
Norm Augustine

1
00:00:21,830 --> 00:00:17,189
thank you

2
00:00:24,550 --> 00:00:21,840
i hope everybody had a as great a day as

3
00:00:25,349 --> 00:00:24,560
i did um it has been a tremendous day

4
00:00:31,189 --> 00:00:25,359
for

5
00:00:33,590 --> 00:00:31,199
country um we were all treated to um

6
00:00:35,750 --> 00:00:33,600
what i have become to know what i have

7
00:00:37,510 --> 00:00:35,760
come to know as an incredible leader

8
00:00:38,549 --> 00:00:37,520
when we had the president here earlier

9
00:00:40,950 --> 00:00:38,559
today

10
00:00:42,310 --> 00:00:40,960
and um particularly for the nasa

11
00:00:45,270 --> 00:00:42,320
employees

12
00:00:47,590 --> 00:00:45,280
i will say thank you one more time for

13
00:00:48,549 --> 00:00:47,600

uh for his efforts in coming and for his

14
00:00:50,950 --> 00:00:48,559
vision

15
00:00:52,709 --> 00:00:50,960
uh what we want to do i i managed to get

16
00:00:54,549 --> 00:00:52,719
around to each of the four groups for

17
00:00:56,869 --> 00:00:54,559
just a little bit of time to listen to

18
00:00:59,670 --> 00:00:56,879
what was going on and i know you had

19
00:01:01,670 --> 00:00:59,680
some vigorous discussion and uh and lots

20
00:01:03,670 --> 00:01:01,680
of information passed and what we want

21
00:01:05,590 --> 00:01:03,680
to do now is take about

22
00:01:07,510 --> 00:01:05,600
no more than 20 minutes okay i know

23
00:01:09,350 --> 00:01:07,520
everybody's had a long day and i'm going

24
00:01:11,030 --> 00:01:09,360
to ask each of the breakout group

25
00:01:14,230 --> 00:01:11,040
leaders to give us about a five-minute

26
00:01:15,830 --> 00:01:14,240
synopsis of what was discussed and what

27
00:01:18,710 --> 00:01:15,840
were the significant

28
00:01:19,590 --> 00:01:18,720
findings or issues in their in their

29
00:01:22,390 --> 00:01:19,600
group

30
00:01:23,990 --> 00:01:22,400
and uh and then i will remind you one

31
00:01:25,590 --> 00:01:24,000
more time for some of you who did well

32
00:01:27,109 --> 00:01:25,600
since everybody didn't get to do what i

33
00:01:28,550 --> 00:01:27,119
did everybody didn't get to go around to

34
00:01:31,510 --> 00:01:28,560
every group

35
00:01:33,429 --> 00:01:31,520
i am told that starting tomorrow i would

36
00:01:35,590 --> 00:01:33,439
say give it until noon

37
00:01:37,270 --> 00:01:35,600
if you go to nasa.gov then you'll be

38
00:01:40,469 --> 00:01:37,280

able to find a link for each of the four

39
00:01:44,870 --> 00:01:40,479
breakout groups and you can just play it

40
00:01:49,190 --> 00:01:46,950
let me go back to what i said when i was

41
00:01:50,389 --> 00:01:49,200
on the podium after before we started

42
00:01:53,109 --> 00:01:50,399
out

43
00:01:55,429 --> 00:01:53,119
this was a great day but as the

44
00:01:57,749 --> 00:01:55,439
president said this is a beginning

45
00:01:59,590 --> 00:01:57,759
uh unless we take what was done here

46
00:02:02,310 --> 00:01:59,600
today forward

47
00:02:05,109 --> 00:02:02,320
and do something with what we heard and

48
00:02:06,469 --> 00:02:05,119
make changes and and become

49
00:02:09,190 --> 00:02:06,479
innovative in the way that we do

50
00:02:11,029 --> 00:02:09,200
business and that's not just nasa

51
00:02:12,790 --> 00:02:11,039
that's every one of the organizations

52
00:02:13,830 --> 00:02:12,800
that's represented here it is going to

53
00:02:16,630 --> 00:02:13,840
be

54
00:02:19,990 --> 00:02:16,640
collaborative effort

55
00:02:21,510 --> 00:02:20,000
among nasa academia industry and and a

56
00:02:23,190 --> 00:02:21,520
group that wasn't significantly

57
00:02:24,550 --> 00:02:23,200
represented here because i didn't think

58
00:02:26,710 --> 00:02:24,560
about it and that's our international

59
00:02:28,150 --> 00:02:26,720
partners i'm not sure how many people

60
00:02:30,070 --> 00:02:28,160
talked about internationals in their

61
00:02:32,710 --> 00:02:30,080
groups today i didn't because i was

62
00:02:34,390 --> 00:02:32,720
passing through i didn't hear a lot but

63
00:02:37,910 --> 00:02:34,400

the things that we want to do cannot be

64
00:02:39,830 --> 00:02:37,920
done without international partners

65
00:02:41,910 --> 00:02:39,840
senator nelson is here i know

66
00:02:43,990 --> 00:02:41,920
congresswoman sheila jackson lee was

67
00:02:46,630 --> 00:02:44,000
here and i think she may have have left

68
00:02:48,229 --> 00:02:46,640
but senator nelson knows my message and

69
00:02:50,470 --> 00:02:48,239
we are going to have to get help from

70
00:02:52,790 --> 00:02:50,480
congress in becoming a little bit more

71
00:02:54,470 --> 00:02:52,800
flexible about allowing us to involve

72
00:02:56,309 --> 00:02:54,480
international partners in a way that has

73
00:02:57,030 --> 00:02:56,319
never been done before

74
00:03:02,949 --> 00:02:57,040
so

75
00:03:04,710 --> 00:03:02,959
whole nation has got to get involved in

76
00:03:07,110 --> 00:03:04,720
i've been really excited

77
00:03:09,190 --> 00:03:07,120
leading up to this because you know i i

78
00:03:11,990 --> 00:03:09,200
don't read papers a lot

79
00:03:14,869 --> 00:03:12,000
but in traveling around the last week

80
00:03:16,869 --> 00:03:14,879
it is incredible being a space junkie

81
00:03:18,229 --> 00:03:16,879
when every day you pick up the paper and

82
00:03:21,190 --> 00:03:18,239
on the front page there's something

83
00:03:23,030 --> 00:03:21,200
about nasa uh and it's and it's

84
00:03:24,949 --> 00:03:23,040
these guys are right these guys are

85
00:03:26,710 --> 00:03:24,959
right these guys are right these guys

86
00:03:29,110 --> 00:03:26,720
are right what we are starting to do is

87
00:03:30,710 --> 00:03:29,120
have the intellectual discussion

88
00:03:32,630 --> 00:03:30,720

around the nation that we probably

89
00:03:34,869 --> 00:03:32,640
should have had

90
00:03:40,309 --> 00:03:34,879
40 or 50 years ago

91
00:03:44,390 --> 00:03:42,390
i really want to thank the college

92
00:03:46,149 --> 00:03:44,400
students who are here

93
00:03:48,630 --> 00:03:46,159
i have had a chance to talk to a number

94
00:03:50,630 --> 00:03:48,640
of them uh i know you didn't have to do

95
00:03:52,550 --> 00:03:50,640
this you could have been out you know

96
00:03:54,550 --> 00:03:52,560
throwing a frisbee or

97
00:03:56,229 --> 00:03:54,560
down on the beach or doing something and

98
00:03:57,750 --> 00:03:56,239
you chose to come here and spend your

99
00:03:58,789 --> 00:03:57,760
time with us and i think that's really

100
00:04:01,350 --> 00:03:58,799
important

101
00:04:03,910 --> 00:04:01,360
so without further ado i'm going to ask

102
00:04:06,309 --> 00:04:03,920
john holdren if he would start and john

103
00:04:08,390 --> 00:04:06,319
talk to us a little bit about your group

104
00:04:10,390 --> 00:04:08,400
well thank you charlie we had a terrific

105
00:04:12,710 --> 00:04:10,400
group the focus was expanding our reach

106
00:04:15,350 --> 00:04:12,720
into the solar system

107
00:04:17,349 --> 00:04:15,360
the presentations were so uh rich and so

108
00:04:19,590 --> 00:04:17,359
informative i can't possibly do justice

109
00:04:21,749 --> 00:04:19,600
to them in the uh five minutes or less

110
00:04:23,430 --> 00:04:21,759
that i've that i've got but i'll just

111
00:04:24,790 --> 00:04:23,440
mention a few highlights of each we

112
00:04:27,510 --> 00:04:24,800
started uh

113
00:04:29,430 --> 00:04:27,520

hearing from ed crawley a professor of

114
00:04:30,710 --> 00:04:29,440
arrow and astro at mit former chairman

115
00:04:32,230 --> 00:04:30,720
of that department and a member of the

116
00:04:33,670 --> 00:04:32,240
augustine

117
00:04:35,189 --> 00:04:33,680
committee

118
00:04:36,870 --> 00:04:35,199
he started by pointing out that what

119
00:04:40,070 --> 00:04:36,880
we're really talking about is a new

120
00:04:41,909 --> 00:04:40,080
exploration strategy a strategy is not

121
00:04:44,070 --> 00:04:41,919
just a destination it's not just a

122
00:04:45,909 --> 00:04:44,080
particular way to get there it's a way

123
00:04:47,749 --> 00:04:45,919
to explore space

124
00:04:49,909 --> 00:04:47,759
and to think about how we're going to do

125
00:04:51,350 --> 00:04:49,919
it in the context of why we're doing it

126
00:04:52,870 --> 00:04:51,360
what we're trying to achieve and really

127
00:04:55,030 --> 00:04:52,880
making

128
00:04:57,270 --> 00:04:55,040
our approach to it the combination of

129
00:04:58,550 --> 00:04:57,280
missions and capabilities match what

130
00:05:01,350 --> 00:04:58,560
we're trying to achieve and that

131
00:05:03,990 --> 00:05:01,360
includes of course inspiration of the

132
00:05:06,390 --> 00:05:04,000
next uh of the next generation

133
00:05:08,550 --> 00:05:06,400
uh he talked about the importance of

134
00:05:10,469 --> 00:05:08,560
having a strategy that is flexible that

135
00:05:12,150 --> 00:05:10,479
is enabled by capability

136
00:05:13,909 --> 00:05:12,160
and that is guided by discovery a

137
00:05:16,310 --> 00:05:13,919
strategy that evolves as you go along

138
00:05:17,990 --> 00:05:16,320

and it has many destinations many

139
00:05:20,390 --> 00:05:18,000
specific accomplishments and

140
00:05:22,870 --> 00:05:20,400
achievements milestones along the way

141
00:05:25,510 --> 00:05:22,880
that among other benefits permit us to

142
00:05:27,510 --> 00:05:25,520
learn as we go and also keep people

143
00:05:29,350 --> 00:05:27,520
engaged and inspired as they see this

144
00:05:31,270 --> 00:05:29,360
progress these various

145
00:05:33,430 --> 00:05:31,280
specific missions

146
00:05:36,710 --> 00:05:33,440
we heard

147
00:05:38,790 --> 00:05:36,720
then from from dr scott hubbard

148
00:05:40,870 --> 00:05:38,800
first mars program director at nasa

149
00:05:42,790 --> 00:05:40,880
headquarters uh past director of the

150
00:05:43,749 --> 00:05:42,800
nasa ames research center

151
00:05:47,990 --> 00:05:43,759
who

152
00:05:49,270 --> 00:05:48,000
robotic and human exploration he pointed

153
00:05:52,310 --> 00:05:49,280
out that all

154
00:05:54,710 --> 00:05:52,320
space exploration is human exploration

155
00:05:56,870 --> 00:05:54,720
sometimes we go in person sometimes we

156
00:05:59,110 --> 00:05:56,880
send our emissaries

157
00:06:02,150 --> 00:05:59,120
which nonetheless we control we control

158
00:06:04,629 --> 00:06:02,160
them from afar or we control them

159
00:06:07,749 --> 00:06:04,639
from somewhat closer as from orbit

160
00:06:09,350 --> 00:06:07,759
around distant worlds and he pointed out

161
00:06:11,990 --> 00:06:09,360
that the way forward is really going to

162
00:06:13,990 --> 00:06:12,000
be a synthesis of robotic and human

163
00:06:16,230 --> 00:06:14,000

missions exploiting the unique

164
00:06:18,870 --> 00:06:16,240
capabilities of each

165
00:06:20,390 --> 00:06:18,880
and the unique symbiosis

166
00:06:23,430 --> 00:06:20,400
that we can derive

167
00:06:26,230 --> 00:06:23,440
from joining those capabilities in

168
00:06:27,510 --> 00:06:26,240
intelligent and innovative ways

169
00:06:29,430 --> 00:06:27,520
we heard

170
00:06:32,550 --> 00:06:29,440
as our third panelist from dr john

171
00:06:38,629 --> 00:06:35,830
john is uh popularly known as the uh

172
00:06:41,270 --> 00:06:38,639
hubble uh repairman

173
00:06:43,189 --> 00:06:41,280
he is a veteran of five space flights

174
00:06:44,469 --> 00:06:43,199
has a phd in physics from the university

175
00:06:45,990 --> 00:06:44,479
of chicago

176
00:06:48,469 --> 00:06:46,000
three of his missions were to service

177
00:06:51,830 --> 00:06:48,479
the hubble space telescope spent a total

178
00:06:53,990 --> 00:06:51,840
of 60 hours in extra vehicular activity

179
00:06:56,469 --> 00:06:54,000
one of them a single spacewalk of almost

180
00:06:57,350 --> 00:06:56,479
eight hours fixing the hubble

181
00:06:59,110 --> 00:06:57,360
and

182
00:07:01,749 --> 00:06:59,120
he had a number of interesting things to

183
00:07:03,350 --> 00:07:01,759
say about what we need the pieces we

184
00:07:05,749 --> 00:07:03,360
need to put together

185
00:07:08,230 --> 00:07:05,759
more economical access to low earth

186
00:07:10,870 --> 00:07:08,240
orbit the heavy lift capability we need

187
00:07:13,189 --> 00:07:10,880
to go farther and faster

188
00:07:15,110 --> 00:07:13,199

modular exploration architecture which

189
00:07:16,870 --> 00:07:15,120
certainly is what we're talking about in

190
00:07:18,950 --> 00:07:16,880
the president's new vision

191
00:07:21,430 --> 00:07:18,960
and frequent and compelling missions

192
00:07:23,749 --> 00:07:21,440
again a theme that we had

193
00:07:25,670 --> 00:07:23,759
that we had heard from from each of our

194
00:07:27,670 --> 00:07:25,680
other panelists but i should say i

195
00:07:29,510 --> 00:07:27,680
thought the most uh the most remarkable

196
00:07:32,550 --> 00:07:29,520
thing he said he was talking about among

197
00:07:35,430 --> 00:07:32,560
the possible missions of visiting uh an

198
00:07:37,350 --> 00:07:35,440
asteroid and and showing that we could

199
00:07:39,029 --> 00:07:37,360
change its trajectory

200
00:07:41,270 --> 00:07:39,039
which would demonstrate once and for all

201
00:07:44,550 --> 00:07:41,280
that were smarter than the dinosaurs and

202
00:07:46,629 --> 00:07:44,560
could therefore avoid what they didn't

203
00:07:52,950 --> 00:07:46,639
er

204
00:07:57,830 --> 00:07:52,960
that we

205
00:07:59,510 --> 00:07:57,840
had some terrific comments at the end

206
00:08:01,110 --> 00:07:59,520
from some folks i called upon in the

207
00:08:02,790 --> 00:08:01,120
audience

208
00:08:04,869 --> 00:08:02,800
buzz aldrin sitting in the front row was

209
00:08:05,749 --> 00:08:04,879
irresistible to call on buzz and he had

210
00:08:07,350 --> 00:08:05,759
some

211
00:08:09,909 --> 00:08:07,360
further inspirational comments that

212
00:08:12,150 --> 00:08:09,919
demonstrated once again that that buzz

213
00:08:14,469 --> 00:08:12,160

although he has an incredible career to

214
00:08:16,629 --> 00:08:14,479
look back on is still looking forward

215
00:08:18,629 --> 00:08:16,639
and thinking about innovative ways to

216
00:08:21,510 --> 00:08:18,639
get to a range of destinations including

217
00:08:23,749 --> 00:08:21,520
mars and do interesting things there

218
00:08:26,230 --> 00:08:23,759
we heard from lori leshan the deputy

219
00:08:28,150 --> 00:08:26,240
nasa administrator for exploration who

220
00:08:29,830 --> 00:08:28,160
told us some very exciting things about

221
00:08:32,949 --> 00:08:29,840
where nasa was going to be going in the

222
00:08:34,389 --> 00:08:32,959
years ahead with a variety of kinds of

223
00:08:35,829 --> 00:08:34,399
of missions

224
00:08:40,550 --> 00:08:35,839
and

225
00:08:44,230 --> 00:08:40,560
i i called on bill nye the science guy

226
00:08:46,070 --> 00:08:44,240
who is an expert at uh at inspiring kids

227
00:08:48,389 --> 00:08:46,080
uh to talk about the potential for

228
00:08:50,870 --> 00:08:48,399
inspiration uh in the sort of program

229
00:08:52,550 --> 00:08:50,880
we're talking about and uh and he did a

230
00:08:54,790 --> 00:08:52,560
fabulous job i think we're going to

231
00:08:57,829 --> 00:08:54,800
enlist him full time

232
00:08:59,670 --> 00:08:57,839
to help us inspire kids with this with

233
00:09:02,710 --> 00:08:59,680
this program

234
00:09:04,949 --> 00:09:02,720
that's a quick survey

235
00:09:06,630 --> 00:09:04,959
thank you very much um

236
00:09:08,150 --> 00:09:06,640
i'm going to do something that has that

237
00:09:09,509 --> 00:09:08,160
i said i wouldn't do but i'm not going

238
00:09:11,430 --> 00:09:09,519

to tell you what it is until we get

239
00:09:13,509 --> 00:09:11,440
through all four so you can sit there

240
00:09:14,389 --> 00:09:13,519
and think what am i going to do

241
00:09:16,389 --> 00:09:14,399
uh

242
00:09:18,470 --> 00:09:16,399
lori let me ask you if you would give

243
00:09:21,430 --> 00:09:18,480
about five minutes on your group

244
00:09:23,829 --> 00:09:21,440
thank you very much charlie

245
00:09:25,910 --> 00:09:23,839
the mind reels so we have diverse and

246
00:09:28,310 --> 00:09:25,920
important aspects uh discussed in my

247
00:09:31,269 --> 00:09:28,320
panel of harnessing space to expand

248
00:09:33,350 --> 00:09:31,279
economic opportunity and we too had had

249
00:09:36,870 --> 00:09:33,360
a great discussion really focused on how

250
00:09:37,670 --> 00:09:36,880
the plan has exp explicitly has the goal

251
00:09:42,070 --> 00:09:37,680
of

252
00:09:44,630 --> 00:09:42,080
american capabilities in space which

253
00:09:46,150 --> 00:09:44,640
will open up new opportunities for the

254
00:09:48,230 --> 00:09:46,160
economy and how this is a basic

255
00:09:50,550 --> 00:09:48,240
underpinning of the plan

256
00:09:52,790 --> 00:09:50,560
in addition commercial procurement of

257
00:09:54,949 --> 00:09:52,800
space transportation services are to

258
00:09:56,949 --> 00:09:54,959
provide the incentives for improvement

259
00:09:59,110 --> 00:09:56,959
and commercial capabilities and that

260
00:10:01,269 --> 00:09:59,120
costs then will be reduced as

261
00:10:02,949 --> 00:10:01,279
capabilities increase and allowing for

262
00:10:04,470 --> 00:10:02,959
the development of a new private sector

263
00:10:06,550 --> 00:10:04,480

activities that employ those

264
00:10:09,269 --> 00:10:06,560
capabilities so we talked a lot about

265
00:10:11,829 --> 00:10:09,279
basics of the job programs in florida

266
00:10:14,470 --> 00:10:11,839
that the white house has announced the

267
00:10:16,710 --> 00:10:14,480
new task force john fernandez was there

268
00:10:18,710 --> 00:10:16,720
from the department of commerce to talk

269
00:10:20,790 --> 00:10:18,720
about this 120-day study that the

270
00:10:24,710 --> 00:10:20,800
president announced will be due on his

271
00:10:26,389 --> 00:10:24,720
desk uh on august 15th to to

272
00:10:28,870 --> 00:10:26,399
outline the economic development

273
00:10:30,710 --> 00:10:28,880
activities uh utilizing the 40 million

274
00:10:33,190 --> 00:10:30,720
dollars that we're going to invest in

275
00:10:47,269 --> 00:10:33,200
this area dale ketchum was one of our

276
00:10:51,350 --> 00:10:49,190
how this

277
00:10:53,110 --> 00:10:51,360
president's plan does something that

278
00:10:55,750 --> 00:10:53,120
we've been wanting to do for a long time

279
00:10:57,590 --> 00:10:55,760
which is to develop that diversified

280
00:11:00,310 --> 00:10:57,600
business case for florida so it's

281
00:11:02,949 --> 00:11:00,320
broader than just a civil human space

282
00:11:04,630 --> 00:11:02,959
flight and he was part of the local

283
00:11:06,710 --> 00:11:04,640
group that met with the president and

284
00:11:08,310 --> 00:11:06,720
talked a little bit about

285
00:11:10,949 --> 00:11:08,320
really the engagement and knowledge that

286
00:11:14,470 --> 00:11:10,959
this president has on this plan and he

287
00:11:17,030 --> 00:11:14,480
his personal uh interest in seeing

288
00:11:20,069 --> 00:11:17,040

again space be that inspiration

289
00:11:22,710 --> 00:11:20,079
to a generation we also had greg juniman

290
00:11:24,710 --> 00:11:22,720
who is the head of the

291
00:11:26,949 --> 00:11:24,720
international federation of professional

292
00:11:28,470 --> 00:11:26,959
and technical engineers union of the

293
00:11:30,389 --> 00:11:28,480
afl-cio

294
00:11:32,790 --> 00:11:30,399
and greg talked about a lot of the

295
00:11:35,829 --> 00:11:32,800
technologies that r d investment has and

296
00:11:38,470 --> 00:11:35,839
how that really equates to greater job

297
00:11:40,710 --> 00:11:38,480
creation he talked about the kinds of

298
00:11:42,710 --> 00:11:40,720
investments and benefits that come from

299
00:11:44,870 --> 00:11:42,720
our investment in the nation space

300
00:11:47,030 --> 00:11:44,880
program and how the plan going forward

301
00:11:49,269 --> 00:11:47,040
really will help us capitalize on

302
00:11:52,389 --> 00:11:49,279
capturing those those jobs and then our

303
00:11:54,870 --> 00:11:52,399
final panelist was uh dr mae jemison who

304
00:11:55,990 --> 00:11:54,880
you many of you probably know she is a

305
00:11:58,230 --> 00:11:56,000
vocal

306
00:12:00,870 --> 00:11:58,240
advocate for the important role that the

307
00:12:02,870 --> 00:12:00,880
space program plays in inspiring a

308
00:12:04,949 --> 00:12:02,880
future generation of scientists and

309
00:12:07,829 --> 00:12:04,959
engineers having flown on endeavor

310
00:12:10,150 --> 00:12:07,839
herself in 1992 and a former member of

311
00:12:11,750 --> 00:12:10,160
the peace corps the she's the founder of

312
00:12:13,430 --> 00:12:11,760
the jemison group and she talked about

313
00:12:15,269 --> 00:12:13,440

how the projects to develop new

314
00:12:17,509 --> 00:12:15,279
technologies as well as those

315
00:12:19,990 --> 00:12:17,519
technologies uh that come from the space

316
00:12:21,990 --> 00:12:20,000
program transfer to real people in the

317
00:12:23,670 --> 00:12:22,000
places where you can benefit from them

318
00:12:26,389 --> 00:12:23,680
the most really talked about the

319
00:12:28,150 --> 00:12:26,399
societal benefits that our investment in

320
00:12:30,790 --> 00:12:28,160
space

321
00:12:32,710 --> 00:12:30,800
engenders into not only our economy but

322
00:12:35,269 --> 00:12:32,720
our education system

323
00:12:38,629 --> 00:12:35,279
and then when we went around to our

324
00:12:41,030 --> 00:12:38,639
audience as well we heard from

325
00:12:42,790 --> 00:12:41,040
robert cabana bob cavana our head of the

326
00:12:45,829 --> 00:12:42,800
kennedy space center who talked about

327
00:12:48,470 --> 00:12:45,839
the 21st century launch complex

328
00:12:50,629 --> 00:12:48,480
investment that this plan

329
00:12:52,550 --> 00:12:50,639
has of over 2 billion

330
00:12:54,790 --> 00:12:52,560
over or 1.9 billion dollars i think over

331
00:12:57,590 --> 00:12:54,800
the next five years and how that is

332
00:12:59,670 --> 00:12:57,600
going to help leverage our investments

333
00:13:01,910 --> 00:12:59,680
here at the kennedy space center he was

334
00:13:05,350 --> 00:13:01,920
sitting right next to general kaler and

335
00:13:07,670 --> 00:13:05,360
they talked together about our

336
00:13:09,590 --> 00:13:07,680
really valuable cooperative efforts we

337
00:13:11,990 --> 00:13:09,600
have with uh nasa

338
00:13:14,629 --> 00:13:12,000

and the military here at uh cape

339
00:13:17,990 --> 00:13:14,639
canaveral and kennedy space center and

340
00:13:20,790 --> 00:13:18,000
uh general koehler spoke of the of how

341
00:13:22,790 --> 00:13:20,800
space has now woven into the fabric of

342
00:13:25,110 --> 00:13:22,800
today and that the

343
00:13:26,230 --> 00:13:25,120
industrial base issues

344
00:13:30,150 --> 00:13:26,240
that

345
00:13:33,030 --> 00:13:30,160
helping

346
00:13:35,590 --> 00:13:33,040
with being addressed by this budget

347
00:13:37,910 --> 00:13:35,600
esther dyson who has created been an

348
00:13:39,750 --> 00:13:37,920
investor and is the in a lot of

349
00:13:42,790 --> 00:13:39,760
technologies that have gone from the

350
00:13:44,550 --> 00:13:42,800
government to the private sector talked

351
00:13:46,870 --> 00:13:44,560
about how she sees

352
00:13:48,550 --> 00:13:46,880
so many similarities between what nasa

353
00:13:49,829 --> 00:13:48,560
is going through and what happened with

354
00:13:52,550 --> 00:13:49,839
the internet

355
00:13:55,509 --> 00:13:52,560
a few years ago she is the

356
00:13:57,030 --> 00:13:55,519
chair of our technology and innovation

357
00:13:58,310 --> 00:13:57,040
subcommittee of the nasa advisory

358
00:14:00,230 --> 00:13:58,320
council right now so that was

359
00:14:02,870 --> 00:14:00,240
interesting and chris christensen who's

360
00:14:04,870 --> 00:14:02,880
head of the tory group outlined the

361
00:14:08,310 --> 00:14:04,880
study that they just finished on the

362
00:14:10,710 --> 00:14:08,320
investment of the commercial crew

363
00:14:12,389 --> 00:14:10,720

and cargo i believe part of the nasa

364
00:14:15,030 --> 00:14:12,399
plan going forward that six billion

365
00:14:17,509 --> 00:14:15,040
dollar investment and how their analysis

366
00:14:19,110 --> 00:14:17,519
was run that states that we develop

367
00:14:21,189 --> 00:14:19,120
about eight eleven thousand eight

368
00:14:23,030 --> 00:14:21,199
hundred jobs each year from that

369
00:14:25,509 --> 00:14:23,040
investment alone

370
00:14:27,670 --> 00:14:25,519
and then we closed with neil tyson who

371
00:14:29,269 --> 00:14:27,680
talked a lot and i'll brag he was with

372
00:14:31,670 --> 00:14:29,279
some other panel but wanted to come to

373
00:14:33,910 --> 00:14:31,680
the space economy panel so he came and

374
00:14:36,710 --> 00:14:33,920
talked about i think as as you closed on

375
00:14:39,189 --> 00:14:36,720
sort of the frequent compelling missions

376
00:14:41,750 --> 00:14:39,199
that you need to be able to drive the

377
00:14:43,670 --> 00:14:41,760
public interest and really the

378
00:14:46,230 --> 00:14:43,680
industries into these fields that will

379
00:14:48,629 --> 00:14:46,240
develop the innovation that that are are

380
00:14:51,110 --> 00:14:48,639
so important to our nation's economic

381
00:14:54,150 --> 00:14:51,120
growth i'm going to finish with a dale

382
00:14:56,629 --> 00:14:54,160
ketchum quote that he spoke of

383
00:14:58,870 --> 00:14:56,639
that space is just way too important to

384
00:15:01,670 --> 00:14:58,880
leave only to the government so that was

385
00:15:05,430 --> 00:15:01,680
the general theme of our panel thanks

386
00:15:07,990 --> 00:15:05,440
darlene great thanks very much lori um

387
00:15:10,949 --> 00:15:08,000
all right there mr norm

388
00:15:15,509 --> 00:15:10,959

all right uh charlie thank you very much

389
00:15:17,509 --> 00:15:15,519
we were the technology assembly and uh

390
00:15:19,030 --> 00:15:17,519
clearly uh an awfully important topic

391
00:15:20,550 --> 00:15:19,040
because it does provide the building

392
00:15:22,710 --> 00:15:20,560
blocks that'll let us do these wonderful

393
00:15:25,829 --> 00:15:22,720
things that we've been talking about

394
00:15:26,790 --> 00:15:25,839
uh the panel consisted

395
00:15:28,550 --> 00:15:26,800
of

396
00:15:30,069 --> 00:15:28,560
ed lew who is the program manager for

397
00:15:32,310 --> 00:15:30,079
advanced programs at google and of

398
00:15:35,030 --> 00:15:32,320
course a former astronaut

399
00:15:37,030 --> 00:15:35,040
bobby brown nasa's chief technologist

400
00:15:39,030 --> 00:15:37,040
and doug cook who is the associate

401
00:15:40,710 --> 00:15:39,040
administrator for exploration systems

402
00:15:41,749 --> 00:15:40,720
mission directorate

403
00:15:47,509 --> 00:15:41,759
i

404
00:15:51,829 --> 00:15:47,519
the

405
00:15:54,550 --> 00:15:51,839
senator nelson will remember when i went

406
00:15:56,790 --> 00:15:54,560
to see you when we were working on this

407
00:15:58,150 --> 00:15:56,800
project last summer i mentioned that one

408
00:16:00,310 --> 00:15:58,160
of the things that was causing us a

409
00:16:02,389 --> 00:16:00,320
great deal of difficulty was that the

410
00:16:03,749 --> 00:16:02,399
the technology cupboard was bare there

411
00:16:05,990 --> 00:16:03,759
just wasn't a lot that we had been

412
00:16:08,150 --> 00:16:06,000
developing in recent years and we found

413
00:16:10,150 --> 00:16:08,160

ourselves using technology from apollo

414
00:16:11,030 --> 00:16:10,160
and from shuttle and so on

415
00:16:13,110 --> 00:16:11,040
uh

416
00:16:15,749 --> 00:16:13,120
i'm going to summarize our discussion

417
00:16:18,710 --> 00:16:15,759
and five quick points it was a very rich

418
00:16:20,069 --> 00:16:18,720
discussion there's much more to be said

419
00:16:21,509 --> 00:16:20,079
the first point

420
00:16:23,189 --> 00:16:21,519
was that

421
00:16:25,189 --> 00:16:23,199
the the missions we're talking about

422
00:16:26,949 --> 00:16:25,199
particularly the mars mission can't be

423
00:16:29,110 --> 00:16:26,959
done without new technology and you can

424
00:16:31,430 --> 00:16:29,120
convince yourself of that pretty quickly

425
00:16:33,749 --> 00:16:31,440
if you calculate the number of uh

426
00:16:35,430 --> 00:16:33,759
shuttle equivalents or iss equivalents

427
00:16:39,430 --> 00:16:35,440
of mass so you have to have a low earth

428
00:16:40,389 --> 00:16:39,440
orbit to support a reasonable mars human

429
00:16:42,230 --> 00:16:40,399
landing

430
00:16:44,310 --> 00:16:42,240
and rather quickly you could see that

431
00:16:46,310 --> 00:16:44,320
without new technology

432
00:16:47,910 --> 00:16:46,320
one can't get there

433
00:16:49,110 --> 00:16:47,920
secondly that

434
00:16:52,069 --> 00:16:49,120
what we're talking about really is

435
00:16:55,110 --> 00:16:52,079
innovation and it was pointed out that

436
00:16:57,509 --> 00:16:55,120
innovation is generally best done

437
00:16:59,350 --> 00:16:57,519
uh at a rapid pace where there are a lot

438
00:17:00,550 --> 00:16:59,360

of opportunities for new things to be

439
00:17:01,749 --> 00:17:00,560
tried

440
00:17:04,230 --> 00:17:01,759
uh

441
00:17:05,909 --> 00:17:04,240
lots of smaller chunks of progress at a

442
00:17:07,669 --> 00:17:05,919
time

443
00:17:09,590 --> 00:17:07,679
thirdly

444
00:17:11,829 --> 00:17:09,600
the one lesson that sort of came through

445
00:17:13,750 --> 00:17:11,839
the discussion was don't try to do

446
00:17:15,350 --> 00:17:13,760
technology development concurrently with

447
00:17:16,710 --> 00:17:15,360
systems development

448
00:17:18,870 --> 00:17:16,720
we've tried that we all know what

449
00:17:20,949 --> 00:17:18,880
happens but that puts a lot of pressure

450
00:17:23,429 --> 00:17:20,959
on the technology development to get

451
00:17:24,789 --> 00:17:23,439
done so that we can start systems

452
00:17:26,390 --> 00:17:24,799
uh

453
00:17:27,590 --> 00:17:26,400
planning

454
00:17:29,190 --> 00:17:27,600
uh

455
00:17:31,110 --> 00:17:29,200
fourth and most interesting to me it

456
00:17:33,430 --> 00:17:31,120
occurred to me walking over here we

457
00:17:35,190 --> 00:17:33,440
heard about all this exciting technology

458
00:17:36,630 --> 00:17:35,200
i mean it really is

459
00:17:38,230 --> 00:17:36,640
but not a one of the questions of our

460
00:17:39,669 --> 00:17:38,240
audience had anything to do with that

461
00:17:42,230 --> 00:17:39,679
technology

462
00:17:44,950 --> 00:17:42,240
it all came was in the vein

463
00:17:47,430 --> 00:17:44,960

of nasa is a very fine

464
00:17:49,750 --> 00:17:47,440
very large very mature

465
00:17:51,669 --> 00:17:49,760
organization without a competitor

466
00:17:52,470 --> 00:17:51,679
and those of us in industry know that

467
00:17:56,230 --> 00:17:52,480
that's

468
00:17:58,630 --> 00:17:56,240
if you're trying to advance

469
00:18:00,630 --> 00:17:58,640
new thinking and new technology so the

470
00:18:03,110 --> 00:18:00,640
main discussion of our

471
00:18:04,870 --> 00:18:03,120
audience was whether or not nasa would

472
00:18:06,789 --> 00:18:04,880
be up to moving at the kind of a pace

473
00:18:08,630 --> 00:18:06,799
that one has to move at

474
00:18:10,150 --> 00:18:08,640
uh if we really are going to get this

475
00:18:12,070 --> 00:18:10,160
technology

476
00:18:13,669 --> 00:18:12,080
for example with the heavy lift launch

477
00:18:15,590 --> 00:18:13,679
vehicle

478
00:18:17,510 --> 00:18:15,600
there's only five years

479
00:18:18,870 --> 00:18:17,520
to get far enough to where we can make a

480
00:18:28,870 --> 00:18:18,880
a

481
00:18:31,350 --> 00:18:28,880
lost

482
00:18:33,510 --> 00:18:31,360
so a lot depends on it and finally nasa

483
00:18:36,070 --> 00:18:33,520
does have a technology plan has lots of

484
00:18:37,830 --> 00:18:36,080
interesting ingredients

485
00:18:40,150 --> 00:18:37,840
and these are the kind of things that

486
00:18:42,549 --> 00:18:40,160
inspired a whole generation of people as

487
00:18:45,029 --> 00:18:42,559
was pointed out my generation

488
00:18:47,110 --> 00:18:45,039

many of us are scientists and engineers

489
00:18:49,669 --> 00:18:47,120
a good part because of

490
00:18:51,669 --> 00:18:49,679
nasa i've often said nothing inspires

491
00:18:53,590 --> 00:18:51,679
young children like

492
00:18:55,350 --> 00:18:53,600
space and dinosaurs and we're very short

493
00:18:57,510 --> 00:18:55,360
on dinosaurs so

494
00:18:59,029 --> 00:18:57,520
it's important we do this well charlie

495
00:19:01,430 --> 00:18:59,039
over and out

496
00:19:02,470 --> 00:19:01,440
norm thanks so very much and we'll end

497
00:19:05,270 --> 00:19:02,480
up with

498
00:19:08,470 --> 00:19:05,280
with miles o'brien summarizing his panel

499
00:19:10,070 --> 00:19:08,480
that talked about iss utilization

500
00:19:12,070 --> 00:19:10,080
thank you very much charlie iss

501
00:19:14,070 --> 00:19:12,080
utilization is what we talked about and

502
00:19:16,310 --> 00:19:14,080
uh so as not to bury the lead i walked

503
00:19:17,830 --> 00:19:16,320
away very inspired and excited about the

504
00:19:19,510 --> 00:19:17,840
prospects for the international space

505
00:19:20,789 --> 00:19:19,520
station and just the thought

506
00:19:23,430 --> 00:19:20,799
the thought that it could have been

507
00:19:25,350 --> 00:19:23,440
deorbited at the end of 2015

508
00:19:27,669 --> 00:19:25,360
that would truly have been a crime

509
00:19:29,510 --> 00:19:27,679
and to think about what we

510
00:19:31,350 --> 00:19:29,520
have done already there

511
00:19:33,510 --> 00:19:31,360
but really more importantly we've just

512
00:19:34,789 --> 00:19:33,520
just begun we have just begun to scratch

513
00:19:36,470 --> 00:19:34,799

the surface

514
00:19:38,470 --> 00:19:36,480
we start off with mike foale who's been

515
00:19:39,990 --> 00:19:38,480
to the space station as a commander uh

516
00:19:42,710 --> 00:19:40,000
in the uh

517
00:19:45,590 --> 00:19:42,720
wake of colombia uh who had some time on

518
00:19:48,230 --> 00:19:45,600
mir as well four-time uh space flight uh

519
00:19:49,990 --> 00:19:48,240
flyer and he talked about a couple

520
00:19:51,590 --> 00:19:50,000
things first of all he stressed the

521
00:19:53,669 --> 00:19:51,600
point that it's important to increase

522
00:19:55,990 --> 00:19:53,679
the operational tempo to the station

523
00:19:57,669 --> 00:19:56,000
increase the number of flights

524
00:19:59,510 --> 00:19:57,679
the more people on the station as he put

525
00:20:01,510 --> 00:19:59,520
it as i read my tweets here i can do

526
00:20:03,990 --> 00:20:01,520
this in 140 characters if you want so

527
00:20:05,430 --> 00:20:04,000
make it real short

528
00:20:07,350 --> 00:20:05,440
he said

529
00:20:09,029 --> 00:20:07,360
when he was up there with one other crew

530
00:20:11,430 --> 00:20:09,039
member after six months that was kind of

531
00:20:13,430 --> 00:20:11,440
hard not mentioning any names of course

532
00:20:14,710 --> 00:20:13,440
but

533
00:20:16,149 --> 00:20:14,720
he said

534
00:20:18,149 --> 00:20:16,159
we need to have more frequent traffic

535
00:20:19,990 --> 00:20:18,159
there he also talked about the parallel

536
00:20:21,830 --> 00:20:20,000
path to the station and how important

537
00:20:23,590 --> 00:20:21,840
that was post colombia and how as we

538
00:20:25,350 --> 00:20:23,600

march toward a commercial world we need

539
00:20:27,909 --> 00:20:25,360
to think about other ways to get there

540
00:20:29,830 --> 00:20:27,919
right now we are soon facing a period of

541
00:20:32,710 --> 00:20:29,840
time when once again we'll be a 100

542
00:20:34,630 --> 00:20:32,720
dependent on the russians and that is um

543
00:20:36,549 --> 00:20:34,640
that's all it's always good to have a

544
00:20:39,830 --> 00:20:36,559
backup system of some kind to get to and

545
00:20:41,909 --> 00:20:39,840
from that station um so uh he was

546
00:20:44,630 --> 00:20:41,919
especially a little concerned about that

547
00:20:46,630 --> 00:20:44,640
uh he said that commercial crew access

548
00:20:49,669 --> 00:20:46,640
has to happen as a result uh the sooner

549
00:20:51,750 --> 00:20:49,679
the better and we will fail ultimately

550
00:20:54,390 --> 00:20:51,760
if at the end of this process of

551
00:20:56,390 --> 00:20:54,400
incubating a commercial space entity we

552
00:20:57,430 --> 00:20:56,400
have only one provider of transport to

553
00:21:00,390 --> 00:20:57,440
space

554
00:21:02,070 --> 00:21:00,400
um he uh talked about how

555
00:21:03,750 --> 00:21:02,080
with the station at the point now where

556
00:21:05,990 --> 00:21:03,760
it has a six-member crew

557
00:21:07,029 --> 00:21:06,000
much more time to utilize it certainly

558
00:21:09,430 --> 00:21:07,039
when there were just two of them on

559
00:21:11,190 --> 00:21:09,440
there he said he spent if 25 of his time

560
00:21:13,510 --> 00:21:11,200
on science obviously they were involved

561
00:21:15,510 --> 00:21:13,520
in in station keeping as much as

562
00:21:17,110 --> 00:21:15,520
anything else he brought out a point

563
00:21:19,750 --> 00:21:17,120

which i hadn't thought much about and we

564
00:21:21,270 --> 00:21:19,760
we might take it for granted the amazing

565
00:21:23,110 --> 00:21:21,280
construction project that is the

566
00:21:24,549 --> 00:21:23,120
international space station we talk

567
00:21:26,710 --> 00:21:24,559
about a lot of the science that goes on

568
00:21:28,149 --> 00:21:26,720
inside but the the amount of robotics

569
00:21:29,669 --> 00:21:28,159
technology that we have pushed with the

570
00:21:32,310 --> 00:21:29,679
canadian arm

571
00:21:34,230 --> 00:21:32,320
dexter the japanese arm is tremendous

572
00:21:36,630 --> 00:21:34,240
just just the process of building the

573
00:21:39,830 --> 00:21:36,640
station has has created great uh

574
00:21:41,190 --> 00:21:39,840
technology improvements um and then he

575
00:21:42,549 --> 00:21:41,200
summed it up with something that i had

576
00:21:44,149 --> 00:21:42,559
personally agree with that the really

577
00:21:45,990 --> 00:21:44,159
the greatest accomplishment of this of

578
00:21:47,669 --> 00:21:46,000
the space station well who knows maybe

579
00:21:50,390 --> 00:21:47,679
they'll cure cancer in a few years but

580
00:21:51,830 --> 00:21:50,400
for now the greatest uh uh

581
00:21:53,909 --> 00:21:51,840
uh contribution to this station is the

582
00:21:56,950 --> 00:21:53,919
fact that you have you know 16 nations

583
00:21:59,270 --> 00:21:56,960
working together this is truly if i

584
00:22:01,510 --> 00:21:59,280
cannot think of anything in in history

585
00:22:03,990 --> 00:22:01,520
that that is of that level of

586
00:22:06,070 --> 00:22:04,000
collaboration between other nations so

587
00:22:08,390 --> 00:22:06,080
uh as we look for ways to uh make the

588
00:22:11,430 --> 00:22:08,400

world a better place frankly uh it might

589
00:22:14,070 --> 00:22:11,440
be off the world uh and we went from

590
00:22:15,190 --> 00:22:14,080
there to tom pickens who's the ceo of

591
00:22:17,750 --> 00:22:15,200
space hab

592
00:22:19,350 --> 00:22:17,760
uh and uh was space have now astrotech

593
00:22:22,230 --> 00:22:19,360
and astrogenetics

594
00:22:23,590 --> 00:22:22,240
and uh he's he's

595
00:22:25,350 --> 00:22:23,600
right now in the business and has been

596
00:22:27,430 --> 00:22:25,360
in the business of

597
00:22:29,590 --> 00:22:27,440
uh putting uh experiments and doing

598
00:22:33,110 --> 00:22:29,600
pharmacy pharmacological research on the

599
00:22:35,430 --> 00:22:33,120
station uh has focused on salmonella

600
00:22:36,870 --> 00:22:35,440
which uh to put it in and he gave

601
00:22:38,950 --> 00:22:36,880
probably the best primer on all this

602
00:22:40,710 --> 00:22:38,960
that i've ever heard frankly and helped

603
00:22:43,270 --> 00:22:40,720
me understand why space is such an

604
00:22:45,750 --> 00:22:43,280
important thing uh in essence what

605
00:22:47,909 --> 00:22:45,760
happens uh to things like salmonella is

606
00:22:50,070 --> 00:22:47,919
for reasons we don't know as he's put

607
00:22:52,710 --> 00:22:50,080
it's just a phenomenon uh things get

608
00:22:54,950 --> 00:22:52,720
more virulent in in orbit the the

609
00:22:58,310 --> 00:22:54,960
virulence goes to 11 to use a spinal tap

610
00:23:01,190 --> 00:22:58,320
term and uh and and that makes it easier

611
00:23:03,270 --> 00:23:01,200
makes it easier to uh find vaccines you

612
00:23:04,870 --> 00:23:03,280
can find that virulence marker much more

613
00:23:06,870 --> 00:23:04,880

quickly and they have as a result

614
00:23:08,710 --> 00:23:06,880
they're in fda approval

615
00:23:10,230 --> 00:23:08,720
for a vaccine for salmonella which is

616
00:23:11,669 --> 00:23:10,240
not a huge problem in the developed

617
00:23:14,390 --> 00:23:11,679
world but is an actual killer in the

618
00:23:15,909 --> 00:23:14,400
third world uh interesting point he said

619
00:23:18,070 --> 00:23:15,919
if you think going to space is hard try

620
00:23:19,190 --> 00:23:18,080
getting fda approval for a drug

621
00:23:21,029 --> 00:23:19,200
um

622
00:23:23,190 --> 00:23:21,039
he now they moved into something a

623
00:23:24,950 --> 00:23:23,200
little more um

624
00:23:26,549 --> 00:23:24,960
well potentially you know i was thinking

625
00:23:28,070 --> 00:23:26,559
of a drama strain the whole time but you

626
00:23:31,510 --> 00:23:28,080
see they're talking about flying you

627
00:23:34,070 --> 00:23:31,520
know they have flown the uh staff um

628
00:23:34,870 --> 00:23:34,080
uh is it a virus is staff a virus or a

629
00:23:37,830 --> 00:23:34,880
uh

630
00:23:38,710 --> 00:23:37,840
what's that mrsa which is a virus or a

631
00:23:40,630 --> 00:23:38,720
uh

632
00:23:43,669 --> 00:23:40,640
where's the science guy when i need him

633
00:23:47,350 --> 00:23:43,679
it's a bacteria thank you

634
00:23:51,269 --> 00:23:49,110
once again showing my history major

635
00:23:53,029 --> 00:23:51,279
roots okay so anyway

636
00:23:54,470 --> 00:23:53,039
the staph virus is up there in the

637
00:23:56,149 --> 00:23:54,480
station but don't worry it's well

638
00:23:57,269 --> 00:23:56,159

contained and it's not going to get out

639
00:23:58,390 --> 00:23:57,279
and they've got it in this thing and

640
00:24:00,310 --> 00:23:58,400
there and

641
00:24:03,510 --> 00:24:00,320
the the process of trying to discover

642
00:24:05,430 --> 00:24:03,520
ways to attack it uh is is laborious

643
00:24:07,029 --> 00:24:05,440
lengthy and what's important for people

644
00:24:10,630 --> 00:24:07,039
like him who are in this business is to

645
00:24:12,950 --> 00:24:10,640
have predictable uh consistent access to

646
00:24:15,269 --> 00:24:12,960
space and he uh was very complimentary

647
00:24:17,269 --> 00:24:15,279
toward nasa and doing business with them

648
00:24:18,789 --> 00:24:17,279
uh really sees not a lot of problems i

649
00:24:22,470 --> 00:24:18,799
did ask him however if there needs to be

650
00:24:23,350 --> 00:24:22,480
sort of a another entity of some kind to

651
00:24:25,750 --> 00:24:23,360
um

652
00:24:28,630 --> 00:24:25,760
do business to be to particularly on the

653
00:24:30,630 --> 00:24:28,640
basic research side uh to

654
00:24:32,070 --> 00:24:30,640
get science to and from the station some

655
00:24:33,990 --> 00:24:32,080
sort of non-profit is what i threw out

656
00:24:35,909 --> 00:24:34,000
he said you know the nih

657
00:24:38,230 --> 00:24:35,919
that's what they do why not make them

658
00:24:41,350 --> 00:24:38,240
funnel science to the station so that

659
00:24:45,029 --> 00:24:41,360
might be something to consider um

660
00:24:46,710 --> 00:24:45,039
uh he uh talked about uh and you know

661
00:24:49,510 --> 00:24:46,720
imagine if they could uh come up with a

662
00:24:51,269 --> 00:24:49,520
uh a vaccine that would uh solve the

663
00:24:53,909 --> 00:24:51,279

staph infections which is a huge problem

664
00:24:56,549 --> 00:24:53,919
uh in hospitals all across the world

665
00:24:59,110 --> 00:24:56,559
brett alexander who is uh head of the uh

666
00:25:00,870 --> 00:24:59,120
commercial space flight federation uh he

667
00:25:02,789 --> 00:25:00,880
uh talked a lot about the uh the

668
00:25:05,830 --> 00:25:02,799
benefits of opening up space to the

669
00:25:07,830 --> 00:25:05,840
commercial uh sector and and how those

670
00:25:09,190 --> 00:25:07,840
partnerships can work and he talked

671
00:25:11,669 --> 00:25:09,200
about um

672
00:25:14,710 --> 00:25:11,679
you know he made the analogy to um the

673
00:25:15,669 --> 00:25:14,720
world of computers and how uh nasa of

674
00:25:17,830 --> 00:25:15,679
course

675
00:25:19,350 --> 00:25:17,840
pushed that world along uh in another

676
00:25:21,190 --> 00:25:19,360
generation and off it went to the

677
00:25:22,870 --> 00:25:21,200
private sector and look what i have in

678
00:25:24,789 --> 00:25:22,880
my hand you know it's more than they had

679
00:25:27,669 --> 00:25:24,799
in that huge room to get

680
00:25:28,390 --> 00:25:27,679
apollo 11 to the moon and uh

681
00:25:30,310 --> 00:25:28,400
so

682
00:25:31,750 --> 00:25:30,320
he the question that he posed is if the

683
00:25:33,830 --> 00:25:31,760
private sector were to get involved in

684
00:25:36,070 --> 00:25:33,840
space where things haven't changed as as

685
00:25:38,470 --> 00:25:36,080
much or as rapidly uh maybe maybe the

686
00:25:40,470 --> 00:25:38,480
silicon valley model is is what will

687
00:25:43,430 --> 00:25:40,480
change things significantly he also

688
00:25:46,149 --> 00:25:43,440

talked about uh the analog to aviation

689
00:25:48,230 --> 00:25:46,159
uh and how uh the u.s of course

690
00:25:51,190 --> 00:25:48,240
wright brothers uh was in the early lead

691
00:25:52,789 --> 00:25:51,200
in aviation but lost that in about 15

692
00:25:54,950 --> 00:25:52,799
years subsequent to the wright brothers

693
00:25:57,590 --> 00:25:54,960
flying to the europeans and then the

694
00:25:59,190 --> 00:25:57,600
naca essentially came in and and the

695
00:26:01,190 --> 00:25:59,200
airmail act and a lot of things were

696
00:26:02,630 --> 00:26:01,200
there to stimulate that and and of

697
00:26:04,390 --> 00:26:02,640
course there there was a military

698
00:26:06,310 --> 00:26:04,400
purpose there as well we can't you know

699
00:26:07,510 --> 00:26:06,320
ignore that but the fact is

700
00:26:09,110 --> 00:26:07,520
there was an appropriate place for the

701
00:26:11,029 --> 00:26:09,120
government to come in and stimulate some

702
00:26:13,190 --> 00:26:11,039
growth and that that uh obviously

703
00:26:16,630 --> 00:26:13,200
changed forever the the face of

704
00:26:17,990 --> 00:26:16,640
of age aviation um he summing up he said

705
00:26:20,390 --> 00:26:18,000
there's nothing unique about getting to

706
00:26:21,909 --> 00:26:20,400
space that should be a government

707
00:26:23,269 --> 00:26:21,919
enterprise forever i guess that's a

708
00:26:24,950 --> 00:26:23,279
theme that probably came up in all of

709
00:26:26,310 --> 00:26:24,960
these and then somebody asked a question

710
00:26:27,510 --> 00:26:26,320
i thought it was a great question and i

711
00:26:28,950 --> 00:26:27,520
didn't plant this but they said you know

712
00:26:30,630 --> 00:26:28,960
why don't we know more about the space

713
00:26:32,149 --> 00:26:30,640

station why why isn't the space station

714
00:26:33,269 --> 00:26:32,159
more alive for people why isn't it in

715
00:26:34,950 --> 00:26:33,279
classrooms why don't we know who's up

716
00:26:36,710 --> 00:26:34,960
there why aren't they communicating well

717
00:26:39,269 --> 00:26:36,720
and tom pickens in essence said well we

718
00:26:40,470 --> 00:26:39,279
need to send miles so

719
00:26:42,789 --> 00:26:40,480
thank you tom

720
00:26:44,390 --> 00:26:42,799
i'm kind of paraphrasing but he said

721
00:26:45,990 --> 00:26:44,400
maybe maybe in the commercial world

722
00:26:47,830 --> 00:26:46,000
there'll be room for the likes of me

723
00:26:49,269 --> 00:26:47,840
people who can communicate as well as do

724
00:26:50,710 --> 00:26:49,279
the science not saying you scientists

725
00:26:53,830 --> 00:26:50,720
aren't good commuters and communicators

726
00:26:55,590 --> 00:26:53,840
in some cases science guy but uh in any

727
00:26:57,029 --> 00:26:55,600
case that was it it was it was a great

728
00:26:59,110 --> 00:26:57,039
discussion we could have gone on another

729
00:27:00,870 --> 00:26:59,120
hour easily i found it fascinating great

730
00:27:04,070 --> 00:27:00,880
thank you i want to thank all four of

731
00:27:06,230 --> 00:27:04,080
the the breakout leaders however

732
00:27:07,750 --> 00:27:06,240
last question of the day and and there

733
00:27:09,590 --> 00:27:07,760
is one more question and i'd like for

734
00:27:11,669 --> 00:27:09,600
them to just very briefly

735
00:27:12,870 --> 00:27:11,679
uh share with you what their biggest

736
00:27:15,269 --> 00:27:12,880
surprise

737
00:27:17,269 --> 00:27:15,279
whether it was pleasant or otherwise

738
00:27:19,669 --> 00:27:17,279

their biggest surprise on the day so

739
00:27:21,269 --> 00:27:19,679
miles and and the day means from the

740
00:27:23,269 --> 00:27:21,279
very beginning

741
00:27:25,430 --> 00:27:23,279
you know when you got here

742
00:27:26,950 --> 00:27:25,440
until right now when i just asked this

743
00:27:29,590 --> 00:27:26,960
question and i'll start with you well

744
00:27:33,029 --> 00:27:29,600
this would be it the question no i um

745
00:27:36,789 --> 00:27:35,190
the um actually i i was a little

746
00:27:38,549 --> 00:27:36,799
surprised and i didn't i should have

747
00:27:40,230 --> 00:27:38,559
mentioned this i i did ask why not make

748
00:27:42,149 --> 00:27:40,240
the chinese partners in the space

749
00:27:43,909 --> 00:27:42,159
station and i got uh cricket as a

750
00:27:47,269 --> 00:27:43,919
response so

751
00:27:48,950 --> 00:27:47,279
cricket cricket that was it

752
00:27:50,710 --> 00:27:48,960
norm

753
00:27:56,789 --> 00:27:50,720
my biggest surprise was the quality of

754
00:28:02,070 --> 00:27:59,350
and i i have to ask a follow-up question

755
00:28:03,750 --> 00:28:02,080
is it good or bad compared to your

756
00:28:05,830 --> 00:28:03,760
normal lunch

757
00:28:07,430 --> 00:28:05,840
because i don't eat lunch at least so

758
00:28:09,350 --> 00:28:07,440
that would be good

759
00:28:10,950 --> 00:28:09,360
at least this water

760
00:28:12,630 --> 00:28:10,960
at least the water wasn't from space

761
00:28:15,750 --> 00:28:12,640
station all right

762
00:28:15,760 --> 00:28:18,630
you think

763
00:28:22,549 --> 00:28:20,389

well i'm tempted to say my biggest

764
00:28:27,269 --> 00:28:22,559
surprise is i haven't yet been blamed

765
00:28:31,750 --> 00:28:30,149
but i think i will go with seriously how

766
00:28:34,549 --> 00:28:31,760
emotional it was to see the president

767
00:28:36,950 --> 00:28:34,559
united states standing in front of as i

768
00:28:40,389 --> 00:28:36,960
say they had me at the nasa flag but

769
00:28:43,350 --> 00:28:40,399
then to have in addition uh the

770
00:28:45,510 --> 00:28:43,360
orion capsule there that we know will

771
00:28:48,230 --> 00:28:45,520
now be going not only to the space

772
00:28:50,389 --> 00:28:48,240
station but beyond to an asteroid for

773
00:28:54,630 --> 00:28:50,399
the first time humanity's ever done that

774
00:28:56,789 --> 00:28:54,640
uh by 2025 in our nasa and commercial

775
00:28:59,029 --> 00:28:56,799
and state-owned facility there it was

776
00:29:00,470 --> 00:28:59,039
pretty emotional and i was surprised by

777
00:29:02,470 --> 00:29:00,480
that but

778
00:29:04,630 --> 00:29:02,480
norm you get to come back because i okay

779
00:29:07,110 --> 00:29:04,640
thank you and i'll go to john

780
00:29:08,549 --> 00:29:07,120
my biggest surprise uh was that there

781
00:29:10,549 --> 00:29:08,559
was really no discussion of the

782
00:29:12,710 --> 00:29:10,559
international aspects of this whole

783
00:29:15,029 --> 00:29:12,720
effort until you just mentioned it now i

784
00:29:17,750 --> 00:29:15,039
didn't talk about it but

785
00:29:19,669 --> 00:29:17,760
that is one place if we have a

786
00:29:22,070 --> 00:29:19,679
money challenge and a

787
00:29:24,310 --> 00:29:22,080
science challenge and so on that we

788
00:29:28,070 --> 00:29:24,320

could get a lot of help

789
00:29:31,430 --> 00:29:28,080
and john i guess my biggest surprise was

790
00:29:33,110 --> 00:29:31,440
the uh level of enthusiasm uh and

791
00:29:35,110 --> 00:29:33,120
excitement with which the president's

792
00:29:37,669 --> 00:29:35,120
remarks were received

793
00:29:39,830 --> 00:29:37,679
given the um

794
00:29:43,269 --> 00:29:39,840
the the pummeling we have sometimes been

795
00:29:45,190 --> 00:29:43,279
taking uh in some of the media over this

796
00:29:45,990 --> 00:29:45,200
over this plan

797
00:29:51,190 --> 00:29:46,000
uh

798
00:29:53,110 --> 00:29:51,200
really learned very much about it i was

799
00:29:54,870 --> 00:29:53,120
i was worried about the sort of

800
00:29:57,269 --> 00:29:54,880
reception the president would receive

801
00:30:00,310 --> 00:29:57,279
here and i i thought it was a a an

802
00:30:01,510 --> 00:30:00,320
astonishingly warm and receptive uh

803
00:30:02,470 --> 00:30:01,520
audience

804
00:30:04,070 --> 00:30:02,480
and

805
00:30:05,750 --> 00:30:04,080
i thought the president did a great job

806
00:30:08,710 --> 00:30:05,760
that was not a surprise

807
00:30:10,710 --> 00:30:08,720
but the uh but the but the warmth and

808
00:30:12,149 --> 00:30:10,720
receptiveness was

809
00:30:14,630 --> 00:30:12,159
thanks very much thanks to all of you

810
00:30:17,029 --> 00:30:14,640
and uh let me a couple of closing

811
00:30:19,430 --> 00:30:17,039
comments here from me um i guess let me

812
00:30:21,510 --> 00:30:19,440
apologize first of all to all of you who

813
00:30:23,590 --> 00:30:21,520

came because i know it wasn't easy to

814
00:30:25,909 --> 00:30:23,600
get here we didn't make it very easy uh

815
00:30:28,870 --> 00:30:25,919
and to to many of you who are corporate

816
00:30:30,549 --> 00:30:28,880
ceos or or acad you know you you're

817
00:30:32,630 --> 00:30:30,559
presidents of universities or whatever

818
00:30:34,950 --> 00:30:32,640
else it is i can promise the next time

819
00:30:37,750 --> 00:30:34,960
we won't we won't be quite as

820
00:30:39,990 --> 00:30:37,760
the way we were this time so so i i

821
00:30:41,909 --> 00:30:40,000
apologize for for handling it the way we

822
00:30:43,990 --> 00:30:41,919
did but we'll do better

823
00:30:46,310 --> 00:30:44,000
and hopefully we will do this again uh

824
00:30:48,070 --> 00:30:46,320
hopefully we will find a way to move

825
00:30:50,389 --> 00:30:48,080
this around the country for some of you

826
00:30:52,470 --> 00:30:50,399
who were around before you know we we

827
00:30:54,470 --> 00:30:52,480
tried this once and it was invaluable

828
00:30:57,350 --> 00:30:54,480
except we didn't do anything with it

829
00:31:00,310 --> 00:30:57,360
and what i would like to see us do is do

830
00:31:02,710 --> 00:31:00,320
this in other venues but do something

831
00:31:05,669 --> 00:31:02,720
with it use it to make a difference

832
00:31:08,310 --> 00:31:05,679
um you know i as i travel from group to

833
00:31:10,230 --> 00:31:08,320
group there were several things that

834
00:31:13,269 --> 00:31:10,240
struck me again

835
00:31:14,789 --> 00:31:13,279
uh and it was one this is a human

836
00:31:17,830 --> 00:31:14,799
robotic effort

837
00:31:20,389 --> 00:31:17,840
uh there is no there is no competition

838
00:31:22,230 --> 00:31:20,399

between humans and robots and and i was

839
00:31:25,509 --> 00:31:22,240
very pleasantly surprised to hear

840
00:31:26,470 --> 00:31:25,519
everybody make that observation uh all

841
00:31:28,149 --> 00:31:26,480
explore

842
00:31:29,909 --> 00:31:28,159
i forgot who it was but somebody said

843
00:31:32,549 --> 00:31:29,919
all that's right

844
00:31:34,549 --> 00:31:32,559
all exploration is human

845
00:31:36,789 --> 00:31:34,559
uh you know it's just sometimes we use a

846
00:31:38,870 --> 00:31:36,799
surrogate in the form of a robot because

847
00:31:41,190 --> 00:31:38,880
we either can't get there or it's too

848
00:31:42,870 --> 00:31:41,200
hostile or we just don't know and so

849
00:31:44,830 --> 00:31:42,880
that's what we're going to be about the

850
00:31:47,909 --> 00:31:44,840
other thing i will address is

851
00:31:50,549 --> 00:31:47,919
risk we do risky stuff

852
00:31:52,630 --> 00:31:50,559
and and that's not just

853
00:31:54,389 --> 00:31:52,640
when i say risky stuff that's not just

854
00:31:57,269 --> 00:31:54,399
life and death risk

855
00:31:58,389 --> 00:31:57,279
we are going to do economically risky

856
00:32:01,509 --> 00:31:58,399
stuff

857
00:32:03,990 --> 00:32:01,519
and and i appeal to you to um

858
00:32:05,909 --> 00:32:04,000
to help us as we do that you know what i

859
00:32:06,789 --> 00:32:05,919
want to do is i want to design i want to

860
00:32:08,950 --> 00:32:06,799
test

861
00:32:11,190 --> 00:32:08,960
i want to go fly and i want to do that

862
00:32:12,389 --> 00:32:11,200
on a routine basis and the only way you

863
00:32:14,230 --> 00:32:12,399

can do that

864
00:32:17,590 --> 00:32:14,240
and do it at the pace ed as you

865
00:32:19,830 --> 00:32:17,600
mentioned is accept risks sometimes so

866
00:32:23,909 --> 00:32:19,840
when we fly a human it's going to be a

867
00:32:25,669 --> 00:32:23,919
very very very very measured risks but

868
00:32:28,630 --> 00:32:25,679
there are some times that we can do

869
00:32:30,389 --> 00:32:28,640
smaller things to set humans up where we

870
00:32:32,149 --> 00:32:30,399
can you know think about it overnight

871
00:32:34,470 --> 00:32:32,159
and then go do it and you know what

872
00:32:36,870 --> 00:32:34,480
we're going to fail now and then

873
00:32:39,830 --> 00:32:36,880
and that too is okay

874
00:32:42,549 --> 00:32:39,840
because if we fail it means we really

875
00:32:44,470 --> 00:32:42,559
tried hard and we stretched what we

876
00:32:46,149 --> 00:32:44,480
thought our capabilities were so that's

877
00:32:48,549 --> 00:32:46,159
very important for all of us to take

878
00:32:50,149 --> 00:32:48,559
from this venue uh and share it with

879
00:32:52,070 --> 00:32:50,159
people who weren't here

880
00:32:54,230 --> 00:32:52,080
uh and then the the third thing i'll

881
00:32:57,269 --> 00:32:54,240
tell you before i before i do my final

882
00:32:59,029 --> 00:32:57,279
wrap-up is uh talk to us

883
00:33:00,230 --> 00:32:59,039
you know i'm accessible

884
00:33:02,549 --> 00:33:00,240
tina

885
00:33:04,870 --> 00:33:02,559
hates it

886
00:33:06,870 --> 00:33:04,880
because she tries to be the guardian

887
00:33:09,590 --> 00:33:06,880
but you know you can reach us by email

888
00:33:12,389 --> 00:33:09,600

you can reach us by phone

889
00:33:15,509 --> 00:33:12,399
you can walk in sometimes and and beat

890
00:33:16,230 --> 00:33:15,519
tina up and uh and talk to me in person

891
00:33:17,830 --> 00:33:16,240
but

892
00:33:20,310 --> 00:33:17,840
we can only help

893
00:33:21,909 --> 00:33:20,320
if we know what you think is wrong so

894
00:33:24,789 --> 00:33:21,919
talk to us

895
00:33:27,830 --> 00:33:24,799
you know don't say nasa didn't do this

896
00:33:30,470 --> 00:33:27,840
uh if you didn't talk to us so i ask you

897
00:33:33,750 --> 00:33:32,230
mike foale said it very well what we're

898
00:33:36,549 --> 00:33:33,760
trying to and mike has said this on a

899
00:33:38,549 --> 00:33:36,559
number of occasions what we all want all

900
00:33:39,990 --> 00:33:38,559
of us who have been to space or who want

901
00:33:42,630 --> 00:33:40,000
to go to space

902
00:33:43,590 --> 00:33:42,640
we want reliable redundant access to

903
00:33:45,430 --> 00:33:43,600
space

904
00:33:47,269 --> 00:33:45,440
and the only way you can do that is if

905
00:33:49,029 --> 00:33:47,279
you open up the aperture

906
00:33:50,310 --> 00:33:49,039
and that means government

907
00:33:52,950 --> 00:33:50,320
commercial

908
00:33:54,310 --> 00:33:52,960
international uh you name it we don't

909
00:33:55,590 --> 00:33:54,320
there there are probably other ways to

910
00:33:58,789 --> 00:33:55,600
get there that we haven't even thought

911
00:34:00,630 --> 00:33:58,799
about and so i ask you to think about

912
00:34:03,029 --> 00:34:00,640
ways that we can provide reliable

913
00:34:05,750 --> 00:34:03,039

redundant access to space i want to

914
00:34:08,950 --> 00:34:05,760
thank all of the organizers from folk in

915
00:34:10,629 --> 00:34:08,960
ostp who did an incredible job

916
00:34:12,629 --> 00:34:10,639
folk around the president and the

917
00:34:14,629 --> 00:34:12,639
executive officer of the president

918
00:34:16,069 --> 00:34:14,639
folk at nasa headquarters but most

919
00:34:18,149 --> 00:34:16,079
importantly

920
00:34:21,829 --> 00:34:18,159
the men and women here at at the kennedy

921
00:34:27,589 --> 00:34:21,839
space center who have been incredible

922
00:34:32,389 --> 00:34:30,149
and then um

923
00:34:34,550 --> 00:34:32,399
and the the final thanks goes to all of

924
00:34:36,389 --> 00:34:34,560
you because as i said i mentioned it

925
00:34:37,909 --> 00:34:36,399
about the students but all of you have

926
00:34:39,909 --> 00:34:37,919
day jobs

927
00:34:42,310 --> 00:34:39,919
and and all of you have very important

928
00:34:44,790 --> 00:34:42,320
things going on senator nelson has you

929
00:34:47,270 --> 00:34:44,800
know missed probably missed a vote today

930
00:34:50,310 --> 00:34:47,280
and he's going to catch a lot of grief

931
00:34:52,790 --> 00:34:50,320
but every single one of you decided that

932
00:34:55,589 --> 00:34:52,800
this was important and you came and for

933
00:34:59,030 --> 00:34:55,599
that we are incredibly thankful and then

934
00:35:02,950 --> 00:34:59,040
i will close by uh sharing uh you know i

935
00:35:06,390 --> 00:35:02,960
am uh i consider myself to be a dreamer

936
00:35:08,630 --> 00:35:06,400
our president uses a term sometime

937
00:35:11,030 --> 00:35:08,640
and it's called the incredible urgency

938
00:35:17,670 --> 00:35:11,040

of now

939
00:35:19,910 --> 00:35:17,680
if we don't take it seriously and we're

940
00:35:21,589 --> 00:35:19,920
not we don't understand that it is

941
00:35:23,990 --> 00:35:21,599
incredibly urgent

942
00:35:25,589 --> 00:35:24,000
for us to do the things that are before

943
00:35:26,950 --> 00:35:25,599
us to accept the challenges that are

944
00:35:29,990 --> 00:35:26,960
before us the congress the

945
00:35:31,670 --> 00:35:30,000
administration industry academia uh we

946
00:35:33,910 --> 00:35:31,680
have all got to come together and make

947
00:35:36,390 --> 00:35:33,920
this happen because the world let me

948
00:35:39,510 --> 00:35:36,400
tell you they are looking for us to lead

949
00:35:41,510 --> 00:35:39,520
they want us to lead um and they do not

950
00:35:43,829 --> 00:35:41,520
expect us to shrink from that leadership

951
00:35:45,750 --> 00:35:43,839
but we all have to develop what what the

952
00:35:48,390 --> 00:35:45,760
president calls the incredible urgency

953
00:35:50,790 --> 00:35:48,400
or the fierce urgency of now so with

954
00:35:52,310 --> 00:35:50,800
that i wish you all a do god bless all