,270 --> 00:05:26,479
planetary sciences then called solar

147
00:05:31,430 --> 00:05:29,280
system exploration uh in

148
00:05:33,510 --> 00:05:31,440
that ssed mean solar system exploration

149
00:05:36,310 --> 00:05:33,520
division uh in

150
00:05:39,350 --> 00:05:36,320
the spring of 1989

151
00:05:42,550 --> 00:05:39,360
and uh he actually uh created a small

152
00:05:44,310 --> 00:05:42,560
initiative uh it uh

153
00:05:47,749 --> 00:05:44,320
and it was part of the strategic

154
00:05:49,350 --> 00:05:47,759
planning that uh ossa was making at that

155
00:05:51,110 --> 00:05:49,360
time and len fisk

156
00:05:52,870 --> 00:05:51,120
told me probably that he thinks he

157
00:05:55,830 --> 00:05:52,880
invented the idea of strategic planning

158
00:05:57,830 --> 00:05:55,840
at nasa for mission planning at any rate

159
00:06:00,790 --> 00:05:57,840
there was a strategic planning process

160
00:06:05,189 --> 00:06:00,800
going on in ossa

161
00:06:07,189 --> 00:06:05,199
in that in 1989 and one of these

162
00:06:09,270 --> 00:06:07,199
workshops that was coming up was at the

163
00:06:12,309 --> 00:06:09,280

164
00:06:15,110 --> 00:06:12,319
in june 1989 and so that this small

165
00:06:16,790 --> 00:06:15,120
program initiative was going to be

166
00:06:19,270 --> 00:06:16,800
discussed there

167
00:06:21,749 --> 00:06:19,280
but there was a lot of hostility in the

168
00:06:24,390 --> 00:06:21,759
community as well or at least skepticism

169
00:06:27,909 --> 00:06:24,400
in the community about a small mission

170
00:06:29,590 --> 00:06:27,919
program because the basic uh message was

171
00:06:31,270 --> 00:06:29,600
well we tried it with observer and it

172
00:06:33,029 --> 00:06:31,280
was a complete failure so why should we

173
00:06:34,629 --> 00:06:33,039
try another small mission program we

174
00:06:36,390 --> 00:06:34,639
can't control costs

175
00:06:38,870 --> 00:06:36,400
planetary missions just cost hundreds of

176
00:06:40,550 --> 00:06:38,880
millions to billions of dollars so

177
00:06:42,870 --> 00:06:40,560
there's nothing you can really do about

178
00:06:45,110 --> 00:06:42,880
that and and others have mentioned

179
00:06:46,870 --> 00:06:45,120
already this problem of piling on

180
00:06:47,990 --> 00:06:46,880
everybody says the last bus out of town

181
00:06:49,589 --> 00:06:48,000
therefore we all have to get our

182
00:06:51,510 --> 00:06:49,599
instruments on it

183
00:06:52,710 --> 00:06:51,520
well um

184
00:06:59,430 --> 00:06:52,720
the

185
00:07:00,390 --> 00:06:59,440
near earth asteroid rendezvous we've

186
00:07:02,230 --> 00:07:00,400
already heard it in several

187
00:07:03,990 --> 00:07:02,240
presentations mentions of the fact that

188
00:07:05,909 --> 00:07:04,000

asteroid missions and asteroid

189
00:07:07,749 --> 00:07:05,919
rendezvous were constantly under

190
00:07:10,550 --> 00:07:07,759
discussion in this period and there was

191
00:07:12,790 --> 00:07:10,560
the more ambitious comet run do asteroid

192
00:07:15,990 --> 00:07:12,800
flyby craft mission to be combined with

193
00:07:17,589 --> 00:07:16,000
cassini program at the time but it would

194
00:07:19,749 --> 00:07:17,599
appear that a near-earth asteroid

195
00:07:22,390 --> 00:07:19,759
mission which was uh relatively low

196
00:07:25,990 --> 00:07:22,400
energy and low complexity might be a

197
00:07:28,790 --> 00:07:26,000
good candidate mission for uh for a

198
00:07:31,430 --> 00:07:28,800
small spacecraft however again there was

199
00:07:33,510 --> 00:07:31,440
this hostility or skepticism in the

200
00:07:35,430 --> 00:07:33,520
planetary sciences community

201
00:07:38,070 --> 00:07:35,440
and that's where uh

202
00:07:39,510 --> 00:07:38,080
i first of my think two key actors what

203
00:07:41,670 --> 00:07:39,520
the other being wes huntress i'll talk

204
00:07:45,749 --> 00:07:41,680
about who's here with this is tom

205
00:07:49,830 --> 00:07:48,070
and this is a picture of tom cremidis

206
00:07:51,830 --> 00:07:49,840
which is this is an audience i mostly

207
00:07:53,510 --> 00:07:51,840
don't have to introduce him to but he's

208
00:07:55,830 --> 00:07:53,520
a very eminent

209
00:07:59,110 --> 00:07:55,840
space plasma physicist student of van

210
00:08:01,029 --> 00:07:59,120
allen had had experiments beginning uh

211
00:08:03,510 --> 00:08:01,039
as a postdoc

212
00:08:08,150 --> 00:08:03,520
at iowa a doctoral student in the

213
00:08:10,230 --> 00:08:08,160

postdoc on mariner 4 and had uh uh but i

214
00:08:11,510 --> 00:08:10,240
think he's there's i don't i don't know

215
00:08:13,990 --> 00:08:11,520
who these other gentlemen are somebody

216
00:08:15,510 --> 00:08:14,000
in the room might be able to tell me

217
00:08:17,510 --> 00:08:15,520
i think this is the low energy charge

218
00:08:20,950 --> 00:08:17,520
particle experiment he was the principal

219
00:08:24,790 --> 00:08:20,960
investigator for lecp on the voyager

220
00:08:27,350 --> 00:08:24,800
mission so he had a cons position of

221
00:08:29,270 --> 00:08:27,360
considerable influence in the in the

222
00:08:31,270 --> 00:08:29,280
area of uh

223
00:08:34,389 --> 00:08:31,280
space physics as a student of van allen

224
00:08:38,149 --> 00:08:34,399
as a very uh successful

225
00:08:40,709 --> 00:08:38,159
pi and co-ey and many many experiments

226
00:08:43,430 --> 00:08:40,719
to virtually every planet and he says

227
00:08:45,509 --> 00:08:43,440
when when new horizons pass pluto he

228
00:08:47,269 --> 00:08:45,519
will become the only scientist who has

229
00:08:49,190 --> 00:08:47,279
had an experiment that's gone to every

230
00:08:51,350 --> 00:08:49,200
single planet i can't verify whether

231
00:08:53,590 --> 00:08:51,360
that's true or not but it's probably

232
00:08:56,790 --> 00:08:53,600
true um

233
00:08:59,829 --> 00:08:56,800
in in uh at this point in time uh tom

234
00:09:00,790 --> 00:08:59,839
cremidis or stomatius uh as his greek

235
00:09:03,829 --> 00:09:00,800
name is

236
00:09:05,110 --> 00:09:03,839
was the chief scientist of apl space

237
00:09:08,630 --> 00:09:05,120
department and i should say something

238
00:09:10,230 --> 00:09:08,640

about apl space department here

239
00:09:12,550 --> 00:09:10,240
for context

240
00:09:14,630 --> 00:09:12,560
although in this discussion in my paper

241
00:09:16,470 --> 00:09:14,640
and everybody else has written about apl

242
00:09:18,949 --> 00:09:16,480
and jpl and competition between two

243
00:09:21,110 --> 00:09:18,959
institutions in fact it's not the

244
00:09:22,550 --> 00:09:21,120
competition between jpl and the entire

245
00:09:24,949 --> 00:09:22,560
apl which is

246
00:09:27,430 --> 00:09:24,959
always has been a predominantly navy

247
00:09:29,269 --> 00:09:27,440
funded laboratory but between space

248
00:09:32,230 --> 00:09:29,279
department which was actually only at

249
00:09:35,670 --> 00:09:32,240
that time about 10 percent of apl's

250
00:09:38,710 --> 00:09:35,680
complement of around 3 000 people uh

251
00:09:40,870 --> 00:09:38,720
the space department had built its

252
00:09:44,949 --> 00:09:40,880
reputation and history on the transit

253
00:09:47,670 --> 00:09:44,959
program for the navy and then had

254
00:09:51,030 --> 00:09:47,680
had been involved heavily with sdio

255
00:09:53,110 --> 00:09:51,040
missions in the 1980s at the and as we

256
00:09:55,590 --> 00:09:53,120
transitioned into this period is

257
00:09:56,470 --> 00:09:55,600
actually uh looking essentially for a

258
00:09:57,430 --> 00:09:56,480
new

259
00:09:59,430 --> 00:09:57,440
uh

260
00:10:01,590 --> 00:09:59,440
would be transitioning again under the

261
00:10:02,949 --> 00:10:01,600
leadership of chris who became head of

262
00:10:06,790 --> 00:10:02,959
space department at the beginning of

263
00:10:08,389 --> 00:10:06,800

1991 to having more nasa emissions so it

264
00:10:10,870 --> 00:10:08,399
had done significant numbers of

265
00:10:14,150 --> 00:10:10,880
heliophysics type or earth orbital

266
00:10:19,430 --> 00:10:17,030
at the new hampshire conference in

267
00:10:21,829 --> 00:10:19,440
in june 1989

268
00:10:23,430 --> 00:10:21,839
uh crimea just talked uh comey just

269
00:10:24,470 --> 00:10:23,440
intervened in one of the discussions

270
00:10:26,550 --> 00:10:24,480
about

271
00:10:29,190 --> 00:10:26,560
what kind of low-cost program could

272
00:10:31,190 --> 00:10:29,200
there be and his intervention was you

273
00:10:33,350 --> 00:10:31,200
guys are looking at the wrong model it's

274
00:10:36,230 --> 00:10:33,360
not mars observer it's the explorer

275
00:10:38,710 --> 00:10:36,240
program explorer should be the model for

276
00:10:40,069 --> 00:10:38,720
what a small spacecraft line should be

277
00:10:42,069 --> 00:10:40,079
not only in its

278
00:10:46,069 --> 00:10:42,079
constant level of funding but also in a

279
00:10:49,030 --> 00:10:46,079
small spacecraft is constrained cost and

280
00:10:51,110 --> 00:10:49,040
science focus and he was challenged to

281
00:10:53,990 --> 00:10:51,120
present something to demonstrate how

282
00:10:57,269 --> 00:10:54,000
that could even be possible and he was

283
00:11:00,150 --> 00:10:57,279
he called the secretary had her facts up

284
00:11:02,230 --> 00:11:00,160
the uh the view graphs that had made for

285
00:11:04,550 --> 00:11:02,240
ace the advanced composition explorer

286
00:11:06,230 --> 00:11:04,560
which actually was launched in 1997 apl

287
00:11:08,389 --> 00:11:06,240
was going to build

288
00:11:09,990 --> 00:11:08,399

and and presented and this is actually a

289
00:11:12,150 --> 00:11:10,000
page from the facts that was sent up to

290
00:11:14,949 --> 00:11:12,160
new hampshire in the presentation of

291
00:11:17,030 --> 00:11:14,959
view graphs that he made uh about this

292
00:11:18,710 --> 00:11:17,040
and and and i just want to read from

293
00:11:20,790 --> 00:11:18,720
oral history because it tells the story

294
00:11:23,110 --> 00:11:20,800
much better than i would ever tell it he

295
00:11:24,630 --> 00:11:23,120
said it had all the ingredients this is

296
00:11:26,310 --> 00:11:24,640
his time crimes all the ingredients of

297
00:11:28,230 --> 00:11:26,320
planetary spacecraft it had a rocket

298
00:11:30,550 --> 00:11:28,240
engine it had the instruments it had the

299
00:11:32,230 --> 00:11:30,560
orientation it had the solar panels then

300
00:11:33,829 --> 00:11:32,240
at the end joe viverko was charging this

301
00:11:36,550 --> 00:11:33,839
and said all right crimijus how much

302
00:11:38,550 --> 00:11:36,560
does that cost i said you guys seem to

303
00:11:40,470 --> 00:11:38,560
be experts in cost you tell me what do

304
00:11:42,870 --> 00:11:40,480
you think this mission should cost he

305
00:11:44,790 --> 00:11:42,880
said 400 million dollars

306
00:11:46,790 --> 00:11:44,800
i said you're in the right ballpark for

307
00:11:47,990 --> 00:11:46,800
the spacecraft except you have one zero

308
00:11:49,829 --> 00:11:48,000
too many

309
00:11:52,150 --> 00:11:49,839
he said what are you talking about i

310
00:11:53,670 --> 00:11:52,160
said the spacecraft is actually 45

311
00:11:56,150 --> 00:11:53,680
million dollars and the instrument's

312
00:11:57,829 --> 00:11:56,160
another 30 million dollars so at least

313
00:11:59,750 --> 00:11:57,839

in his telling of the story this is the

314
00:12:02,790 --> 00:11:59,760
origin story of discovery from tom

315
00:12:04,790 --> 00:12:02,800
cremagious's perspective that he that

316
00:12:06,389 --> 00:12:04,800
coming out of that workshop they decided

317
00:12:10,150 --> 00:12:06,399
indeed well at least we should study

318
00:12:12,150 --> 00:12:10,160
that study the concept of a small

319
00:12:14,069 --> 00:12:12,160
spacecraft mission maybe uh based on an

320
00:12:16,550 --> 00:12:14,079
explorer model and i think it's

321
00:12:18,150 --> 00:12:16,560
interesting that tom cremages is a

322
00:12:20,069 --> 00:12:18,160
participant in both the planetary

323
00:12:22,150 --> 00:12:20,079
sciences community and the space physics

324
00:12:25,190 --> 00:12:22,160
are now called most likely called

325
00:12:27,670 --> 00:12:25,200
heliophysics communities and he had this

326
00:12:30,470 --> 00:12:27,680
dual disciplinary perspective which

327
00:12:32,069 --> 00:12:30,480
allowed him to look across it

328
00:12:34,069 --> 00:12:32,079
lines that the planetary scientists

329
00:12:35,750 --> 00:12:34,079
didn't think it didn't hadn't known much

330
00:12:36,870 --> 00:12:35,760
about explorer he said to his great

331
00:12:40,629 --> 00:12:36,880
surprise

332
00:12:42,550 --> 00:12:40,639
so in in fiscal year 1990 jeff briggs

333
00:12:45,030 --> 00:12:42,560
started the discovery program created a

334
00:12:47,030 --> 00:12:45,040
discovery science program a science

335
00:12:49,190 --> 00:12:47,040
working group uh

336
00:12:51,910 --> 00:12:49,200
named bob farquhar who was at goddard to

337
00:12:54,949 --> 00:12:51,920
be the program chief program head at

338
00:12:56,710 --> 00:12:54,959

least part-time of this little program

339
00:12:59,030 --> 00:12:56,720
the science working group held two

340
00:13:00,949 --> 00:12:59,040
meetings and yet somehow the near

341
00:13:03,190 --> 00:13:00,959
concept which had emerged from the new

342
00:13:05,590 --> 00:13:03,200
hampshire workshop as the

343
00:13:07,509 --> 00:13:05,600
probable next mission and a way to go

344
00:13:09,750 --> 00:13:07,519
didn't really go anywhere and i'm

345
00:13:11,269 --> 00:13:09,760
actually it's a long story and i don't

346
00:13:13,670 --> 00:13:11,279
i'm and i'm going to take up way too

347
00:13:16,069 --> 00:13:13,680
much time here to talk about it but it

348
00:13:19,910 --> 00:13:16,079
did does seem to have languished during

349
00:13:22,150 --> 00:13:19,920
the year 1989 1990. one theory that i

350
00:13:24,550 --> 00:13:22,160
have is that us lack of a sense of

351
00:13:26,629 --> 00:13:24,560
urgency from the top from len fisk and

352
00:13:29,110 --> 00:13:26,639
others at the time things seem to be

353
00:13:31,590 --> 00:13:29,120
going well there was lots of money was

354
00:13:34,870 --> 00:13:31,600
this urgent maybe not another question

355
00:13:37,110 --> 00:13:34,880
is whether the creation of bush's space

356
00:13:39,509 --> 00:13:37,120
exploration initiative which caused the

357
00:13:41,189 --> 00:13:39,519
replanting process in the planetary

358
00:13:43,829 --> 00:13:41,199
program to consider what we're going to

359
00:13:46,629 --> 00:13:43,839
do to support a human mission to mars

360
00:13:48,710 --> 00:13:46,639
might have resulted in a distraction but

361
00:13:50,550 --> 00:13:48,720
at any rate not much of anything

362
00:13:53,990 --> 00:13:50,560
happened during that fiscal year and

363
00:13:57,509 --> 00:13:54,000

near was not funded as uh tom creme just

364
00:14:00,629 --> 00:13:59,110
now of course we have west hunters who's

365
00:14:03,030 --> 00:14:00,639
sitting here so it's an interesting

366
00:14:05,910 --> 00:14:03,040
experience i'm used to writing about

367
00:14:08,069 --> 00:14:05,920
about dead people or not nazis that

368
00:14:10,150 --> 00:14:08,079
won't talk to me

369
00:14:12,069 --> 00:14:10,160
so it's very it's a little intimidating

370
00:14:15,269 --> 00:14:12,079
to sit here and talk to the participants

371
00:14:18,629 --> 00:14:15,279
and but anyway um

372
00:14:22,230 --> 00:14:18,639
uh wes huntress became uh chief of ssed

373
00:14:25,350 --> 00:14:22,240
in august 1990 uh replacing briggs and

374
00:14:26,870 --> 00:14:25,360
uh uh discovery as he said instead of

375
00:14:28,150 --> 00:14:26,880
three oral histories that i have with

376
00:14:30,389 --> 00:14:28,160
him and in a pers in a phone

377
00:14:32,150 --> 00:14:30,399
conversation we had discovery was one of

378
00:14:33,910 --> 00:14:32,160
his three major objectives interestingly

379
00:14:35,590 --> 00:14:33,920
enough one of them was extrasolar

380
00:14:37,990 --> 00:14:35,600
planets he initiated an extra solar

381
00:14:40,069 --> 00:14:38,000
planetary program out of the planetary

382
00:14:42,870 --> 00:14:40,079
solar system exploration division

383
00:14:44,710 --> 00:14:42,880
and he decided that in order to revive

384
00:14:48,310 --> 00:14:44,720
this initiative which seemed to be

385
00:14:50,310 --> 00:14:48,320
languishing he revised the

386
00:14:52,069 --> 00:14:50,320
science working group put joe vaverka in

387
00:14:54,550 --> 00:14:52,079
command of that or in the leadership of

388
00:14:56,550 --> 00:14:54,560

that he created a technical committee

389
00:14:59,509 --> 00:14:56,560
jim martin of langley a

390
00:15:01,990 --> 00:14:59,519
legendary manager of viking as the head

391
00:15:04,870 --> 00:15:02,000
of a technical community and hope said

392
00:15:07,430 --> 00:15:04,880
go out and try to get this thing going

393
00:15:11,110 --> 00:15:07,440
and go somewhere

394
00:15:13,509 --> 00:15:11,120
at this point in time at least by

395
00:15:15,350 --> 00:15:13,519
wes huntress's account he basically was

396
00:15:18,150 --> 00:15:15,360
looking at the options who could be a

397
00:15:20,629 --> 00:15:18,160
competitor to jpl and this is a story

398
00:15:22,150 --> 00:15:20,639
that is uh unfortunately all our jpl

399
00:15:24,389 --> 00:15:22,160
friends in the room is not entirely

400
00:15:26,069 --> 00:15:24,399
flattering to jpl because the perception

401
00:15:29,110 --> 00:15:26,079
that he had and several other people and

402
00:15:31,749 --> 00:15:29,120
tom comey just had was place was

403
00:15:34,629 --> 00:15:31,759
very wedded to giant expensive projects

404
00:15:36,310 --> 00:15:34,639
could not adapt to a small low-cost

405
00:15:37,189 --> 00:15:36,320
mission

406
00:15:39,590 --> 00:15:37,199
was

407
00:15:41,430 --> 00:15:39,600
very resistant to any other organization

408
00:15:43,509 --> 00:15:41,440
having any piece of its turf was very

409
00:15:45,990 --> 00:15:43,519
afraid that some other organization

410
00:15:49,749 --> 00:15:46,000
would come and steal its charter and so

411
00:15:52,230 --> 00:15:49,759
it was very resistant and he and and

412
00:15:54,790 --> 00:15:52,240
and hunters looked around and what are

413
00:15:56,710 --> 00:15:54,800

the options nrl was an option but they

414
00:15:58,230 --> 00:15:56,720
didn't seem terribly interested

415
00:16:00,870 --> 00:15:58,240
uh uh

416
00:16:02,629 --> 00:16:00,880
sorry our friends at ames but

417
00:16:03,910 --> 00:16:02,639
he's told me and or told several oral

418
00:16:05,670 --> 00:16:03,920
history interviews he didn't have much

419
00:16:07,430 --> 00:16:05,680
confidence in ames anymore an ability to

420
00:16:08,389 --> 00:16:07,440
do an interplanetary mission

421
00:16:11,910 --> 00:16:08,399
and that

422
00:16:14,949 --> 00:16:11,920
left apl as one of the most like the the

423
00:16:17,749 --> 00:16:14,959
most likely candidates for a

424
00:16:19,590 --> 00:16:17,759
competition to a competition whose

425
00:16:21,990 --> 00:16:19,600
project was maybe not only to get

426
00:16:23,829 --> 00:16:22,000
discovery started and to do a good

427
00:16:26,949 --> 00:16:23,839
near-earth asteroid mission but also to

428
00:16:29,269 --> 00:16:26,959
give jpl a shaking up and

429
00:16:30,629 --> 00:16:29,279
a motivation to do better on small

430
00:16:32,069 --> 00:16:30,639
programs

431
00:16:33,749 --> 00:16:32,079
so

432
00:16:36,629 --> 00:16:33,759
this led to the funding of the near

433
00:16:38,150 --> 00:16:36,639
project in fiscal 1991

434
00:16:41,269 --> 00:16:38,160
uh

435
00:16:42,629 --> 00:16:41,279
and a showdown that happened in pasadena

436
00:16:44,870 --> 00:16:42,639
in in

437
00:16:47,350 --> 00:16:44,880
may 1991

438
00:16:51,189 --> 00:16:47,360

apl versus jpl near this is an early

439
00:16:54,710 --> 00:16:51,199
near sketch near proposal idea

440
00:16:57,509 --> 00:16:54,720
the outcome of that was rather

441
00:17:00,550 --> 00:16:57,519
a legend at apl and forgotten the jpl

442
00:17:03,110 --> 00:17:00,560
because basically jpl's proposal was a

443
00:17:06,069 --> 00:17:03,120
disaster and

444
00:17:07,990 --> 00:17:06,079
was proposed for a 450 million program

445
00:17:10,390 --> 00:17:08,000
that would monopolize discovery for a

446
00:17:12,949 --> 00:17:10,400
decade uh and take three missions just

447
00:17:16,150 --> 00:17:12,959
to get to the asteroid an apl proposed

448
00:17:20,069 --> 00:17:16,160
110 mission 110 million dollar mission

449
00:17:22,069 --> 00:17:20,079
and so hunters decided to pick apl

450
00:17:23,909 --> 00:17:22,079
although it's interesting i really i'm

451
00:17:26,390 --> 00:17:23,919
talking too long i don't running out of

452
00:17:27,429 --> 00:17:26,400
time to to to to tell the rest of this

453
00:17:28,789 --> 00:17:27,439
story

454
00:17:31,270 --> 00:17:28,799
but uh

455
00:17:34,310 --> 00:17:31,280
he he decided in part because it the

456
00:17:36,870 --> 00:17:34,320
superior proposal was apl even after jpl

457
00:17:39,190 --> 00:17:36,880
got a second chance but it was also

458
00:17:41,510 --> 00:17:39,200
because he was looking for a way to

459
00:17:42,789 --> 00:17:41,520
stimulate jpl to think about doing

460
00:17:45,430 --> 00:17:42,799
something new

461
00:17:47,510 --> 00:17:45,440
and to try it a different way and he has

462
00:17:50,390 --> 00:17:47,520
specifically picked out tony speer who

463
00:17:52,549 --> 00:17:50,400

had been project manager on magellan has

464
00:17:54,789 --> 00:17:52,559
saved magellan to be

465
00:17:55,750 --> 00:17:54,799
run a small project office

466
00:17:57,190 --> 00:17:55,760
uh

467
00:17:59,270 --> 00:17:57,200
at the time

468
00:18:01,990 --> 00:17:59,280
then this near mission seemed like it

469
00:18:03,750 --> 00:18:02,000
should go to apl he picked apl so he

470
00:18:05,270 --> 00:18:03,760
decided to create a lunar mission called

471
00:18:07,430 --> 00:18:05,280
lunar scout

472
00:18:09,830 --> 00:18:07,440
but unfortunately shortly after lunar

473
00:18:11,750 --> 00:18:09,840
scout's creation it was stolen away by

474
00:18:14,870 --> 00:18:11,760
mike griffin who had just been appointed

475
00:18:17,110 --> 00:18:14,880
the head of a new codex for exploration

476
00:18:19,830 --> 00:18:17,120
to try to revive the bush

477
00:18:23,350 --> 00:18:19,840
space exploration initiative and so

478
00:18:25,430 --> 00:18:23,360
ossa lost the moon for a little while

479
00:18:27,590 --> 00:18:25,440
while codex existed

480
00:18:30,150 --> 00:18:27,600
which as he said and i quote that really

481
00:18:31,430 --> 00:18:30,160
pissed me off so

482
00:18:34,630 --> 00:18:31,440
there's an oral history there's an

483
00:18:36,150 --> 00:18:34,640
uncensored oral history i like that um

484
00:18:38,789 --> 00:18:36,160
so

485
00:18:41,430 --> 00:18:38,799
he decided we got to find a mars mission

486
00:18:42,390 --> 00:18:41,440
for jpl a some way and of course they're

487
00:18:43,510 --> 00:18:42,400
already

488
00:18:46,390 --> 00:18:43,520

you know there's a lot of other things

489
00:18:49,750 --> 00:18:46,400
going on which eric conway is is has a

490
00:18:52,230 --> 00:18:49,760
history in in the works about that

491
00:18:54,230 --> 00:18:52,240
and so out of this came the pathfinder

492
00:18:56,549 --> 00:18:54,240
proposal uh

493
00:18:59,830 --> 00:18:56,559
and there was an aim study for so-called

494
00:19:02,070 --> 00:18:59,840
measure uh mars environmental survey

495
00:19:03,669 --> 00:19:02,080
mission and there'd be a pathfinder

496
00:19:05,990 --> 00:19:03,679
mission to a network

497
00:19:09,750 --> 00:19:06,000
and all of that and let me summarize

498
00:19:11,909 --> 00:19:09,760
more quickly here uh a micro rover was

499
00:19:14,070 --> 00:19:11,919
added and at the end of this process

500
00:19:14,870 --> 00:19:14,080
which sort of happened during the

501
00:19:20,549 --> 00:19:14,880
of

502
00:19:22,549 --> 00:19:20,559
the decision was his decision was to

503
00:19:27,029 --> 00:19:22,559
incorporate the

504
00:19:30,470 --> 00:19:27,039
pathfinder into discovery uh it was uh

505
00:19:32,230 --> 00:19:30,480
the hunt the the basic measure for uh

506
00:19:35,669 --> 00:19:32,240
discovery had been decided would be a

507
00:19:37,990 --> 00:19:35,679
150 million dollar fy ninety two dollars

508
00:19:40,150 --> 00:19:38,000
project this would have to come under

509
00:19:42,549 --> 00:19:40,160
the 150 million dollar cap but the rover

510
00:19:45,029 --> 00:19:42,559
was counted as a separate thing it came

511
00:19:46,710 --> 00:19:45,039
from a different part of nasa and it was

512
00:19:49,590 --> 00:19:46,720
it it was extra

513
00:19:53,430 --> 00:19:49,600

and that was the decision then that his

514
00:19:55,830 --> 00:19:53,440
decision was to make pathfinder first

515
00:19:57,669 --> 00:19:55,840
and to push near into the background to

516
00:20:00,470 --> 00:19:57,679
push near to not in the background but

517
00:20:02,549 --> 00:20:00,480
push near to second to push it off

518
00:20:06,390 --> 00:20:02,559
out of being the first in line which did

519
00:20:07,430 --> 00:20:06,400
not make tom creme just happy at all and

520
00:20:09,909 --> 00:20:07,440
so

521
00:20:14,149 --> 00:20:09,919
this would bump the near launch which

522
00:20:16,630 --> 00:20:14,159
had been scheduled for 1997 into 1998.

523
00:20:17,870 --> 00:20:16,640
uh this is of course now we're talking

524
00:20:21,669 --> 00:20:17,880
about

525
00:20:24,070 --> 00:20:21,679
1992 but the funding for discovery could

526
00:20:25,510 --> 00:20:24,080
not happen until the next fiscal year so

527
00:20:28,870 --> 00:20:25,520
it would not come up for budget

528
00:20:30,950 --> 00:20:28,880
consideration until the spring of 1993

529
00:20:35,590 --> 00:20:30,960
and so essentially there was a year

530
00:20:38,470 --> 00:20:35,600
where uh apl which was uh ticked off by

531
00:20:41,430 --> 00:20:38,480
this sudden demotion to second in the in

532
00:20:44,070 --> 00:20:41,440
discovery program uh didn't come about

533
00:20:47,190 --> 00:20:44,080
into a political consideration

534
00:20:49,350 --> 00:20:47,200
uh however uh tom comey just told bob

535
00:20:51,110 --> 00:20:49,360
farquhar you should go look for other

536
00:20:54,230 --> 00:20:51,120
options and they found another option

537
00:20:56,230 --> 00:20:54,240
they found a launch to eros in early

538
00:20:58,710 --> 00:20:56,240

1996.

539
00:21:00,789 --> 00:20:58,720
this would in fact greatly accelerate

540
00:21:04,470 --> 00:21:00,799
the program result in apl having to

541
00:21:07,909 --> 00:21:04,480
produce a spacecraft in only two years

542
00:21:11,430 --> 00:21:07,919
pathfinder was still first in the budget

543
00:21:12,470 --> 00:21:11,440
consideration when it came up in 1993

544
00:21:18,549 --> 00:21:12,480
and

545
00:21:21,990 --> 00:21:18,559
that year but tom cremidis was not about

546
00:21:23,590 --> 00:21:22,000
to take that lying down basically

547
00:21:25,270 --> 00:21:23,600
and the reason that he was able to do

548
00:21:28,549 --> 00:21:25,280
anything at all was because he had a

549
00:21:29,430 --> 00:21:28,559
long history of close association

550
00:21:32,390 --> 00:21:29,440
with

551
00:21:34,950 --> 00:21:32,400
senator barbara mikulski in using the

552
00:21:37,669 --> 00:21:34,960
political system to lobby for apl's

553
00:21:41,350 --> 00:21:37,679
projects and he intervened directly with

554
00:21:43,669 --> 00:21:41,360
the office of senator mikulski who then

555
00:21:46,549 --> 00:21:43,679
changed the whole dynamic the budget

556
00:21:49,430 --> 00:21:46,559
consideration of fy 93 would have funded

557
00:21:52,789 --> 00:21:49,440
pathfinder basically and near on a very

558
00:21:55,190 --> 00:21:52,799
small budget for a 1998 launch instead

559
00:21:58,230 --> 00:21:55,200
by using the political system tom

560
00:22:00,950 --> 00:21:58,240
cremiges was able to get mikulski to

561
00:22:03,750 --> 00:22:00,960
insert into the bill the full funding

562
00:22:05,990 --> 00:22:03,760
for near on a honor accelerated launch

563
00:22:08,230 --> 00:22:06,000

schedule to reach eros by launching in

564
00:22:10,710 --> 00:22:08,240
february 1996.

565
00:22:13,590 --> 00:22:10,720
and as a result of that very

566
00:22:15,990 --> 00:22:13,600
abbreviated version of that history

567
00:22:19,190 --> 00:22:16,000
the discovery program started in the

568
00:22:22,549 --> 00:22:19,200
fall of 1993 as a much better funded

569
00:22:25,350 --> 00:22:22,559
program with two full new start missions

570
00:22:27,029 --> 00:22:25,360
than it would otherwise have been and

571
00:22:29,830 --> 00:22:27,039
one of the questions we have to ask is

572
00:22:31,430 --> 00:22:29,840
whether it might have resulted if it had

573
00:22:33,110 --> 00:22:31,440
not been funded that way would it have

574
00:22:35,270 --> 00:22:33,120
become a one mission program for

575
00:22:36,230 --> 00:22:35,280
pathfinder west hunter says well at

576
00:22:38,630 --> 00:22:36,240
least

577
00:22:40,390 --> 00:22:38,640
golden was really only interested in

578
00:22:43,190 --> 00:22:40,400
pathfinder and didn't know much about

579
00:22:45,350 --> 00:22:43,200
near at the very least discovery became

580
00:22:48,390 --> 00:22:45,360
a viable program at a higher funded

581
00:22:50,070 --> 00:22:48,400
level early on and so i would say my my

582
00:22:51,590 --> 00:22:50,080
fundamental interpretation that i've

583
00:22:54,070 --> 00:22:51,600
offered in this paper

584
00:22:56,310 --> 00:22:54,080
is although jeff briggs had a role in

585
00:22:58,470 --> 00:22:56,320
starting the project that the two key

586
00:23:00,789 --> 00:22:58,480
actors which made it happen

587
00:23:03,110 --> 00:23:00,799
were wes huntress and tom cremiges and

588
00:23:05,110 --> 00:23:03,120

without them discovery might not have

589
00:23:06,310 --> 00:23:05,120
emerged at all

590
00:23:08,549 --> 00:23:06,320
and certainly

591
00:23:10,950 --> 00:23:08,559
led it to become the successful and

592
00:23:12,710 --> 00:23:10,960
transformative project for plancha

593
00:23:26,310 --> 00:23:12,720
exploration that it has become thank you

594
00:23:29,750 --> 00:23:28,710
speaking of participants talking to my

595
00:23:32,789 --> 00:23:29,760
pager

596
00:23:33,590 --> 00:23:32,799
i mean is this thing dangerous

597
00:23:36,950 --> 00:23:33,600
uh

598
00:23:40,070 --> 00:23:36,960
just just a comment yeah on your last

599
00:23:45,190 --> 00:23:43,029
dan golden and i were not unaware

600
00:23:46,230 --> 00:23:45,200
of what the final outcome

601
00:23:47,830 --> 00:23:46,240
might be

602
00:23:49,269 --> 00:23:47,840
we were actually happy to see it happen

603
00:23:50,789 --> 00:23:49,279
that way

604
00:23:52,789 --> 00:23:50,799
which final outcome are you meet you

605
00:23:55,510 --> 00:23:52,799
mean that we would get a new start for

606
00:23:57,510 --> 00:23:55,520
two not yet yeah but in one of your oral

607
00:23:59,669 --> 00:23:57,520
histories you say that you you that he

608
00:24:02,630 --> 00:23:59,679
was really angry because of mulkulski's

609
00:24:05,190 --> 00:24:02,640
intervention he was yeah he was

610
00:24:07,110 --> 00:24:05,200
yeah i know you weren't yeah

611
00:24:08,789 --> 00:24:07,120
i mean i i should add as an

612
00:24:10,390 --> 00:24:08,799
appendix to that i have not mentioned

613
00:24:11,830 --> 00:24:10,400

gold in this talk for the very simple

614
00:24:13,990 --> 00:24:11,840
reason that he actually doesn't deserve

615
00:24:16,470 --> 00:24:14,000
much credit or blame or anything else

616
00:24:17,190 --> 00:24:16,480
for this this is a project that became

617
00:24:22,070 --> 00:24:17,200
the

618
00:24:24,230 --> 00:24:22,080
was launched without him and his basic

619
00:24:26,549 --> 00:24:24,240
uh contribution was to stay out of the

620
00:24:28,230 --> 00:24:26,559
way now maybe in later years you could

621
00:24:29,830 --> 00:24:28,240
argue you know it would not have

622
00:24:31,909 --> 00:24:29,840
necessarily continue without the

623
00:24:33,590 --> 00:24:31,919
continual support of a of an

624
00:24:34,789 --> 00:24:33,600
administrator who wanted to keep it

625
00:24:36,710 --> 00:24:34,799
going

626
00:24:38,630 --> 00:24:36,720
that's probably a contribution this is

627
00:24:41,029 --> 00:24:38,640
really more of a comment than a question

628
00:24:43,350 --> 00:24:41,039
that was a lot of fantastic background

629
00:24:44,789 --> 00:24:43,360
that i have wanted to have for years

630
00:24:46,149 --> 00:24:44,799
and i'm coming at this from the

631
00:24:48,230 --> 00:24:46,159
perspective of somebody who's been

632
00:24:50,390 --> 00:24:48,240
involved with discovery almost since its

633
00:24:53,190 --> 00:24:50,400
inception but not that far back

634
00:24:55,110 --> 00:24:53,200
in 1996 i was asked by charles alachi

635
00:24:58,149 --> 00:24:55,120
who was was an assistant director of the

636
00:25:01,350 --> 00:24:58,159
lab to head jpl's discovery program

637
00:25:03,590 --> 00:25:01,360
and i knew about apl i knew what a

638
00:25:06,390 --> 00:25:03,600

formidable technical powerhouse they

639
00:25:08,630 --> 00:25:06,400
were i'd heard about tom cremidis and i

640
00:25:10,230 --> 00:25:08,640
knew about barbara mikulski's special

641
00:25:12,149 --> 00:25:10,240
relationship with him

642
00:25:14,149 --> 00:25:12,159
and so we took that competition

643
00:25:16,070 --> 00:25:14,159
extremely seriously in fact i think

644
00:25:18,470 --> 00:25:16,080
hilachi asked me to do that job because

645
00:25:20,470 --> 00:25:18,480
i was the pi on a on an earth science

646
00:25:22,470 --> 00:25:20,480
mission about the size of an explorer

647
00:25:24,149 --> 00:25:22,480
but i'll tell you this at the lab my

648
00:25:25,590 --> 00:25:24,159
friend said greg why are you doing this

649
00:25:27,350 --> 00:25:25,600
this is a dead end you know it's the

650
00:25:29,510 --> 00:25:27,360
flagship missions account this this

651
00:25:31,750 --> 00:25:29,520
discovery thing is never going to last

652
00:25:34,549 --> 00:25:31,760
that was the attitude there for quite

653
00:25:36,710 --> 00:25:34,559
for quite a while and now i can tell you

654
00:25:38,710 --> 00:25:36,720
uh that that today i just passed the

655
00:25:41,269 --> 00:25:38,720
reins to someone else after insight was

656
00:25:44,310 --> 00:25:41,279
selected it's a core part of what we do

657
00:25:46,310 --> 00:25:44,320
at the lab and not only that but it has

658
00:25:48,070 --> 00:25:46,320
also had a very profound impact on how

659
00:25:50,390 --> 00:25:48,080
we do strategic mission planning in

660
00:25:51,350 --> 00:25:50,400
terms of the way we formulate them we

661
00:26:01,669 --> 00:25:51,360
have

662
00:26:03,430 --> 00:26:01,679
over the strategic missions now that we

663
00:26:05,750 --> 00:26:03,440

never had before and i think it's really

664
00:26:08,149 --> 00:26:05,760
going to help us keep them on track in

665
00:26:10,870 --> 00:26:08,159
the future so i think the ramifications

666
00:26:12,549 --> 00:26:10,880
of discovery are far uh

667
00:26:14,789 --> 00:26:12,559
far beyond what we might even think

668
00:26:16,390 --> 00:26:14,799
today yeah certainly

669
00:26:18,310 --> 00:26:16,400
planning to mention that's been

670
00:26:24,070 --> 00:26:18,320
important in terms of pi led missions

671
00:26:29,029 --> 00:26:26,789
final paper this afternoon is from peter

672
00:26:31,110 --> 00:26:29,039
markowski from university of oklahoma on

673
00:26:39,510 --> 00:26:31,120
a subject near and dear to my heart on

674
00:26:43,350 --> 00:26:41,510
i just wanted to make a quick note

675
00:26:45,029 --> 00:26:43,360
on the program agenda

676
00:26:47,110 --> 00:26:45,039
i originally wanted to talk about

677
00:26:48,950 --> 00:26:47,120
ulysses and giado

678
00:26:51,669 --> 00:26:48,960
but my paper and my project sort of

679
00:26:53,029 --> 00:26:51,679
evolved to only just talk about ulysses

680
00:26:55,110 --> 00:26:53,039
i think in the kind of grander scheme of

681
00:26:56,870 --> 00:26:55,120
things i'm going to fold giato in there

682
00:27:00,549 --> 00:26:56,880
but for today i'm only going to focus on

683
00:27:06,149 --> 00:27:04,230
in may 1987 former issa director rymar

684
00:27:08,870 --> 00:27:06,159
loosed upon reflection on american and

685
00:27:11,190 --> 00:27:08,880
european cooperation in space emphasized

686
00:27:13,110 --> 00:27:11,200
quote the importance of a free and open

687
00:27:14,710 --> 00:27:13,120
exchange of views between the scientific

688
00:27:16,470 --> 00:27:14,720

communities of the united states and of

689
00:27:18,870 --> 00:27:16,480
europe end quote

690
00:27:20,470 --> 00:27:18,880
he further stated that it is true and we

691
00:27:22,470 --> 00:27:20,480
should never deny the fact that we live

692
00:27:24,230 --> 00:27:22,480
in a world of conflicting or at least

693
00:27:25,430 --> 00:27:24,240
divergent political and economic

694
00:27:27,269 --> 00:27:25,440
interests

695
00:27:29,110 --> 00:27:27,279
but in spite of that i do believe that

696
00:27:30,710 --> 00:27:29,120
many of our present problems can be

697
00:27:33,029 --> 00:27:30,720
solved more easily when there is an

698
00:27:35,190 --> 00:27:33,039
international community of scientists

699
00:27:37,590 --> 00:27:35,200
and scholars free to follow common goals

700
00:27:39,430 --> 00:27:37,600
and comment objectives

701
00:27:40,950 --> 00:27:39,440
his reflective statements are perhaps in

702
00:27:43,190 --> 00:27:40,960
light of the tumultuous period of

703
00:27:44,870 --> 00:27:43,200
cooperation earlier in the decade

704
00:27:46,070 --> 00:27:44,880
involving the collapse of the original

705
00:27:48,149 --> 00:27:46,080
agreement

706
00:27:51,430 --> 00:27:48,159
of the on the international solar polar

707
00:27:53,190 --> 00:27:51,440
mission ispm in 1981.

708
00:27:55,269 --> 00:27:53,200
this mission would would re-emerge as

709
00:27:57,830 --> 00:27:55,279
ulysses later in the decade and by the

710
00:27:59,430 --> 00:27:57,840
time of its launch in 1990 it would cap

711
00:28:01,029 --> 00:27:59,440
an almost three decade journey from its

712
00:28:03,750 --> 00:28:01,039
original conception as an out of

713
00:28:07,430 --> 00:28:03,760

ecliptic or oee probe

714
00:28:11,510 --> 00:28:09,750
today i hope to show you that how i hope

715
00:28:13,510 --> 00:28:11,520
to show you how the history of ulysses

716
00:28:14,950 --> 00:28:13,520
the ulysses mission can be reframed

717
00:28:17,029 --> 00:28:14,960
within a new emerging historical

718
00:28:18,950 --> 00:28:17,039
literature which attempts to marry the

719
00:28:20,630 --> 00:28:18,960
history of space within a transnational

720
00:28:22,070 --> 00:28:20,640
framework to perhaps tell a more

721
00:28:23,590 --> 00:28:22,080
globalized narrative of space

722
00:28:25,269 --> 00:28:23,600
exploration

723
00:28:27,990 --> 00:28:25,279
my work is an attempt to build upon what

724
00:28:30,310 --> 00:28:28,000
historian asif siddiqui proclaims as the

725
00:28:32,630 --> 00:28:30,320
issue of multiple and contradictory

726
00:28:34,549 --> 00:28:32,640
narratives engendered by national claims

727
00:28:36,310 --> 00:28:34,559
which which have been a staple of space

728
00:28:37,990 --> 00:28:36,320
history

729
00:28:40,230 --> 00:28:38,000
while these nationalistic and even cold

730
00:28:42,549 --> 00:28:40,240
war contexts have have certainly had a

731
00:28:45,029 --> 00:28:42,559
tremendous influence upon the american

732
00:28:46,789 --> 00:28:45,039
and soviet programs what about those po

733
00:28:48,710 --> 00:28:46,799
pro what about those ones which matured

734
00:28:51,269 --> 00:28:48,720
in the post-cold war era such as the

735
00:28:53,510 --> 00:28:51,279
chinese japanese or indian programs or

736
00:28:54,870 --> 00:28:53,520
programs like isa which emerge in the

737
00:28:56,710 --> 00:28:54,880
same period

738
00:28:59,430 --> 00:28:56,720

amidst larger concerns of european

739
00:29:01,430 --> 00:28:59,440
political integration

740
00:29:03,590 --> 00:29:01,440
in the following talk i will detail the

741
00:29:06,630 --> 00:29:03,600
25-year history of ulysses from its

742
00:29:09,510 --> 00:29:06,640
origins as a proposed ooe mission to its

743
00:29:11,350 --> 00:29:09,520
launch in 1990

744
00:29:12,549 --> 00:29:11,360
in doing so i will attempt to reframe

745
00:29:14,789 --> 00:29:12,559
the history

746
00:29:16,630 --> 00:29:14,799
of ulysses and transnational perspective

747
00:29:18,149 --> 00:29:16,640
and show two things

748
00:29:19,750 --> 00:29:18,159
first i will demonstrate that the

749
00:29:22,950 --> 00:29:19,760
spacecraft itself can be seen as a

750
00:29:25,430 --> 00:29:22,960
transnational object that is it's a form

751
00:29:26,630 --> 00:29:25,440
it's a transnational form of cooperation

752
00:29:28,870 --> 00:29:26,640
is embedded

753
00:29:31,110 --> 00:29:28,880
in this in the technology itself which

754
00:29:33,269 --> 00:29:31,120
was negotiated and shaped by the

755
00:29:35,269 --> 00:29:33,279
multitude of american and european

756
00:29:36,470 --> 00:29:35,279
historical actors over its 25-year

757
00:29:38,710 --> 00:29:36,480
history

758
00:29:40,310 --> 00:29:38,720
second and more importantly in detailing

759
00:29:42,870 --> 00:29:40,320
this history from the perspective of a

760
00:29:44,789 --> 00:29:42,880
number of historical actors i will show

761
00:29:46,870 --> 00:29:44,799
that the emergence i will show the

762
00:29:48,950 --> 00:29:46,880
emergence of varied meanings and

763
00:29:57,909 --> 00:29:48,960

imaginings of cooperation amidst the

764
00:30:01,590 --> 00:29:59,430
um all right

765
00:30:04,149 --> 00:30:01,600
so shortly after the launch of sputnik

766
00:30:05,909 --> 00:30:04,159
in 1957 space scientists began to

767
00:30:07,350 --> 00:30:05,919
discuss the advantages of utilizing

768
00:30:09,190 --> 00:30:07,360
spacecraft for a number of scientific

769
00:30:11,029 --> 00:30:09,200
investigations

770
00:30:13,029 --> 00:30:11,039
almost immediately scientists on both

771
00:30:15,350 --> 00:30:13,039
sides of the atlantic began to pursue

772
00:30:17,110 --> 00:30:15,360
solar observatory capabilities these

773
00:30:19,269 --> 00:30:17,120
scientists began to coalesce and develop

774
00:30:20,470 --> 00:30:19,279
new and interesting strategies for solar

775
00:30:21,909 --> 00:30:20,480
exploration

776
00:30:23,430 --> 00:30:21,919
one of which was an out of ecliptic

777
00:30:25,669 --> 00:30:23,440
mission

778
00:30:27,029 --> 00:30:25,679
by the early to mid 1960s a number of

779
00:30:28,470 --> 00:30:27,039
developments from both european and

780
00:30:31,590 --> 00:30:28,480
american scientists and engineers

781
00:30:34,470 --> 00:30:31,600
occurred in europe two champions emerged

782
00:30:36,710 --> 00:30:34,480
german astrophysicist ludwig ludwig

783
00:30:39,190 --> 00:30:36,720
biermann of the max planck institute and

784
00:30:40,549 --> 00:30:39,200
british space scientist harry elliott of

785
00:30:42,070 --> 00:30:40,559
imperial college

786
00:30:43,909 --> 00:30:42,080
biermann's contribution included the

787
00:30:47,269 --> 00:30:43,919
first publication to consider the

788
00:30:49,269 --> 00:30:47,279

scientific value of an ooe mission

789
00:30:50,710 --> 00:30:49,279
the second champion elliott was one of

790
00:30:52,870 --> 00:30:50,720
britain's leading authorities in space

791
00:30:54,389 --> 00:30:52,880
science in this period as an appointed

792
00:30:57,750 --> 00:30:54,399
chair of the british national committee

793
00:31:00,149 --> 00:30:57,760
on space research's working group three

794
00:31:01,830 --> 00:31:00,159
he successfully steered his committee to

795
00:31:03,509 --> 00:31:01,840
the conclusion that an auto ecliptic

796
00:31:05,750 --> 00:31:03,519
mission would best meet the dual

797
00:31:07,509 --> 00:31:05,760
necessities of yielding novel scientific

798
00:31:09,669 --> 00:31:07,519
results and stimulating the nation's

799
00:31:12,549 --> 00:31:09,679
aerospace industry

800
00:31:14,470 --> 00:31:12,559
from 1968 to 1971

801
00:31:15,909 --> 00:31:14,480
he had mixed success regarding support

802
00:31:17,909 --> 00:31:15,919
and interest for an auto ecliptic

803
00:31:21,110 --> 00:31:17,919
mission but ultimately his efforts

804
00:31:23,669 --> 00:31:21,120
resulted in the april 1982 european

805
00:31:26,470 --> 00:31:23,679
space research organization or esro's

806
00:31:28,389 --> 00:31:26,480
mission definition study

807
00:31:30,149 --> 00:31:28,399
by the early 1970s there were parallel

808
00:31:32,070 --> 00:31:30,159
domes excuse me there are parallel

809
00:31:34,630 --> 00:31:32,080
developments amongst

810
00:31:36,149 --> 00:31:34,640
nasa and american space scientists

811
00:31:37,509 --> 00:31:36,159
regarding the feasibility of such a

812
00:31:39,269 --> 00:31:37,519
mission

813
00:31:41,190 --> 00:31:39,279

as it was also seen as a potential

814
00:31:43,509 --> 00:31:41,200
candidate for nasa's emerging planetary

815
00:31:45,350 --> 00:31:43,519
exploration program

816
00:31:46,870 --> 00:31:45,360
by this time american scientists and

817
00:31:48,710 --> 00:31:46,880
engineers were already developing

818
00:31:51,269 --> 00:31:48,720
solutions for issues that might that a

819
00:31:53,350 --> 00:31:51,279
possible ooe mission might face and by

820
00:31:55,669 --> 00:31:53,360
extension technical issues facing future

821
00:31:57,430 --> 00:31:55,679
interplanetary probes

822
00:32:00,789 --> 00:31:57,440
while not as complete as the ezro study

823
00:32:03,830 --> 00:32:00,799
in july 1971 the ames research center

824
00:32:06,630 --> 00:32:03,840
published the pioneer h jupiter swing by

825
00:32:08,389 --> 00:32:06,640
out of ecliptic mission study

826
00:32:09,830 --> 00:32:08,399
while the while the report outlined a

827
00:32:13,590 --> 00:32:09,840
number of different launch and hardware

828
00:32:15,990 --> 00:32:13,600
configurations the proposed pioneer ooe

829
00:32:17,990 --> 00:32:16,000
would use the spare pioneer spacecraft

830
00:32:20,230 --> 00:32:18,000
for pioneers f and g which would

831
00:32:22,149 --> 00:32:20,240
eventually become pioneers 10 and 11

832
00:32:23,830 --> 00:32:22,159
respectively

833
00:32:25,110 --> 00:32:23,840
for the next few years attempts by a

834
00:32:27,269 --> 00:32:25,120
number of american scientists to

835
00:32:29,590 --> 00:32:27,279
persuade nasa administrators to use the

836
00:32:32,389 --> 00:32:29,600
backup pioneer probe for an oe mission

837
00:32:33,750 --> 00:32:32,399
went largely unsuccessful

838
00:32:35,750 --> 00:32:33,760

while a number of administrators

839
00:32:38,230 --> 00:32:35,760
recognize the potential benefits a few

840
00:32:40,710 --> 00:32:38,240
concerns arose regarding its use

841
00:32:42,470 --> 00:32:40,720
writing to john nagle norman ness the

842
00:32:45,430 --> 00:32:42,480
chief of laboratory for

843
00:32:47,430 --> 00:32:45,440
extraterrestrial physics at goddard

844
00:32:48,950 --> 00:32:47,440
expressed concerns about the use of a

845
00:32:51,110 --> 00:32:48,960
backup pioneer

846
00:32:53,590 --> 00:32:51,120
according to him an ooe mission seems

847
00:32:55,430 --> 00:32:53,600
like an exceedingly worthwhile mission

848
00:32:57,590 --> 00:32:55,440
scientifically and perhaps a backup

849
00:33:00,070 --> 00:32:57,600
pioneer probe might not fully capture

850
00:33:02,310 --> 00:33:00,080
the potential of an oe mission at his

851
00:33:05,430 --> 00:33:02,320
behest he urged its adoption only if the

852
00:33:07,509 --> 00:33:05,440
payload be entirely reconsidered

853
00:33:08,710 --> 00:33:07,519
in response nangle cited budgetary and

854
00:33:10,230 --> 00:33:08,720
time constraints regarding the

855
00:33:12,070 --> 00:33:10,240
solicitation of an entirely new

856
00:33:15,029 --> 00:33:12,080
spacecraft

857
00:33:16,630 --> 00:33:15,039
about a year later in august 1972 home

858
00:33:18,389 --> 00:33:16,640
renewal expressed another concern

859
00:33:20,870 --> 00:33:18,399
regarding the use of a backup pioneer

860
00:33:22,789 --> 00:33:20,880
probe for an ooe mission

861
00:33:25,269 --> 00:33:22,799
his suggestion was to keep the pioneer

862
00:33:27,430 --> 00:33:25,279
was to keep the pioneer h as it was to

863
00:33:29,590 --> 00:33:27,440

keep pioneer h as a backup in case

864
00:33:30,950 --> 00:33:29,600
pioneer 10 would not provide sufficient

865
00:33:32,950 --> 00:33:30,960
data regarding

866
00:33:34,710 --> 00:33:32,960
issues like radiation environment of the

867
00:33:36,870 --> 00:33:34,720
interplanetary space

868
00:33:39,110 --> 00:33:36,880
by mid-decade nasa administrators would

869
00:33:40,789 --> 00:33:39,120
continue to solicit advice regarding an

870
00:33:42,389 --> 00:33:40,799
ooe mission

871
00:33:43,750 --> 00:33:42,399
but as as we have seen in yesterday's

872
00:33:45,590 --> 00:33:43,760
talks which highlighted budgetary

873
00:33:47,509 --> 00:33:45,600
concerns in this period

874
00:33:49,269 --> 00:33:47,519
nasa as a result became increasingly

875
00:33:51,990 --> 00:33:49,279
supportive of a joint international

876
00:33:53,830 --> 00:33:52,000
mission

877
00:33:55,990 --> 00:33:53,840
american scientists reactions to such a

878
00:33:58,950 --> 00:33:56,000
joint mission were varied by summer of

879
00:34:00,950 --> 00:33:58,960
1974 some expressed concern

880
00:34:03,269 --> 00:34:00,960
about the perceived lack of consultation

881
00:34:05,190 --> 00:34:03,279
within the scientific community

882
00:34:06,789 --> 00:34:05,200
john simpson physicist at the enrico

883
00:34:08,869 --> 00:34:06,799
firming institute wrote to james

884
00:34:12,149 --> 00:34:08,879
fletcher in 1974 expressing the

885
00:34:14,069 --> 00:34:12,159
importance of an oe mission he stated i

886
00:34:15,990 --> 00:34:14,079
was shocked to learn when i was in italy

887
00:34:17,669 --> 00:34:16,000
that nasa had invited the european space

888
00:34:19,909 --> 00:34:17,679

group to consider taking over this type

889
00:34:21,669 --> 00:34:19,919
of mission i find this incredible since

890
00:34:23,190 --> 00:34:21,679
i can think of no other mission which

891
00:34:25,589 --> 00:34:23,200
would guarantee as many scientific

892
00:34:27,190 --> 00:34:25,599
discoveries per dollar spent on a major

893
00:34:28,950 --> 00:34:27,200
mission than this one

894
00:34:31,510 --> 00:34:28,960
thus this potential reduction of

895
00:34:34,149 --> 00:34:31,520
participation by u.s scientists is hard

896
00:34:35,829 --> 00:34:34,159
to justify within the united states both

897
00:34:37,909 --> 00:34:35,839
for strengthening us science at this

898
00:34:39,750 --> 00:34:37,919
time and for nasa's stated objective of

899
00:34:42,149 --> 00:34:39,760
supporting u.s science this mission is

900
00:34:43,750 --> 00:34:42,159
outstanding i am just strongly enough

901
00:34:45,030 --> 00:34:43,760
oriented towards strengthening u.s

902
00:34:46,629 --> 00:34:45,040
science

903
00:34:50,069 --> 00:34:46,639
at this time to argue that this should

904
00:34:51,750 --> 00:34:50,079
be an all-us mission if possible

905
00:34:53,349 --> 00:34:51,760
nagel recognized by mid-decade that

906
00:34:54,710 --> 00:34:53,359
while u.s scientists were increasingly

907
00:34:56,950 --> 00:34:54,720
concerned about the idea of

908
00:34:58,150 --> 00:34:56,960
international cooperation congress on

909
00:34:59,910 --> 00:34:58,160
the other hand was becoming more

910
00:35:02,150 --> 00:34:59,920
interested in the idea of cooperation

911
00:35:04,150 --> 00:35:02,160
and space missions in general according

912
00:35:06,230 --> 00:35:04,160
to him congress views such cooperation

913
00:35:08,069 --> 00:35:06,240

as a reduction in funding requirements

914
00:35:09,589 --> 00:35:08,079
whereas the u.s scientists regard such

915
00:35:11,670 --> 00:35:09,599
missions which will carry u.s and

916
00:35:15,190 --> 00:35:11,680
foreign experiments as a reduction in

917
00:35:16,790 --> 00:35:15,200
their own opportunities to do research

918
00:35:18,630 --> 00:35:16,800
in the tight budget climate for space

919
00:35:20,550 --> 00:35:18,640
science two different concerns from two

920
00:35:23,510 --> 00:35:20,560
different groups seem to place their

921
00:35:25,270 --> 00:35:23,520
opinions at odds

922
00:35:27,190 --> 00:35:25,280
to nagel and perhaps other nasa

923
00:35:28,550 --> 00:35:27,200
administrators cooperation would

924
00:35:30,630 --> 00:35:28,560
actually be a good compromise for all

925
00:35:32,550 --> 00:35:30,640
parties involved as collaboration would

926
00:35:34,310 --> 00:35:32,560
produce a net increase in the number of

927
00:35:38,069 --> 00:35:34,320
flights and hence a net increase in the

928
00:35:39,829 --> 00:35:38,079
total opportunities for us scientists

929
00:35:42,950 --> 00:35:39,839
moving on

930
00:35:46,310 --> 00:35:42,960
by the end of 1974 two main developments

931
00:35:48,150 --> 00:35:46,320
led to what would eventually become ispm

932
00:35:49,990 --> 00:35:48,160
in europe as ezra was considering

933
00:35:52,230 --> 00:35:50,000
mission priorities for the 1980s a

934
00:35:54,150 --> 00:35:52,240
stereoscopic mission to study coronal

935
00:35:55,829 --> 00:35:54,160
phenomena emerge as a compelling and

936
00:35:56,870 --> 00:35:55,839
worthwhile candidate for a future

937
00:35:58,630 --> 00:35:56,880
mission

938
00:36:00,710 --> 00:35:58,640

ezreal's launching program advisory

939
00:36:02,230 --> 00:36:00,720
committee elpac included both an

940
00:36:03,990 --> 00:36:02,240
o-e-o-o-e

941
00:36:05,750 --> 00:36:04,000
and a stereoscopic mission as top

942
00:36:07,349 --> 00:36:05,760
priorities which led to the second

943
00:36:10,790 --> 00:36:07,359
development the combination of a

944
00:36:13,430 --> 00:36:10,800
stereoscopic mission and an ooe one

945
00:36:15,670 --> 00:36:13,440
and this essentially proposed that

946
00:36:17,910 --> 00:36:15,680
the out of ecliptic mission would use

947
00:36:19,349 --> 00:36:17,920
two you would launch two satellites one

948
00:36:20,950 --> 00:36:19,359
which would fly over the north pole of

949
00:36:24,950 --> 00:36:20,960
the sun and another one which would fly

950
00:36:28,150 --> 00:36:26,710
nasa seemed to agree and according to

951
00:36:29,990 --> 00:36:28,160
james fletcher the best chance of

952
00:36:31,750 --> 00:36:30,000
implementing an out of ecliptic mission

953
00:36:34,630 --> 00:36:31,760
is with a mission mode that will attract

954
00:36:36,790 --> 00:36:34,640
as wide a constituency as possible

955
00:36:38,630 --> 00:36:36,800
something that a combined stereoscopic

956
00:36:40,390 --> 00:36:38,640
and oee mission would do

957
00:36:43,510 --> 00:36:40,400
these these developments created a ripe

958
00:36:45,030 --> 00:36:43,520
atmosphere for cooperation in 1974 ezra

959
00:36:46,550 --> 00:36:45,040
and nasa agreed to cooperate on two

960
00:36:49,030 --> 00:36:46,560
joint missions

961
00:36:51,510 --> 00:36:49,040
at the at the joint science program

962
00:36:53,109 --> 00:36:51,520
review held at aztec and one of the

963
00:36:56,710 --> 00:36:53,119

agreed programs was the combined

964
00:36:58,310 --> 00:36:56,720
stereoscopic ooe mission

965
00:36:59,670 --> 00:36:58,320
combining two such missions was very

966
00:37:01,829 --> 00:36:59,680
favorable to both nasa and ezra

967
00:37:03,750 --> 00:37:01,839
administrators and as a result

968
00:37:06,390 --> 00:37:03,760
a science working group was established

969
00:37:08,950 --> 00:37:06,400
in order to form an optimum mission mode

970
00:37:11,829 --> 00:37:08,960
in the first few months of 1975 based on

971
00:37:13,829 --> 00:37:11,839
the joint study esro science planners

972
00:37:16,069 --> 00:37:13,839
recommended that an ooe dual

973
00:37:17,430 --> 00:37:16,079
stereoscopic spacecraft using a jupiter

974
00:37:22,230 --> 00:37:17,440
gravitational assist as the most

975
00:37:26,390 --> 00:37:24,150
as historian carl huff bauer has shown

976
00:37:28,950 --> 00:37:26,400
esa which replaced ezro as europe's

977
00:37:30,790 --> 00:37:28,960
prime space organization in 1975

978
00:37:33,109 --> 00:37:30,800
emphasized a number of priorities for

979
00:37:35,190 --> 00:37:33,119
the cooperative ooe mission such as

980
00:37:37,109 --> 00:37:35,200
clean interfaces their involvement into

981
00:37:39,030 --> 00:37:37,119
choice of experiments and principal

982
00:37:41,030 --> 00:37:39,040
investigators

983
00:37:42,710 --> 00:37:41,040
observations of jupiter their insistence

984
00:37:44,870 --> 00:37:42,720
on observations of jupiter be made

985
00:37:46,790 --> 00:37:44,880
during the swing by and the conviction

986
00:37:48,550 --> 00:37:46,800
that the two spacecraft option remain

987
00:37:50,230 --> 00:37:48,560
essential

988
00:37:52,630 --> 00:37:50,240

overall by mid-decade the mission

989
00:37:57,349 --> 00:37:52,640
constituency for an ooe mission

990
00:38:03,190 --> 00:38:00,470
in april 1977 nasa and esa began

991
00:38:05,750 --> 00:38:03,200
soliciting proposed proposals for an oe

992
00:38:07,430 --> 00:38:05,760
and by march 1978 a total of 16

993
00:38:09,510 --> 00:38:07,440
experiments were chosen for more than

994
00:38:12,069 --> 00:38:09,520
200 scientists belonging to 65

995
00:38:13,349 --> 00:38:12,079
universities from europe and the united

996
00:38:14,710 --> 00:38:13,359
states

997
00:38:16,710 --> 00:38:14,720
while the specific technical and

998
00:38:18,950 --> 00:38:16,720
scientific capabilities of

999
00:38:20,870 --> 00:38:18,960
the ooe mission were developed from 77

1000
00:38:22,230 --> 00:38:20,880
to 78 securing funding for the

1001
00:38:23,910 --> 00:38:22,240
cooperative mission was increasingly

1002
00:38:26,390 --> 00:38:23,920
becoming a problem

1003
00:38:29,109 --> 00:38:26,400
for instance in may 1977 nasa was

1004
00:38:31,270 --> 00:38:29,119
scheduled to take a 77 million cut to

1005
00:38:33,109 --> 00:38:31,280
the fiscal year 78 budget this had a

1006
00:38:34,790 --> 00:38:33,119
particular impact on the planetary

1007
00:38:37,030 --> 00:38:34,800
missions program especially for the

1008
00:38:38,630 --> 00:38:37,040
newly planned jupiter orbiter probe in

1009
00:38:41,030 --> 00:38:38,640
july the house of representatives

1010
00:38:43,990 --> 00:38:41,040
approved 17.7 million dollars for the

1011
00:38:45,750 --> 00:38:44,000
jupiter probe and as a stipu although

1012
00:38:47,430 --> 00:38:45,760
they had a stipulation

1013
00:38:49,190 --> 00:38:47,440

and that was

1014
00:38:52,310 --> 00:38:49,200
that the

1015
00:38:54,470 --> 00:38:52,320
upcoming plan start 1979 plan start for

1016
00:38:56,710 --> 00:38:54,480
oae would use a modified version of the

1017
00:38:58,069 --> 00:38:56,720
jupiter orbiter probe

1018
00:39:00,470 --> 00:38:58,079
so thus

1019
00:39:02,230 --> 00:39:00,480
the fates both of oe and the jupiter

1020
00:39:03,990 --> 00:39:02,240
orbiter were connected with this new

1021
00:39:06,230 --> 00:39:04,000
budget approval for the for the orbiter

1022
00:39:09,030 --> 00:39:06,240
the oe mission plans would have been thr

1023
00:39:12,310 --> 00:39:09,040
without the new budget approval the oe

1024
00:39:16,310 --> 00:39:13,750
requesting more funding for the out of

1025
00:39:18,230 --> 00:39:16,320
ecliptic mission which by late 1977 was

1026
00:39:20,150 --> 00:39:18,240
renamed as the solar polar mission was

1027
00:39:22,630 --> 00:39:20,160
becoming increasingly difficult in

1028
00:39:25,829 --> 00:39:22,640
september 1977 nasa secured

1029
00:39:28,790 --> 00:39:25,839
authorization from the uh omb

1030
00:39:30,870 --> 00:39:28,800
from omb for an initial fiscal 78 budget

1031
00:39:33,109 --> 00:39:30,880
of 13 million dollars arguing that it

1032
00:39:34,950 --> 00:39:33,119
was their only new start for that year

1033
00:39:37,910 --> 00:39:34,960
despite these issues one year later in

1034
00:39:39,750 --> 00:39:37,920
1978 after intense lobbying efforts of

1035
00:39:41,510 --> 00:39:39,760
the american space science community and

1036
00:39:43,109 --> 00:39:41,520
harold glasser the first director of

1037
00:39:44,710 --> 00:39:43,119
nest of the nasa's solar terrestrial

1038
00:39:48,150 --> 00:39:44,720

division jimmy carter officially

1039
00:39:53,190 --> 00:39:51,589
six months later on march 29 1979 nasa

1040
00:39:54,710 --> 00:39:53,200
and issa signed the memorandum of

1041
00:39:58,069 --> 00:39:54,720
understanding for the international

1042
00:40:02,390 --> 00:39:59,829
as was seen prior to the signing of the

1043
00:40:03,829 --> 00:40:02,400
mou ispm was already facing budget

1044
00:40:06,630 --> 00:40:03,839
issues

1045
00:40:09,190 --> 00:40:06,640
in january 1978 nasa submitted a budget

1046
00:40:10,790 --> 00:40:09,200
request for fiscal year 79

1047
00:40:13,270 --> 00:40:10,800
which included 13 million dollars for

1048
00:40:15,030 --> 00:40:13,280
ispm

1049
00:40:16,790 --> 00:40:15,040
claiming it was one of their five new

1050
00:40:18,390 --> 00:40:16,800
start programs for that year although

1051
00:40:20,550 --> 00:40:18,400
congress approved it they cut five

1052
00:40:22,790 --> 00:40:20,560
million dollars of that budget in order

1053
00:40:24,309 --> 00:40:22,800
to reallocate those funds to cover cost

1054
00:40:25,829 --> 00:40:24,319
overruns for the space shuttle

1055
00:40:27,270 --> 00:40:25,839
development

1056
00:40:29,030 --> 00:40:27,280
by the end of the year the senate

1057
00:40:31,190 --> 00:40:29,040
appropriations subcommittee wrote to

1058
00:40:33,430 --> 00:40:31,200
nasa administrator robert frosh

1059
00:40:35,750 --> 00:40:33,440
suggesting that ispm delayed two years

1060
00:40:37,510 --> 00:40:35,760
citing two reasons to reflect the delays

1061
00:40:39,270 --> 00:40:37,520
in shuttle development and because the

1062
00:40:41,430 --> 00:40:39,280
committee was concerned with the initial

1063
00:40:43,349 --> 00:40:41,440

upper stage necessary to send the two

1064
00:40:45,109 --> 00:40:43,359
spacecraft on the flight path would not

1065
00:40:49,829 --> 00:40:45,119
be adequate and that nasa should develop

1066
00:40:54,309 --> 00:40:51,910
despite 135 million dollars worth of

1067
00:40:55,910 --> 00:40:54,319
contracts already promised by this point

1068
00:40:58,069 --> 00:40:55,920
ispm was teetering on the edge of

1069
00:40:59,670 --> 00:40:58,079
cancellation as a carter

1070
00:41:02,550 --> 00:40:59,680
as the carter administration submitted

1071
00:41:03,910 --> 00:41:02,560
an amended budget fiscal year 1981 which

1072
00:41:07,109 --> 00:41:03,920
called for a two-year launch delay and

1073
00:41:08,870 --> 00:41:07,119
roughly 43 million dollar cut

1074
00:41:10,550 --> 00:41:08,880
the cut and delay urged protests by a

1075
00:41:12,390 --> 00:41:10,560
number of groups which included not only

1076
00:41:14,950 --> 00:41:12,400
european nations but also the white

1077
00:41:17,190 --> 00:41:14,960
house and state department

1078
00:41:18,790 --> 00:41:17,200
white house officials in a letter to

1079
00:41:20,950 --> 00:41:18,800
massachusetts representative edward

1080
00:41:23,030 --> 00:41:20,960
boland claimed the action threatens not

1081
00:41:26,069 --> 00:41:23,040
only international cooperation in space

1082
00:41:27,510 --> 00:41:26,079
but other areas of technology as well

1083
00:41:29,109 --> 00:41:27,520
a few months later the house

1084
00:41:31,349 --> 00:41:29,119
appropriations committee recommended in

1085
00:41:34,710 --> 00:41:31,359
the 1980 supplemental appropriations

1086
00:41:36,150 --> 00:41:34,720
bill that ispm be cancelled citing among

1087
00:41:38,790 --> 00:41:36,160
other reasons that the two-year delay

1088
00:41:40,230 --> 00:41:38,800

would cost at least an additional 150

1089
00:41:41,829 --> 00:41:40,240
million dollars

1090
00:41:43,589 --> 00:41:41,839
while esa reacted to the possible

1091
00:41:45,829 --> 00:41:43,599
cancellation of strong diplomatic

1092
00:41:47,670 --> 00:41:45,839
protests florida representative don

1093
00:41:49,190 --> 00:41:47,680
fuqua successfully argued that the

1094
00:41:50,550 --> 00:41:49,200
cancellation of the funds would

1095
00:41:52,950 --> 00:41:50,560
constitute legislation and

1096
00:41:54,470 --> 00:41:52,960
appropriations bill a violation of house

1097
00:41:56,470 --> 00:41:54,480
rules

1098
00:41:58,309 --> 00:41:56,480
as joan johnson freeze has shown the

1099
00:42:00,390 --> 00:41:58,319
fate of ispm took a turn for the worse

1100
00:42:02,309 --> 00:42:00,400
in the early 1980s as the whole budget

1101
00:42:03,829 --> 00:42:02,319
process and attitude fundamentally

1102
00:42:05,430 --> 00:42:03,839
changed with the election of

1103
00:42:06,790 --> 00:42:05,440
president ronald reagan and his

1104
00:42:08,790 --> 00:42:06,800
appointment of david stockton as

1105
00:42:11,270 --> 00:42:08,800
director of omb

1106
00:42:12,950 --> 00:42:11,280
by early 1981 it became clear that the

1107
00:42:15,109 --> 00:42:12,960
reagan administration's proposed budget

1108
00:42:17,030 --> 00:42:15,119
cuts for nasa would effectively cancel

1109
00:42:19,109 --> 00:42:17,040
ispm

1110
00:42:21,430 --> 00:42:19,119
after reagan took office omb amended the

1111
00:42:23,349 --> 00:42:21,440
fiscal year 82 space science budget by

1112
00:42:24,790 --> 00:42:23,359
almost 23 percent

1113
00:42:26,069 --> 00:42:24,800

this move effectively signaled the

1114
00:42:27,589 --> 00:42:26,079
cancer the cancellation of the

1115
00:42:29,750 --> 00:42:27,599
development of the american portion of

1116
00:42:31,589 --> 00:42:29,760
ispm

1117
00:42:33,349 --> 00:42:31,599
swift and almost unilateral decision by

1118
00:42:35,510 --> 00:42:33,359
the reagan administration elicited

1119
00:42:36,790 --> 00:42:35,520
uproar from both american and european

1120
00:42:39,349 --> 00:42:36,800
delegations

1121
00:42:41,190 --> 00:42:39,359
american politicians decried that that

1122
00:42:43,190 --> 00:42:41,200
that a lack of new start projects could

1123
00:42:44,630 --> 00:42:43,200
jeopardize the ability for nasa to keep

1124
00:42:46,150 --> 00:42:44,640
its status as a scientific and

1125
00:42:48,309 --> 00:42:46,160
engineering leader

1126
00:42:50,150 --> 00:42:48,319
esa individuals responded by declaring

1127
00:42:54,069 --> 00:42:50,160
decision to be an unacceptable breach of

1128
00:42:57,750 --> 00:42:55,829
as a response nasa and

1129
00:42:59,510 --> 00:42:57,760
the reagan administration offered vague

1130
00:43:01,589 --> 00:42:59,520
reassurances that the u.s would remain

1131
00:43:03,190 --> 00:43:01,599
as part of the ispm mission at a reduced

1132
00:43:05,430 --> 00:43:03,200
capacity

1133
00:43:06,630 --> 00:43:05,440
which europe viewed as unacceptable as

1134
00:43:08,550 --> 00:43:06,640
well

1135
00:43:11,109 --> 00:43:08,560
by march of that year isa assembled its

1136
00:43:13,190 --> 00:43:11,119
political forces against this decision

1137
00:43:15,750 --> 00:43:13,200
director general of issa at the time

1138
00:43:17,510 --> 00:43:15,760

eric quisguard stated to the house

1139
00:43:19,109 --> 00:43:17,520
science and technology committee that it

1140
00:43:21,589 --> 00:43:19,119
cannot be accepted that it's such an

1141
00:43:23,030 --> 00:43:21,599
advanced stage of ispm development and

1142
00:43:25,670 --> 00:43:23,040
after a commitment of more than half of

1143
00:43:27,430 --> 00:43:25,680
the european funding nasa presents isa

1144
00:43:28,950 --> 00:43:27,440
with the fatal complete of its

1145
00:43:31,030 --> 00:43:28,960
withdrawal from an international

1146
00:43:33,349 --> 00:43:31,040
cooperative program especially without

1147
00:43:35,190 --> 00:43:33,359
prior consultation

1148
00:43:36,870 --> 00:43:35,200
he further went on to tell the committee

1149
00:43:38,790 --> 00:43:36,880
that the short-term financial advantage

1150
00:43:41,109 --> 00:43:38,800
for nasa might come at the cost of

1151
00:43:43,510 --> 00:43:41,119
potential future cooperative entries in

1152
00:43:45,190 --> 00:43:43,520
the following weeks quiz garden at and

1153
00:43:47,510 --> 00:43:45,200
esa expressed willingness for a

1154
00:43:52,390 --> 00:43:47,520
compromise solution as long as the us

1155
00:43:56,790 --> 00:43:53,910
despite some promising efforts in the

1156
00:43:58,790 --> 00:43:56,800
early summer of 1981 newly instated nasa

1157
00:44:01,589 --> 00:43:58,800
administrator james bags informed quiz

1158
00:44:03,270 --> 00:44:01,599
guard on september 9th quote that nasa

1159
00:44:05,589 --> 00:44:03,280
would not include any request for funds

1160
00:44:07,589 --> 00:44:05,599
for the second ispm spacecraft in the

1161
00:44:09,270 --> 00:44:07,599
fiscal year 83 budget

1162
00:44:11,270 --> 00:44:09,280
he did offer support and encouragement

1163
00:44:13,349 --> 00:44:11,280

for issa to pursue a single spacecraft

1164
00:44:15,349 --> 00:44:13,359
mission in which nasa would fulfill any

1165
00:44:16,550 --> 00:44:15,359
remaining commitments

1166
00:44:18,710 --> 00:44:16,560
by the end of the year the dual

1167
00:44:22,870 --> 00:44:18,720
spacecraft ispm mission was officially

1168
00:44:27,030 --> 00:44:24,390
despite the cancellation of the u.s

1169
00:44:28,870 --> 00:44:27,040
craft esa decided to continue with the

1170
00:44:30,069 --> 00:44:28,880
solar polar probe

1171
00:44:32,390 --> 00:44:30,079
citing a

1172
00:44:34,870 --> 00:44:32,400
substantial commitment already made thus

1173
00:44:39,910 --> 00:44:37,510
in the early 1982 issa sought continued

1174
00:44:41,510 --> 00:44:39,920
assurance from nasa and congress

1175
00:44:43,510 --> 00:44:41,520
they also made a point to stress in

1176
00:44:45,589 --> 00:44:43,520
their discussions

1177
00:44:47,270 --> 00:44:45,599
to develop

1178
00:44:48,829 --> 00:44:47,280
and establish a framework for future

1179
00:44:51,190 --> 00:44:48,839
cooperative

1180
00:44:53,190 --> 00:44:51,200
ventures the start of what johnson

1181
00:44:55,270 --> 00:44:53,200
freeze characterizes as a strategy that

1182
00:44:57,430 --> 00:44:55,280
all as a strategy that ultimately made

1183
00:45:02,550 --> 00:44:57,440
east a stronger autonomous and more

1184
00:45:08,230 --> 00:45:05,270
moreover in july 1984 issa announced the

1185
00:45:09,670 --> 00:45:08,240
renaming of ispm to ulysses

1186
00:45:11,510 --> 00:45:09,680
while they suggested the name change

1187
00:45:13,510 --> 00:45:11,520
which was chosen to reflect the hero in

1188
00:45:15,510 --> 00:45:13,520

the odyssey and a reference to dante's

1189
00:45:17,109 --> 00:45:15,520
inferno perhaps this name change also

1190
00:45:19,829 --> 00:45:17,119
reflects a long arduous journey of

1191
00:45:24,710 --> 00:45:19,839
development

1192
00:45:28,470 --> 00:45:26,630
while the ulysses was originally

1193
00:45:31,030 --> 00:45:28,480
scheduled to be launched in 1980s in may

1194
00:45:34,550 --> 00:45:31,040
1986 aboard the space shuttle

1195
00:45:36,390 --> 00:45:34,560
the challenger the challenger accident

1196
00:45:37,190 --> 00:45:36,400
delayed further

1197
00:45:38,790 --> 00:45:37,200
launch

1198
00:45:40,950 --> 00:45:38,800
indefinitely

1199
00:45:42,550 --> 00:45:40,960
a new launch date was eventually chosen

1200
00:45:44,630 --> 00:45:42,560
after the restoration of the shuttle

1201
00:45:51,510 --> 00:45:44,640
program and ulysses was finally launched

1202
00:45:55,349 --> 00:45:53,109
so what makes the history of ulysses

1203
00:45:56,950 --> 00:45:55,359
transnational to start i would like to

1204
00:45:59,270 --> 00:45:56,960
suggest that the main technological

1205
00:46:01,510 --> 00:45:59,280
component the spacecraft itself is an

1206
00:46:03,349 --> 00:46:01,520
example of a transnational object by

1207
00:46:05,190 --> 00:46:03,359
this i mean that the mission and the

1208
00:46:07,030 --> 00:46:05,200
spacecraft was negotiated along

1209
00:46:09,030 --> 00:46:07,040
transnational lines in which a host of

1210
00:46:11,430 --> 00:46:09,040
actors and institutions helped to shape

1211
00:46:13,109 --> 00:46:11,440
the technological component itself

1212
00:46:14,790 --> 00:46:13,119
that is its development into what it

1213
00:46:16,550 --> 00:46:14,800

eventually became was a result of a

1214
00:46:18,550 --> 00:46:16,560
number of different factors and lines of

1215
00:46:23,990 --> 00:46:18,560
cooperation from both european and

1216
00:46:27,349 --> 00:46:25,349
finally i would like to conclude with

1217
00:46:29,109 --> 00:46:27,359
another aspect of ulysses history that

1218
00:46:30,230 --> 00:46:29,119
benefits from this perspective

1219
00:46:31,750 --> 00:46:30,240
the approach that i have taken

1220
00:46:32,950 --> 00:46:31,760
highlights the changing meanings and

1221
00:46:35,270 --> 00:46:32,960
imaginings of cooperation and

1222
00:46:37,270 --> 00:46:35,280
collaboration between the various actors

1223
00:46:39,510 --> 00:46:37,280
and organizations such as the number of

1224
00:46:41,030 --> 00:46:39,520
individuals at nasa and esa as well as a

1225
00:46:43,510 --> 00:46:41,040
number of scientific and engineering

1226
00:46:45,510 --> 00:46:43,520
communities it seems at different times

1227
00:46:48,069 --> 00:46:45,520
different individuals saw different sets

1228
00:46:51,510 --> 00:46:48,079
of values or perhaps no value at all in

1229
00:46:53,190 --> 00:46:51,520
cooperation on an auto ecliptic mission

1230
00:46:54,790 --> 00:46:53,200
furthermore ulysses provides an

1231
00:46:56,870 --> 00:46:54,800
interesting case study for such an

1232
00:46:58,630 --> 00:46:56,880
analysis as it complicates the nature of

1233
00:47:00,390 --> 00:46:58,640
cooperation in the sense that it was a

1234
00:47:02,230 --> 00:47:00,400
failed project as its original

1235
00:47:03,670 --> 00:47:02,240
conception as a dual spacecraft mission

1236
00:47:05,750 --> 00:47:03,680
dissolved

1237
00:47:07,270 --> 00:47:05,760
yet while the original vision of cooper

1238
00:47:10,230 --> 00:47:07,280

the original vision of a cooperative

1239
00:47:12,710 --> 00:47:10,240
ispm mission failed the project lived on

1240
00:47:15,109 --> 00:47:12,720
both in the sense that if uh actual

1241
00:47:17,589 --> 00:47:15,119
material object was created ulysses

1242
00:47:19,349 --> 00:47:17,599
and the ulysses probe

1243
00:47:22,150 --> 00:47:19,359
and the ulysses mission continued albeit

1244
00:47:26,390 --> 00:47:23,589
in this light i would like to ask the

1245
00:47:27,910 --> 00:47:26,400
question what exactly is a failure

1246
00:47:30,069 --> 00:47:27,920
while the ispm mission was never

1247
00:47:31,349 --> 00:47:30,079
launched some form of an oee mission did

1248
00:47:33,510 --> 00:47:31,359
eventually make its journey around

1249
00:47:34,790 --> 00:47:33,520
jupiter and towards the sun while i do

1250
00:47:37,349 --> 00:47:34,800
not think i can provide a concrete

1251
00:47:39,670 --> 00:47:37,359
historical answer as of yet i think in

1252
00:47:41,109 --> 00:47:39,680
reframing ulysses in this way

1253
00:47:42,950 --> 00:47:41,119
hopefully i can tease out some of the

1254
00:47:45,109 --> 00:47:42,960
more interesting and nuanced aspects

1255
00:47:46,790 --> 00:47:45,119
involved in failure more generally in

1256
00:47:49,510 --> 00:47:46,800
space exploration and cooperative

1257
00:47:50,790 --> 00:47:49,520
ventures in space exploration

1258
00:47:52,790 --> 00:47:50,800
so to conclude hopefully i've

1259
00:47:54,470 --> 00:47:52,800
demonstrated why and how adopting a

1260
00:47:56,630 --> 00:47:54,480
transnational perspective might enrich

1261
00:47:58,230 --> 00:47:56,640
our understanding of international of

1262
00:48:00,150 --> 00:47:58,240
international cooperation and space

1263
00:48:01,910 --> 00:48:00,160

exploration more generally while i've

1264
00:48:03,589 --> 00:48:01,920
only scratched the surface in this paper

1265
00:48:04,870 --> 00:48:03,599
i believe that ultimately adopting this

1266
00:48:06,549 --> 00:48:04,880
perspective

1267
00:48:07,910 --> 00:48:06,559
might help us understand the multiple

1268
00:48:10,150 --> 00:48:07,920
imagine and varying meanings of

1269
00:48:26,069 --> 00:48:10,160
collaboration constructed by both nasa

1270
00:48:26,079 --> 00:48:40,309
questions

1271
00:48:40,319 --> 00:48:49,109
thank you

1272
00:48:49,119 --> 00:48:52,150
encouragement

1273
00:48:56,230 --> 00:48:53,829
oh i'm sorry i can't see over here sure

1274
00:48:57,510 --> 00:48:56,240
go ahead no worries

1275
00:48:59,190 --> 00:48:57,520
thank you yeah this is for the last

1276
00:49:01,190 --> 00:48:59,200
speaker thank you for the fantastic

1277
00:49:02,630 --> 00:49:01,200
presentation i wanted to ask a little

1278
00:49:03,910 --> 00:49:02,640
bit or push a little more allow you to

1279
00:49:05,990 --> 00:49:03,920
expand a bit on the notion of a

1280
00:49:08,230 --> 00:49:06,000
transnational object particularly as

1281
00:49:10,150 --> 00:49:08,240
distinct from say a boundary object and

1282
00:49:11,910 --> 00:49:10,160
especially in the light of uh current

1283
00:49:13,750 --> 00:49:11,920
trends in a transnational theory and

1284
00:49:15,270 --> 00:49:13,760
anthropology for example that would

1285
00:49:16,870 --> 00:49:15,280
inspire us to step away from any idea

1286
00:49:19,190 --> 00:49:16,880
that nation states are necessarily the

1287
00:49:21,030 --> 00:49:19,200
boundaries by means of which

1288
00:49:23,190 --> 00:49:21,040

national or transnational collaboration

1289
00:49:24,790 --> 00:49:23,200
should be understood and how that's

1290
00:49:26,069 --> 00:49:24,800
particularly tricky in the case of space

1291
00:49:28,150 --> 00:49:26,079
missions when you have these large

1292
00:49:29,910 --> 00:49:28,160
institutions that are bound up in

1293
00:49:32,390 --> 00:49:29,920
national frameworks but also especially

1294
00:49:34,230 --> 00:49:32,400
that represent national interests and

1295
00:49:35,829 --> 00:49:34,240
i'm wondering how looking at say the

1296
00:49:37,990 --> 00:49:35,839
ulysses

1297
00:49:40,390 --> 00:49:38,000
as a transnational object inspires us to

1298
00:49:41,670 --> 00:49:40,400
break apart perhaps our notions of the

1299
00:49:45,589 --> 00:49:41,680
singular

1300
00:49:47,510 --> 00:49:45,599
for example european space agency etc

1301
00:49:49,109 --> 00:49:47,520
yeah so in the in the longer story i

1302
00:49:50,710 --> 00:49:49,119
didn't outline it in the paper i mean in

1303
00:49:51,910 --> 00:49:50,720
my talk but in the paper

1304
00:49:52,950 --> 00:49:51,920
there are a lot more discussions

1305
00:49:56,069 --> 00:49:52,960
particularly about the specific

1306
00:49:59,349 --> 00:49:56,079
components uh one such thing was the

1307
00:50:02,710 --> 00:49:59,359
kind of the engine component

1308
00:50:05,829 --> 00:50:02,720
and rtg was eventually used for ulysses

1309
00:50:08,549 --> 00:50:05,839
but i i think that in focusing on these

1310
00:50:10,470 --> 00:50:08,559
discussions which which uh were within

1311
00:50:12,790 --> 00:50:10,480
the specific communities themselves so

1312
00:50:14,630 --> 00:50:12,800
they weren't necessarily discussions

1313
00:50:16,069 --> 00:50:14,640

amongst administrators to administrator

1314
00:50:17,990 --> 00:50:16,079
but these were the different scientific

1315
00:50:19,190 --> 00:50:18,000
communities arguing well you know this

1316
00:50:21,589 --> 00:50:19,200
configuration is better this

1317
00:50:24,309 --> 00:50:21,599
configuration is worse or

1318
00:50:26,470 --> 00:50:24,319
something along those lines um i think

1319
00:50:28,470 --> 00:50:26,480
of sort of prioritizing the sort of

1320
00:50:30,630 --> 00:50:28,480
top-down

1321
00:50:32,870 --> 00:50:30,640
view less and kind of teasing out these

1322
00:50:33,990 --> 00:50:32,880
these smaller kind of arrangements and

1323
00:50:36,069 --> 00:50:34,000
arguments

1324
00:50:37,190 --> 00:50:36,079
and discussions

1325
00:50:39,190 --> 00:50:37,200
it doesn't it won't necessarily

1326
00:50:41,270 --> 00:50:39,200
completely push out the national context

1327
00:50:43,030 --> 00:50:41,280
but it won't prioritize it as a kind of

1328
00:50:45,349 --> 00:50:43,040
major focus

1329
00:50:46,309 --> 00:50:45,359
thank you

1330
00:50:48,630 --> 00:50:46,319
did the

1331
00:50:52,069 --> 00:50:48,640
clamps of the green bank telescope

1332
00:50:53,589 --> 00:50:52,079
create concerns at parks

1333
00:50:55,190 --> 00:50:53,599
uh the the

1334
00:50:57,030 --> 00:50:55,200
radio telescope the green bank had the

1335
00:50:59,990 --> 00:50:57,040
rather speculative collapse a few years

1336
00:51:01,510 --> 00:51:00,000
ago from 1998 yes that one uh yeah well

1337
00:51:03,670 --> 00:51:01,520
that was actually that's a good point

1338
00:51:07,430 --> 00:51:03,680

because the the green bank i think is

1339
00:51:09,589 --> 00:51:07,440
the 120 foot telescope that collapsed um

1340
00:51:10,790 --> 00:51:09,599
was put together very rapidly

1341
00:51:11,829 --> 00:51:10,800
for a very

1342
00:51:13,990 --> 00:51:11,839
designed

1343
00:51:16,950 --> 00:51:14,000
to be used only for a a very short

1344
00:51:18,950 --> 00:51:16,960
period and then but it was continually

1345
00:51:20,710 --> 00:51:18,960
extended of course and it was a transit

1346
00:51:23,270 --> 00:51:20,720
instrument and

1347
00:51:25,990 --> 00:51:23,280
it failed from metal fatigue and so on

1348
00:51:28,230 --> 00:51:26,000
um but the parks telescope was designed

1349
00:51:29,270 --> 00:51:28,240
to have a lifetime of about 20 or so

1350
00:51:31,109 --> 00:51:29,280
years and

1351
00:51:32,790 --> 00:51:31,119
last year we celebrated the 50th

1352
00:51:34,549 --> 00:51:32,800
anniversary and with the new upgrades

1353
00:51:36,790 --> 00:51:34,559
we're doing we're gonna probably

1354
00:51:37,750 --> 00:51:36,800
continue for for many more years to to

1355
00:51:38,790 --> 00:51:37,760
come

1356
00:51:43,510 --> 00:51:38,800
um

1357
00:51:45,990 --> 00:51:43,520
of the parks telescope were users of

1358
00:51:48,390 --> 00:51:46,000
of um the instruments at greenbank the

1359
00:51:50,309 --> 00:51:48,400
national radio astronomy observatory in

1360
00:51:52,230 --> 00:51:50,319
west virginia and

1361
00:51:55,030 --> 00:51:52,240
there were always a lot of close ties

1362
00:51:58,069 --> 00:51:55,040
between the the two

1363
00:51:59,910 --> 00:51:58,079

radio astronomy communities and

1364
00:52:01,109 --> 00:51:59,920
i think at the time it came as a

1365
00:52:03,349 --> 00:52:01,119
profound

1366
00:52:05,030 --> 00:52:03,359
surprise i know it came as a surprise to

1367
00:52:07,270 --> 00:52:05,040
the observer at the time

1368
00:52:09,270 --> 00:52:07,280
um

1369
00:52:10,710 --> 00:52:09,280
he just was not expecting that i hope it

1370
00:52:15,190 --> 00:52:10,720
never happens to parks because the

1371
00:52:17,510 --> 00:52:16,710
so

1372
00:52:22,710 --> 00:52:17,520
but

1373
00:52:25,750 --> 00:52:22,720
replacement of it the green the 110 foot

1374
00:52:27,190 --> 00:52:25,760
um green bank telescope is a magnificent

1375
00:52:29,190 --> 00:52:27,200
instrument you know

1376
00:52:31,829 --> 00:52:29,200
um and i certainly hope that

1377
00:52:33,990 --> 00:52:31,839
um it's able to to continue i understand

1378
00:52:35,270 --> 00:52:34,000
that it's it's under some threat because

1379
00:52:38,309 --> 00:52:35,280
of the

1380
00:52:40,390 --> 00:52:38,319
reassessment of its funding and so on um

1381
00:52:41,910 --> 00:52:40,400
but it really is a magnificent

1382
00:52:44,870 --> 00:52:41,920
instrument the replacement for the one

1383
00:52:49,589 --> 00:52:44,880
that collapsed and um

1384
00:52:53,670 --> 00:52:51,750
yeah torrence johnson uh this is just a

1385
00:52:54,950 --> 00:52:53,680
further comment for peter's excellent

1386
00:52:58,549 --> 00:52:54,960
study on the

1387
00:53:03,589 --> 00:53:01,510
international issues uh

1388
00:53:05,990 --> 00:53:03,599

and it's what i find interesting is

1389
00:53:08,150 --> 00:53:06,000
despite the natural angst which you have

1390
00:53:10,150 --> 00:53:08,160
described between the communities

1391
00:53:11,670 --> 00:53:10,160
involved because uh

1392
00:53:14,950 --> 00:53:11,680
everybody felt

1393
00:53:16,870 --> 00:53:14,960
uh if not betrayed at least not dealt

1394
00:53:18,230 --> 00:53:16,880
with fairly by each other's governments

1395
00:53:21,109 --> 00:53:18,240
and so forth

1396
00:53:23,829 --> 00:53:21,119
uh within a few years we were actually

1397
00:53:25,750 --> 00:53:23,839
cooperating as you point out on a number

1398
00:53:27,910 --> 00:53:25,760
of things interestingly enough one of

1399
00:53:29,670 --> 00:53:27,920
the most important cooperations was on

1400
00:53:31,349 --> 00:53:29,680
the return to flight

1401
00:53:32,390 --> 00:53:31,359
launch schedules

1402
00:53:35,510 --> 00:53:32,400
because

1403
00:53:38,390 --> 00:53:35,520
as they got the shuttle going again

1404
00:53:39,910 --> 00:53:38,400
both galileo and ulysses wanted to

1405
00:53:42,549 --> 00:53:39,920
launch in the same opportunity they're

1406
00:53:44,950 --> 00:53:42,559
going to the same place jupiter so that

1407
00:53:46,390 --> 00:53:44,960
so the windows were the same

1408
00:53:48,309 --> 00:53:46,400
and as

1409
00:53:50,390 --> 00:53:48,319
it turned out it fell to peter wenzel

1410
00:53:52,630 --> 00:53:50,400
who was the project scientist for

1411
00:53:54,950 --> 00:53:52,640
ulysses and myself to work with our

1412
00:53:56,950 --> 00:53:54,960
individual project science groups to try

1413
00:53:59,270 --> 00:53:56,960

to develop the arguments as to who

1414
00:54:01,510 --> 00:53:59,280
should go first because admiral truly

1415
00:54:03,589 --> 00:54:01,520
said i can't launch you both in the same

1416
00:54:05,829 --> 00:54:03,599
month that puts too much risk on getting

1417
00:54:06,870 --> 00:54:05,839
you guys back into space

1418
00:54:08,950 --> 00:54:06,880
and

1419
00:54:11,430 --> 00:54:08,960
we did that very amicably with both of

1420
00:54:13,430 --> 00:54:11,440
our psgs having people both from europe

1421
00:54:15,589 --> 00:54:13,440
and the us on it and so forth so that's

1422
00:54:18,470 --> 00:54:15,599
another example of how that

1423
00:54:20,950 --> 00:54:18,480
the uh sort of the the

1424
00:54:23,510 --> 00:54:20,960
international uh gestalt if you will

1425
00:54:25,190 --> 00:54:23,520
that was was developed on this in spite

1426
00:54:27,109 --> 00:54:25,200
of the stresses

1427
00:54:30,309 --> 00:54:27,119
ended up coming up with an amicable

1428
00:54:34,630 --> 00:54:32,309
the interesting thing aspects about this

1429
00:54:36,710 --> 00:54:34,640
story is despite all of these sort of

1430
00:54:39,349 --> 00:54:36,720
conflicts involved

1431
00:54:42,470 --> 00:54:39,359
things do happen things did happen and

1432
00:54:45,030 --> 00:54:42,480
seemingly um you know uh in the early

1433
00:54:48,309 --> 00:54:45,040
80s issa kind of really saw

1434
00:54:50,150 --> 00:54:48,319
the the cancellation of the u.s

1435
00:54:51,910 --> 00:54:50,160
spacecraft as

1436
00:54:53,750 --> 00:54:51,920
to them it was a big deal as a kind of a

1437
00:54:55,109 --> 00:54:53,760
breach of an agreement almost as if they

1438
00:54:56,870 --> 00:54:55,119

would breach any other treat uh

1439
00:54:59,349 --> 00:54:56,880
political treaty

1440
00:55:02,630 --> 00:54:59,359
but despite all of that you know

1441
00:55:08,150 --> 00:55:04,309
yes okay

1442
00:55:10,069 --> 00:55:08,160
mr burke i would uh appreciate your

1443
00:55:12,069 --> 00:55:10,079
insight as to the

1444
00:55:14,470 --> 00:55:12,079
role or the effect that the apollo

1445
00:55:16,390 --> 00:55:14,480
program had on ranger

1446
00:55:20,549 --> 00:55:16,400
uh you've already indicated the

1447
00:55:22,390 --> 00:55:20,559
reduction to just the tv as the payload

1448
00:55:24,309 --> 00:55:22,400
but

1449
00:55:26,069 --> 00:55:24,319
i would be very interested to know if

1450
00:55:28,470 --> 00:55:26,079
there were other

1451
00:55:30,870 --> 00:55:28,480
reasons for that related to apollo

1452
00:55:34,309 --> 00:55:30,880
especially

1453
00:55:35,349 --> 00:55:34,319
the apollo program

1454
00:55:37,349 --> 00:55:35,359
had

1455
00:55:38,870 --> 00:55:37,359
some effect on

1456
00:55:42,549 --> 00:55:38,880
ranger uh

1457
00:55:44,309 --> 00:55:42,559
primarily an indirect effect of uh

1458
00:55:47,030 --> 00:55:44,319
causing the

1459
00:55:50,069 --> 00:55:47,040
community interested in ranger

1460
00:55:53,589 --> 00:55:50,079
boss at jpl and the scientists and

1461
00:55:59,109 --> 00:55:57,750
really really wanted some success

1462
00:56:00,710 --> 00:55:59,119
and that's why

1463
00:56:04,789 --> 00:56:00,720

the

1464
00:56:07,190 --> 00:56:04,799
block of four rangers 6 7 8 and 9

1465
00:56:09,829 --> 00:56:07,200
had the much simplified objective of not

1466
00:56:12,470 --> 00:56:09,839
trying to land on the moon stop and have

1467
00:56:13,510 --> 00:56:12,480
a seismometer there but just go on and

1468
00:56:14,390 --> 00:56:13,520
crash

1469
00:56:17,109 --> 00:56:14,400
with

1470
00:56:19,589 --> 00:56:17,119
the television on the way in

1471
00:56:20,549 --> 00:56:19,599
simplifying the objective

1472
00:56:22,789 --> 00:56:20,559
uh

1473
00:56:24,630 --> 00:56:22,799
just changing the payload leaving the

1474
00:56:26,549 --> 00:56:24,640
bus the same you see

1475
00:56:28,950 --> 00:56:26,559
simplifying the objective by putting the

1476
00:56:31,589 --> 00:56:28,960
rca camera payload on

1477
00:56:34,309 --> 00:56:31,599
instead of the more complicated

1478
00:56:37,510 --> 00:56:34,319
objective of a retro rocket a radar

1479
00:56:39,829 --> 00:56:37,520
trigger a ball it has to survive etc all

1480
00:56:43,829 --> 00:56:39,839
the things that soviets did with

1481
00:56:45,910 --> 00:56:43,839
luna 9 eventually in 1966

1482
00:56:47,349 --> 00:56:45,920
simplifying the objective

1483
00:56:49,829 --> 00:56:47,359
in the attempt

1484
00:56:51,990 --> 00:56:49,839
to get a success

1485
00:56:55,030 --> 00:56:52,000
was the number one priority

1486
00:56:57,430 --> 00:56:55,040
the number two priority was to

1487
00:56:58,789 --> 00:56:57,440
get some images that might be useful for

1488
00:56:59,510 --> 00:56:58,799

apollo

1489
00:57:01,670 --> 00:56:59,520
but

1490
00:57:03,510 --> 00:57:01,680
images can't really tell you what you

1491
00:57:05,510 --> 00:57:03,520
really want to know is is the thing

1492
00:57:06,309 --> 00:57:05,520
going to sink in

1493
00:57:11,589 --> 00:57:06,319
or

1494
00:57:14,710 --> 00:57:11,599
ranger

1495
00:57:16,390 --> 00:57:14,720
did move its objectives towards support

1496
00:57:18,950 --> 00:57:16,400
of apollo

1497
00:57:21,349 --> 00:57:18,960
but it couldn't really go very far

1498
00:57:23,109 --> 00:57:21,359
taking pictures on the way in is all you

1499
00:57:25,670 --> 00:57:23,119
can do

1500
00:57:27,430 --> 00:57:25,680
and yes we got three beautiful successes

1501
00:57:30,390 --> 00:57:27,440
with thousands and thousands of good

1502
00:57:33,109 --> 00:57:30,400
images whether the apollo

1503
00:57:37,670 --> 00:57:33,119
designers paid any attention to those uh

1504
00:57:42,230 --> 00:57:39,510
so in listening to all the talks what

1505
00:57:43,349 --> 00:57:42,240
what strikes me is that perhaps things

1506
00:57:45,829 --> 00:57:43,359
in the past

1507
00:57:47,270 --> 00:57:45,839
aren't as different as they are today it

1508
00:57:49,910 --> 00:57:47,280
sounds like that

1509
00:57:52,309 --> 00:57:49,920
in in each case there were

1510
00:57:55,030 --> 00:57:52,319
there were technical issues going on

1511
00:57:56,870 --> 00:57:55,040
that were running into political issues

1512
00:57:58,870 --> 00:57:56,880
and political cycles that were running

1513
00:58:00,950 --> 00:57:58,880

on time scales that were much shorter

1514
00:58:03,510 --> 00:58:00,960
than the technical ones

1515
00:58:05,109 --> 00:58:03,520
and so i guess i'm just wondering i mean

1516
00:58:07,270 --> 00:58:05,119
right now we're looking with the with

1517
00:58:09,190 --> 00:58:07,280
the planetary budget here in the us has

1518
00:58:11,270 --> 00:58:09,200
already precipitated

1519
00:58:13,990 --> 00:58:11,280
new issues with

1520
00:58:17,990 --> 00:58:14,000
cooperation with esa not terribly unlike

1521
00:58:19,750 --> 00:58:18,000
what happened with ulysses and we've got

1522
00:58:21,990 --> 00:58:19,760
we've either gotten going out of

1523
00:58:24,230 --> 00:58:22,000
business sale or we've got a bump in the

1524
00:58:26,150 --> 00:58:24,240
road uh depending upon how things come

1525
00:58:28,309 --> 00:58:26,160
out sort of like what had happened with

1526
00:58:30,549 --> 00:58:28,319
uh perhaps with the discovery program

1527
00:58:32,390 --> 00:58:30,559
and i'm just wondering you know

1528
00:58:35,030 --> 00:58:32,400
hopefully history is good because it

1529
00:58:37,349 --> 00:58:35,040
helps to inform the future and

1530
00:58:40,230 --> 00:58:37,359
i'm just wondering if if perhaps all of

1531
00:58:41,270 --> 00:58:40,240
you might comment a little bit on

1532
00:58:43,109 --> 00:58:41,280
you know

1533
00:58:44,549 --> 00:58:43,119
what are the real lessons that we

1534
00:58:46,950 --> 00:58:44,559
perhaps should have learned from all of

1535
00:58:48,710 --> 00:58:46,960
this and and how can that those perhaps

1536
00:58:50,789 --> 00:58:48,720
help to inform us of

1537
00:58:52,710 --> 00:58:50,799
what perhaps we should be doing to uh to

1538
00:58:56,230 --> 00:58:52,720

keep going forward with all the physical

1539
00:59:00,549 --> 00:58:58,069
you know it's uh historians i guess we

1540
00:59:02,950 --> 00:59:00,559
never really want to talk about

1541
00:59:04,470 --> 00:59:02,960
predicting or influencing the future

1542
00:59:05,910 --> 00:59:04,480
we're mostly interested in explaining

1543
00:59:08,549 --> 00:59:05,920
the past

1544
00:59:10,069 --> 00:59:08,559
but clearly we've you know seen

1545
00:59:11,670 --> 00:59:10,079
multiple papers throughout this

1546
00:59:13,750 --> 00:59:11,680
conference that

1547
00:59:14,950 --> 00:59:13,760
the issue of budgetary cycles of

1548
00:59:19,750 --> 00:59:14,960
political

1549
00:59:21,829 --> 00:59:19,760
to very much put the current crisis in

1550
00:59:24,230 --> 00:59:21,839
perspective and realize

1551
00:59:27,270 --> 00:59:24,240
that that your problems aren't new at

1552
00:59:29,589 --> 00:59:27,280
all in most cases simply really almost

1553
00:59:30,829 --> 00:59:29,599
nothing new it's more more of a cyclical

1554
00:59:34,150 --> 00:59:30,839
nature

1555
00:59:36,789 --> 00:59:34,160
um that's not a very good answer to your

1556
00:59:39,430 --> 00:59:36,799
to your question because uh

1557
00:59:41,670 --> 00:59:39,440
lessons learned uh

1558
00:59:43,910 --> 00:59:41,680
probably it's useful for the actors and

1559
00:59:46,789 --> 00:59:43,920
the participants to just be

1560
00:59:49,670 --> 00:59:46,799
conscious of of this this larger context

1561
00:59:51,109 --> 00:59:49,680
in which they operate

1562
00:59:54,069 --> 00:59:51,119
i might

1563
00:59:55,670 --> 00:59:54,079

follow that in a little bit

1564
00:59:58,309 --> 00:59:55,680
different direction but i think it's

1565
01:00:00,710 --> 00:59:58,319
related they

1566
01:00:03,109 --> 01:00:00,720
the difficulty on ranger

1567
01:00:05,589 --> 01:00:03,119
that caused me to be replaced by bud

1568
01:00:07,670 --> 01:00:05,599
shermeyer my good friend

1569
01:00:11,349 --> 01:00:07,680
originated really

1570
01:00:15,430 --> 01:00:11,359
not with the five consecutive failures

1571
01:00:17,430 --> 01:00:15,440
uh over which i presided but rather

1572
01:00:20,309 --> 01:00:17,440
with the attempt

1573
01:00:21,750 --> 01:00:20,319
by members of the scientific community

1574
01:00:22,950 --> 01:00:21,760
to

1575
01:00:24,630 --> 01:00:22,960
add

1576
01:00:26,069 --> 01:00:24,640
space physics

1577
01:00:27,510 --> 01:00:26,079
experiments

1578
01:00:29,910 --> 01:00:27,520
eight of them

1579
01:00:31,910 --> 01:00:29,920
on board rangers at a time when we were

1580
01:00:35,510 --> 01:00:31,920
in big trouble already

1581
01:00:37,750 --> 01:00:35,520
and uh my version of it is look we're

1582
01:00:39,829 --> 01:00:37,760
trying to do something about the moon

1583
01:00:42,309 --> 01:00:39,839
space physics is wonderful

1584
01:00:44,390 --> 01:00:42,319
go do some experiments on a spacecraft

1585
01:00:46,549 --> 01:00:44,400
that's more appropriately suited to that

1586
01:00:48,470 --> 01:00:46,559
one that stays out there and goes around

1587
01:00:50,309 --> 01:00:48,480
and does things and of course nowadays

1588
01:00:51,990 --> 01:00:50,319

there are hundreds of them doing

1589
01:00:54,069 --> 01:00:52,000
beautiful space physics in the

1590
01:00:57,270 --> 01:00:54,079
magnetosphere and all the way out to the

1591
01:01:00,870 --> 01:00:57,280
voyagers to the edge of the heliosphere

1592
01:01:01,829 --> 01:01:00,880
so space physics is being richly served

1593
01:01:04,069 --> 01:01:01,839
now

1594
01:01:06,069 --> 01:01:04,079
but adding them to the rangers at the

1595
01:01:07,109 --> 01:01:06,079
time when we were already in terrific

1596
01:01:09,670 --> 01:01:07,119
trouble

1597
01:01:11,829 --> 01:01:09,680
was something i just didn't want to do

1598
01:01:14,710 --> 01:01:11,839
and remember i still thought the project

1599
01:01:17,589 --> 01:01:14,720
manager had a lot more authority than

1600
01:01:20,789 --> 01:01:17,599
i really did have so i pushed back at

1601
01:01:22,870 --> 01:01:20,799
nasa very hard

1602
01:01:25,349 --> 01:01:22,880
that might have been

1603
01:01:27,349 --> 01:01:25,359
a strong contributor to the capsize of

1604
01:01:28,870 --> 01:01:27,359
the project and the replacement of the

1605
01:01:31,750 --> 01:01:28,880
project manager

1606
01:01:34,069 --> 01:01:31,760
uh argument between those communities

1607
01:01:36,950 --> 01:01:34,079
interestingly enough

1608
01:01:40,549 --> 01:01:36,960
in mr neufeld's paper

1609
01:01:42,630 --> 01:01:40,559
that exact same dispute erupted again

1610
01:01:45,030 --> 01:01:42,640
during the discussion of

1611
01:01:47,030 --> 01:01:45,040
near and the other missions

1612
01:01:50,150 --> 01:01:47,040
between the space physics community and

1613
01:01:52,870 --> 01:01:50,160

the planetary geology etc

1614
01:01:55,190 --> 01:01:52,880
at that stage so much a contest

1615
01:01:57,109 --> 01:01:55,200
anymore it was more about differing

1616
01:01:59,270 --> 01:01:57,119
communities operating in differing

1617
01:02:00,390 --> 01:01:59,280
worlds and not actually communicating

1618
01:02:02,549 --> 01:02:00,400
that's it

1619
01:02:04,390 --> 01:02:02,559
i mean you know corridor says i was

1620
01:02:05,589 --> 01:02:04,400
amazed that the

1621
01:02:07,349 --> 01:02:05,599
planetary scientists didn't know

1622
01:02:09,750 --> 01:02:07,359
anything about explorer

1623
01:02:14,230 --> 01:02:09,760
as you know a famous name in in the

1624
01:02:16,069 --> 01:02:14,240
history of of uh her satellite uh

1625
01:02:17,589 --> 01:02:16,079
development general yeah i hate to

1626
01:02:19,589 --> 01:02:17,599
interrupt but we have two more questions

1627
01:02:21,270 --> 01:02:19,599
that if we can get them in very quickly

1628
01:02:22,789 --> 01:02:21,280
with a quick response

1629
01:02:25,670 --> 01:02:22,799
well i'm following up on ralph's

1630
01:02:27,349 --> 01:02:25,680
question which you you commented that uh

1631
01:02:28,789 --> 01:02:27,359
you know that we've been through these

1632
01:02:31,190 --> 01:02:28,799
ebbs and flows before and there's

1633
01:02:33,430 --> 01:02:31,200
nothing new under the sun in this in a

1634
01:02:36,230 --> 01:02:33,440
sense uh however when i've talked with

1635
01:02:38,470 --> 01:02:36,240
some of the folks from the early days

1636
01:02:40,870 --> 01:02:38,480
when uh when things really looked dire

1637
01:02:42,390 --> 01:02:40,880
this was back in the early 80s i mean

1638
01:02:44,549 --> 01:02:42,400

people like lou friedman i don't know if

1639
01:02:46,470 --> 01:02:44,559
who's still here right now i've said

1640
01:02:48,789 --> 01:02:46,480
well how do things compare today on the

1641
01:02:50,950 --> 01:02:48,799
planetary the risks of the planetary

1642
01:02:53,029 --> 01:02:50,960
program future uh compared with that and

1643
01:02:55,750 --> 01:02:53,039
he said he thinks that it's much worse

1644
01:02:59,270 --> 01:02:55,760
that it's a much more dire situation

1645
01:03:01,430 --> 01:02:59,280
potentially so as a historian can you

1646
01:03:03,750 --> 01:03:01,440
help us mine from the lessons of the

1647
01:03:05,670 --> 01:03:03,760
past what are maybe some of the key

1648
01:03:07,270 --> 01:03:05,680
things that we ought to be doing today

1649
01:03:08,950 --> 01:03:07,280
in order to make sure that we don't

1650
01:03:10,069 --> 01:03:08,960
suffer the faith that we could be

1651
01:03:11,750 --> 01:03:10,079
suffering

1652
01:03:13,190 --> 01:03:11,760
the second person asked me to help you

1653
01:03:16,309 --> 01:03:13,200
do the future

1654
01:03:18,230 --> 01:03:16,319
and i don't feel at all i'm asking

1655
01:03:19,910 --> 01:03:18,240
see what things worked in the past and

1656
01:03:21,430 --> 01:03:19,920
just share those what were the things

1657
01:03:22,950 --> 01:03:21,440
that really helped turn things around i

1658
01:03:25,029 --> 01:03:22,960
mean actually john lawson would be the

1659
01:03:28,549 --> 01:03:25,039
better person to talk about the the

1660
01:03:30,950 --> 01:03:28,559
survival crisis of the early 80s than i

1661
01:03:32,789 --> 01:03:30,960
would but you know clearly having a

1662
01:03:35,349 --> 01:03:32,799
program of missions

1663
01:03:37,270 --> 01:03:35,359

discovery is a good model in many ways

1664
01:03:39,190 --> 01:03:37,280
for having a line and a program a

1665
01:03:41,430 --> 01:03:39,200
consistent direction

1666
01:03:43,589 --> 01:03:41,440
uh it's harder to sustain something like

1667
01:03:45,670 --> 01:03:43,599
that with the huge flagship programs you

1668
01:03:47,510 --> 01:03:45,680
can only afford a multi-billion dollar

1669
01:03:49,750 --> 01:03:47,520
program every once in a while so it's

1670
01:03:50,950 --> 01:03:49,760
much harder to keep a sustained project

1671
01:03:52,470 --> 01:03:50,960
like that

1672
01:03:53,829 --> 01:03:52,480
obviously there has to be considerable

1673
01:03:54,789 --> 01:03:53,839
attention to

1674
01:03:56,870 --> 01:03:54,799
to

1675
01:03:58,630 --> 01:03:56,880
convincing the political establishment

1676
01:04:00,470 --> 01:03:58,640
that there's still important new

1677
01:04:02,470 --> 01:04:00,480
information to come out of this but

1678
01:04:04,150 --> 01:04:02,480
often it boils down to as in the case of

1679
01:04:06,230 --> 01:04:04,160
tom crumejs i'm sure that barbara

1680
01:04:08,789 --> 01:04:06,240
mikulski believed the science coming out

1681
01:04:09,910 --> 01:04:08,799
of apl and daughter and space telescope

1682
01:04:11,910 --> 01:04:09,920
science institute the maryland

1683
01:04:13,190 --> 01:04:11,920
institutions were great but her first

1684
01:04:14,950 --> 01:04:13,200
concern was

1685
01:04:17,190 --> 01:04:14,960
you know high paying jobs in maryland

1686
01:04:19,349 --> 01:04:17,200
keep them keep them there and so

1687
01:04:21,510 --> 01:04:19,359
obviously often this boils down to going

1688
01:04:24,470 --> 01:04:21,520

back to politicians and arguing for

1689
01:04:26,390 --> 01:04:24,480
sustaining institutions that are

1690
01:04:29,430 --> 01:04:26,400
contributing a lot to the economy and

1691
01:04:32,150 --> 01:04:29,440
science is a nice byproduct of that of

1692
01:04:36,710 --> 01:04:34,309
uh okay well i'm going to commit one of

1693
01:04:38,309 --> 01:04:36,720
the things i don't the sin that i don't

1694
01:04:40,390 --> 01:04:38,319
condone which is i'm going to comment

1695
01:04:41,990 --> 01:04:40,400
more than question but um

1696
01:04:44,630 --> 01:04:42,000
you know i'm going to dispute what what

1697
01:04:47,829 --> 01:04:44,640
greg said and also somewhat the premise

1698
01:04:49,910 --> 01:04:47,839
of ralph uh ralph mcnutt there and i

1699
01:04:52,150 --> 01:04:49,920
think there is a fundamental difference

1700
01:04:54,470 --> 01:04:52,160
today than the past you know there's a

1701
01:04:56,230 --> 01:04:54,480
number of sayings about um you know

1702
01:04:57,589 --> 01:04:56,240
those who fail to learn from history are

1703
01:04:59,029 --> 01:04:57,599
condemned to repeat it and then there's

1704
01:05:01,430 --> 01:04:59,039
a saying that you know history doesn't

1705
01:05:03,589 --> 01:05:01,440
repeat itself but it rhymes you know but

1706
01:05:05,670 --> 01:05:03,599
i think there is a certain you know we

1707
01:05:07,990 --> 01:05:05,680
have learned things there are things

1708
01:05:10,069 --> 01:05:08,000
that are different today than what than

1709
01:05:11,910 --> 01:05:10,079
back uh in the period than a number of

1710
01:05:14,789 --> 01:05:11,920
these people were talking about you know

1711
01:05:17,589 --> 01:05:14,799
we have a decadal survey now we did not

1712
01:05:19,750 --> 01:05:17,599
have that that process and i i'm a big

1713
01:05:22,069 --> 01:05:19,760

believer in that process having seen it

1714
01:05:25,029 --> 01:05:22,079
work i think it has credibility i think

1715
01:05:27,029 --> 01:05:25,039
it has credit external credibility um to

1716
01:05:29,190 --> 01:05:27,039
important political constituencies and

1717
01:05:32,150 --> 01:05:29,200
then we have program lines like

1718
01:05:34,390 --> 01:05:32,160
discovery like new frontiers

1719
01:05:35,990 --> 01:05:34,400
i think that one of the the big

1720
01:05:38,950 --> 01:05:36,000
difference another big difference that

1721
01:05:39,990 --> 01:05:38,960
we have is you are less likely to see

1722
01:05:43,109 --> 01:05:40,000
today

1723
01:05:45,029 --> 01:05:43,119
the the big gaps in exploration programs

1724
01:05:47,029 --> 01:05:45,039
that we saw in the past i mean how long

1725
01:05:49,510 --> 01:05:47,039
did we go between mars missions how long

1726
01:05:52,549 --> 01:05:49,520
do we go between lunar missions and now

1727
01:05:54,549 --> 01:05:52,559
those things are much more uh

1728
01:05:56,630 --> 01:05:54,559
included in uh discovery they're

1729
01:05:59,029 --> 01:05:56,640
included in other program lines and and

1730
01:06:00,870 --> 01:05:59,039
it seems like uh you know

1731
01:06:03,270 --> 01:06:00,880
i i know you guys rely on your

1732
01:06:05,510 --> 01:06:03,280
day-to-day existence upon um you know

1733
01:06:06,710 --> 01:06:05,520
new programs coming along but but i

1734
01:06:07,510 --> 01:06:06,720
think that there's

1735
01:06:08,309 --> 01:06:07,520
you know

1736
01:06:12,069 --> 01:06:08,319
uh

1737
01:06:12,870 --> 01:06:12,079
i do see a certain progressive um trend

1738
01:06:14,630 --> 01:06:12,880

in

1739
01:06:16,390 --> 01:06:14,640
you know what has happened that we've

1740
01:06:17,990 --> 01:06:16,400
learned from some of these uh these

1741
01:06:19,990 --> 01:06:18,000
errors and doesn't mean we're not going

1742
01:06:22,069 --> 01:06:20,000
to commit the mistake again but thank

1743
01:06:27,670 --> 01:06:22,079
you very much please join me in thanking

1744
01:06:32,390 --> 01:06:29,990
my last line is that perhaps our

1745
01:06:34,309 --> 01:06:32,400
troubles were a necessary step in the

1746
01:06:36,630 --> 01:06:34,319
evolution toward the harmony that we

1747
01:06:38,150 --> 01:06:36,640
have today

1748
01:06:40,630 --> 01:06:38,160
and that that sounds like a good way to

1749
01:06:42,309 --> 01:06:40,640
go take a break all right uh thank you

1750
01:06:44,470 --> 01:06:42,319
all so very much to joan for running an

1751
01:06:46,309 --> 01:06:44,480
uh real time panel because we're on time

1752
01:06:48,069 --> 01:06:46,319
as we go into our break remember be back

1753
01:06:49,589 --> 01:06:48,079
here at 3 15