# VIA PHONE

**Sally Ride**

President and CEO, Sally Ride Science
America's first woman in space

1
00:00:09,270 --> 00:00:07,670
good afternoon my name is duane brown

2
00:00:11,830 --> 00:00:09,280
from the office of communications and

3
00:00:14,709 --> 00:00:11,840
welcome to nasa headquarters

4
00:00:17,910 --> 00:00:14,719
nasa rang in 2012 with twin spacecraft

5
00:00:19,510 --> 00:00:17,920
being placed in orbit around our moon

6
00:00:22,310 --> 00:00:19,520
and not only will you hear the current

7
00:00:24,710 --> 00:00:22,320
status of the twins but also upcoming

8
00:00:26,630 --> 00:00:24,720
plans for science operations

9
00:00:28,070 --> 00:00:26,640
and for the grand finale

10
00:00:30,390 --> 00:00:28,080
the announcement

11
00:00:33,830 --> 00:00:30,400
of new names for the spacecraft as a

12
00:00:35,670 --> 00:00:33,840
result of a nationwide student contest

13
00:00:38,310 --> 00:00:35,680

we will have brief remarks

14
00:00:40,630 --> 00:00:38,320
from our participants here in washington

15
00:00:42,310 --> 00:00:40,640
then go to the phone with sally ride

16
00:00:45,510 --> 00:00:42,320
america's first woman in space and

17
00:00:48,069 --> 00:00:45,520
president and ceo sally rad science san

18
00:00:49,910 --> 00:00:48,079
diego would take us into the grand

19
00:00:51,910 --> 00:00:49,920
finale

20
00:00:54,310 --> 00:00:51,920
let me introduce you to today's

21
00:00:55,910 --> 00:00:54,320
participants here on stage in order of

22
00:00:58,389 --> 00:00:55,920
their seating

23
00:01:00,549 --> 00:00:58,399
first leland melvin

24
00:01:03,510 --> 00:01:00,559
associate administrator for education

25
00:01:06,310 --> 00:01:04,869
maria zuber

26
00:01:08,950 --> 00:01:06,320
grail principal investigator

27
00:01:12,870 --> 00:01:08,960
massachusetts institute of technology

28
00:01:17,990 --> 00:01:15,350
jim green director planetary science

29
00:01:19,670 --> 00:01:18,000
division science mission directorate

30
00:01:20,630 --> 00:01:19,680
nasa headquarters we'll start with

31
00:01:21,990 --> 00:01:20,640
leland

32
00:01:24,390 --> 00:01:22,000
then jim

33
00:01:26,710 --> 00:01:24,400
and then to maria leon

34
00:01:28,950 --> 00:01:26,720
thanks duane

35
00:01:30,469 --> 00:01:28,960
i'm really pleased to be here today to

36
00:01:31,510 --> 00:01:30,479
share in the next step of the grail

37
00:01:33,109 --> 00:01:31,520
mission

38
00:01:35,350 --> 00:01:33,119

and learning the names that the students

39
00:01:37,270 --> 00:01:35,360
have chosen for the twin spacecraft

40
00:01:39,429 --> 00:01:37,280
nasa's science and education programs

41
00:01:41,510 --> 00:01:39,439
are perfect complements for engaging

42
00:01:43,749 --> 00:01:41,520
america's students in stem which is

43
00:01:45,109 --> 00:01:43,759
science technology engineering and

44
00:01:46,870 --> 00:01:45,119
mathematics

45
00:01:49,749 --> 00:01:46,880
nasa's scientific missions and the

46
00:01:51,749 --> 00:01:49,759
exciting discoveries that they reveal

47
00:01:54,149 --> 00:01:51,759
are wonderful catalysts for getting

48
00:01:56,230 --> 00:01:54,159
students interested in studying science

49
00:01:58,870 --> 00:01:56,240
and it's really cool

50
00:02:00,149 --> 00:01:58,880
i mean like really cool to study science

51
00:02:02,069 --> 00:02:00,159
i was talking to maria a little bit

52
00:02:04,149 --> 00:02:02,079
earlier about how my mother gave me a

53
00:02:05,670 --> 00:02:04,159
chemistry set when i was a young boy and

54
00:02:07,749 --> 00:02:05,680
this was before osha got involved with

55
00:02:09,910 --> 00:02:07,759
chemistry sets but i mixed these two

56
00:02:12,309 --> 00:02:09,920
dissimilar chemicals and created this

57
00:02:15,030 --> 00:02:12,319
fantastic explosion in my mother's

58
00:02:17,350 --> 00:02:15,040
living room so the coolness led me to

59
00:02:19,190 --> 00:02:17,360
become a chemistry major so we have to

60
00:02:23,110 --> 00:02:19,200
do more things like this to get kids

61
00:02:24,550 --> 00:02:23,120
inspired in in doing cool stuff but

62
00:02:26,390 --> 00:02:24,560
science has always been an important

63
00:02:28,390 --> 00:02:26,400

component of nasa's education program

64
00:02:29,910 --> 00:02:28,400
and i think it will be featured even

65
00:02:32,390 --> 00:02:29,920
more prominently now

66
00:02:34,790 --> 00:02:32,400
that we're in the post shuttle era

67
00:02:36,710 --> 00:02:34,800
in november nasa education joined our

68
00:02:39,509 --> 00:02:36,720
friends in science in celebrating the

69
00:02:41,509 --> 00:02:39,519
launch of the mars science laboratory

70
00:02:44,470 --> 00:02:41,519
and the curiosity rover

71
00:02:46,869 --> 00:02:44,480
the name curiosity was also chosen by a

72
00:02:48,630 --> 00:02:46,879
student clara ma of kansas

73
00:02:50,070 --> 00:02:48,640
by engaging students in the interactive

74
00:02:52,630 --> 00:02:50,080
learning tools developed for this

75
00:02:54,390 --> 00:02:52,640
mission were really taking them along on

76
00:02:56,229 --> 00:02:54,400
the journey

77
00:02:58,229 --> 00:02:56,239
this mission even captured the attention

78
00:03:00,149 --> 00:02:58,239
of entertainer will i am

79
00:03:01,830 --> 00:03:00,159
he joined us for the launch and has

80
00:03:04,470 --> 00:03:01,840
restated his commitment to helping

81
00:03:06,070 --> 00:03:04,480
students get excited about robotics and

82
00:03:07,750 --> 00:03:06,080
technical subjects

83
00:03:09,670 --> 00:03:07,760
we're happy to be working with him so

84
00:03:11,670 --> 00:03:09,680
they can do more of that

85
00:03:13,670 --> 00:03:11,680
science is exciting and the grail

86
00:03:15,990 --> 00:03:13,680
spacecraft will no doubt offer many

87
00:03:18,550 --> 00:03:16,000
opportunities for students to learn more

88
00:03:20,229 --> 00:03:18,560

about earth's only natural satellite

89
00:03:22,309 --> 00:03:20,239
i am really delighted to work with my

90
00:03:24,949 --> 00:03:22,319
science colleagues to my left

91
00:03:27,750 --> 00:03:24,959
to inspire and truly inspire the next

92
00:03:30,630 --> 00:03:27,760
generation of explorers thank you

93
00:03:32,149 --> 00:03:30,640
thank you lily jim

94
00:03:34,309 --> 00:03:32,159
well you know this has just been a

95
00:03:35,430 --> 00:03:34,319
tremendous year and a half for planetary

96
00:03:37,589 --> 00:03:35,440
science

97
00:03:38,789 --> 00:03:37,599
over that time period we flew by two

98
00:03:41,830 --> 00:03:38,799
comments

99
00:03:42,710 --> 00:03:41,840
we took we put two spacecraft in orbit

100
00:03:44,949 --> 00:03:42,720
around

101
00:03:47,270 --> 00:03:44,959
bodies in our solar system messenger

102
00:03:49,830 --> 00:03:47,280
around mercury and dawn around a

103
00:03:51,910 --> 00:03:49,840
fabulous asteroid called vesta

104
00:03:54,149 --> 00:03:51,920
we also did three launches

105
00:03:55,830 --> 00:03:54,159
we launched juno to jupiter

106
00:03:58,789 --> 00:03:55,840
as leland mentioned

107
00:04:01,670 --> 00:03:58,799
msl or the curiosity rover is on its way

108
00:04:03,350 --> 00:04:01,680
to mars and of course the grail mission

109
00:04:05,030 --> 00:04:03,360
in september

110
00:04:06,710 --> 00:04:05,040
now since that time

111
00:04:09,110 --> 00:04:06,720
since september 10th

112
00:04:10,149 --> 00:04:09,120
the two grail spacecraft have made it to

113
00:04:12,550 --> 00:04:10,159

the moon

114
00:04:14,869 --> 00:04:12,560
and it's going to open a new era for us

115
00:04:16,710 --> 00:04:14,879
it's really going to be a new moon it's

116
00:04:18,390 --> 00:04:16,720
going to look at the moon in ways we've

117
00:04:20,310 --> 00:04:18,400
never seen before

118
00:04:22,629 --> 00:04:20,320
and to give you an update on the health

119
00:04:25,909 --> 00:04:22,639
of those spacecraft and where they are

120
00:04:28,230 --> 00:04:25,919
maria right thank you very much again

121
00:04:29,030 --> 00:04:28,240
okay if we could run the first video all

122
00:04:31,510 --> 00:04:29,040
right

123
00:04:35,350 --> 00:04:31,520
on uh new year's eve and new year's day

124
00:04:37,110 --> 00:04:35,360
the sparkling cider uh was popping um

125
00:04:38,950 --> 00:04:37,120
out at the control

126
00:04:40,310 --> 00:04:38,960
rooms in the jet propulsion laboratory

127
00:04:43,510 --> 00:04:40,320
in pasadena

128
00:04:45,270 --> 00:04:43,520
um as well as uh in our control room at

129
00:04:47,830 --> 00:04:45,280
the spacecraft contractor lockheed

130
00:04:50,629 --> 00:04:47,840
martin astronautics in denver

131
00:04:53,670 --> 00:04:50,639
uh on new year's eve uh the grail a

132
00:04:55,189 --> 00:04:53,680
spacecraft inserted successfully into uh

133
00:04:57,430 --> 00:04:55,199
lunar orbit

134
00:04:59,270 --> 00:04:57,440
and then

135
00:05:02,469 --> 00:04:59,280
just in time to take a little bit of

136
00:05:05,990 --> 00:05:02,479
breath 25 hours later on new year's day

137
00:05:07,909 --> 00:05:06,000
grail b inserted successfully into lunar

138
00:05:10,629 --> 00:05:07,919

orbit

139
00:05:12,710 --> 00:05:10,639
and we've been busy since then um the

140
00:05:15,670 --> 00:05:12,720
two spacecraft have

141
00:05:18,230 --> 00:05:15,680
each gone through a series of three main

142
00:05:20,070 --> 00:05:18,240
engine maneuvers to reduce their orbital

143
00:05:22,310 --> 00:05:20,080
periods they both started eleven and a

144
00:05:25,110 --> 00:05:22,320
half hour uh orbits

145
00:05:29,510 --> 00:05:25,120
and now grail a is uh orbiting it with a

146
00:05:33,670 --> 00:05:29,520
3.7 hour period and grail b is at a 3.9

147
00:05:35,749 --> 00:05:33,680
hour period um grail a is um

148
00:05:38,150 --> 00:05:35,759
about 93 kilometers above the surface of

149
00:05:40,629 --> 00:05:38,160
the moon grail b is

150
00:05:43,270 --> 00:05:40,639
109 kilometers above the surface of the

151
00:05:45,670 --> 00:05:43,280
moon and the two spacecraft will undergo

152
00:05:48,629 --> 00:05:45,680
further main engine maneuvers to get

153
00:05:51,590 --> 00:05:48,639
them down to their mapping orbit of 55

154
00:05:54,710 --> 00:05:51,600
kilometers so at this point

155
00:05:56,230 --> 00:05:54,720
both spacecraft are still being operated

156
00:05:58,550 --> 00:05:56,240
independently

157
00:06:00,950 --> 00:05:58,560
but then we're going to line them up

158
00:06:02,950 --> 00:06:00,960
and they'll begin mapping the moon in

159
00:06:05,029 --> 00:06:02,960
early march so you can see here in this

160
00:06:07,590 --> 00:06:05,039
animation the first spacecraft there

161
00:06:09,830 --> 00:06:07,600
being accelerated due to that mountain

162
00:06:11,670 --> 00:06:09,840
um there on the moon and it stretches

163
00:06:13,189 --> 00:06:11,680

gets a larger distance from the second

164
00:06:14,710 --> 00:06:13,199
spacecraft and then once the second

165
00:06:17,029 --> 00:06:14,720
spacecraft is affected by that

166
00:06:19,830 --> 00:06:17,039
gravitational mass it catches up to the

167
00:06:21,270 --> 00:06:19,840
first spacecraft so these two spacecraft

168
00:06:23,749 --> 00:06:21,280
they're going to be in orbit the one

169
00:06:25,749 --> 00:06:23,759
behind chasing the one in front in a

170
00:06:29,430 --> 00:06:25,759
polar orbit while the moon slowly

171
00:06:31,749 --> 00:06:29,440
rotates um beneath them and uh and in

172
00:06:33,430 --> 00:06:31,759
that way we will map the moon determine

173
00:06:36,070 --> 00:06:33,440
the gravity field

174
00:06:37,830 --> 00:06:36,080
and gain in our understanding of the

175
00:06:40,870 --> 00:06:37,840
inside of the moon

176
00:06:43,110 --> 00:06:40,880
we could have the next uh slide please

177
00:06:46,309 --> 00:06:43,120
um so mapping of the two of the moon

178
00:06:48,230 --> 00:06:46,319
will begin um in early march and um and

179
00:06:49,589 --> 00:06:48,240
you see in this

180
00:06:53,029 --> 00:06:49,599
still here

181
00:06:55,510 --> 00:06:53,039
the two spacecraft side by side in their

182
00:06:57,990 --> 00:06:55,520
launch configuration out in the the

183
00:06:59,990 --> 00:06:58,000
clean room at lockheed martin

184
00:07:01,670 --> 00:07:00,000
these two spacecraft as i said are now

185
00:07:02,870 --> 00:07:01,680
in lunar orbit

186
00:07:04,390 --> 00:07:02,880
we were

187
00:07:06,309 --> 00:07:04,400
so busy

188
00:07:07,830 --> 00:07:06,319

in the design

189
00:07:09,990 --> 00:07:07,840
and getting these two spacecraft

190
00:07:11,430 --> 00:07:10,000
launched on time

191
00:07:13,189 --> 00:07:11,440
that when we gave them names we gave

192
00:07:13,990 --> 00:07:13,199
them names of a and b

193
00:07:20,070 --> 00:07:14,000
and

194
00:07:22,309 --> 00:07:20,080
the youth of america to um assist us in

195
00:07:25,270 --> 00:07:22,319
uh in getting slightly better names and

196
00:07:28,309 --> 00:07:25,280
we held a nationwide contest

197
00:07:29,189 --> 00:07:28,319
um we had um if we could go to the next

198
00:07:32,390 --> 00:07:29,199
uh

199
00:07:34,950 --> 00:07:32,400
chart i think we'll have here

200
00:07:37,670 --> 00:07:34,960
we had over 11 000

201
00:07:39,909 --> 00:07:37,680
students involved in the naming from 45

202
00:07:43,110 --> 00:07:39,919
states and several

203
00:07:45,430 --> 00:07:43,120
territories and provinces

204
00:07:47,589 --> 00:07:45,440
we all of these students wrote essays

205
00:07:49,029 --> 00:07:47,599
there was a very competitive um

206
00:07:51,350 --> 00:07:49,039
competition

207
00:07:54,230 --> 00:07:51,360
and uh and the students really um

208
00:07:55,749 --> 00:07:54,240
stepped up and made a very difficult uh

209
00:07:58,469 --> 00:07:55,759
decision for us

210
00:08:01,589 --> 00:07:58,479
so to um to talk a little bit more

211
00:08:02,869 --> 00:08:01,599
about the program and the contest and

212
00:08:05,589 --> 00:08:02,879
also

213
00:08:08,710 --> 00:08:05,599

grails education public outreach program

214
00:08:10,950 --> 00:08:08,720
i'm going to turn it over to sally ride

215
00:08:14,150 --> 00:08:10,960
dr brad

216
00:08:16,390 --> 00:08:14,160
thanks duane thanks maria um i'm really

217
00:08:19,110 --> 00:08:16,400
proud to say that grail is the first

218
00:08:22,070 --> 00:08:19,120
spacecraft mission to carry instruments

219
00:08:23,749 --> 00:08:22,080
that are entirely dedicated to education

220
00:08:25,749 --> 00:08:23,759
each of the two spacecraft carry

221
00:08:27,670 --> 00:08:25,759
dedicated cameras that will be operated

222
00:08:29,430 --> 00:08:27,680
by students

223
00:08:31,350 --> 00:08:29,440
maria and i designed an education

224
00:08:33,190 --> 00:08:31,360
program using these cameras that will

225
00:08:35,110 --> 00:08:33,200
rocket over two hundred thousand

226
00:08:36,149 --> 00:08:35,120
elementary and middle school students to

227
00:08:37,990 --> 00:08:36,159
the moon

228
00:08:39,670 --> 00:08:38,000
the program is called mooncam that's

229
00:08:41,350 --> 00:08:39,680
mooncam with a k

230
00:08:43,509 --> 00:08:41,360
and it lets classrooms around the

231
00:08:45,269 --> 00:08:43,519
country and in fact around the world

232
00:08:47,030 --> 00:08:45,279
control the cameras on the grail

233
00:08:49,430 --> 00:08:47,040
spacecraft

234
00:08:51,590 --> 00:08:49,440
students own these cameras

235
00:08:54,150 --> 00:08:51,600
there they'll decide what pictures to

236
00:08:56,070 --> 00:08:54,160
take then they'll use their pictures and

237
00:08:58,790 --> 00:08:56,080
if they like pictures taken by other

238
00:09:01,910 --> 00:08:58,800

schools to study the moon

239
00:09:03,110 --> 00:09:01,920
we already have over 2 100 classrooms

240
00:09:07,030 --> 00:09:03,120
signed up

241
00:09:09,829 --> 00:09:07,040
representing over 150 000 students

242
00:09:12,790 --> 00:09:09,839
and by mid-march when the mission starts

243
00:09:14,230 --> 00:09:12,800
we expect over three thousand stu

244
00:09:15,990 --> 00:09:14,240
three thousand schools to be

245
00:09:17,829 --> 00:09:16,000
participating

246
00:09:20,230 --> 00:09:17,839
now the classroom that won the naming

247
00:09:22,870 --> 00:09:20,240
contest is one of those already

248
00:09:24,710 --> 00:09:22,880
registered for mooncam we're about to

249
00:09:27,590 --> 00:09:24,720
introduce the winning classroom to

250
00:09:29,590 --> 00:09:27,600
unveil the names of the grail spacecraft

251
00:09:31,350 --> 00:09:29,600
but first i wanted to announce that in

252
00:09:33,030 --> 00:09:31,360
mid-march

253
00:09:36,070 --> 00:09:33,040
they'll have the honor of being the

254
00:09:38,630 --> 00:09:36,080
first school to take photos of the moon

255
00:09:41,430 --> 00:09:38,640
with the moon cam cameras

256
00:09:43,430 --> 00:09:41,440
now we'll go live via skype to bozeman

257
00:09:45,590 --> 00:09:43,440
montana

258
00:09:48,710 --> 00:09:45,600
and it's my pleasure to introduce fourth

259
00:09:51,350 --> 00:09:48,720
grade teacher nina demaro

260
00:09:54,310 --> 00:09:51,360
her class at emily dinkinson school in

261
00:10:04,069 --> 00:09:54,320
bozeman submitted the winning entry

262
00:10:10,949 --> 00:10:07,910
oh my gosh this is unbelievable

263
00:10:13,829 --> 00:10:10,959

uh first of all welcome to our classroom

264
00:10:16,470 --> 00:10:13,839
at emily dickinson school in bozeman

265
00:10:19,030 --> 00:10:16,480
montana

266
00:10:23,350 --> 00:10:19,040
this has been just a phenomenal

267
00:10:27,030 --> 00:10:23,360
experience um we're so excited it's an

268
00:10:29,750 --> 00:10:27,040
exceptional honor we can't believe it's

269
00:10:32,150 --> 00:10:29,760
actually happened to us we're so

270
00:10:34,470 --> 00:10:32,160
thrilled that our names were chosen for

271
00:10:38,069 --> 00:10:34,480
girls a and b

272
00:10:41,030 --> 00:10:38,079
we hope but we didn't know that this is

273
00:10:42,310 --> 00:10:41,040
we're so anxious now to share the names

274
00:10:46,310 --> 00:10:42,320
with you

275
00:10:46,320 --> 00:10:52,630
bring us in a class sure

276
00:10:52,640 --> 00:10:55,509
give me an e

277
00:11:01,110 --> 00:10:58,230
give me an f

278
00:11:03,829 --> 00:11:01,120
give me a b

279
00:11:06,470 --> 00:11:03,839
give me an o

280
00:11:08,790 --> 00:11:06,480
give me a b

281
00:11:11,350 --> 00:11:08,800
give me an o

282
00:11:12,829 --> 00:11:11,360
give me an n

283
00:11:16,430 --> 00:11:12,839
give me a

284
00:11:31,030 --> 00:11:16,440
w have we

285
00:11:35,990 --> 00:11:32,949
thank you for the honor of being the

286
00:11:37,990 --> 00:11:36,000
first class to use the moon cam in march

287
00:11:50,069 --> 00:11:38,000
we can't wait

288
00:11:53,509 --> 00:11:51,350

maria i would say they're a little

289
00:11:56,389 --> 00:11:53,519
excited

290
00:11:58,470 --> 00:11:56,399
just a wee bit i hope they apply to mit

291
00:12:00,629 --> 00:11:58,480
someday

292
00:12:02,870 --> 00:12:00,639
and and uh before we open it up for

293
00:12:04,389 --> 00:12:02,880
questions maria uh wants to

294
00:12:05,750 --> 00:12:04,399
re give you some more details on the

295
00:12:08,389 --> 00:12:05,760
winning essay

296
00:12:11,269 --> 00:12:08,399
so i didn't uh i didn't even know that

297
00:12:12,310 --> 00:12:11,279
fourth graders studied gravity but

298
00:12:14,389 --> 00:12:12,320
but this

299
00:12:16,629 --> 00:12:14,399
class full of students

300
00:12:17,829 --> 00:12:16,639
wrote a very clear

301
00:12:19,750 --> 00:12:17,839
essay

302
00:12:21,030 --> 00:12:19,760
obviously learned something about the

303
00:12:24,710 --> 00:12:21,040
grail mission

304
00:12:26,310 --> 00:12:24,720
um they noted the fact that uh grail is

305
00:12:27,910 --> 00:12:26,320
going to be studying

306
00:12:28,710 --> 00:12:27,920
gravity on the moon

307
00:12:33,350 --> 00:12:28,720
and

308
00:12:35,430 --> 00:12:33,360
earth is seen every day

309
00:12:36,310 --> 00:12:35,440
in terms of tides that we have on the

310
00:12:39,910 --> 00:12:36,320
earth

311
00:12:43,110 --> 00:12:39,920
so um so they chose ebb and flow because

312
00:12:45,110 --> 00:12:43,120
it was the daily uh example of how the

313
00:12:46,629 --> 00:12:45,120

moon's gravity um is working on the

314
00:12:50,470 --> 00:12:46,639
earth and i thought that that was

315
00:12:53,670 --> 00:12:50,480
although uh it was very simple um sally

316
00:12:56,230 --> 00:12:53,680
and i were extremely persuaded um as

317
00:12:58,790 --> 00:12:56,240
well as all of us on the team about how

318
00:13:00,710 --> 00:12:58,800
sophisticated the thinking was that uh

319
00:13:02,470 --> 00:13:00,720
that went into that uh

320
00:13:05,110 --> 00:13:02,480
selection by the students so

321
00:13:07,030 --> 00:13:05,120
congratulations their students

322
00:13:09,509 --> 00:13:07,040
congratulations again

323
00:13:12,389 --> 00:13:09,519
and ebb and flow

324
00:13:14,629 --> 00:13:12,399
congratulations emily dickerson and

325
00:13:16,550 --> 00:13:14,639
teacher and the students

326
00:13:18,870 --> 00:13:16,560
this is what nasa is about

327
00:13:20,150 --> 00:13:18,880
inspiring the next generation no better

328
00:13:21,670 --> 00:13:20,160
way to do it ladies and gentlemen

329
00:13:23,829 --> 00:13:21,680
congratulations

330
00:13:25,190 --> 00:13:23,839
okay now we're going to wrap up uh here

331
00:13:26,790 --> 00:13:25,200
soon but uh we're going to see if there

332
00:13:29,110 --> 00:13:26,800
any questions here in the audience so

333
00:13:30,949 --> 00:13:29,120
any questions are you

334
00:13:32,949 --> 00:13:30,959
wait for the mic and identify yourself

335
00:13:34,550 --> 00:13:32,959
please

336
00:13:38,550 --> 00:13:34,560
global brazil

337
00:13:43,189 --> 00:13:40,150
would like to to

338
00:13:45,750 --> 00:13:43,199

understand if the uh the separation

339
00:13:46,629 --> 00:13:45,760
of the two aircraft

340
00:13:47,750 --> 00:13:46,639
when

341
00:13:49,430 --> 00:13:47,760
used

342
00:13:51,110 --> 00:13:49,440
with the cameras

343
00:13:52,150 --> 00:13:51,120
produce

344
00:13:54,150 --> 00:13:52,160
depth

345
00:13:57,030 --> 00:13:54,160
of image

346
00:13:59,990 --> 00:13:57,040
oh so so um you're essentially asking if

347
00:14:01,189 --> 00:14:00,000
um if we can do stereo

348
00:14:02,550 --> 00:14:01,199
with that

349
00:14:04,230 --> 00:14:02,560
um

350
00:14:06,389 --> 00:14:04,240
uh

351
00:14:10,470 --> 00:14:06,399
actually i don't know the answer

352
00:14:13,030 --> 00:14:10,480
to that um i suspect that uh

353
00:14:15,189 --> 00:14:13,040
i suspect that the spacing between the

354
00:14:17,910 --> 00:14:15,199
two spacecraft

355
00:14:21,509 --> 00:14:17,920
may be too great for that

356
00:14:23,350 --> 00:14:21,519
in their regular mapping configuration

357
00:14:25,030 --> 00:14:23,360
but that's something that that we could

358
00:14:28,230 --> 00:14:25,040
check you would need to have both

359
00:14:30,710 --> 00:14:28,240
spacecraft viewing the same

360
00:14:32,550 --> 00:14:30,720
object on the surface um at the same

361
00:14:35,189 --> 00:14:32,560
time and and i believe that they're

362
00:14:37,110 --> 00:14:35,199
probably from a 55 kilometer orbit given

363
00:14:38,790 --> 00:14:37,120

their spacing but it's probably too

364
00:14:41,509 --> 00:14:38,800
great

365
00:14:44,949 --> 00:14:41,519
if i could follow up they will

366
00:14:47,030 --> 00:14:44,959
not be flying exactly over the poles

367
00:14:48,949 --> 00:14:47,040
but but close to the pose

368
00:14:50,150 --> 00:14:48,959
another aircraft

369
00:14:51,590 --> 00:14:50,160
have

370
00:14:53,189 --> 00:14:51,600
detected what

371
00:14:55,269 --> 00:14:53,199
is

372
00:14:57,189 --> 00:14:55,279
possible

373
00:15:00,550 --> 00:14:57,199
the possibility of

374
00:15:02,389 --> 00:15:00,560
a large increase in the amount of of

375
00:15:05,030 --> 00:15:02,399
what could be water

376
00:15:09,030 --> 00:15:05,040
even two percent of every

377
00:15:11,269 --> 00:15:09,040
shadowed surface on the poles

378
00:15:13,269 --> 00:15:11,279
would those two aircraft

379
00:15:14,310 --> 00:15:13,279
kind of shine any more information on

380
00:15:16,550 --> 00:15:14,320
that

381
00:15:19,269 --> 00:15:16,560
okay so uh so the question was about

382
00:15:22,550 --> 00:15:19,279
water at the lunar poles okay so uh so

383
00:15:24,790 --> 00:15:22,560
the lunar poles are being monitored um

384
00:15:27,430 --> 00:15:24,800
with the lunar reconnaissance orbiter

385
00:15:29,189 --> 00:15:27,440
spacecraft which is

386
00:15:30,790 --> 00:15:29,199
orbiting the moon and collecting data

387
00:15:33,030 --> 00:15:30,800
right now

388
00:15:33,990 --> 00:15:33,040

and we have

389
00:15:35,990 --> 00:15:34,000
taken

390
00:15:38,790 --> 00:15:36,000
topographic measurements which have

391
00:15:41,670 --> 00:15:38,800
allowed us to map the inside of lunar

392
00:15:44,230 --> 00:15:41,680
polar craters and we've also taken um

393
00:15:46,470 --> 00:15:44,240
images and also spectral information to

394
00:15:47,910 --> 00:15:46,480
tell us composition um in the vicinity

395
00:15:51,430 --> 00:15:47,920
of the lunar poles

396
00:15:53,590 --> 00:15:51,440
so the um the the craters that have uh

397
00:15:55,110 --> 00:15:53,600
hydrogen deposits that

398
00:15:56,470 --> 00:15:55,120
that may be

399
00:16:01,509 --> 00:15:56,480
water ice

400
00:16:04,310 --> 00:16:01,519
um are in permanent shadow so a um

401
00:16:06,230 --> 00:16:04,320
a visual image will not reveal that

402
00:16:08,629 --> 00:16:06,240
because uh because you can't see into

403
00:16:12,069 --> 00:16:08,639
those dark craters okay

404
00:16:13,670 --> 00:16:12,079
however it is actually possible

405
00:16:17,509 --> 00:16:13,680
that the size of the craters that are

406
00:16:19,350 --> 00:16:17,519
believed to have deposits

407
00:16:20,389 --> 00:16:19,360
if grail is approved for an extended

408
00:16:22,069 --> 00:16:20,399
mission

409
00:16:25,990 --> 00:16:22,079
we will reduce the altitude of the

410
00:16:28,550 --> 00:16:26,000
craters of the two spacecraft down to um

411
00:16:30,870 --> 00:16:28,560
about uh 20 kilometers so that we will

412
00:16:33,350 --> 00:16:30,880
actually be able to resolve small simple

413
00:16:36,069 --> 00:16:33,360

craters on the moon and if there is

414
00:16:38,230 --> 00:16:36,079
enough water ice within the craters or

415
00:16:40,150 --> 00:16:38,240
beneath the surface

416
00:16:42,790 --> 00:16:40,160
we may be able to detect that with the

417
00:16:45,590 --> 00:16:42,800
grail mission but uh but that remains to

418
00:16:48,150 --> 00:16:45,600
be seen if that's the case

419
00:16:49,189 --> 00:16:48,160
okay we're going to now go to our phone

420
00:16:51,590 --> 00:16:49,199
lines

421
00:16:54,550 --> 00:16:51,600
take a few questions there

422
00:16:57,509 --> 00:16:54,560
first up is denise chow from space.com

423
00:17:02,230 --> 00:17:00,230
hi um thanks for taking my question um

424
00:17:04,230 --> 00:17:02,240
this one is for maria i was wondering if

425
00:17:06,309 --> 00:17:04,240
you could just talk a little bit about

426
00:17:08,069 --> 00:17:06,319
um how the mission has gone so far in

427
00:17:10,470 --> 00:17:08,079
line with your expectations and how

428
00:17:13,189 --> 00:17:10,480
exciting that was for you and your team

429
00:17:13,990 --> 00:17:13,199
on new year's eve and new year's day for

430
00:17:15,990 --> 00:17:14,000
both

431
00:17:16,710 --> 00:17:16,000
very successful orbital insertions thank

432
00:17:19,590 --> 00:17:16,720
you

433
00:17:22,309 --> 00:17:19,600
sure um okay so um

434
00:17:23,510 --> 00:17:22,319
so on the missions whenever we practice

435
00:17:25,510 --> 00:17:23,520
um

436
00:17:29,110 --> 00:17:25,520
in all of our practices

437
00:17:32,870 --> 00:17:29,120
uh everything goes wrong okay and um

438
00:17:34,310 --> 00:17:32,880

and it's uh it was just an extraordinary

439
00:17:36,630 --> 00:17:34,320
experience

440
00:17:39,590 --> 00:17:36,640
to be sitting there and just having

441
00:17:41,270 --> 00:17:39,600
everything go perfectly uh it's i say

442
00:17:43,430 --> 00:17:41,280
it's something that we never trained for

443
00:17:44,950 --> 00:17:43,440
for the insertion for the real insertion

444
00:17:46,549 --> 00:17:44,960
um and um

445
00:17:49,669 --> 00:17:46,559
and so uh

446
00:17:50,789 --> 00:17:49,679
so the uh both uh orbit insertions were

447
00:17:53,510 --> 00:17:50,799
um

448
00:17:55,430 --> 00:17:53,520
precisely where we wanted them to be

449
00:17:56,630 --> 00:17:55,440
and then um subsequent to those

450
00:17:58,950 --> 00:17:56,640
insertions

451
00:18:01,350 --> 00:17:58,960
um the first weekend after we inserted

452
00:18:03,750 --> 00:18:01,360
there were three main engine maneuvers

453
00:18:06,630 --> 00:18:03,760
to reduce the period of the orbits where

454
00:18:08,070 --> 00:18:06,640
we actually expended more fuel in those

455
00:18:10,390 --> 00:18:08,080
three maneuvers than we actually did in

456
00:18:12,789 --> 00:18:10,400
the orbit insertion maneuver

457
00:18:15,750 --> 00:18:12,799
and those all went successfully and then

458
00:18:17,990 --> 00:18:15,760
the week after that this past weekend um

459
00:18:21,350 --> 00:18:18,000
we did three more main engine maneuvers

460
00:18:22,789 --> 00:18:21,360
and um uh for the grail b flow

461
00:18:26,310 --> 00:18:22,799
spacecraft now

462
00:18:29,669 --> 00:18:26,320
um and um and all of those were um were

463
00:18:31,750 --> 00:18:29,679

nominal um so so far uh

464
00:18:36,390 --> 00:18:31,760
these uh spacecraft

465
00:18:38,870 --> 00:18:36,400
uh have operated um nearly flawlessly i

466
00:18:40,470 --> 00:18:38,880
uh they're this is a very operationally

467
00:18:43,190 --> 00:18:40,480
intensive mission because there are two

468
00:18:45,510 --> 00:18:43,200
spacecraft and and i you know have said

469
00:18:47,190 --> 00:18:45,520
to people sometimes i i think i know

470
00:18:48,789 --> 00:18:47,200
what it's like now for people who raise

471
00:18:51,430 --> 00:18:48,799
twins okay

472
00:18:52,789 --> 00:18:51,440
um however um they're very well behaved

473
00:18:54,470 --> 00:18:52,799
twins

474
00:18:56,470 --> 00:18:54,480
and actually their personalities are

475
00:18:58,710 --> 00:18:56,480
very similar because the behavior that

476
00:19:01,029 --> 00:18:58,720
we see in one

477
00:19:03,669 --> 00:19:01,039
gives us a pretty good expectation of

478
00:19:06,710 --> 00:19:03,679
how the other one is going to react when

479
00:19:09,110 --> 00:19:06,720
when we do these maneuvers so um so

480
00:19:11,270 --> 00:19:09,120
space flight is a very risky thing and

481
00:19:15,669 --> 00:19:11,280
whenever you have two of something that

482
00:19:17,990 --> 00:19:15,679
uh doubles the opportunities uh for

483
00:19:19,669 --> 00:19:18,000
things that can go wrong but so far so

484
00:19:21,590 --> 00:19:19,679
far so good and both of the the

485
00:19:23,590 --> 00:19:21,600
spacecraft have been

486
00:19:24,390 --> 00:19:23,600
operating very well

487
00:19:28,950 --> 00:19:24,400
and

488
00:19:30,230 --> 00:19:28,960

the team is actually uh delighted um

489
00:19:31,990 --> 00:19:30,240
with uh

490
00:19:33,909 --> 00:19:32,000
with how things have been going so far

491
00:19:35,590 --> 00:19:33,919
but we're really

492
00:19:37,750 --> 00:19:35,600
trying to keep our eye on the ball here

493
00:19:39,510 --> 00:19:37,760
because we have a great deal of work to

494
00:19:42,549 --> 00:19:39,520
do yet before we start returning science

495
00:19:47,270 --> 00:19:44,390
our last question is coming from robert

496
00:19:49,750 --> 00:19:47,280
perlman from collectspace.com

497
00:19:55,750 --> 00:19:53,830
hi thanks for taking my question um

498
00:19:58,150 --> 00:19:55,760
not to take anything away from ebb and

499
00:20:00,230 --> 00:19:58,160
flow uh but if

500
00:20:02,470 --> 00:20:00,240
maria zuber if you could uh comment a

501
00:20:03,590 --> 00:20:02,480
little bit about what this competition

502
00:20:05,270 --> 00:20:03,600
was

503
00:20:06,390 --> 00:20:05,280
with so many missions were there others

504
00:20:08,070 --> 00:20:06,400
that stood out

505
00:20:11,110 --> 00:20:08,080
and i think back at the launch

506
00:20:12,310 --> 00:20:11,120
conference you you had your own names

507
00:20:14,710 --> 00:20:12,320
uh

508
00:20:16,070 --> 00:20:14,720
could you share what those were

509
00:20:17,190 --> 00:20:16,080
uh

510
00:20:19,990 --> 00:20:17,200
let's see

511
00:20:23,110 --> 00:20:20,000
uh well i i had uh so the competition

512
00:20:26,230 --> 00:20:23,120
over there were over um 900

513
00:20:27,430 --> 00:20:26,240

uh pairs of names that were proposed

514
00:20:29,350 --> 00:20:27,440
uh

515
00:20:32,230 --> 00:20:29,360
i had my own set everybody on the team

516
00:20:34,549 --> 00:20:32,240
had their own set of names and none of

517
00:20:37,110 --> 00:20:34,559
those names that any of us had

518
00:20:40,310 --> 00:20:37,120
were nearly as good as what we got from

519
00:20:43,669 --> 00:20:40,320
the the students what we uh it actually

520
00:20:45,990 --> 00:20:43,679
was um it was very difficult to make

521
00:20:48,710 --> 00:20:46,000
this um decision

522
00:20:51,110 --> 00:20:48,720
and um but uh you know what what won the

523
00:20:52,789 --> 00:20:51,120
day actually was the the quality of the

524
00:20:55,430 --> 00:20:52,799
the essays that the students wrote so

525
00:21:00,950 --> 00:20:58,070
okay that's going to do it nice short

526
00:21:03,110 --> 00:21:00,960
and sweet again congratulations

527
00:21:05,029 --> 00:21:03,120
to the students at emily dickerson

528
00:21:06,470 --> 00:21:05,039
school in bozeman and to the teacher

529
00:21:08,630 --> 00:21:06,480
this is tomorrow

530
00:21:10,630 --> 00:21:08,640
ebb and flow

531
00:21:12,870 --> 00:21:10,640
thank you all for joining us here and of

532
00:21:14,950 --> 00:21:12,880
course to dr sally ride on our phone and

533
00:21:17,270 --> 00:21:14,960
sally ride science ladies and gentlemen

534
00:21:19,990 --> 00:21:17,280
the number speaks for themselves

535
00:21:21,270 --> 00:21:20,000
we inspire students

536
00:21:23,190 --> 00:21:21,280
and we do it

537
00:21:24,390 --> 00:21:23,200
and we will continue to do it ebb and

538
00:21:27,110 --> 00:21:24,400

flow