



1
00:00:06,005 --> 00:00:12,679
WELCOME TO N.A.S.A.'S JET

2
00:00:12,679 --> 00:00:13,279
PROPULSION LABORATORY.

3
00:00:13,279 --> 00:00:16,850
THE IT HAS ENDED THE END OF ITS

4
00:00:16,850 --> 00:00:17,250
JOURNEY.

5
00:00:17,250 --> 00:00:18,718
THE SPACECRAFT MADE ITS FINAL

6
00:00:18,718 --> 00:00:21,154
APPROACH TO THE PLANET AND

7
00:00:21,154 --> 00:00:24,758
PLUNGED INTO SATURN'S UPPER

8
00:00:24,758 --> 00:00:25,759
ATMOSPHERE, ENDING THE MISSION.

9
00:00:25,759 --> 00:00:29,062
DUE TO THE TIME IT TAKES FOR THE

10
00:00:29,062 --> 00:00:31,064
SIGNALS TO TRAVEL ALMOST A

11
00:00:31,064 --> 00:00:32,298
BILLION MILES BETWEEN THE PLANET

12
00:00:32,298 --> 00:00:34,534
AND EARTH, THE TEAM WON'T HAVE

13
00:00:34,534 --> 00:00:36,369

CONFIRMATION THAT THE MISSION

14

00:00:36,369 --> 00:00:39,372

HAS ENDED UNTIL THEY SEE ITS

15

00:00:39,372 --> 00:00:41,141

SIGNAL DROP AWAY.

16

00:00:41,141 --> 00:00:43,710

THE DEEP SPACE NETWORK IS

17

00:00:43,710 --> 00:00:44,677

MONITORING THE SIGNAL.

18

00:00:44,677 --> 00:00:48,248

AS YOU CAN SEE ON THE CSN NOW

19

00:00:48,248 --> 00:00:48,581

DISPLAY.

20

00:00:48,581 --> 00:00:51,618

IT'S BEING TRACKED BY A 70 METRE

21

00:00:51,618 --> 00:00:55,288

WIDE ANTENNA, AN ETEN A43 IN

22

00:00:55,288 --> 00:00:55,922

CANBERRA, AUSTRALIA.

23

00:00:55,922 --> 00:01:03,897

HERE IS A -- ANTENNA 43 IN

24

00:01:03,897 --> 00:01:04,464

CANBERRA AUSTRALIA.

25

00:01:04,464 --> 00:01:07,267

THEY'RE KEEPING AN EYE ON THE

26

00:01:07,267 --> 00:01:07,867

TRANSMISSION.

27

00:01:07,867 --> 00:01:09,803

MEANWHILE IT IS 4AM HERE IN

28

00:01:09,803 --> 00:01:10,203

CALIFORNIA.

29

00:01:10,203 --> 00:01:13,506

THE SUN IS NOT UP YET AND MORE

30

00:01:13,506 --> 00:01:18,545

THAN 1500 SCIENTISTS, ENGINEERS,

31

00:01:18,545 --> 00:01:19,746

ALUMNI FRIENDS AND FAMILY HAVE

32

00:01:19,746 --> 00:01:21,181

GATHERED FOR THIS MOMENT.

33

00:01:21,181 --> 00:01:22,816

THE FLIGHT TEAM IS IN THE

34

00:01:22,816 --> 00:01:25,919

MISSION CONTROL AREA.

35

00:01:25,919 --> 00:01:29,222

OTHERS HAVE GATHERED IN JPL AND

36

00:01:29,222 --> 00:01:35,094

STILL MORE ARE AT CALTECK IN

37

00:01:35,094 --> 00:01:35,562

PASADENA.

38

00:01:35,562 --> 00:01:37,464

FOLKS WANTED TO BE TOGETHER TO

39

00:01:37,464 --> 00:01:38,431

JOIN THIS MOMENT.

40

00:01:38,431 --> 00:01:39,966

IT IS A VISUAL BUT ALSO A

41

00:01:39,966 --> 00:01:41,935

CELEBRATION OF A REMARKABLE

42

00:01:41,935 --> 00:01:42,802

MISSION.

43

00:01:42,802 --> 00:01:45,872

THIS IS THE LAST HOUR OF THE

44

00:01:45,872 --> 00:01:50,143

LAST CHAPTER OF THE GRAND

45

00:01:50,143 --> 00:01:52,879

FINALE.

46

00:01:52,879 --> 00:01:55,215

[■■■■].

47

00:01:55,215 --> 00:01:58,685

>> AN LONE EXPLORER, ON A

48

00:01:58,685 --> 00:02:02,655

MISSION TO REVEAL THE GRANDEUR

49

00:02:02,655 --> 00:02:07,760

OF SATURN, IT'S RINGS AND MOONS.

50

00:02:07,760 --> 00:02:08,294

[■■■■].

51
00:02:08,294 --> 00:02:11,831
>> AFTER 20 YEARS IN SPACE,

52
00:02:11,831 --> 00:02:15,101
N.A.S.A.'S SPACECRAFT IS RUNNING

53
00:02:15,101 --> 00:02:17,170
OUT OF FUEL.

54
00:02:17,170 --> 00:02:22,242
SO TO PROTECT THE MOONS OF

55
00:02:22,242 --> 00:02:27,447
SATURN WHICH COULD HAVE AN AREA

56
00:02:27,447 --> 00:02:34,187
FOR LIFE, CONDITIONS FOR LIFE.

57
00:02:34,187 --> 00:02:38,992
>> THREE, TWO, ONE, AND LIFT OFF

58
00:02:38,992 --> 00:02:43,563
OF THE SPACECRAFT ON A TREK TO

59
00:02:43,563 --> 00:02:47,667
SATURN.

60
00:02:47,667 --> 00:02:51,538
[■] IN 2004 FOLLOWING A

61
00:02:51,538 --> 00:02:52,605
SEVEN-YEAR JOURNEY THROUGH THE

62
00:02:52,605 --> 00:02:59,212
SOLAR SYSTEM, IT ARRIVES AT

63
00:02:59,212 --> 00:02:59,546

SATURN.

64

00:02:59,546 --> 00:03:03,983

>> THE SPACECRAFT CARRIED A

65

00:03:03,983 --> 00:03:07,120

PASSENGER, THE EUROPEAN PROBE,

66

00:03:07,120 --> 00:03:09,155

THE FIRST HUMAN-MADE OBJECT TO

67

00:03:09,155 --> 00:03:12,258

LAND IN A WORLD IN THE OUTER

68

00:03:12,258 --> 00:03:14,260

SOLAR SYSTEM.

69

00:03:14,260 --> 00:03:16,996

FOR OVER A DECADE IT WILL SHARE

70

00:03:16,996 --> 00:03:20,533

THE WONDERS OF SATURN AND ITS

71

00:03:20,533 --> 00:03:25,371

FAMILY OF ICY MOONS, TAKING US

72

00:03:25,371 --> 00:03:27,840

TO ANOTHER WORLD, WHERE JETS OF

73

00:03:27,840 --> 00:03:30,843

ICE AND GAS ARE BLASTING

74

00:03:30,843 --> 00:03:33,079

MATERIAL INTO SPACE FROM THE

75

00:03:33,079 --> 00:03:34,981

LIQUID WATER OCEAN THAT MIGHT

76
00:03:34,981 --> 00:03:38,084
HARBOUR THE INGREDIENTS FOR

77
00:03:38,084 --> 00:03:38,551
LIFE.

78
00:03:38,551 --> 00:03:42,355
AND SATURN, A GIANT WORLD RULED

79
00:03:42,355 --> 00:03:48,795
BY RAGING STORMS AND DELICATE

80
00:03:48,795 --> 00:03:51,130
HARMONIES OF GRAVITY.

81
00:03:51,130 --> 00:04:03,443
NOW IT HAS ONE LAST ASSIGNMENT.

82
00:04:03,443 --> 00:04:03,810
[■]

83
00:04:03,810 --> 00:04:09,015
THE GRAND FINALE IS A BRAND NEW

84
00:04:09,015 --> 00:04:09,382
ADVENTURE.

85
00:04:09,382 --> 00:04:11,384
AS IT REPEATEDLY BRAVES THIS

86
00:04:11,384 --> 00:04:14,153
UNEXPLORED REGION, IT SEEKS NEW

87
00:04:14,153 --> 00:04:15,455
INSIGHTS ABOUT THE ORIGINS OF

88
00:04:15,455 --> 00:04:19,058

THE RAIN AND THE NATURE OF THE

89

00:04:19,058 --> 00:04:21,928

PLANET'S INTERIOR, CLOSER TO

90

00:04:21,928 --> 00:04:29,202

SATURN THAN EVER BEFORE.

91

00:04:29,202 --> 00:04:32,939

ON THE FINAL ORBIT, IT WILL

92

00:04:32,939 --> 00:04:36,676

PLUNGE INTO SATURN SATE FIGHTING

93

00:04:36,676 --> 00:04:39,145

TO KEEP POINTED AT EARTH AS IT

94

00:04:39,145 --> 00:04:42,415

TRANSMITS ITS FAREWELL.

95

00:04:42,415 --> 00:04:47,387

IN THE SKIES OF SATURN, THE

96

00:04:47,387 --> 00:04:50,456

JOURNEY ENDS.

97

00:04:50,456 --> 00:04:57,497

IT BECOMES PART OF THE PLANET.

98

00:05:14,013 --> 00:05:06,472

[■■■]

99

00:05:14,013 --> 00:05:19,752

[■] OKAY.

100

00:05:19,752 --> 00:05:21,688

LET'S DO THE NUMBERS.

101
00:05:21,688 --> 00:05:23,856
THE MISSION HAS TRAVELLED NEARLY

102
00:05:23,856 --> 00:05:27,560
5 BILLION MILES SINCE LAUNCH,

103
00:05:27,560 --> 00:05:31,397
EXECUTED 2.5 MILLION COMMANDS,

104
00:05:31,397 --> 00:05:35,201
TAKEN 453,000 PLUS IMAGES,

105
00:05:35,201 --> 00:05:38,271
DISCOVERED SIX MOONS, PUBLISHED

106
00:05:38,271 --> 00:05:40,873
NEARLY 4,000 SCIENCE PAPERS AND

107
00:05:40,873 --> 00:05:42,141
IT'S NOT DONE.

108
00:05:42,141 --> 00:05:44,177
IT IS SENDING HOME DATA RIGHT

109
00:05:44,177 --> 00:05:45,912
NOW RIGHT TO THE END.

110
00:05:45,912 --> 00:05:48,815
LET'S TAKE A LOOK NOW AND TALK

111
00:05:48,815 --> 00:05:51,417
TO THE PROGRAM MANAGER ABOUT

112
00:05:51,417 --> 00:05:51,718
THIS.

113
00:05:51,718 --> 00:05:53,586

AFTER A LINE-UP LIKE THAT, YOU

114

00:05:53,586 --> 00:05:54,887
HAVE TO BE IMPRESSED.

115

00:05:54,887 --> 00:05:57,423
>> WE WERE IMPRESSED.

116

00:05:57,423 --> 00:05:59,859
-- WE ARE IMPRESSED.

117

00:05:59,859 --> 00:06:02,462
WE'RE PROUD OF WHAT WE HAVE BEEN

118

00:06:02,462 --> 00:06:04,797
ABLE TO ACCOMPLISH OVER THE LAST

119

00:06:04,797 --> 00:06:05,198
13 YEARS.

120

00:06:05,198 --> 00:06:07,300
>>> WHY MUST WE END IT THIS WAY?

121

00:06:07,300 --> 00:06:08,768
>> IF YOU THINK ABOUT IT A

122

00:06:08,768 --> 00:06:11,404
LITTLE BIT, YOU WILL FIND OUT WE

123

00:06:11,404 --> 00:06:13,172
DIDN'T HAVE ANY CHOICE.

124

00:06:13,172 --> 00:06:16,242
IT MUST BE DISPOSED OF PROPERLY.

125

00:06:16,242 --> 00:06:17,577
AT SOME POINT.

126
00:06:17,577 --> 00:06:21,948
THERE ARE INTERNATIONAL

127
00:06:21,948 --> 00:06:23,015
AGREEMENTS THAT WE CAN'T ALLOW

128
00:06:23,015 --> 00:06:24,016
IT THERE.

129
00:06:24,016 --> 00:06:25,852
WE HAVE GOT TO DO SOMETHING

130
00:06:25,852 --> 00:06:26,486
ABOUT IT.

131
00:06:26,486 --> 00:06:28,855
WE COULD HAVE SENT IT AWAY FROM

132
00:06:28,855 --> 00:06:31,724
SATURN, BUT SATURN WAS SO

133
00:06:31,724 --> 00:06:33,426
COMPELLING, SO EXCITING AND THE

134
00:06:33,426 --> 00:06:35,528
MISSION THAT WE FINALLY CAME UP

135
00:06:35,528 --> 00:06:38,364
WITH IS SO RICH SCIENTIFICALLY

136
00:06:38,364 --> 00:06:41,033
THAT WE HAD TO FINISH UP AT

137
00:06:41,033 --> 00:06:43,269
SATURN, NOT SOME PLACE ELSE.

138
00:06:43,269 --> 00:06:44,971

THE MISSION REALLY STARTED ABOUT

139

00:06:44,971 --> 00:06:46,038

SEVEN YEARS AGO.

140

00:06:46,038 --> 00:06:47,507

WE'VE BEEN ON THIS PATH TO END

141

00:06:47,507 --> 00:06:50,877

UP RIGHT NOW IN LESS THAN AN

142

00:06:50,877 --> 00:06:51,177

HOUR.

143

00:06:51,177 --> 00:06:52,311

>>> LET'S TALK ABOUT WHAT IS

144

00:06:52,311 --> 00:06:55,181

ABOUT TO HAPPEN AND WALK VIEWERS

145

00:06:55,181 --> 00:06:57,283

THROUGH WHAT TO EXPECT.

146

00:06:57,283 --> 00:06:58,084

>> SURE.

147

00:06:58,084 --> 00:07:00,153

>>> IT STARTS WITH MONDAY AND

148

00:07:00,153 --> 00:07:01,020

THE KISS GOODBYE.

149

00:07:01,020 --> 00:07:03,322

COULD YOU TALK ABOUT THAT.

150

00:07:03,322 --> 00:07:03,856

>> OKAY.

151

00:07:03,856 --> 00:07:07,760

THIS FIRST GRAPHIC, THIS IS THE

152

00:07:07,760 --> 00:07:10,263

LAST 22 MOVEMENTS OF SATURN.

153

00:07:10,263 --> 00:07:12,398

THEY ARE GOING BETWEEN THE RINGS

154

00:07:12,398 --> 00:07:15,001

AND SATURN UNEXPLORED TERRITORY,

155

00:07:15,001 --> 00:07:16,502

FANTASTIC SCIENCE EVERY TIME.

156

00:07:16,502 --> 00:07:18,571

WHAT'S BEEN ALSO HAPPENING IS

157

00:07:18,571 --> 00:07:20,006

THAT OUT OF THERE FURTHER AWAY

158

00:07:20,006 --> 00:07:22,942

IS TITAN AND THAT COMES BY

159

00:07:22,942 --> 00:07:24,644

EVERY NOW AND AGAIN, AND YOU

160

00:07:24,644 --> 00:07:26,078

WILL SEE IT FOR ONE LAST FINAL

161

00:07:26,078 --> 00:07:26,913

KISS GOODBYE.

162

00:07:26,913 --> 00:07:27,814

THAT WAS IT.

163

00:07:27,814 --> 00:07:30,016

IT WAS VERY QUICK.

164

00:07:30,016 --> 00:07:30,716

DON'T BLINK.

165

00:07:30,716 --> 00:07:35,087

WHAT HAPPENED ON MONDAY WAS THAT

166

00:07:35,087 --> 00:07:38,024

TITAN CAME BY AND GIVE ONE LAST

167

00:07:38,024 --> 00:07:40,126

NUDGE, IT SLOWS DOWN JUST ENOUGH

168

00:07:40,126 --> 00:07:41,861

SO THAT OUR ENTRY INTO SATURN IN

169

00:07:41,861 --> 00:07:46,465

A FEW MINUTES NOW IS ABSOLUTELY

170

00:07:46,465 --> 00:07:46,866

INEVITABLE.

171

00:07:46,866 --> 00:07:49,368

>>> SO, THE FATE IS JUST SEALED.

172

00:07:49,368 --> 00:07:51,103

>> SEALED ABSOLUTELY DONE.

173

00:07:51,103 --> 00:07:52,238

THERE WASN'T MUCH WE COULD HAVE

174

00:07:52,238 --> 00:07:54,073

DONE ABOUT IT BEFORE BECAUSE IT

175

00:07:54,073 --> 00:07:55,441

HAD BEEN SO WIRED IN, BUT AFTER

176
00:07:55,441 --> 00:07:58,778
THE TITANFULLY BUY THERE'S

177
00:07:58,778 --> 00:08:03,049
NOTHING -- TITN FULLY BUY,

178
00:08:03,049 --> 00:08:06,252
THERE IS NOTHING WOULD CAN DO.

179
00:08:06,252 --> 00:08:07,119
>> IT IS STILL A SCIENCE

180
00:08:07,119 --> 00:08:07,453
MACHINE.

181
00:08:07,453 --> 00:08:09,856
MOST OF WHAT WE HAVE BEEN DOING

182
00:08:09,856 --> 00:08:10,790
IS GATHERING MORE SCIENCE.

183
00:08:10,790 --> 00:08:12,458
IF YOU LOOK AT THIS GRAPHIC,

184
00:08:12,458 --> 00:08:17,263
THERE IS THE TITAN, THE KISS

185
00:08:17,263 --> 00:08:20,700
GOODBYE ON SEPTEMBER 11, THEN

186
00:08:20,700 --> 00:08:22,401
TURNING AROUND, PLAYED ALL THE

187
00:08:22,401 --> 00:08:25,471
DATA BACK, IT'S ON THE MONITORS

188
00:08:25,471 --> 00:08:27,406

AS YOU CAN SEE, PLAY BACK ALL

189

00:08:27,406 --> 00:08:29,242

THE DATA, GOOD VIEWS OF THE

190

00:08:29,242 --> 00:08:31,410

LAKES AND THE CLOUDS AGAIN, THEN

191

00:08:31,410 --> 00:08:33,846

IT TURNED BACK AROUND AGAIN FOR

192

00:08:33,846 --> 00:08:35,815

ITS FINAL SET OF SCIENCE

193

00:08:35,815 --> 00:08:36,249

OBSERVATIONS.

194

00:08:36,249 --> 00:08:37,817

WE ACTUALLY DID A LITTLE BIT OF

195

00:08:37,817 --> 00:08:45,391

SCIENCE AND A LITTLE BIT OF JUST

196

00:08:45,391 --> 00:08:49,562

LAST PICTURES, RINGS, PLANET AND

197

00:08:49,562 --> 00:08:52,765

WE WANT TO LOOK AT THE

198

00:08:52,765 --> 00:08:53,833

PROPELLARS THERE.

199

00:08:53,833 --> 00:08:56,102

THERE IS A LITTLE BIT OF SCIENCE

200

00:08:56,102 --> 00:09:01,707

AND JUST KIND OF LAST PHOTOS AND

201
00:09:01,707 --> 00:09:03,175
THEY WERE PLAYED BACK YESTERDAY

202
00:09:03,175 --> 00:09:03,542
AFTERNOON.

203
00:09:03,542 --> 00:09:05,544
IT TURNED BACK FOR A FINAL CALL

204
00:09:05,544 --> 00:09:09,415
TO EARTH, PLAYED THE DATA BACK.

205
00:09:09,415 --> 00:09:11,183
IT IS AVAILABLE.

206
00:09:11,183 --> 00:09:12,985
ABOUT 1 O'CLOCK MORNING ALL THE

207
00:09:12,985 --> 00:09:14,587
DATA WAS ON THE GROUND.

208
00:09:14,587 --> 00:09:16,255
IT THEN WENT UP FOR, GOING BACK

209
00:09:16,255 --> 00:09:20,993
TO THE TIMELINE FOR A MOMENT.

210
00:09:20,993 --> 00:09:22,128
GO BACK ONE.

211
00:09:22,128 --> 00:09:26,132
SEPTEMBER 15 AT 1.37, DOWN TO

212
00:09:26,132 --> 00:09:28,968
THE LAST PLOT, WE HAD A REAL

213
00:09:28,968 --> 00:09:30,136

TIME SATURN PROBE.

214

00:09:30,136 --> 00:09:31,904

EVERYTHING THAT COMES INTO THE

215

00:09:31,904 --> 00:09:32,972

SPACECRAFT GOES RIGHT OUT.

216

00:09:32,972 --> 00:09:35,441

SO THERE IS NO DELAY, OR LITTLE

217

00:09:35,441 --> 00:09:38,311

DELAY, SO WE CAN BECOME AN

218

00:09:38,311 --> 00:09:39,879

ATMOSPHERE SAMPLING MISSION.

219

00:09:39,879 --> 00:09:43,516

AT 4.55AM, GIVE OR TAKE A FEW

220

00:09:43,516 --> 00:09:46,352

SECONDS ON THAT, WE WILL BE

221

00:09:46,352 --> 00:09:47,920

ENTERING INTO SATURN'S

222

00:09:47,920 --> 00:09:48,321

ATMOSPHERE.

223

00:09:48,321 --> 00:09:49,021

>>> TO THE NEXT DISPLAY.

224

00:09:49,021 --> 00:09:51,257

THIS IS WHAT IS GOING TO BE

225

00:09:51,257 --> 00:09:52,758

HAPPENING WITHIN THE LAST HOUR.

226

00:09:52,758 --> 00:09:53,659

>> THAT'S EXACTLY RIGHT.

227

00:09:53,659 --> 00:09:55,962

WE CAME IN OVER THE NORTH, JUST

228

00:09:55,962 --> 00:09:58,931

A LITTLE BIT EAST FROM THAT

229

00:09:58,931 --> 00:09:59,332

PERSPECTIVE.

230

00:09:59,332 --> 00:10:01,300

ACTUALLY IT LOOKS WEST HERE, BUT

231

00:10:01,300 --> 00:10:03,035

OVER THE NORTH POLE, JUST BEFORE

232

00:10:03,035 --> 00:10:04,637

4 O'CLOCK MORNING. WE WERE 6

233

00:10:04,637 --> 00:10:05,371

DEGREES NORTH.

234

00:10:05,371 --> 00:10:08,607

AS YOU CAN SEE, THAT DESCENT IS

235

00:10:08,607 --> 00:10:08,941

RAPID.

236

00:10:08,941 --> 00:10:11,377

IN 20 MINUTES WE WILL BE AT 50

237

00:10:11,377 --> 00:10:13,379

DEGREES NORTH AND 12 MINUTES

238

00:10:13,379 --> 00:10:16,282

LATER, 40 AND VERY RAPIDLY

239

00:10:16,282 --> 00:10:16,682

INCREASING.

240

00:10:16,682 --> 00:10:19,051

THE 10 DEGREE NORTH LATITUDE

241

00:10:19,051 --> 00:10:20,152

IMPACT POINT IS JUST ABOUT WHERE

242

00:10:20,152 --> 00:10:22,989

WE'RE GOING TO FINISH UP.

243

00:10:22,989 --> 00:10:24,457

IT'S GOING TO HAPPEN ABOUT FIVE

244

00:10:24,457 --> 00:10:26,325

OF FIVE THIS MORNING LOCAL TIME.

245

00:10:26,325 --> 00:10:28,694

>>> THE LAST 90 SECONDS.

246

00:10:28,694 --> 00:10:30,162

>> THE LAST 90 SECONDS, THIS IS

247

00:10:30,162 --> 00:10:31,697

REALLY WHERE IT IS GOING TO BE

248

00:10:31,697 --> 00:10:32,698

HAPPENING.

249

00:10:32,698 --> 00:10:35,935

IT IS NOT GOING TO NOTICE SATURN

250

00:10:35,935 --> 00:10:37,903

UNTIL THE LAST 90 SECONDS

251
00:10:37,903 --> 00:10:39,138
BECAUSE IT'S IN FREE FALL AROUND

252
00:10:39,138 --> 00:10:40,773
THE GRAVITATIONAL BODY.

253
00:10:40,773 --> 00:10:42,441
IT IS DOING ITS THING, BUT

254
00:10:42,441 --> 00:10:44,510
BETWEEN 70 AND 60 SECONDS OUT

255
00:10:44,510 --> 00:10:46,178
FROM FINAL IMPACT, IT WILL START

256
00:10:46,178 --> 00:10:47,380
TO NOTICE THE ATMOSPHERE AND YOU

257
00:10:47,380 --> 00:10:50,416
CAN SEE IN THIS GRAPHIC THE VERY

258
00:10:50,416 --> 00:10:51,817
TENUOUS ATMOSPHERE STARTING TO

259
00:10:51,817 --> 00:10:52,218
EXPERIENCE.

260
00:10:52,218 --> 00:10:53,786
IT HAS BEEN FIGHTING THAT

261
00:10:53,786 --> 00:10:54,320
ATMOSPHERE BEFORE.

262
00:10:54,320 --> 00:10:56,956
AS A MATTER OF FACT FOR THE LAST

263
00:10:56,956 --> 00:10:58,858

FIVE REVS WE'VE BEEN DOING THAT.

264

00:10:58,858 --> 00:11:00,393

IT HAS DONE VERY WELL, BUT THIS

265

00:11:00,393 --> 00:11:01,727

TIME BECAUSE WE'RE GOING TO GO

266

00:11:01,727 --> 00:11:03,662

IN SO DEEP, THERE'S NOT A CHANCE

267

00:11:03,662 --> 00:11:05,431

THAT IT CAN FIGHT TO HOLD ON TO

268

00:11:05,431 --> 00:11:06,098

THE ATMOSPHERE.

269

00:11:06,098 --> 00:11:07,166

THAT ATMOSPHERE WHERE WE HAVE

270

00:11:07,166 --> 00:11:09,568

BEEN FIGHTING IS SO FAR ABOUT

271

00:11:09,568 --> 00:11:12,405

THE SAME DENSITY AS THE

272

00:11:12,405 --> 00:11:13,205

ATMOSPHERE THAT'S IN THE

273

00:11:13,205 --> 00:11:14,640

INTERNATIONAL SPACE STATION HERE

274

00:11:14,640 --> 00:11:15,174

ON EARTH.

275

00:11:15,174 --> 00:11:17,476

VERY THIN, BUT WE'RE GOING VERY,

276

00:11:17,476 --> 00:11:18,544

VERY FAST.

277

00:11:18,544 --> 00:11:19,412

>>> ALL RIGHT.

278

00:11:19,412 --> 00:11:21,781

WE HAVE THE ANIMATION FROM THE

279

00:11:21,781 --> 00:11:22,915

VIDEO EARLIER.

280

00:11:22,915 --> 00:11:23,349

>> OKAY.

281

00:11:23,349 --> 00:11:24,917

>>> IT HELPS US ENVISION,

282

00:11:24,917 --> 00:11:28,788

ALTHOUGH IT MIGHT BE PAINFUL TO

283

00:11:28,788 --> 00:11:29,088

WATCH.

284

00:11:29,088 --> 00:11:30,056

>> WELL, IT IS ACTUALLY,

285

00:11:30,056 --> 00:11:32,058

WATCHING THIS, YOU CAN SEE THE

286

00:11:32,058 --> 00:11:33,459

THRUSTERS COMING OUT OF BACK TO

287

00:11:33,459 --> 00:11:33,859

BACK.

288

00:11:33,859 --> 00:11:35,895

IT STARTS TO ENCOUNTER THE

289

00:11:35,895 --> 00:11:36,295

ATMOSPHERE.

290

00:11:36,295 --> 00:11:37,863

THOSE ARE SMALL THRUSTERS.

291

00:11:37,863 --> 00:11:40,199

THEY JUST ARE NOT BUILT TO FIGHT

292

00:11:40,199 --> 00:11:42,701

THE KIND OF TORQUES.

293

00:11:42,701 --> 00:11:45,971

THAT'S THE ANTENNA.

294

00:11:45,971 --> 00:11:48,774

THE THEY'RE NOT BUILT TO HANDLE

295

00:11:48,774 --> 00:11:50,142

THE ATMOSPHERIC TORQUE AND DRAG

296

00:11:50,142 --> 00:11:51,043

THAT IT WILL EXPERIENCE.

297

00:11:51,043 --> 00:11:53,479

FOR ABOUT A MINUTE, IT WILL HANG

298

00:11:53,479 --> 00:11:53,746

ON.

299

00:11:53,746 --> 00:11:55,081

WE WILL BE SAMPLING THE

300

00:11:55,081 --> 00:11:56,115

ATMOSPHERE, SENDING THE DATA

301
00:11:56,115 --> 00:11:57,983
BACK AS QUICKLY AS WE CAN AND

302
00:11:57,983 --> 00:11:59,652
THEN FINALLY, OF COURSE, IT IS

303
00:11:59,652 --> 00:12:01,854
GOING TO LOSE THE BATTLE AND

304
00:12:01,854 --> 00:12:04,590
WITHIN THE NEXT MINUTE WILL BE

305
00:12:04,590 --> 00:12:07,526
WITHIN THE NEXT MINUTE, IT WILL

306
00:12:07,526 --> 00:12:10,096
BECOME COMPLETELY AND TOTALLY

307
00:12:10,096 --> 00:12:12,398
VAPORIZED, BECOMING PART OF THE

308
00:12:12,398 --> 00:12:14,033
PLANET IT WENT TO EXPLORE.

309
00:12:14,033 --> 00:12:14,900
>> AS PLANNED.

310
00:12:14,900 --> 00:12:15,434
>> EXACTLY.

311
00:12:15,434 --> 00:12:20,739
>> FOR THE TEAM, IT IS

312
00:12:20,739 --> 00:12:21,273
BITTERSWEET.

313
00:12:21,273 --> 00:12:23,142

THERE'S TREMENDOUS ENERGY HERE.

314

00:12:23,142 --> 00:12:24,810

I THINK WE'RE EXCITED.

315

00:12:24,810 --> 00:12:28,347

THIS IS EXACTLY THE WAY WE

316

00:12:28,347 --> 00:12:34,553

ALWAYS PLANNED THIS.

317

00:12:34,553 --> 00:12:36,989

NOW IT'S WORKING EXACTLY THE WAY

318

00:12:36,989 --> 00:12:40,059

WE SET IT UP.

319

00:12:40,059 --> 00:12:51,770

THE IMAGES --

320

00:12:51,770 --> 00:12:53,706

>> THANKS SO MUCH FOR JOINING

321

00:12:53,706 --> 00:12:54,106

US.

322

00:12:54,106 --> 00:12:55,641

I'LL LET YOU BACK IN THE ROOM.

323

00:12:55,641 --> 00:12:57,943

I KNOW YOU WANT TO BE BACK IN

324

00:12:57,943 --> 00:12:59,011

HERE.

325

00:12:59,011 --> 00:13:03,048

MEANWHILE, DSN43 IN AUSTRALIA IS

326

00:13:03,048 --> 00:13:05,584

THE ANTENNA LOCKED ON THE

327

00:13:05,584 --> 00:13:06,285

SIGNAL.

328

00:13:06,285 --> 00:13:09,288

LET'S CHECK THE UPDATE DISPLAY.

329

00:13:09,288 --> 00:13:12,424

THE EXPECTED LOSS OF SIGNAL IS

330

00:13:12,424 --> 00:13:16,962

4:55 A.M., AND THAT IS ABOUT 41

331

00:13:16,962 --> 00:13:22,268

MINUTES AWAY FROM NOW.

332

00:13:22,268 --> 00:13:25,004

>> WE'VE MANAGED TO INSPIRE A

333

00:13:25,004 --> 00:13:28,174

YOUNGER GENERATION OF

334

00:13:28,174 --> 00:13:29,408

SCIENTISTS, AND THEY WILL

335

00:13:29,408 --> 00:13:31,410

CONTINUE AFTER THIS IS OVER AND

336

00:13:31,410 --> 00:13:36,215

AFTER THE ORIGINAL INVESTIGATORS

337

00:13:36,215 --> 00:13:36,949

ARE GONE TO MARCH ON FOR THEIR

338

00:13:36,949 --> 00:13:38,884

OWN CHALLENGES FOR FUTURE

339

00:13:38,884 --> 00:13:43,088

SPACECRAFT EXPLORATION.

340

00:13:43,088 --> 00:13:46,258

>> LET'S LOOK BACK TO WHAT

341

00:13:46,258 --> 00:13:48,360

INSPIRED THE MISSION, AND THE

342

00:13:48,360 --> 00:13:51,730

DAY CASSINI ARRIVED AT SATURN.

343

00:13:51,730 --> 00:13:57,369

IT WAS A JOINT EFFORT OF NASA,

344

00:13:57,369 --> 00:14:01,407

THE EUROPEAN SPACE AGENCY AND

345

00:14:01,407 --> 00:14:02,741

ITALIAN SPACE AGENCY.

346

00:14:02,741 --> 00:14:04,310

SCIENTISTS ALL OVER THE WORLD

347

00:14:04,310 --> 00:14:18,490

INSISTED THEY HAD TO GO BACK.

348

00:14:18,490 --> 00:14:25,864

>> HELLO.

349

00:14:25,864 --> 00:14:26,599

THANKS TO THE WORLDWIDE WEB, I

350

00:14:26,599 --> 00:14:29,201

HAVE BEEN FOLLOWING THE PROGRESS

351

00:14:29,201 --> 00:14:32,204

OF CASSINI FROM THE TIME OF

352

00:14:32,204 --> 00:14:35,474

LAUNCH SEVERAL YEARS AGO.

353

00:14:35,474 --> 00:14:39,945

AS YOU KNOW, THERE IS BLOSSOMING

354

00:14:39,945 --> 00:14:42,314

INTEREST IN SATURN.

355

00:14:42,314 --> 00:14:44,750

SO I'M GOING TO BASE MY COURSE

356

00:14:44,750 --> 00:14:46,819

ON WHAT CASSINI DISCOVERS.

357

00:14:46,819 --> 00:14:48,254

WHO KNOWS.

358

00:14:48,254 --> 00:14:50,289

OUR SURVIVAL ON EARTH MAY DEPEND

359

00:14:50,289 --> 00:15:37,169

ON WHAT WE DISCOVER THERE.

360

00:15:37,169 --> 00:15:38,037

>> OKAY.

361

00:15:38,037 --> 00:15:45,144

WE ARE COMPLETE.

362

00:15:45,144 --> 00:15:48,080

>> FOR SATURN'S STRONG GRAVITY

363

00:15:48,080 --> 00:15:50,716

BURNING IN, OR POINTING

364

00:15:50,716 --> 00:15:52,584

DIRECTION, AND WE'LL HOPE TO

365

00:15:52,584 --> 00:15:54,086

ACQUIRE A SIGNAL BEFORE THAT

366

00:15:54,086 --> 00:15:56,055

TURN COMPLETES. THE COMPLETION

367

00:15:56,055 --> 00:15:57,790

OF THAT TURN IS AROUND --

368

00:15:57,790 --> 00:16:01,293

>> THE WORDS YOU HEARD

369

00:16:01,293 --> 00:16:02,661

ANNOUNCING THE ARRIVAL OF JUNE

370

00:16:02,661 --> 00:16:09,101

30th, 2004, WAS THE VOICE OF

371

00:16:09,101 --> 00:16:12,338

CASSINI ENGINEER, TODD BARBER,

372

00:16:12,338 --> 00:16:22,514

AND HE IS BACK HERE AGAIN TODAY.

373

00:16:22,514 --> 00:16:24,750

>> IT'S COOL TO AGE 13 YEARS IN

374

00:16:24,750 --> 00:16:26,185

TWO SECONDS AND HAVE TO WATCH

375

00:16:26,185 --> 00:16:26,485

THAT.

376
00:16:26,485 --> 00:16:29,388
BUT WHAT A DEMONSTRATION OF THE

377
00:16:29,388 --> 00:16:30,589
LONGEVITY OF THIS MISSION.

378
00:16:30,589 --> 00:16:34,226
AS YOU AND I SAT THERE IN 2004,

379
00:16:34,226 --> 00:16:37,029
WE NEVER DREAMT WE'D BE HERE IN

380
00:16:37,029 --> 00:16:40,899
2017 STILL TALKING ABOUT CASSINI

381
00:16:40,899 --> 00:16:41,600
AND COLLECTING SCIENCE DATA.

382
00:16:41,600 --> 00:16:44,069
I'M THRILLED TO BE HERE, EVEN

383
00:16:44,069 --> 00:16:49,541
HAVING AGED SOME YEARS.

384
00:16:49,541 --> 00:16:51,977
>> EXPLAIN TO US WHY THE TEAM

385
00:16:51,977 --> 00:16:53,879
HAS GATHERED HERE, EVEN THOUGH

386
00:16:53,879 --> 00:16:56,415
YOU HAD TOLD ME THAT THE

387
00:16:56,415 --> 00:16:58,851
SPACECRAFT MET ITS FATE PROBABLY

388
00:16:58,851 --> 00:17:02,187

ABOUT 3:30 PACIFIC TIME OUT AT

389

00:17:02,187 --> 00:17:03,822

SATURN, BUT YET THE TEAM IS

390

00:17:03,822 --> 00:17:05,691

WAITING HERE NOW AND HOLDING

391

00:17:05,691 --> 00:17:05,991

VIGIL.

392

00:17:05,991 --> 00:17:07,659

WHY IS THAT?

393

00:17:07,659 --> 00:17:12,331

>> IT'S THAT PESKY ALBERT

394

00:17:12,331 --> 00:17:13,799

EINSTEIN AND HIS SPEED OF LIGHT

395

00:17:13,799 --> 00:17:16,168

SPEED LIMIT. SO SATURN IS ABOUT

396

00:17:16,168 --> 00:17:19,805

AN HOUR AND 23 MINUTES AWAY FROM

397

00:17:19,805 --> 00:17:20,172

US.

398

00:17:20,172 --> 00:17:22,674

I'M A BIG SPORTS NUT.

399

00:17:22,674 --> 00:17:25,110

I TAKE GAMES AND DVR THEM.

400

00:17:25,110 --> 00:17:27,045

THE GAME IS SO EXCITING IF YOU

401
00:17:27,045 --> 00:17:29,014
DON'T KNOW THE RESULT, AND NO

402
00:17:29,014 --> 00:17:31,049
ONE HAS SEEN CASSINI'S LAST BITS

403
00:17:31,049 --> 00:17:33,419
OF SCIENCE COME BACK YET.

404
00:17:33,419 --> 00:17:35,220
IT'S JUST ABOUT TO CROSS THE

405
00:17:35,220 --> 00:17:37,356
ORBIT OF JUPITER.

406
00:17:37,356 --> 00:17:40,592
THERE'S OUR GRAPHIC.

407
00:17:40,592 --> 00:17:43,929
JUPITER'S A DIFFERENT POSITION.

408
00:17:43,929 --> 00:17:45,531
THEY'LL KNOW CASSINI'S FATE AND

409
00:17:45,531 --> 00:17:47,166
LAST BIT OF DATA BEFORE WE WILL

410
00:17:47,166 --> 00:17:47,833
ON EARTH.

411
00:17:47,833 --> 00:17:52,538
SO WE'RE HOLDING VIGIL HERE.

412
00:17:52,538 --> 00:17:53,372
WE ALSO HAVE THIS DISPLAY, KIND

413
00:17:53,372 --> 00:17:55,974

OF LIKE GAUGES IN YOUR CAR.

414

00:17:55,974 --> 00:17:58,544

THIS IS THE SPEED NOTICE 63,000

415

00:17:58,544 --> 00:18:01,680

MILES PER HOUR AND CLIMBING AS

416

00:18:01,680 --> 00:18:04,183

WE DESCEND INTO SATURN'S GRAVITY

417

00:18:04,183 --> 00:18:04,483

WELL.

418

00:18:04,483 --> 00:18:06,318

AND ON THE RIGHT SIDE IS THE

419

00:18:06,318 --> 00:18:07,986

DISTANCE FROM THE CLOUD TOPS,

420

00:18:07,986 --> 00:18:10,889

AND THAT'S SHRINKING.

421

00:18:10,889 --> 00:18:12,758

IT'S GOING TO HEAD DOWN OVER THE

422

00:18:12,758 --> 00:18:15,861

NEXT 37 MINUTES AS WE HEAD DOWN.

423

00:18:15,861 --> 00:18:17,563

>> AND TODD, HELP US UNDERSTAND

424

00:18:17,563 --> 00:18:19,531

HOW THEND TEAM WILL BE MONITORING

425

00:18:19,531 --> 00:18:19,832

THIS.

426

00:18:19,832 --> 00:18:22,267

>> YES, WE'VE GOT A FEW WAYS.

427

00:18:22,267 --> 00:18:24,503

THERE'S A DISPLAY FROM -- HERE'S

428

00:18:24,503 --> 00:18:26,572

OUR RADIO SIGNAL.

429

00:18:26,572 --> 00:18:28,574

SO THIS IS THE CARRIER

430

00:18:28,574 --> 00:18:31,543

FREQUENCY. AND WHAT I LIKE TO

431

00:18:31,543 --> 00:18:34,913

POINT OUT HERE, THE PEAK IN THE

432

00:18:34,913 --> 00:18:37,082

MIDDLE, THIS IS THE LOUDNESS OR

433

00:18:37,082 --> 00:18:38,584

THE SIGNAL STRENGTH.

434

00:18:38,584 --> 00:18:40,319

AND THE CASSINI FREQUENCY THAT

435

00:18:40,319 --> 00:18:41,687

IT'S TALKING.

436

00:18:41,687 --> 00:18:43,822

WE HAVE X BAND AND S BAND, TWO

437

00:18:43,822 --> 00:18:45,691

DIFFERENT RADIO FREQUENCIES. IF

438

00:18:45,691 --> 00:18:47,726

YOU THINK IN YOUR CAR RADIO OF

439

00:18:47,726 --> 00:18:49,394

TUNING TO DIFFERENT FREQUENCIES,

440

00:18:49,394 --> 00:18:52,564

THAT'S LIKE MOVING ALONG THE X

441

00:18:52,564 --> 00:18:54,266

AXIS, THE HORIZONTAL AXIS.

442

00:18:54,266 --> 00:18:56,802

WE'RE GETTING A NICE, BIG,

443

00:18:56,802 --> 00:18:58,837

STRONG, BOOMING SIGNAL FROM THE

444

00:18:58,837 --> 00:19:01,940

X AXIS. AS WE COME INTO THE

445

00:19:01,940 --> 00:19:03,775

ATMOSPHERE AND TURN AWAY FROM

446

00:19:03,775 --> 00:19:05,744

EARTH, OUR THRUSTERS CAN'T KEEP

447

00:19:05,744 --> 00:19:08,514

UP ANYMORE WITH THE TORQUE.

448

00:19:08,514 --> 00:19:10,148

THOSE WILL FLAT LINE AND THAT'S

449

00:19:10,148 --> 00:19:11,316

WHEN WE'LL SAY GOOD-BYE.

450

00:19:11,316 --> 00:19:13,085

THE KEY IS TO KEEP THE DATA

451
00:19:13,085 --> 00:19:15,053
COMING DOWN TO EARTH AND GET THE

452
00:19:15,053 --> 00:19:16,822
PRECIOUS LAST FEW BITS OF

453
00:19:16,822 --> 00:19:19,758
SCIENCE DATA FROM SATURN, OUR

454
00:19:19,758 --> 00:19:22,861
FIRST SNIP OF THE UPPER SATURN

455
00:19:22,861 --> 00:19:24,363
ATMOSPHERE, AND BOY WE'RE

456
00:19:24,363 --> 00:19:25,197
EXCITED FOR THAT.

457
00:19:25,197 --> 00:19:25,831
>> ALL RIGHT.

458
00:19:25,831 --> 00:19:26,398
THANKS TODD.

459
00:19:26,398 --> 00:19:28,000
WE WILL CHECK BACK WITH YOU

460
00:19:28,000 --> 00:19:28,333
LATER.

461
00:19:28,333 --> 00:19:30,502
AND ONE OF THE SIGNALS TODD

462
00:19:30,502 --> 00:19:33,839
SHOWED YOU IS PART OF A COMPUTER

463
00:19:33,839 --> 00:19:35,674

VISUALIZATION TOOL THAT WE CALL

464

00:19:35,674 --> 00:19:38,710

EYES ON THE SOLAR SYSTEM, THE

465

00:19:38,710 --> 00:19:40,245

JPL COMPUTER SIMULATION SOFTWARE

466

00:19:40,245 --> 00:19:42,447

ISOF BASED ON REAL DATA FROM

467

00:19:42,447 --> 00:19:43,582

MISSIONS, AND IT'S SOMETHING

468

00:19:43,582 --> 00:19:45,217

THAT YOUET CAN DOWNLOAD ON YOUR

469

00:19:45,217 --> 00:19:46,985

OWN COMPUTER AND FOLLOW ALONG

470

00:19:46,985 --> 00:19:48,654

THIS MORNING.

471

00:19:48,654 --> 00:19:52,891

GO TO EYES.NASA.GOV, DOWNLOAD

472

00:19:52,891 --> 00:19:56,695

THE APP, AND CLICK ON CASSINI'S

473

00:19:56,695 --> 00:19:57,095

TOUR.

474

00:19:57,095 --> 00:19:59,331

HERE ARE TWO FAMILY PHOTOS WE'D

475

00:19:59,331 --> 00:20:01,767

LIKE TO SHARE. THE TOP ONE WAS

476

00:20:01,767 --> 00:20:04,336

TAKEN JUNE 21, 2017.

477

00:20:04,336 --> 00:20:06,738

IT'S THE TEAM AND ALUMNI, AND

478

00:20:06,738 --> 00:20:08,040

THEY, FILLED THE STAIRCASE ON THE

479

00:20:08,040 --> 00:20:08,607

MALL HERE.

480

00:20:08,607 --> 00:20:10,709

MOST OF THEM ARE ENGINEERS. ON

481

00:20:10,709 --> 00:20:12,678

THE BOTTOM PHOTO, AND THIS ONE

482

00:20:12,678 --> 00:20:15,847

WAS TAKEN JUST A FEW DAYS AGO,

483

00:20:15,847 --> 00:20:18,517

IT'S THE SCIENCE TEAM AT CAL

484

00:20:18,517 --> 00:20:18,817

TECH.

485

00:20:18,817 --> 00:20:20,252

THE TEAM INCLUDES SCIENTISTS

486

00:20:20,252 --> 00:20:21,420

FROM ALL OVER THE WORLD.

487

00:20:21,420 --> 00:20:22,854

OVER THE YEARS, THOUSANDS OF

488

00:20:22,854 --> 00:20:26,992

PEOPLE HAVE WORKED ON THIS

489

00:20:26,992 --> 00:20:27,326

MISSION.

490

00:20:27,326 --> 00:20:28,126

THERE ARE SO MANY MEMBERS OF THE

491

00:20:28,126 --> 00:20:29,795

CASSINI FAMILY, WE COULDN'T FIT

492

00:20:29,795 --> 00:20:32,731

THEM ALL HERE AT JPL.

493

00:20:32,731 --> 00:20:36,001

THAT'S WHY THERE'S A BIG CROWD

494

00:20:36,001 --> 00:20:38,704

IN PASADENA, WHERE CASSINI

495

00:20:38,704 --> 00:20:40,539

SCIENCE TEAM MEMBER, MORGAN

496

00:20:40,539 --> 00:20:43,175

CABLE, IS RIGHT NOW.

497

00:20:43,175 --> 00:20:45,010

WHAT IS IT LIKE OUT THERE?

498

00:20:45,010 --> 00:20:47,846

>> Reporter: HI, HERE AT CAL

499

00:20:47,846 --> 00:20:49,982

TECH, YOU CAN HEAR IT BEHIND ME

500

00:20:49,982 --> 00:20:50,382

RIGHT?

501
00:20:50,382 --> 00:20:51,984
THIS IS AN HISTORIC MOMENT.

502
00:20:51,984 --> 00:20:54,620
AND I THINK THE MOOD REFLECTS

503
00:20:54,620 --> 00:20:54,920
THAT.

504
00:20:54,920 --> 00:20:57,456
BUT IT'S ALSO LIKE A FAMILY

505
00:20:57,456 --> 00:20:57,990
REUNION.

506
00:20:57,990 --> 00:21:00,726
WE'RE HERE WITH OUR OTHER FELLOW

507
00:21:00,726 --> 00:21:02,461
CASSINI FAMILY MEMBERS.

508
00:21:02,461 --> 00:21:03,862
WE'RE SEEING PEOPLE WE HAVEN'T

509
00:21:03,862 --> 00:21:05,797
SEEN FOR A LONG TIME FOR SOME

510
00:21:05,797 --> 00:21:06,498
CASES.

511
00:21:06,498 --> 00:21:07,599
IT'S JUST BEEN WONDERFUL TO

512
00:21:07,599 --> 00:21:09,501
SHARE THESE MEMORIES, TO REVEL

513
00:21:09,501 --> 00:21:12,604

IN THEEVE EXCITEMENT.

514

00:21:12,604 --> 00:21:13,305

THIS IS A CELEBRATION OF AN

515

00:21:13,305 --> 00:21:15,374

AMAZING MISSION AND AN

516

00:21:15,374 --> 00:21:15,974

INCREDIBLE LEGACY.

517

00:21:15,974 --> 00:21:20,379

>> MORGAN, YOU'RE ONE OF THE

518

00:21:20,379 --> 00:21:21,179

SCIENTISTS -- YOU'RE ONE OF THE

519

00:21:21,179 --> 00:21:22,681

SCIENTISTS OUT THERE.

520

00:21:22,681 --> 00:21:24,750

FOR YOU, YOU'RE PROBABLY BEING

521

00:21:24,750 --> 00:21:25,651

VERY REFLECTIVE.

522

00:21:25,651 --> 00:21:29,121

WHAT WAS ONE OF THE HIGHLIGHTS

523

00:21:29,121 --> 00:21:30,555

FOR YOU THIS MISSION?

524

00:21:30,555 --> 00:21:34,593

>> FOR ME PERSONALLY, THE

525

00:21:34,593 --> 00:21:36,361

DISCOVERIES HAVE REALLY

526
00:21:36,361 --> 00:21:39,698
REVOLUTIONIZED OUR VIEW OF WHERE

527
00:21:39,698 --> 00:21:40,666
WE MIGHT FIND LIFE, OR AT LEAST

528
00:21:40,666 --> 00:21:42,601
CONDITIONS SUITABLE FOR LIFE IN

529
00:21:42,601 --> 00:21:44,803
NOT ONLY OUR SOLAR SYSTEM, BUT

530
00:21:44,803 --> 00:21:45,804
THE UNIVERSE.

531
00:21:45,804 --> 00:21:47,472
WE'VE LEARNED THERE ARE PLACES

532
00:21:47,472 --> 00:21:49,875
WHERE LIQUID WATER AND THE OTHER

533
00:21:49,875 --> 00:21:52,878
INGREDIENTS FOR LIFE AS WE KNOW

534
00:21:52,878 --> 00:21:55,847
IT DO EXIST.

535
00:21:55,847 --> 00:21:57,883
THAT'S THANKS TO THE CASSINI

536
00:21:57,883 --> 00:22:04,690
MISSION, WHICH THROUGH THROUGH

537
00:22:04,690 --> 00:22:05,991
THE PLUME OF INSELIDIS.

538
00:22:05,991 --> 00:22:08,627

NOW WE CAN START TO LOOK FOR

539

00:22:08,627 --> 00:22:14,666

PLACES LIKE INSELIDIS OR UROTHA

540

00:22:14,666 --> 00:22:16,935

AND EXTEND OUR SEARCH TO TRY TO

541

00:22:16,935 --> 00:22:19,137

FIND THAT AMAZING DISCOVERY OF

542

00:22:19,137 --> 00:22:19,905

LIFE SOMEWHERE ELSE.

543

00:22:19,905 --> 00:22:21,673

>> WE WILL BE CHECKING BACK WITH

544

00:22:21,673 --> 00:22:23,842

YOU, MORGAN, LATER ON IN THE

545

00:22:23,842 --> 00:22:24,142

SHOW.

546

00:22:24,142 --> 00:22:25,577

THANKS FOR THAT REPORT.

547

00:22:25,577 --> 00:22:28,714

IT ISR ABOUT 23 MINUTES PAST THE

548

00:22:28,714 --> 00:22:29,247

HOUR.

549

00:22:29,247 --> 00:22:31,283

YOU'RE WATCHING LIVE COVERAGE,

550

00:22:31,283 --> 00:22:34,653

MARKING THE FINAL MOMENTS OF

551
00:22:34,653 --> 00:22:36,221
NASA TV, THE DEEP SPACE NETWORK

552
00:22:36,221 --> 00:22:39,057
IS AWAITING THE LOSS OF SIGNAL.

553
00:22:39,057 --> 00:22:42,394
AND LET'S GO TO CASSINI'S FINAL

554
00:22:42,394 --> 00:22:43,295
HOUR DISPLAY.

555
00:22:43,295 --> 00:22:45,731
ATLA THIS POINT THE SPACECRAFT HAS

556
00:22:45,731 --> 00:22:49,267
SENT US DATA FROM ABOUT THE 50

557
00:22:49,267 --> 00:22:51,970
DEGREE NORTH LATITUDE MARK AND

558
00:22:51,970 --> 00:22:54,773
LOSS OF SIGNAL SHOULD BE COMING

559
00:22:54,773 --> 00:23:13,291
ABOUT 32 MINUTES FROM NOW.

560
00:23:58,837 --> 00:23:13,625

■■

561
00:23:58,837 --> 00:24:02,374
>> BEAUTIFUL IMAGES FROM

562
00:24:02,374 --> 00:24:03,508
CASSINI.

563
00:24:03,508 --> 00:24:05,510

THE MISSION MADE SO MANY

564

00:24:05,510 --> 00:24:09,314

HISTORIC DISCOVERIES.

565

00:24:09,314 --> 00:24:10,081

THE PROBE SENT BACK DETAILS OF

566

00:24:10,081 --> 00:24:12,050

AN ALIEN WORLD, A WORLD THAT

567

00:24:12,050 --> 00:24:14,786

APPEARS TO BE VERY SIMILAR TO

568

00:24:14,786 --> 00:24:15,120

EARTH.

569

00:24:15,120 --> 00:24:17,923

IT FOUND JET SPRANG WATER ICE

570

00:24:17,923 --> 00:24:20,425

AND ORGANICS ON THE SOUTH POLES

571

00:24:20,425 --> 00:24:23,595

OF ENCELADUS, AN OCEAN WHERE

572

00:24:23,595 --> 00:24:24,863

THERE COULD BE LIFE.

573

00:24:24,863 --> 00:24:27,933

THE MISSION REVEALED SCIENTIFIC

574

00:24:27,933 --> 00:24:30,068

WONDERS ABOUT SATURN, ITS RINGS

575

00:24:30,068 --> 00:24:32,504

AND MOONS, AND IT HASN'T

576
00:24:32,504 --> 00:24:32,838
STOPPED.

577
00:24:32,838 --> 00:24:33,905
AT LEAST NOT YET.

578
00:24:33,905 --> 00:24:38,076
WITH ME NOW IS CASSINI PROJECT

579
00:24:38,076 --> 00:24:38,710
SCIENTIST, LINDA SPOKER.

580
00:24:38,710 --> 00:24:40,245
THIS MISSION WAS DETERMINED TO

581
00:24:40,245 --> 00:24:41,646
SEND DOWN SCIENCE RIGHT DOWN TO

582
00:24:41,646 --> 00:24:42,314
THE VERY END.

583
00:24:42,314 --> 00:24:45,217
>> THAT'S RIGHT, TO THE VERY

584
00:24:45,217 --> 00:24:47,619
LAST SECOND.

585
00:24:47,619 --> 00:24:49,421
WE WERE TOLD A LITTLE WHILE AGO,

586
00:24:49,421 --> 00:24:51,790
THAT OVERNIGHT THE SPACECRAFT

587
00:24:51,790 --> 00:24:55,026
SENT BACK THE LAST PICTURE SHOW,

588
00:24:55,026 --> 00:24:55,660

IT'S BEEN CALLED.

589

00:24:55,660 --> 00:24:57,095

CAN YOU DESCRIBEE WHAT THOSE ARE?

590

00:24:57,095 --> 00:24:59,464

>> LET'S GO TO THE VERY FIRST

591

00:24:59,464 --> 00:25:00,899

IMAGE, IMAGE A, PROBABLY THE

592

00:25:00,899 --> 00:25:02,434

LAST PICTURE SHOWN.

593

00:25:02,434 --> 00:25:05,303

THE FIRST THING WE DID WAS MAKE

594

00:25:05,303 --> 00:25:07,305

A COLOR MOSAIC, AND THESE ARE A

595

00:25:07,305 --> 00:25:10,709

COUPLE OF PICTURES FROM THAT

596

00:25:10,709 --> 00:25:11,176

MOSAIC.

597

00:25:11,176 --> 00:25:12,510

WE'LL STITCH THOSE TOGETHER AND

598

00:25:12,510 --> 00:25:14,412

HAVE A BEAUTIFUL IMAGE OF SATURN

599

00:25:14,412 --> 00:25:17,048

PLUS THE RINGS. IF WE GO TO

600

00:25:17,048 --> 00:25:21,887

IMAGE C, THAT'S A MOVIE OF

601
00:25:21,887 --> 00:25:23,688
ENCELADUS SETTING BEHIND THE

602
00:25:23,688 --> 00:25:24,756
RING OF SATURN.

603
00:25:24,756 --> 00:25:25,924
>> TELL ME HOW THE TEAM DECIDED

604
00:25:25,924 --> 00:25:28,159
TO COME UP WITH THIS IMAGERY AND

605
00:25:28,159 --> 00:25:29,060
THIS SELECTION?

606
00:25:29,060 --> 00:25:30,662
>> THERE'S A LOT OF SCIENCE IN

607
00:25:30,662 --> 00:25:33,865
THESE IMAGES.

608
00:25:33,865 --> 00:25:36,568
THERE'S WHENCE ENCELADUS SETTING

609
00:25:36,568 --> 00:25:40,005
BEHIND THE RING OF SATURN.

610
00:25:40,005 --> 00:25:41,973
GOOD-BYE TO ENCELADUS, AND WE

611
00:25:41,973 --> 00:25:44,376
WANTED TO DO A SURVEY AND LOOK

612
00:25:44,376 --> 00:25:47,212
AT EACH OF THESE KEY TARGETS AND

613
00:25:47,212 --> 00:25:50,582

COLLECT POSTCARDSEY FOR OUR

614

00:25:50,582 --> 00:25:50,949

SCRAPBOOK.

615

00:25:50,949 --> 00:25:53,385

IF YOU LOOK AT IMAGE D, THAT'S A

616

00:25:53,385 --> 00:25:55,887

TRUE COLOR IMAGE OF TITAN, AND

617

00:25:55,887 --> 00:25:58,023

YOU CAN SEE THE LIGHTS UP IN THE

618

00:25:58,023 --> 00:25:58,556

NORTH.

619

00:25:58,556 --> 00:26:01,927

IMAGE F SHOWS THIS IN A FALSE

620

00:26:01,927 --> 00:26:04,362

COLOR, THERE'S A UV FILTER, AND

621

00:26:04,362 --> 00:26:07,332

THE LIGHTS REALLY POP OUT. AND

622

00:26:07,332 --> 00:26:09,668

YOU CAN SEE THAT BLUISH HAZE AT

623

00:26:09,668 --> 00:26:12,070

THE EDGE OF TITAN.

624

00:26:12,070 --> 00:26:14,506

TITAN HAS A THICK NITROGEN

625

00:26:14,506 --> 00:26:14,906

ATMOSPHERE.

626
00:26:14,906 --> 00:26:16,808
WE TOOK PICTURES OF THE RINGS,

627
00:26:16,808 --> 00:26:18,944
IF YOU GO TO IMAGE G, WE'RE

628
00:26:18,944 --> 00:26:20,679
LOOKING FOR PROPELLERS.

629
00:26:20,679 --> 00:26:23,348
YOU CAN JUST SEE A HINT OF IT

630
00:26:23,348 --> 00:26:24,349
ABOVE THAT DARK GAP.

631
00:26:24,349 --> 00:26:26,818
IF WE GO TO IMAGE H, THAT'S A

632
00:26:26,818 --> 00:26:27,485
BLOW UP.

633
00:26:27,485 --> 00:26:30,055
SEE THAT TWO-ARM PROPELLER?

634
00:26:30,055 --> 00:26:33,325
IT'S THE WHITE FEATURE ABOVE THE

635
00:26:33,325 --> 00:26:33,692
DARK GAP.

636
00:26:33,692 --> 00:26:34,426
THERE'S A COLLECTION OF RING

637
00:26:34,426 --> 00:26:36,461
PARTICLES THATRK ARE LARGE ENOUGH,

638
00:26:36,461 --> 00:26:37,829

TRYING TO OPEN THEIR OWN GAP.

639

00:26:37,829 --> 00:26:39,464

AND THEY CREATE WHAT LOOKS LIKE

640

00:26:39,464 --> 00:26:41,032

AN AIRPLANE PROPELLER.

641

00:26:41,032 --> 00:26:51,309

AND THEY HAVE FUN NAMES OF

642

00:26:51,309 --> 00:26:51,676

AVIATORS.

643

00:26:51,676 --> 00:26:54,913

YOU CAN SEE THE CRINKLY EDGES

644

00:26:54,913 --> 00:26:56,648

ALONG THE GAP?

645

00:26:56,648 --> 00:27:01,586

THAT'S CREATED BY GAS IN THE

646

00:27:01,586 --> 00:27:10,862

SYSTEM.

647

00:27:10,862 --> 00:27:13,498

AND FINALLY IMAGE J THIS IS AN

648

00:27:13,498 --> 00:27:16,935

IMAGE LOOKING AT SATURN IN A

649

00:27:16,935 --> 00:27:21,306

PLACE WHERE CASSINI WILL BE

650

00:27:21,306 --> 00:27:22,240

ENTERING, ONE OF OUR LAST

651
00:27:22,240 --> 00:27:24,175
PICTURES OF SATURN.

652
00:27:24,175 --> 00:27:26,678
YOU CAN THINK OF CASSINI RUNNING

653
00:27:26,678 --> 00:27:27,412
A MARATHON.

654
00:27:27,412 --> 00:27:29,547
FOR 13 YEARS WE HAVE BEEN

655
00:27:29,547 --> 00:27:30,615
RUNNING A MARATHON FOR

656
00:27:30,615 --> 00:27:32,050
SCIENTIFIC DISCOVERY, AND WE'RE

657
00:27:32,050 --> 00:27:33,585
ON THE LAST LAP.

658
00:27:33,585 --> 00:27:35,920
SO WE'RE HERE TODAY TO CHEER AS

659
00:27:35,920 --> 00:27:37,655
CASSINI FINISHES THAT RACE.

660
00:27:37,655 --> 00:27:40,625
>> NOW, MANY OF THESE IMAGES AND

661
00:27:40,625 --> 00:27:41,926
WHAT THE SPACECRAFT WILL BE

662
00:27:41,926 --> 00:27:44,996
DOING RIGHT NOW, ALL OF THIS IS

663
00:27:44,996 --> 00:27:46,264

UNKNOWN TERRITORY.

664

00:27:46,264 --> 00:27:49,434

THEIR SPACECRAFT HAS NEVER BEEN

665

00:27:49,434 --> 00:27:49,868

HERE BEFORE.

666

00:27:49,868 --> 00:27:51,803

>> THAT'S RIGHT.

667

00:27:51,803 --> 00:27:54,039

WE'RE FLYING INTO SATURN MORE

668

00:27:54,039 --> 00:27:57,042

DEEPLY THAN WE HAVE EVER FLOWN

669

00:27:57,042 --> 00:27:57,375

BEFORE.

670

00:27:57,375 --> 00:27:59,944

THE KEY INSTRUMENT IS THE

671

00:27:59,944 --> 00:28:01,446

NEUTRAL MASS SPECTROMETER.

672

00:28:01,446 --> 00:28:06,117

IT IS ORIENTED TO SAMPLE THE

673

00:28:06,117 --> 00:28:13,291

ATMOSPHERE'S LEVEL.

674

00:28:13,291 --> 00:28:15,827

IT WILL SEND BACK THE LAST VERY

675

00:28:15,827 --> 00:28:17,362

VALUABLE PACKETS OF DATA.

676
00:28:17,362 --> 00:28:24,035
>> AND WHO KNOWS HOW MANY PHD

677
00:28:24,035 --> 00:28:26,971
THESIS MIGHT BE IN THIS DATA.

678
00:28:26,971 --> 00:28:30,008
>> WE WILL HAVE SCIENTISTS AND

679
00:28:30,008 --> 00:28:31,810
STUDENTS LOOKING OVER THIS DATA

680
00:28:31,810 --> 00:28:33,344
FOR YEARS TO COME.

681
00:28:33,344 --> 00:28:35,213
>> WE WILL HOPE TO UNDERSTAND

682
00:28:35,213 --> 00:28:38,149
HOW SATURN FORMED, EVOLVED, AND

683
00:28:38,149 --> 00:28:41,286
WHO KNOWS WHAT ELSE WE'LL SEE.

684
00:28:41,286 --> 00:28:43,254
>> WHAT GREAT SCIENCE IS STILL

685
00:28:43,254 --> 00:28:43,688
AHEAD.

686
00:28:43,688 --> 00:28:45,190
LINDA, THANKS FOR JOINING US.

687
00:28:45,190 --> 00:28:47,892
>> YEAH, GLAD TO BE HERE.

688
00:28:47,892 --> 00:28:50,095

>> YOU'RE WATCHING LIVE COVERAGE

689

00:28:50,095 --> 00:28:54,933
OF CASSINI'S FINAL HOUR.

690

00:28:54,933 --> 00:28:57,669
JPL IS MANAGED BY THE CALIFORNIA

691

00:28:57,669 --> 00:28:59,504
INSTITUTE OFOR TECHNOLOGY.

692

00:28:59,504 --> 00:29:01,706
LET'S CHECK OUT OUR DISPLAY.

693

00:29:01,706 --> 00:29:04,542
WE ARE NOW ABOUT JUST A LITTLE

694

00:29:04,542 --> 00:29:08,546
UNDER 26 MINUTES FROM THE END OF

695

00:29:12,617 --> 00:29:12,283
MISSION.

696

00:29:39,978 --> 00:29:12,951

■■■

697

00:29:39,978 --> 00:29:43,248
>> HERE IS ONE EXAMPLE OF A TEAM

698

00:29:43,248 --> 00:29:44,682
THAT LEARNS TOGETHER PLAYS

699

00:29:44,682 --> 00:29:45,049
TOGETHER.

700

00:29:45,049 --> 00:29:48,253
THE SINGERS HAVE A KNACK FOR

701
00:29:48,253 --> 00:29:51,022
PUTTING A CASSINI SPIN ON JUST

702
00:29:51,022 --> 00:29:53,191
ABOUT ANY SHOW TUNE.

703
00:29:53,191 --> 00:29:56,094
AND I SAW TODD BARBER IN THAT

704
00:29:56,094 --> 00:29:56,694
GROUP.

705
00:29:56,694 --> 00:29:58,796
IT IS A VERY CLOSE KNIT GROUP,

706
00:29:58,796 --> 00:30:01,866
AND A MULTIGENERATIONAL GROUP.

707
00:30:01,866 --> 00:30:03,201
SOME PEOPLE HAVE SPENT THEIR

708
00:30:03,201 --> 00:30:04,702
ENTIRE CAREERS ON THIS MISSION,

709
00:30:04,702 --> 00:30:06,571
AND OTHERS ARE JUST STARTING

710
00:30:06,571 --> 00:30:09,674
THEIR CAREERS ON CASSINI.

711
00:30:09,674 --> 00:30:11,342
TODDSI BARBER IS STANDING BY WITH

712
00:30:11,342 --> 00:30:13,311
ONE OF THE YOUNGER MEMBERS OF

713
00:30:13,311 --> 00:30:16,714

THE TEAM, GUIDANCE AND CONTROL

714

00:30:16,714 --> 00:30:17,515

ENGINEER WHO STARTED HER CAREER

715

00:30:17,515 --> 00:30:32,330

WITH CASSINI, RIGHT?

716

00:30:32,330 --> 00:30:33,898

>> CAN YOU EXPLAIN TO OUR

717

00:30:33,898 --> 00:30:34,265

VIEWERS?

718

00:30:34,265 --> 00:30:34,432

>>

719

00:30:34,432 --> 00:30:36,034

ABSOLUTELY.

720

00:30:36,034 --> 00:30:37,735

I AND MY TEAM ARE IN CHARGE OF

721

00:30:37,735 --> 00:30:38,636

THE ORIENTATION.

722

00:30:38,636 --> 00:30:40,471

WE POINT ALL OF THE CAMERAS AND

723

00:30:40,471 --> 00:30:41,272

THE ANTENNA.

724

00:30:41,272 --> 00:30:42,340

>> THAT'S GREAT.

725

00:30:42,340 --> 00:30:44,375

AND YOU HAVE A PARTICULARLY

726
00:30:44,375 --> 00:30:45,777
IMPORTANT ROLE THIS EVENING

727
00:30:45,777 --> 00:30:46,211
RIGHT?

728
00:30:46,211 --> 00:30:49,447
OR THIS MORNING, I GUESS I

729
00:30:49,447 --> 00:30:49,981
SHOULD SAY?

730
00:30:49,981 --> 00:30:52,984
>> ISA HAVE ALLUDED TO WE WANT TO

731
00:30:52,984 --> 00:30:54,152
GET EVERY LAST POSSIBLE SECOND

732
00:30:54,152 --> 00:30:56,754
OF INFORMATION, WHICH MEANS OUR

733
00:30:56,754 --> 00:30:58,723
ANTENNA NEEDS TO BE POINTED

734
00:30:58,723 --> 00:31:01,793
TOWARDS EARTH AS LONG AS WE

735
00:31:01,793 --> 00:31:06,231
POSSIBLY CAN.

736
00:31:06,231 --> 00:31:07,765
>> HOW DO YOU DO THAT?

737
00:31:07,765 --> 00:31:12,370
>> WE HAVE LITTLE ENGINES OR

738
00:31:12,370 --> 00:31:18,710

THRUSTERS.

739

00:31:18,710 --> 00:31:22,714

>> WE WILL LOSE THE BATTLE WITH

740

00:31:22,714 --> 00:31:23,681

SATURN'S ATMOSPHERE.

741

00:31:23,681 --> 00:31:25,316

>> WE TRY AND HOLD THAT ANTENNA

742

00:31:25,316 --> 00:31:27,051

FOR AS LONG AS WE CAN.

743

00:31:27,051 --> 00:31:30,321

THAT WILL LAST FOR ONLY ABOUT A

744

00:31:30,321 --> 00:31:30,755

MINUTE.

745

00:31:30,755 --> 00:31:32,156

>> WOW.

746

00:31:32,156 --> 00:31:34,859

THAT'S -- AMAZING.

747

00:31:34,859 --> 00:31:37,562

THOSE PRECIOUS SECONDS OF

748

00:31:37,562 --> 00:31:40,031

SCIENCE DATA ARE WORTH EVERY

749

00:31:40,031 --> 00:31:41,432

PULSE WE PUT UP THERE.

750

00:31:41,432 --> 00:31:43,768

>> EVERY SECOND.

751
00:31:43,768 --> 00:31:45,003
WE'RE LEARNING ALL ABOUT

752
00:31:45,003 --> 00:31:46,971
SATURN'S ATMOSPHERE WITH ALL THE

753
00:31:46,971 --> 00:31:47,772
INSTRUMENTS WE CAN.

754
00:31:47,772 --> 00:31:49,974
WE WANT TO POINT AS LONG AS WE

755
00:31:49,974 --> 00:31:50,275
CAN.

756
00:31:50,275 --> 00:31:51,609
>> YOU STARTED YOUR CAREER HERE.

757
00:31:51,609 --> 00:31:53,278
HOW ARE YOU FEELING TONIGHT

758
00:31:53,278 --> 00:31:55,179
KNOWING WE HAVE TO SAY GOOD-BYE

759
00:31:55,179 --> 00:31:56,447
TO OUR BEAUTIFUL SPACECRAFT?

760
00:31:56,447 --> 00:31:59,317
>> I STARTED MY CAREER, I WAS IN

761
00:31:59,317 --> 00:32:01,119
HIGH SCHOOL WHEN CASSINI ARRIVED

762
00:32:01,119 --> 00:32:01,719
AT SATURN.

763
00:32:01,719 --> 00:32:03,488

SO YOU .KNOW, IT'S REALLY

764

00:32:03,488 --> 00:32:05,490

EXCITING AND I'M PROUD TO HAVE

765

00:32:05,490 --> 00:32:07,225

WORKED ON SUCH AN INCREDIBLE

766

00:32:07,225 --> 00:32:08,593

MISSION AND BE PART OF SUCH A

767

00:32:08,593 --> 00:32:11,329

WONDERFUL FAMILY.

768

00:32:11,329 --> 00:32:12,063

I'M USED TO CHECKING HOW THE

769

00:32:12,063 --> 00:32:13,698

SPACECRAFTK IS FEELING EVERY

770

00:32:13,698 --> 00:32:15,733

MORNING, SO LIT BE A LITTLE SAD

771

00:32:15,733 --> 00:32:26,778

TO NOT HAVE THAT ANYMORE.

772

00:32:26,778 --> 00:32:30,048

>> WE GOT A FEW TRUCKS UP THEIR

773

00:32:30,048 --> 00:32:30,381

SLEEVES.

774

00:32:30,381 --> 00:32:32,750

IF WE CAN HEAD BACK TO THE RADIO

775

00:32:32,750 --> 00:32:35,787

SCIENCE DISPLAY AND CHECK AND

776
00:32:35,787 --> 00:32:56,441
SEE --

777
00:32:56,441 --> 00:32:57,975
>> SO SO FAR SO GOOD.

778
00:32:57,975 --> 00:32:58,910
BACK TO YOU.

779
00:32:58,910 --> 00:33:01,846
>> THANKS, TODD, THANKS, JOANIE.

780
00:33:01,846 --> 00:33:04,415
IT IS ABOUT 33 MINUTES PAST THE

781
00:33:04,415 --> 00:33:06,417
HOUR, AND THE ESTIMATED TIME OF

782
00:33:06,417 --> 00:33:10,988
LOSS OF SIGNAL IS 4:55 A.M.

783
00:33:10,988 --> 00:33:27,071
PACIFIC.

784
00:33:27,071 --> 00:34:12,750
■■

785
00:34:12,750 --> 00:34:15,353
>> THE CASSINI MISSION HAS BEEN

786
00:34:15,353 --> 00:34:17,855
AN EPIC ADVENTURE AROUND THE

787
00:34:17,855 --> 00:34:18,656
SATURN SYSTEM.

788
00:34:18,656 --> 00:34:20,591

IT HAS SENT HOME MOUNTAINS OF

789

00:34:20,591 --> 00:34:24,128

SCIENCE DATA AND STUNNING

790

00:34:24,128 --> 00:34:26,764

IMAGES. THE SPACECRAFT

791

00:34:26,764 --> 00:34:33,638

PERFORMED BEAUTIFULLY.

792

00:34:33,638 --> 00:34:35,273

MEMBERS OF THE MISSION SAY THEY

793

00:34:35,273 --> 00:34:35,973

COULDN'T HAVE ASKED

794

00:34:58,162 --> 00:34:36,307

■■■

795

00:34:58,162 --> 00:35:00,898

>> I'VE WORKED ON THE CASSINI

796

00:35:00,898 --> 00:35:03,668

PROJECT FOR ALMOST 30 YEARS, AND

797

00:35:03,668 --> 00:35:05,670

THAT'S AN ENTIRE SATURN ORBIT.

798

00:35:05,670 --> 00:35:08,606

>> THE BEAUTY IS THE DESIGN.

799

00:35:08,606 --> 00:35:12,009

IT'S THE LARGEST EVER BUILT, 12

800

00:35:12,009 --> 00:35:13,578

DIFFERENT INSTRUMENTS. THE

801
00:35:13,578 --> 00:35:15,546
PROBE FROM THE EUROPEAN SPACE

802
00:35:15,546 --> 00:35:19,684
AGENCY, IT'S JUST A MONUMENTAL

803
00:35:19,684 --> 00:35:22,453
MACHINE.

804
00:35:22,453 --> 00:35:26,924
>> THREE, TWO, ONE, AND

805
00:35:26,924 --> 00:36:01,092
LIFT-OFF!

806
00:36:01,092 --> 00:36:03,394
>> I REMEMBER COMING BACK TO JPL

807
00:36:03,394 --> 00:36:04,896
EARLY IN THE MORNING SO I COULD

808
00:36:04,896 --> 00:36:07,231
BE THERE ANLDD WATCH THE PICTURES,

809
00:36:07,231 --> 00:36:09,300
ONE BY ONE, COME DOWN.

810
00:36:09,300 --> 00:36:10,768
I FELT LIKE I COULD ALMOST REACH

811
00:36:10,768 --> 00:36:14,238
OUT AND TOUCH THE RINGS THAT

812
00:36:14,238 --> 00:36:22,313
WERE RIGHT THERE.

813
00:36:22,313 --> 00:36:24,849

>> WE'VE BEEN COLLABORATING

814

00:36:24,849 --> 00:36:28,085

SINCEIN LAUNCH TO BE SURE WE HAD

815

00:36:28,085 --> 00:36:28,953

EVERYTHING RIGHT.

816

00:36:28,953 --> 00:36:31,055

>> THE PROBE WAS DROPPED ON TO

817

00:36:31,055 --> 00:36:31,389

TITAN.

818

00:36:31,389 --> 00:36:34,325

THESE ARE IMAGES FROM A BILLION

819

00:36:34,325 --> 00:36:38,529

MILES AWAY ON THE SURFACE OF

820

00:36:38,529 --> 00:36:59,917

TITAN.

821

00:36:59,917 --> 00:37:05,389

>> WE REMAPPED TO CONCENTRATE ON

822

00:37:05,389 --> 00:37:06,791

THE QUESTIONS THAT CASSINI

823

00:37:06,791 --> 00:37:07,124

RAISED.

824

00:37:07,124 --> 00:37:11,262

>> THE PLUME OF ENCELADUS,

825

00:37:11,262 --> 00:37:13,097

TESTING THE GAS AND MEASURING

826

00:37:13,097 --> 00:37:14,465

PARTICLES IN A WAY THAT WE

827

00:37:14,465 --> 00:37:17,401

HADN'T PLANNED.

828

00:37:17,401 --> 00:37:19,470

CASSINI HAS CHANGED THE PARADIGM

829

00:37:19,470 --> 00:37:21,205

IN WHERE WE LOOK FOR LIFE.

830

00:37:21,205 --> 00:37:24,108

>> 13 YEARS OF EXPLORING SATURN.

831

00:37:24,108 --> 00:37:27,878

IT REALLY IS JUST A SMOOTH

832

00:37:27,878 --> 00:37:44,161

OPERATION.

833

00:37:44,161 --> 00:37:46,497

>> JOINING ME NOW IS JIM GREEN.

834

00:37:46,497 --> 00:37:49,133

SOME OF CASSINI'S GREATEST

835

00:37:49,133 --> 00:37:50,167

ACCOMPLISHMENTS CAME AS BIG

836

00:37:50,167 --> 00:37:50,868

SURPRISES, DIDN'T THEY?

837

00:37:50,868 --> 00:37:54,238

>> THEY DID.

838

00:37:54,238 --> 00:38:30,941

ABSOLUTELY.

839

00:38:30,941 --> 00:38:32,143

>> THAT GAVE A HINT THAT

840

00:38:32,143 --> 00:38:33,411

SOMETHING WAS GOING ON AND IT

841

00:38:33,411 --> 00:38:35,046

NEEDED TO BE LOOKED AT.

842

00:38:35,046 --> 00:38:36,480

THE NEXT PASS, THEY CAME UP WITH

843

00:38:36,480 --> 00:38:40,384

THE IDEA, WELL, LET'S LOOK AT IT

844

00:38:40,384 --> 00:38:41,419

IN BACK LIGHT, AND WOW, THERE

845

00:38:41,419 --> 00:38:43,087

WERE THE PLUMES. AND THAT

846

00:38:43,087 --> 00:38:46,691

STARTED, THEN, A SERIES OF NEW

847

00:38:46,691 --> 00:38:49,794

ORBITS AND TRAJECTORIES TO GO

848

00:38:49,794 --> 00:38:52,096

THROUGH AND TASTE THE PLUMES AND

849

00:38:52,096 --> 00:38:55,533

GET MORE DETAILS ABOUT WHAT'S

850

00:38:55,533 --> 00:38:59,236

HAPPENING AT ENCELADUS.

851
00:38:59,236 --> 00:39:00,805
>> HOW DOES THIS CHANGE THE WAY

852
00:39:00,805 --> 00:39:02,440
WE LOOK FOR LIFE IN THIS SOLAR

853
00:39:02,440 --> 00:39:02,773
SYSTEM?

854
00:39:02,773 --> 00:39:04,809
>> THIS IS REALLY A CALLING, IF

855
00:39:04,809 --> 00:39:08,345
YOU WILL, OF HEY, YOU'RE GOING

856
00:39:08,345 --> 00:39:10,214
TO HAVE TOO COME BACK.

857
00:39:10,214 --> 00:39:13,117
THERE'S SEVERAL THINGS WE KNOW

858
00:39:13,117 --> 00:39:13,517
ABOUT LIFE.

859
00:39:13,517 --> 00:39:17,388
ONE, IT METABOLIZES AND TAKES IN

860
00:39:17,388 --> 00:39:27,832
A LIQUID.

861
00:39:27,832 --> 00:39:29,767
AND LIKE I CAN'T MEASURE ANY OF

862
00:39:29,767 --> 00:39:31,836
THOSE OTHER THAN GOING AFTER

863
00:39:31,836 --> 00:39:32,136

WATER.

864

00:39:32,136 --> 00:39:34,972

ONCE WE SEE AN AREA THAT HAS

865

00:39:34,972 --> 00:39:38,209

WATER, WE KNOW IT'S A

866

00:39:38,209 --> 00:39:40,077

POSSIBILITY OF BEING A HABITABLE

867

00:39:40,077 --> 00:39:40,511

ENVIRONMENT.

868

00:39:40,511 --> 00:39:41,746

>> AND TRANSITIONING TO THE

869

00:39:41,746 --> 00:39:43,214

OTHER BIG STORIES IS ANOTHER

870

00:39:43,214 --> 00:39:44,048

MOON, TITAN.

871

00:39:44,048 --> 00:39:45,549

>> OH YEAH, TITAN.

872

00:39:45,549 --> 00:39:46,984

WHAT A BEAUTIFUL MOON THIS IS.

873

00:39:46,984 --> 00:39:49,920

YOU KNOW, IT'S BIGGER THAN THE

874

00:39:49,920 --> 00:39:50,988

PLANET MERCURY.

875

00:39:50,988 --> 00:39:53,691

ONE.ATMOSPHERE IS A SIGNIFICANT

876
00:39:53,691 --> 00:39:55,259
IT'S TWICE THE PRESSURE WE HAVE

877
00:39:55,259 --> 00:39:56,060
HERE ON EARTH.

878
00:39:56,060 --> 00:39:57,328
IT'S SIMILAR IN THE SENSE THAT

879
00:39:57,328 --> 00:39:59,463
IT HAS A LOT OF NITROGEN, IN

880
00:39:59,463 --> 00:40:03,000
FACT IT'S DOMINATED BY NITROGEN.

881
00:40:03,000 --> 00:40:09,306
BUT IT ALSO HAS LIQUID ON ITS

882
00:40:09,306 --> 00:40:13,911
SURFACE, WHICH WE KNOW NOW IS

883
00:40:13,911 --> 00:40:15,980
METHANE.

884
00:40:15,980 --> 00:40:19,383
>> INCREDIBLE SCIENCE LEGACY,

885
00:40:19,383 --> 00:40:21,919
BUT TITAN ALSO HELPED US WITH AN

886
00:40:21,919 --> 00:40:23,020
ENGINEERING LEGACY AS WELL.

887
00:40:23,020 --> 00:40:25,956
>> THE CONCEPT OF USING TITAN TO

888
00:40:25,956 --> 00:40:34,165

DO LUNAR -- TO DO GRAVITY

889

00:40:34,165 --> 00:40:34,932

ASSIST, SWING BYES THAT ENABLE

890

00:40:34,932 --> 00:40:35,733

IT TO GET INTO DIFFERENT ORBITS

891

00:40:35,733 --> 00:40:38,836

IS A FABULOUS CONCEPT.

892

00:40:38,836 --> 00:40:39,570

WHILE WE WERE DOING THAT, AND

893

00:40:39,570 --> 00:40:42,673

HERE'S THE KOOSH BALL, ALL OF

894

00:40:42,673 --> 00:40:45,209

THE FLY BYES ALLOW US TO LOOK AT

895

00:40:45,209 --> 00:40:46,544

TITAN IN DETAIL.

896

00:40:46,544 --> 00:40:48,512

FROM MULTIPLE FLY BYES, WE CAN

897

00:40:48,512 --> 00:40:50,347

GET A GLOBAL VIEW OF THAT MOON,

898

00:40:50,347 --> 00:40:53,684

AND WE'RE USING THAT SAME

899

00:40:53,684 --> 00:40:58,823

CONCEPT AT JUPITER WITH ANOTHER

900

00:40:58,823 --> 00:41:01,392

MOON CALLED EUROPA.

901
00:41:01,392 --> 00:41:03,794
>> BEFORE WE GO, I WANTED TO

902
00:41:03,794 --> 00:41:06,330
BRING UP THE E BOOK, ONE OF THE

903
00:41:06,330 --> 00:41:07,898
MOST FANTASTIC THINGS ABOUT THE

904
00:41:07,898 --> 00:41:09,333
MISSION HAS BEEN THE IMAGERY.

905
00:41:09,333 --> 00:41:11,602
CAN YOU TELL US A LITTLE ABOUT

906
00:41:11,602 --> 00:41:11,902
THAT?

907
00:41:11,902 --> 00:41:13,737
>> WE REALLY NEEDED TO MAKE SURE

908
00:41:13,737 --> 00:41:16,907
THAT WE HAD WONDERFULLY

909
00:41:16,907 --> 00:41:20,544
DESCRIBED AND BEAUTIFUL SET

910
00:41:20,544 --> 00:41:23,180
IMAGES THAT WERE ACCESSIBLE TO

911
00:41:23,180 --> 00:41:23,547
EVERYONE.

912
00:41:23,547 --> 00:41:26,350
AND AFTER, YOU KNOW, 450,000

913
00:41:26,350 --> 00:41:29,220

PLUS IMAGES, IT'S SO HARD TO

914

00:41:29,220 --> 00:41:29,520

PICK.

915

00:41:29,520 --> 00:41:31,889

WE WERE ABLE TO GO BACK IN AND

916

00:41:31,889 --> 00:41:33,757

GET 100 BEAUTIFUL IMAGES OR

917

00:41:33,757 --> 00:41:35,626

MORE, AND VIDEOS AND ALL KINDS

918

00:41:35,626 --> 00:41:36,260

OF --

919

00:41:36,260 --> 00:41:37,528

>> AND THERE'S A LINK.

920

00:41:37,528 --> 00:41:42,032

IF YOU WANT TO GET IT, YOU CAN

921

00:41:42,032 --> 00:41:45,703

DOWNLOAD IT OFF THE INTERNET.

922

00:41:45,703 --> 00:41:47,137

JIM, THANKS FOR JOINING US.

923

00:41:47,137 --> 00:41:50,474

THANKS FOR TAKING TIME FOR US.

924

00:41:50,474 --> 00:41:52,810

AND I KNOW YOU WANT TO GET BACK

925

00:41:52,810 --> 00:41:53,410

INTO THAT CONTROL ROOM.

926

00:41:53,410 --> 00:41:53,844

>> ABSOLUTELY.

927

00:41:53,844 --> 00:44:01,171

THANK YOU.

928

00:44:01,171 --> 00:44:03,474

>> WELL, WE ARE A LITTLE OVER

929

00:44:03,474 --> 00:44:05,109

TEN MINUTES AWAY FROM THE LOSS

930

00:44:05,109 --> 00:44:07,277

OF SIGNAL, SO WE WILL BE

931

00:44:07,277 --> 00:44:08,545

FOCUSING OUR ATTENTION TO THE

932

00:44:08,545 --> 00:44:09,580

CONTROL ROOM VERY SOON NOW.

933

00:44:09,580 --> 00:44:11,915

BUT BEFORE WE DO, LET'S TAKE A

934

00:44:11,915 --> 00:44:14,718

MOMENT TO CHAT WITH JPL DIRECTOR

935

00:44:14,718 --> 00:44:15,452

MIKEIR WATKINS.

936

00:44:15,452 --> 00:44:17,321

MIKE, HOW ARE YOU FEELING?

937

00:44:17,321 --> 00:44:19,556

>> WELL, FIRST, GOOD MORNING.

938

00:44:19,556 --> 00:44:22,693

>> YES, VERY EARLY.

939

00:44:22,693 --> 00:44:25,162

>> WE ALWAYS DO THESE EVENTS AT

940

00:44:25,162 --> 00:44:27,297

3:00 IN THE MORNING AND 5:00 IN

941

00:44:27,297 --> 00:44:27,998

THE MORNING.

942

00:44:27,998 --> 00:44:29,900

>> WHY DO WE DO THAT?

943

00:44:29,900 --> 00:44:32,036

>> IT'S PRETTY BITTERSWEET.

944

00:44:32,036 --> 00:44:34,671

FOR ME IT'S MORE SWEET THAN

945

00:44:34,671 --> 00:44:36,140

BITTER BECAUSE CASSINI HAS BEEN

946

00:44:36,140 --> 00:44:37,408

SUCH A FANTASTIC MISSION.

947

00:44:37,408 --> 00:44:39,443

ONE OFSS THE IMPORTANT THINGS OF

948

00:44:39,443 --> 00:44:42,479

THESE EVENTS IS TO CELEBRATE THE

949

00:44:42,479 --> 00:44:44,448

DECADES OF HARD WORK OF THE TEAM

950

00:44:44,448 --> 00:44:47,251

THAT DESIGNED, BUILT, AND WORKED

951
00:44:47,251 --> 00:44:48,052
ON CASSINI.

952
00:44:48,052 --> 00:44:49,119
THE PEOPLE THAT HAVE BEEN

953
00:44:49,119 --> 00:44:51,088
OPERATING IT, THIS IS A GREAT

954
00:44:51,088 --> 00:44:53,357
TIME TO CELEBRATE THAT LEVEL OF

955
00:44:53,357 --> 00:44:54,892
DEDICATION, THAT DEVOTION TO

956
00:44:54,892 --> 00:44:57,294
WORK ON SOMETHING FOR 10, 20, 30

957
00:44:57,294 --> 00:44:59,663
YEARS, THAT'S SORT OF

958
00:44:59,663 --> 00:45:01,131
UNPARALLELED IN HUMAN HISTORY.

959
00:45:01,131 --> 00:45:02,733
>> SO HOW DO YOU THINK CASSINI

960
00:45:02,733 --> 00:45:04,468
WILL BE REMEMBERED IN THE

961
00:45:04,468 --> 00:45:05,235
SCIENCE BOOKS?

962
00:45:05,235 --> 00:45:07,004
>> WELL, MOST OF THE SCIENCE

963
00:45:07,004 --> 00:45:11,542

BOOKS, MOST OF WHAT WE HAVE IN

964

00:45:11,542 --> 00:45:12,276

SCIENCE BOOKS ABOUT SATURN COME

965

00:45:12,276 --> 00:45:12,709

FROM CASSINI.

966

00:45:12,709 --> 00:45:13,777

IT WILL BE WELL REMEMBERED.

967

00:45:13,777 --> 00:45:15,979

IF YOU LOOK AT EVERYTHING YOU

968

00:45:15,979 --> 00:45:17,981

KNOW, IT CAME FROM CASSINI ABOUT

969

00:45:17,981 --> 00:45:18,315

SATURN.

970

00:45:18,315 --> 00:45:18,682

ONE OF THE

971

00:45:18,682 --> 00:45:19,950

GREATEST LEGACIES OF

972

00:45:19,950 --> 00:45:21,518

A MISSION IS NOT JUST THE

973

00:45:21,518 --> 00:45:23,053

SCIENTIFIC DISCOVERIES THAT IT

974

00:45:23,053 --> 00:45:24,021

MAKES AND WHAT YOU LEARN ABOUT

975

00:45:24,021 --> 00:45:28,692

IT, BUT THE FACT THAT YOU MAKE

976
00:45:28,692 --> 00:45:29,293
DISCOVERIES THAT ARE SO

977
00:45:29,293 --> 00:45:30,060
COMPELLING THAT YOU HAVE TO COME

978
00:45:30,060 --> 00:45:30,360
BACK.

979
00:45:30,360 --> 00:45:31,762
AND THAT'S PART OF WHAT MAKES

980
00:45:31,762 --> 00:45:35,099
THE ENDES OF CASSINI SWEET IS THAT

981
00:45:35,099 --> 00:45:37,334
THE DISCOVERIES ARE SO GREAT

982
00:45:37,334 --> 00:45:40,771
THAT WE HAVE TO GO BACK.

983
00:45:40,771 --> 00:45:43,440
WE WILL GO BACK AND LOOK AT

984
00:45:43,440 --> 00:45:44,374
ENCELADUS AND TITAN.

985
00:45:44,374 --> 00:45:48,512
>> THE WAY MISSIONS ARE, ONE

986
00:45:48,512 --> 00:45:51,915
SETS THE FOOTSTEPS FOR THE NEXT

987
00:45:51,915 --> 00:45:52,249
MISSION.

988
00:45:52,249 --> 00:45:53,784

WHAT'S COMING UP NEXT AFTER

989

00:45:53,784 --> 00:45:54,151

CASSINI?

990

00:45:54,151 --> 00:45:56,286

>> SO ONE OF THE THINGS WE'VE

991

00:45:56,286 --> 00:45:58,455

LEARNED ABOUT THE OUTER SOLAR

992

00:45:58,455 --> 00:46:01,725

SYSTEM IS HOW MUCH WATER IS

993

00:46:01,725 --> 00:46:06,897

THERE.

994

00:46:06,897 --> 00:46:09,099

THE ZONE BETWEEN VENUS AND MARS.

995

00:46:09,099 --> 00:46:11,068

WES. REALIZE THERE'S A LOT OF

996

00:46:11,068 --> 00:46:16,807

WATER IN THE OUTER SOLAR SYSTEM,

997

00:46:16,807 --> 00:46:18,909

EUROPA, ENCELADUS, AND WHAT YOU

998

00:46:18,909 --> 00:46:21,178

SEE ABOUT THE PLANETS IS TO GO

999

00:46:21,178 --> 00:46:23,347

BACK AND LOOK AT THE OCEAN

1000

00:46:23,347 --> 00:46:26,016

WORLDS, TAKE A LOOK AT THE

1001

00:46:26,016 --> 00:46:27,718

COMPOSITION OF THE ICE.

1002

00:46:27,718 --> 00:46:29,520

ARE THESE HABITABLE PLACES? ARE

1003

00:46:29,520 --> 00:46:31,555

THESE PLACES WHERE THERE COULD

1004

00:46:31,555 --> 00:46:32,356

BE LIFE?

1005

00:46:32,356 --> 00:46:34,992

WE HERE AT NASA HAVE PLANS TO GO

1006

00:46:34,992 --> 00:46:38,028

BACK TO MANY OF THE OCEAN

1007

00:46:38,028 --> 00:46:40,631

WORLDS.

1008

00:46:40,631 --> 00:46:41,465

THE NEXT ONE IS MULTIPLE FLY BY

1009

00:46:41,465 --> 00:46:47,671

OF EUROPA, 40 OR 50 TIMES.

1010

00:46:47,671 --> 00:46:49,106

TAKING A CLOSE LOOK AT THAT

1011

00:46:49,106 --> 00:46:50,440

OCEAN FROM ABOVE THE ICE AND THE

1012

00:46:50,440 --> 00:46:52,543

CAUTION OF THE ICE. WE'LL MAKE

1013

00:46:52,543 --> 00:46:54,411

OUR WAY TO THE OTHER OCEAN

1014

00:46:54,411 --> 00:46:54,745

WORLDS.

1015

00:46:54,745 --> 00:46:56,079

>> OCEAN WORLDS ARE THE THINGS

1016

00:46:56,079 --> 00:46:58,248

TOHI LOOK AT RIGHT NOW, IT SEEMS.

1017

00:46:58,248 --> 00:46:59,116

>> ABSOLUTELY.

1018

00:46:59,116 --> 00:47:00,984

THE SEARCH FOR LIFE IS ONE OF

1019

00:47:00,984 --> 00:47:04,621

THE COMPELLING THREADS FOR NASA.

1020

00:47:04,621 --> 00:47:09,193

IT'S BEEN A SCIENCE MISSION

1021

00:47:09,193 --> 00:47:11,495

DIRECTORATE FOR LIFE IN THE

1022

00:47:11,495 --> 00:47:12,262

SOLAR SYSTEM AND OUTSIDE THE

1023

00:47:12,262 --> 00:47:13,664

SOLAR SYSTEM.

1024

00:47:13,664 --> 00:47:15,799

BUT THE OCEAN WORLDS LOOK LIKE

1025

00:47:15,799 --> 00:47:17,734

AN INCREDIBLY COMPELLING TARGET.

1026
00:47:17,734 --> 00:47:19,670
>> THANK YOU SO MUCH, MIKE, FOR

1027
00:47:19,670 --> 00:47:23,340
COMING BY AND JOINING US.

1028
00:47:23,340 --> 00:47:24,074
I KNOW ALL YOU GUYS WANT TO GET

1029
00:47:24,074 --> 00:47:25,075
BACK IN THERE IN THE CONTROL

1030
00:47:25,075 --> 00:47:26,543
ROOM AND BE THERE FOR THE

1031
00:47:26,543 --> 00:47:26,877
MOMENT.

1032
00:47:26,877 --> 00:47:28,345
THANK YOU SO MUCH.

1033
00:47:28,345 --> 00:47:30,414
YOU'RE WATCHING LIVE COVERAGE OF

1034
00:47:30,414 --> 00:47:33,050
CASSINI'S FINAL HOUR FROM NASA'S

1035
00:47:33,050 --> 00:47:35,252
JET PROPULSION LABORATORY.

1036
00:47:35,252 --> 00:47:37,955
IT'S LOCATED IN PASADENA AND

1037
00:47:37,955 --> 00:47:39,056
MANAGED BY THE CALIFORNIA

1038
00:47:39,056 --> 00:47:40,657

INSTITUTE OF TECHNOLOGY.

1039

00:47:40,657 --> 00:47:43,126

LET'S TAKE A LOOK AT OUR LAST

1040

00:47:43,126 --> 00:47:43,827

HOUR DISPLAY.

1041

00:47:43,827 --> 00:47:47,030

OUR DISPLAY SHOWS THAT WE ARE

1042

00:47:47,030 --> 00:47:50,734

JUST OVER SEVEN MINUTES AWAY

1043

00:47:50,734 --> 00:47:52,869

FROM THE END OF MISSION.

1044

00:47:52,869 --> 00:47:56,673

AND IT'S NOW TRAVELING ABOUT

1045

00:47:56,673 --> 00:47:58,942

75,000 MILES PER HOUR.

1046

00:47:58,942 --> 00:48:03,513

SO CASSINI IS TRAVELING RAPIDLY

1047

00:48:03,513 --> 00:48:11,955

TOWARDS THIS END OF MISSION.

1048

00:48:11,955 --> 00:48:15,726

>> FOR ALL OF THE BEAUTY, THOSE

1049

00:48:15,726 --> 00:48:17,027

ARE PLACES THAT STARTLE AND

1050

00:48:17,027 --> 00:48:18,462

AMAZE, BUT NOT A PLACE WHERE YOU

1051
00:48:18,462 --> 00:48:18,962
CAN LIVE.

1052
00:48:18,962 --> 00:48:21,031
I THINK IT BRINGS A PERSPECTIVE

1053
00:48:21,031 --> 00:48:24,134
ON THE EARTH AND WHAT A

1054
00:48:24,134 --> 00:48:32,776
WONDERFUL PLACE IT IS.

1055
00:48:32,776 --> 00:48:34,544
>> WE ARE GETTING CLOSE TO TIME,

1056
00:48:34,544 --> 00:48:35,979
AND TIME WHERE WE SHOULD LOSE

1057
00:48:35,979 --> 00:48:36,880
THAT SIGNAL.

1058
00:48:36,880 --> 00:48:39,483
FOLKS ARE WATCHING THE RADIO

1059
00:48:39,483 --> 00:48:40,617
DISPLAY RIGHT NOW.

1060
00:48:40,617 --> 00:48:43,420
SO LET'S GO TO TODD AND JOANIE

1061
00:48:43,420 --> 00:48:44,288
IN MISSION CONTROL.

1062
00:48:44,288 --> 00:48:48,091
>> HI, SIX MINUTES TO GO UNTIL

1063
00:48:48,091 --> 00:48:49,459

WE'RE SIX FEET UNDER.

1064

00:48:49,459 --> 00:48:52,362

IT'S GOING TO BE HARD TO SAY

1065

00:48:52,362 --> 00:48:53,096

GOOD-BYE HERE.

1066

00:48:53,096 --> 00:48:55,265

RADIO DISPLAY LOOKS GREAT.

1067

00:48:55,265 --> 00:48:58,035

MISSION CONTROL, I HEAR A LOT OF

1068

00:48:58,035 --> 00:49:00,003

BUZZ IN THE ROOM ABOUT THE

1069

00:49:00,003 --> 00:49:01,805

THRUSTER CYCLES.

1070

00:49:01,805 --> 00:49:04,007

THE THRUSTERS ARE FIRING.

1071

00:49:04,007 --> 00:49:05,509

WE'RE STILL OUTSIDE THE

1072

00:49:05,509 --> 00:49:07,277

ATMOSPHERE, AND THEY'RE KEEPING

1073

00:49:07,277 --> 00:49:10,547

THAT POINTING ON EARTH AS LONG

1074

00:49:10,547 --> 00:49:16,286

AS POSSIBLE.

1075

00:49:16,286 --> 00:49:19,089

ONCE WE HIT THAT ATMOSPHERE,

1076

00:49:19,089 --> 00:49:20,791

THINGS HAPPEN SUPER FAST.

1077

00:49:20,791 --> 00:49:23,160

>> WE'RE IN LOW 8 MODE AND WE'RE

1078

00:49:23,160 --> 00:49:25,562

WAITING FOR THE TRANSITION.

1079

00:49:25,562 --> 00:49:26,496

>> COPY.

1080

00:49:26,496 --> 00:49:27,698

THANK YOU.

1081

00:49:27,698 --> 00:49:29,933

>> FULL PROTECTION.

1082

00:49:29,933 --> 00:49:31,034

>> GO AHEAD.

1083

00:49:31,034 --> 00:49:34,705

>> JUST GOING TO GET A QUICK

1084

00:49:34,705 --> 00:49:35,906

UPDATE ON STATUS.

1085

00:49:35,906 --> 00:49:37,607

>> NOMINAL.

1086

00:49:37,607 --> 00:49:40,344

>> THERMAL SYSTEMS.

1087

00:49:40,344 --> 00:49:43,914

>> THERMAL DEVICES NOMINAL.

1088

00:49:43,914 --> 00:49:44,815

>> COPY.

1089

00:49:49,920 --> 00:49:48,418

THANK YOU.

1090

00:49:49,920 --> 00:49:53,323

>> SYSTEM FULL PROTECTION IS

1091

00:49:53,323 --> 00:49:55,058

NOMINAL.

1092

00:49:55,058 --> 00:49:55,992

>> COPY.

1093

00:49:55,992 --> 00:49:58,261

THANK YOU.

1094

00:49:58,261 --> 00:49:59,963

>> CDS IS NOMINAL.

1095

00:49:59,963 --> 00:50:02,699

TWO FRAMES BUFFERED.

1096

00:50:02,699 --> 00:50:03,667

>> COPY.

1097

00:50:03,667 --> 00:50:05,535

THANK YOU.

1098

00:50:05,535 --> 00:50:08,205

>> TELECOM SYSTEMS.

1099

00:50:08,205 --> 00:50:10,474

>> NOW GOOD, SNT.

1100

00:50:10,474 --> 00:50:13,176

>> THANK YOU.

1101
00:50:13,176 --> 00:50:13,510
RADIO?

1102
00:50:13,510 --> 00:50:18,749
>>O RADIO NOMINAL.

1103
00:50:18,749 --> 00:50:21,084
FREQUENCY IS STARTING TO

1104
00:50:21,084 --> 00:50:21,451
INCREASE.

1105
00:50:21,451 --> 00:50:22,986
>> COPY.

1106
00:50:22,986 --> 00:50:24,154
THANK YOU.

1107
00:50:24,154 --> 00:50:25,322
PROPULSION SYSTEMS.

1108
00:50:25,322 --> 00:50:29,559
>> PRESSURES AND TEMPERATURES

1109
00:50:29,559 --> 00:50:32,329
ARE NOMINAL, PROPULSION IS

1110
00:50:32,329 --> 00:50:32,696
NOMINAL.

1111
00:50:32,696 --> 00:50:33,130
>> THANK YOU.

1112
00:50:33,130 --> 00:50:35,098
>> MISSION PLANNING SYSTEMS.

1113
00:50:35,098 --> 00:50:37,000

>> MISSION PLANNING IS NOMINAL.

1114

00:50:37,000 --> 00:50:37,467

>> THANK YOU.

1115

00:50:37,467 --> 00:50:40,303

>> EVERYTHING IS NOMINAL.

1116

00:50:40,303 --> 00:50:44,174

>> COPY.

1117

00:50:44,174 --> 00:50:45,242

>> THANK YOU, ACE.

1118

00:50:45,242 --> 00:50:49,312

>> SO WHAT WE JUST HEARD WAS THE

1119

00:50:49,312 --> 00:50:52,416

ROOM GOING AROUND AND CHECKING

1120

00:50:52,416 --> 00:50:54,951

ALL THE SUBSYSTEMS.

1121

00:50:54,951 --> 00:51:00,290

SO FAR ALL OF THE SUBSYSTEMS ARE

1122

00:51:00,290 --> 00:51:01,024

NOMINAL, ABOUT THREE AND A HALF

1123

00:51:01,024 --> 00:51:01,591

TO TO MINUTES AWAY.

1124

00:51:01,591 --> 00:51:03,460

>> WE WENT FROM LOW RATE TO HIGH

1125

00:51:03,460 --> 00:51:04,060

RATE CONTROL.

1126
00:51:04,060 --> 00:51:05,228
CAN YOU COMMENT ON THAT?

1127
00:51:05,228 --> 00:51:07,664
>> SURE, WE HAVE OUR COMPUTER

1128
00:51:07,664 --> 00:51:08,432
CONTROLLING OUR POINTING HAS

1129
00:51:08,432 --> 00:51:10,934
DIFFERENT MODES, AND IT'S SMART

1130
00:51:10,934 --> 00:51:12,035
ENOUGH TO KNOW WHEN WE START

1131
00:51:12,035 --> 00:51:14,237
HAVING TO FIGHT A LITTLE HARDER.

1132
00:51:14,237 --> 00:51:15,238
WE HEARD THE COMPUTER

1133
00:51:15,238 --> 00:51:17,207
ACKNOWLEDGED THAT THEY'RE HAVING

1134
00:51:17,207 --> 00:51:20,477
TO FIGHT A LITTLE BIT.

1135
00:51:20,477 --> 00:51:21,244
>> OKAY.

1136
00:51:21,244 --> 00:51:23,146
THANKS.

1137
00:51:23,146 --> 00:51:26,349
WE WERE REMARKING EARLIER, IT'S

1138
00:51:26,349 --> 00:51:27,784

INCREDIBLE THAT THIS ENTIRE

1139

00:51:27,784 --> 00:51:31,354

SPACECRAFT RUNS ON 600 WATTS OF

1140

00:51:31,354 --> 00:51:31,688

POWER.

1141

00:51:31,688 --> 00:51:34,791

>> ABOUT HALF A HAIR DRIER IS

1142

00:51:34,791 --> 00:51:35,926

ALL WE GOT RIGHT NOW.

1143

00:51:35,926 --> 00:51:37,694

>> I WANT TO TALK ABOUT HOW

1144

00:51:37,694 --> 00:51:45,402

LITTLE FUEL WE HAVE RIGHT NOW.

1145

00:51:45,402 --> 00:52:09,192

UNDER THREE MINUTES NOW.

1146

00:52:09,192 --> 00:52:11,294

>> WE DON'T KNOW EXACTLY WHEN WE

1147

00:52:11,294 --> 00:52:14,397

WILL LOSE SIGNAL, SO STAY TUNED.

1148

00:52:14,397 --> 00:52:18,768

RADIO SIGNAL LOOKS WONDERFUL.

1149

00:52:18,768 --> 00:52:21,171

S BAND AND X BAND, TWO DIFFERENT

1150

00:52:21,171 --> 00:52:23,173

RADIO BANDS STILL GETTING THE

1151
00:52:23,173 --> 00:52:23,507
SIGNAL.

1152
00:52:23,507 --> 00:52:25,775
>> PUSHING ABOUT 10 DEGREES

1153
00:52:25,775 --> 00:52:36,086
NORTHERN LATITUDE ON SATURN.

1154
00:52:36,086 --> 00:52:38,655
>> I REMEMBER SEEING WE WERE

1155
00:52:38,655 --> 00:52:40,590
GOING TO HIT THE ATMOSPHERE

1156
00:52:40,590 --> 00:52:44,561
ABOUT 77,000 MILES AN HOUR; YOU

1157
00:52:44,561 --> 00:52:45,428
WERE CLOSE.

1158
00:52:45,428 --> 00:52:46,596
>>. YEAH.

1159
00:52:46,596 --> 00:52:59,342
>> TWO MINUTES AND COUNTING.

1160
00:52:59,342 --> 00:53:02,812
>> WE'RE STARTING TO EXIT.

1161
00:53:02,812 --> 00:53:06,917
>> THIS IS ACS ONE.

1162
00:53:06,917 --> 00:53:24,234
WE'RE STILL WAITING.

1163
00:53:24,234 --> 00:53:26,236

>> LOOKS LIKE THEY'RE STARTING

1164

00:53:26,236 --> 00:53:28,405

TO LOSE THE BATTLE WITH THE

1165

00:53:28,405 --> 00:53:28,805

ATMOSPHERE.

1166

00:53:28,805 --> 00:53:30,273

>> WE JUST HAD THE TRANSITION TO

1167

00:53:30,273 --> 00:53:37,180

HIGH RATE MODE WITH THIS, WE'RE

1168

00:53:37,180 --> 00:53:39,416

GOING TO SEE IT MOVE VERY

1169

00:53:39,416 --> 00:53:39,749

QUICKLY.

1170

00:53:39,749 --> 00:53:41,651

WE ARE IN THE ATMOSPHERE.

1171

00:53:41,651 --> 00:53:43,086

>> COPY.

1172

00:53:43,086 --> 00:53:43,853

THANK YOU.

1173

00:53:43,853 --> 00:53:46,489

>> ROUGHLY ONE MINUTE TILL LOSS

1174

00:53:46,489 --> 00:53:47,691

OF SIGNAL.

1175

00:53:47,691 --> 00:53:49,693

>> GO AHEAD.

1176
00:53:49,693 --> 00:53:54,197
>> WE CAN CONFIRM.

1177
00:53:54,197 --> 00:53:55,198
>> COPY.

1178
00:53:55,198 --> 00:53:59,169
THANK YOU.

1179
00:53:59,169 --> 00:54:03,506
>> I'M JUST STARTING TO SEE THE

1180
00:54:03,506 --> 00:54:11,715
THRUSTERS FIRE MORE AND MORE.

1181
00:54:11,715 --> 00:54:15,352
>> SIGNAL IS STILL HOLDING.

1182
00:54:15,352 --> 00:54:18,088
30 SECONDS.

1183
00:54:18,088 --> 00:54:20,457
>> SYSTEMS LEAD, MISSION

1184
00:54:22,892 --> 00:54:20,824
PLANNING.

1185
00:54:22,892 --> 00:54:25,295
>> SPACECRAFT JUST CROSSED 10

1186
00:54:25,295 --> 00:54:29,032
DEGREES NORTH LATITUDE, 1,000

1187
00:54:29,032 --> 00:54:29,366
MILES.

1188
00:54:29,366 --> 00:54:30,033

>> COPY.

1189

00:54:30,033 --> 00:54:33,236

THANK YOU.

1190

00:54:33,236 --> 00:54:34,571

>> ACS ONE.

1191

00:54:34,571 --> 00:54:35,572

>> GO AHEAD.

1192

00:54:35,572 --> 00:54:38,241

>> WITH THE ADDITIONAL THRUSTER

1193

00:54:38,241 --> 00:54:41,778

TIME, WE'RE GOING TO START

1194

00:54:41,778 --> 00:54:42,145

WRITING.

1195

00:54:42,145 --> 00:54:54,157

>> COPY.

1196

00:54:54,157 --> 00:55:53,316

>> WE CROSSED OUR ZERO TIME.

1197

00:55:53,316 --> 00:55:55,618

>> PROJECT MANAGER, FLIGHT

1198

00:55:55,618 --> 00:55:55,985

DIRECTOR.

1199

00:55:55,985 --> 00:55:56,653

>> GO AHEAD.

1200

00:55:56,653 --> 00:55:57,687

>> OKAY.

1201
00:55:57,687 --> 00:56:01,925
WE CALL LOSS OF SIGNAL, LOSS OF

1202
00:56:01,925 --> 00:56:13,336
X BAND AT... CALL LOSS OF SIGNAL

1203
00:56:13,336 --> 00:56:16,306
AT 115546 FOR THE S BAND.

1204
00:56:16,306 --> 00:56:19,876
THAT WOULD BE THE END OF THE

1205
00:56:19,876 --> 00:56:20,276
SPACECRAFT.

1206
00:56:20,276 --> 00:56:21,444
>> COPY THAT.

1207
00:56:21,444 --> 00:56:27,350
PROJECT MANAGER ON FSO COORD.

1208
00:56:27,350 --> 00:56:29,519
MAYBE A TRICKLE OF TELEMETRY

1209
00:56:29,519 --> 00:56:32,455
LEFT, BUT THE SIGNAL FROM THE

1210
00:56:32,455 --> 00:56:33,690
SPACECRAFT IS GONE AND WITHIN

1211
00:56:33,690 --> 00:56:35,525
THE NEXT 45 SECONDS, SO WILL BE

1212
00:56:35,525 --> 00:56:36,760
THE SPACECRAFT.

1213
00:56:36,760 --> 00:56:39,262

I HOPE YOU'RE ALL AS DEEPLY

1214

00:56:39,262 --> 00:56:41,898

PROUD OF THIS AMAZING

1215

00:56:41,898 --> 00:56:42,899

ACCOMPLISHMENT.

1216

00:56:42,899 --> 00:56:43,867

CONGRATULATIONS TO YOU ALL.

1217

00:56:43,867 --> 00:56:45,935

THIS HAS BEEN AN INCREDIBLE

1218

00:56:45,935 --> 00:56:48,138

MISSION, AN INCREDIBLE

1219

00:56:48,138 --> 00:56:51,341

SPACECRAFT, AND YOU'RE ALL AN

1220

00:56:51,341 --> 00:56:52,208

INCREDIBLE TEAM.

1221

00:56:52,208 --> 00:56:55,278

I'M GOING TO CALL THIS IS END OF

1222

00:56:55,278 --> 00:56:55,645

MISSION.

1223

00:56:55,645 --> 00:56:56,346

PROJECT MANAGER, OFF THE NET.

1224

00:56:56,346 --> 00:58:29,672

[APPLAUSE]

1225

00:58:31,207 --> 01:00:45,775

■ ■

1226
01:00:45,775 --> 01:00:48,945
>> SO JUST A SHORT TIME AGO,

1227
01:00:48,945 --> 01:00:50,513
JULIE WEBSTER, THE SPACE

1228
01:00:50,513 --> 01:00:52,315
OPERATIONS TEAM MANAGER AND

1229
01:00:52,315 --> 01:00:54,217
PROGRAM MANAGER EARL MAYS CALLED

1230
01:00:54,217 --> 01:00:57,520
IT THE END OF MISSION FOR

1231
01:00:57,520 --> 01:00:57,920
CASSINI.

1232
01:00:57,920 --> 01:01:01,124
IT CAME AT ABOUT 4:55, AS

1233
01:01:01,124 --> 01:01:01,591
PREDICTED.

1234
01:01:01,591 --> 01:01:04,794
LET'S GO TO BECKMAN AUDITORIUM

1235
01:01:04,794 --> 01:01:28,718
AND CHECK IN WITH MORGAN CABLE.

1236
01:01:28,718 --> 01:01:30,853
>> THERE'S GOING TO BE LOTS OF

1237
01:01:30,853 --> 01:01:32,255
DATA TO ANALYZE FOR YEARS TO

1238
01:01:32,255 --> 01:01:32,822

COME.

1239

01:01:32,822 --> 01:01:34,290

JONATHAN, HOW ARE YOU FEELING

1240

01:01:34,290 --> 01:01:36,192

RIGHT NOW?

1241

01:01:36,192 --> 01:01:38,261

>> I'M ACTUALLY BREATHING AGAIN.

1242

01:01:38,261 --> 01:01:41,264

I FEEL SAD, BUT WE FELT SAD THE

1243

01:01:41,264 --> 01:01:41,864

WHOLE WEEK.

1244

01:01:41,864 --> 01:01:43,499

WE KNEW THIS WAS GOING TO

1245

01:01:43,499 --> 01:01:44,000

HAPPEN.

1246

01:01:44,000 --> 01:01:45,768

AND CASSINI PERFORMED EXACTLY AS

1247

01:01:45,768 --> 01:01:47,470

SHE WAS SUPPOSED TO.

1248

01:01:47,470 --> 01:01:49,439

I BET THERE'S SOME TERRIFIC DATA

1249

01:01:49,439 --> 01:01:52,442

ON THE GROUND NOW ABOUT SATURN'S

1250

01:01:52,442 --> 01:01:52,842

ATMOSPHERE.

1251

01:01:52,842 --> 01:01:54,877

>> I BET YOU'RE RIGHT.

1252

01:01:54,877 --> 01:01:57,080

WHAT WAS YOUR FAVORITE MEMORY OF

1253

01:01:57,080 --> 01:01:57,447

CASSINI?

1254

01:01:57,447 --> 01:02:00,249

SHARE A STORY.

1255

01:02:00,249 --> 01:02:10,293

ANYTHING THAT COMES TO MIND.

1256

01:02:10,293 --> 01:02:13,062

>> ONE WAS SEEING THE SEAS OF

1257

01:02:13,062 --> 01:02:14,964

TITAN, AND THE OTHER WAS SEEING

1258

01:02:14,964 --> 01:02:21,070

THE SURFACE FROM THE PROBE.

1259

01:02:21,070 --> 01:02:22,772

SITTING WITH A TRAILER IN THE

1260

01:02:22,772 --> 01:02:24,607

MIDDLE OF GERMANY AND WINTER,

1261

01:02:24,607 --> 01:02:26,742

THERE WERE THE FIRST PICTURES OF

1262

01:02:26,742 --> 01:02:28,744

GULLIES ON THE SURFACE OF AN

1263

01:02:28,744 --> 01:02:29,445

ALIEN WORLD.

1264

01:02:29,445 --> 01:02:31,447

>> HOW DID THIS BLOW YOUR MIND?

1265

01:02:31,447 --> 01:02:32,215

>> IT DID.

1266

01:02:32,215 --> 01:02:33,683

I WAS SCREAMING.

1267

01:02:33,683 --> 01:02:34,584

SO WAS EVERYONE ELSE.

1268

01:02:34,584 --> 01:02:36,519

>> I THINK THE MOOD'S BEEN A

1269

01:02:36,519 --> 01:02:39,055

LITTLE MORE SOMBER NOW, BUT

1270

01:02:39,055 --> 01:02:39,956

THERE WAS APPLAUSE RIGHT NEAR

1271

01:02:39,956 --> 01:02:40,590

THE END.

1272

01:02:40,590 --> 01:02:42,658

THIS IS A CELEBRATION OF

1273

01:02:42,658 --> 01:02:45,595

CASSINI'S LIFE AND CASSINI'S

1274

01:02:45,595 --> 01:02:45,928

LEGACY.

1275

01:02:45,928 --> 01:02:47,096

WE SHOULD TALK A LITTLE BIT

1276

01:02:47,096 --> 01:02:48,331

ABOUT THE FUTURE.

1277

01:02:48,331 --> 01:02:52,034

WHAT DO YOU SEE NEXT FOR THE

1278

01:02:52,034 --> 01:02:53,069

SATURN SYSTEM?

1279

01:02:53,069 --> 01:02:54,871

>> WELL, WHAT I WOULD LIKE TO

1280

01:02:54,871 --> 01:02:56,405

SEE NEXT IS THAT WE GO BACK

1281

01:02:56,405 --> 01:02:56,706

THERE.

1282

01:02:56,706 --> 01:02:59,208

AND THERE'S SO MANY THINGS THAT

1283

01:02:59,208 --> 01:03:01,477

CASSINI HAS GIVEN US IN TERMS OF

1284

01:03:01,477 --> 01:03:03,846

A LEGACY TO EXPLORE.

1285

01:03:03,846 --> 01:03:05,381

ENCELADUS AND THE POSSIBILITY OF

1286

01:03:05,381 --> 01:03:07,683

LIFE, TITAN AND ITS AMAZING

1287

01:03:07,683 --> 01:03:10,386

ATMOSPHERE AND LAKES AND SEAS

1288

01:03:10,386 --> 01:03:12,088

AND HYDROLOGIC CYCLE.

1289

01:03:12,088 --> 01:03:13,823

SATURN AND THE RINGS AND THE

1290

01:03:13,823 --> 01:03:16,058

MYSTERY OF WHAT LIES BENEATH THE

1291

01:03:16,058 --> 01:03:16,592

CLOUDS.

1292

01:03:16,592 --> 01:03:18,794

THERE'S AN AWFUL LOT THAT

1293

01:03:18,794 --> 01:03:20,630

CASSINI SAID TO US THAT WE MUST

1294

01:03:20,630 --> 01:03:22,198

GO BACK AND EXPLORE.

1295

01:03:22,198 --> 01:03:23,900

>> THERE'S A LOT LEFT TO DO IN

1296

01:03:23,900 --> 01:03:25,568

THE SATURN SYSTEM AND ELSEWHERE

1297

01:03:25,568 --> 01:03:39,182

IN THE SOLAR SYSTEM AS WELL.

1298

01:03:39,182 --> 01:03:41,584

IN TERMS OF FOLLOWING ON

1299

01:03:41,584 --> 01:03:43,719

CASSINI'S LEGACY AND MENTORING

1300

01:03:43,719 --> 01:03:45,488

THE NEXT GENERATION, WHAT DO YOU

1301
01:03:45,488 --> 01:03:47,523
SEE IN TERMS OF NEXT MISSIONS

1302
01:03:47,523 --> 01:03:49,225
COMING UP, BEING ABLE TO BRING

1303
01:03:49,225 --> 01:03:51,160
IN THE NEXT GENERATION OF

1304
01:03:51,160 --> 01:03:52,195
SCIENTISTS AND ENGINEERS.

1305
01:03:52,195 --> 01:03:56,265
>> FIRST OF ALL, I'M VERY, VERY

1306
01:03:56,265 --> 01:03:58,234
CONFIDENT AND OPTIMISTIC ABOUT

1307
01:03:58,234 --> 01:03:59,702
THE NEXT GENERATION, BECAUSE I

1308
01:03:59,702 --> 01:04:01,604
CAN SEE THAT THE EXPERTS ARE

1309
01:04:01,604 --> 01:04:02,438
HERE ALREADY.

1310
01:04:02,438 --> 01:04:04,273
WE WILL BE WELL SERVED IN THE

1311
01:04:04,273 --> 01:04:04,607
FUTURE.

1312
01:04:04,607 --> 01:04:10,379
OF COURSE, NASA IS GOING BACK TO

1313
01:04:10,379 --> 01:04:13,616

EUROPA, WITH THE EUROPA CLIPPER

1314

01:04:13,616 --> 01:04:15,818

AND THE EUROPEANS ARE DOING

1315

01:04:15,818 --> 01:04:17,587

JUICE TO THE OTHER MOONS.

1316

01:04:17,587 --> 01:04:19,655

THERE ARE CONCEPTS FOR GOING

1317

01:04:19,655 --> 01:04:22,658

BACK TO ENCELADUS AND TITAN AND

1318

01:04:22,658 --> 01:04:22,992

SATURN.

1319

01:04:22,992 --> 01:04:26,028

WE DON'T KNOW IF ANY OF THOSE

1320

01:04:26,028 --> 01:04:26,796

ARE GOING HAPPEN IN THE NEXT FEW

1321

01:04:26,796 --> 01:04:28,130

YEARS, BUT WE'LL SEE. THE

1322

01:04:28,130 --> 01:04:29,298

IMPORTANT POINT IS THAT CASSINI

1323

01:04:29,298 --> 01:04:32,768

HAS GOT TO BE A JUMPING OFF

1324

01:04:32,768 --> 01:04:37,773

POINT TO EVEN MORE EXCITING

1325

01:04:37,773 --> 01:04:42,044

EXPLORATORY MISSIONS.

1326
01:04:42,044 --> 01:04:47,483
WE NEED TO GO BACK TO SATURN AND

1327
01:04:47,483 --> 01:04:48,718
URANUS AND NEAP TUNE.

1328
01:04:48,718 --> 01:04:51,120
>> I THINK ONE OF THE AMAZING

1329
01:04:51,120 --> 01:04:52,555
THINGS THAT CASSINI HAS SHOWN US

1330
01:04:52,555 --> 01:04:55,091
IS THAT IT'S NOT A BORING, COLD

1331
01:04:55,091 --> 01:04:55,491
PLACE.

1332
01:04:55,491 --> 01:04:58,227
IT'S DYNAMIC AND SO INCREDIBLY

1333
01:04:58,227 --> 01:04:58,561
VARIED.

1334
01:04:58,561 --> 01:05:00,496
THE DIFFERENCES IN THE MOONS OF

1335
01:05:00,496 --> 01:05:02,365
SATURN ALONE INSPIRES US TO WANT

1336
01:05:02,365 --> 01:05:04,233
TO GO BACK AND LEARN MORE.

1337
01:05:04,233 --> 01:05:07,803
>> YEAH, YOU KNOW, 40 YEARS AGO,

1338
01:05:07,803 --> 01:05:09,972

VOYAGER 1 WAS LAUNCHED.

1339

01:05:09,972 --> 01:05:12,775

IT WAS VOYAGER 1 AND 2 THAT

1340

01:05:12,775 --> 01:05:14,443

BROKE UP THE OUTER SYSTEM FOR

1341

01:05:14,443 --> 01:05:19,382

US, TOLD US THAT THIS WAS NOT A

1342

01:05:19,382 --> 01:05:22,118

COLD DEAD PLACE.

1343

01:05:22,118 --> 01:05:26,422

GALILEO CASSINI FOLLOWED ON AND

1344

01:05:26,422 --> 01:05:28,157

SHOWED US WHAT WERE GOING ON IN

1345

01:05:28,157 --> 01:05:30,259

THE SYSTEM AND THAT THERE MIGHT

1346

01:05:30,259 --> 01:05:31,794

BE PLACES FOR LIFE TO EXIST.

1347

01:05:31,794 --> 01:05:33,729

I HAVE A POEM THAT I WANT TO

1348

01:05:33,729 --> 01:05:35,264

READ TO YOU AS WELL AT SOME

1349

01:05:35,264 --> 01:05:35,598

POINT.

1350

01:05:35,598 --> 01:05:36,465

IS THIS A GOOD TIME?

1351

01:05:36,465 --> 01:05:38,334

>> I THINK IT'S A GREAT TIME.

1352

01:05:38,334 --> 01:05:40,069

>> A LOT HAS BEEN SAID ABOUT

1353

01:05:40,069 --> 01:05:41,170

CASSINI ALREADY, AND THE END OF

1354

01:05:41,170 --> 01:05:43,105

THE MISSION.

1355

01:05:43,105 --> 01:05:45,574

BUT I THINK THAT THE BEST I CAN

1356

01:05:45,574 --> 01:05:49,145

DO TO LEAVE, FOR ME, LEAVE THIS

1357

01:05:49,145 --> 01:05:51,180

CELEBRATION OF CASSINI'S END IS

1358

01:05:51,180 --> 01:05:56,752

TO READ A BIT OF A POEM, "ON THE

1359

01:05:56,752 --> 01:05:58,521

VERGE," A NAUTICAL POEM ABOUT

1360

01:05:58,521 --> 01:05:59,322

DEATH AND DYING.

1361

01:05:59,322 --> 01:06:01,190

AND SO, I'M GOING TO READ THE

1362

01:06:01,190 --> 01:06:04,093

LAST FEW LINES OF IT.

1363

01:06:04,093 --> 01:06:09,098

AND I HAVE CHANGED ONE OF THE

1364

01:06:09,098 --> 01:06:10,866

WORDS.

1365

01:06:10,866 --> 01:06:13,536

AH, BUT HEAR CASSINI'S HEART

1366

01:06:13,536 --> 01:06:16,672

LEAPS, YEARNING TOWARDS THE

1367

01:06:16,672 --> 01:06:17,440

BLUE.

1368

01:06:17,440 --> 01:06:20,843

ROCK NOR SHOAL, FROM THE SHORE

1369

01:06:20,843 --> 01:06:23,179

THAT HATH NO SHORE, BEYOND WHAT

1370

01:06:23,179 --> 01:06:24,513

IS SAID IN ALL THE SEA.

1371

01:06:24,513 --> 01:06:25,448

>> THAT'S BEAUTIFUL.

1372

01:06:25,448 --> 01:06:28,351

YOU HAD TO DO THAT, DIDN'T YOU?

1373

01:06:28,351 --> 01:06:29,819

THANK YOU JONATHAN, FOR

1374

01:06:29,819 --> 01:06:30,219

EVERYTHING.

1375

01:06:30,219 --> 01:06:32,788

>> MORGAN, THE FUTURE IS IN YOUR

1376
01:06:32,788 --> 01:06:34,757
HANDS AND THE HANDS OF YOUR

1377
01:06:34,757 --> 01:06:35,157
GENERATION.

1378
01:06:35,157 --> 01:06:36,692
AND THIS WAS A MOMENT OF

1379
01:06:36,692 --> 01:06:37,093
TRANSITION.

1380
01:06:37,093 --> 01:06:38,961
IT WAS NOT THE END.

1381
01:06:38,961 --> 01:06:42,798
AND SO LET'S EXPLORE THE SOLAR

1382
01:06:42,798 --> 01:06:43,566
SYSTEM TOGETHER.

1383
01:06:43,566 --> 01:06:46,502
>> ALL RIGHT.

1384
01:06:46,502 --> 01:06:53,142
THAT'S A BEAUTIFUL SENTIMENT.

1385
01:06:53,142 --> 01:06:54,844
WHAT WAS YOUR REACTION BEING IN

1386
01:06:54,844 --> 01:06:56,312
THAT CONTROL ROOM?

1387
01:06:56,312 --> 01:06:59,014
>> I WAS JUST OVERWHELMED WITH

1388
01:06:59,014 --> 01:07:01,917

UNDERSTANDING HOW PROFESSIONAL

1389

01:07:01,917 --> 01:07:04,820

THIS TEAM IS.

1390

01:07:04,820 --> 01:07:07,556

IT WAS CLEARLY EMOTIONAL FOR

1391

01:07:07,556 --> 01:07:07,923

EVERYONE.

1392

01:07:07,923 --> 01:07:09,892

THE LUCKY PEANUTS WERE THERE,

1393

01:07:09,892 --> 01:07:13,896

AND THERE WAS A LOT OF KLEENEX.

1394

01:07:13,896 --> 01:07:15,164

I SAW IT HAPPENING.

1395

01:07:15,164 --> 01:07:17,633

IT WENT SO FAST. SOMEBODY WAS

1396

01:07:17,633 --> 01:07:21,137

SHOUTING OUT, WOW, WE'RE

1397

01:07:21,137 --> 01:07:24,106

STRUGGLE WITH Z AXIS AND, OH,

1398

01:07:24,106 --> 01:07:25,608

IT'S GONE. THE WHOLE TEAM

1399

01:07:25,608 --> 01:07:27,743

WORKED UNTIL THE VERY END.

1400

01:07:27,743 --> 01:07:29,145

IT WAS ALL ABOUT TEAM WORK.

1401

01:07:29,145 --> 01:07:31,647

IT SHOWED UNTIL THE LAST

1402

01:07:31,647 --> 01:07:32,014

SECONDS.

1403

01:07:32,014 --> 01:07:33,182

>> IT TRULY DID.

1404

01:07:33,182 --> 01:07:35,451

WHAT SORT OF LEGACY DO YOU THINK

1405

01:07:35,451 --> 01:07:36,452

THIS MISSION LEAVES?

1406

01:07:36,452 --> 01:07:38,254

>> I THINK IT REWROTE NOT ONLY

1407

01:07:38,254 --> 01:07:39,855

WHAT WE KNOW ABOUT THE OUTER

1408

01:07:39,855 --> 01:07:41,590

SOLAR SYSTEM, BUT HOW WE THINK

1409

01:07:41,590 --> 01:07:43,692

AS HUMANS ABOUT OURSELVES. YOU

1410

01:07:43,692 --> 01:07:46,462

KNOW, THESE WORLDS THAT HAVE

1411

01:07:46,462 --> 01:07:47,930

FOUND, WE NEVER KNEW WERE THERE,

1412

01:07:47,930 --> 01:07:50,833

ARE CHANGING HOW WE THINK ABOUT

1413

01:07:50,833 --> 01:07:51,367

LIFE ITSELF.

1414

01:07:51,367 --> 01:07:55,004

FOR ME, THAT'S WHY IT'S TRULY A

1415

01:07:55,004 --> 01:07:56,405

CIVILIZATION SCALE MISSION, ONE

1416

01:07:56,405 --> 01:07:58,407

THAT WILL STAND OUT AMONG OTHER

1417

01:07:58,407 --> 01:07:59,642

MISSIONS ANYWHERE.

1418

01:07:59,642 --> 01:08:02,778

>> AND HOW WILL IT IMPACT FUTURE

1419

01:08:02,778 --> 01:08:05,080

IDEAS AND FUTURE MISSIONS AS WE

1420

01:08:05,080 --> 01:08:06,148

PLAN NEW THINGS?

1421

01:08:06,148 --> 01:08:08,684

>> SOME OF THE HARDEST QUESTIONS

1422

01:08:08,684 --> 01:08:11,754

TO ANSWER ARE QUESTIONS LIKE IS

1423

01:08:11,754 --> 01:08:13,522

THERE LIFE OUT THERE?

1424

01:08:13,522 --> 01:08:17,293

AND THIS MISSION REDEFINES THAT

1425

01:08:17,293 --> 01:08:18,561

AND WILL AFFECT HOW WE THINK

1426

01:08:18,561 --> 01:08:20,029

ABOUT THAT QUESTION.

1427

01:08:20,029 --> 01:08:21,530

WE'RE TACKLING THAT WITH A

1428

01:08:21,530 --> 01:08:22,998

MULTITUDE OF MISSIONS, LOOKING

1429

01:08:22,998 --> 01:08:29,038

BACK AT MARS. SO LOOKING AT

1430

01:08:29,038 --> 01:08:32,341

EUROPA, OUTER OCEANS, AND

1431

01:08:32,341 --> 01:08:38,814

FINDING THEM ALL OVER OUR

1432

01:08:38,814 --> 01:08:39,148

GALAXY.

1433

01:08:39,148 --> 01:08:40,616

THE THOUSANDS OF THE EXO PLANETS

1434

01:08:40,616 --> 01:08:43,285

AND SATURN-LIKE AND

1435

01:08:43,285 --> 01:08:44,253

JUPITER-LIKE, AND THINKING ABOUT

1436

01:08:44,253 --> 01:08:45,955

THEM IN A TOTALLY NEW WAY.

1437

01:08:45,955 --> 01:08:49,959

>> SO THE THOUGHT IS PEOPLE ARE

1438

01:08:49,959 --> 01:08:52,862

CAN CLAMOURING TO GO BACK.

1439

01:08:52,862 --> 01:08:54,663

WILL THAT BE DIFFICULT TO DO?

1440

01:08:54,663 --> 01:08:56,298

TO BE ABLE TO ENVISION ANOTHER

1441

01:08:56,298 --> 01:09:00,202

MISSION TO THESE PLACES SOON?

1442

01:09:00,202 --> 01:09:00,970

>> IT'S ALWAYS VERY DIFFICULT TO

1443

01:09:00,970 --> 01:09:02,738

DO, BECAUSE THESE MACHINES ARE

1444

01:09:02,738 --> 01:09:03,506

SO HARD.

1445

01:09:03,506 --> 01:09:05,608

TO GO BACK AND TAKE THE NEXT

1446

01:09:05,608 --> 01:09:07,510

STEP ON ENCELADUS, WE WANT TO

1447

01:09:07,510 --> 01:09:08,711

REALLY THINK WHAT THAT WOULD

1448

01:09:08,711 --> 01:09:10,312

TAKE THERE'S GREAT IDEAS ALREADY

1449

01:09:10,312 --> 01:09:13,482

OUT THERE, AND PERHAPS SOME OF

1450

01:09:13,482 --> 01:09:14,183

THESE IDEAS WILL COME TO

1451

01:09:14,183 --> 01:09:15,918

FRUITION RELATIVELY EARLY, I

1452

01:09:15,918 --> 01:09:16,585

DON'T KNOW.

1453

01:09:16,585 --> 01:09:18,621

BUT WE WANT TO REALLY START

1454

01:09:18,621 --> 01:09:20,489

THINKING AND TALKING ABOUT THIS.

1455

01:09:20,489 --> 01:09:22,791

AND THE SCIENCE COMMUNITY

1456

01:09:22,791 --> 01:09:24,527

OVERALL, I WOULD ENCOURAGE THEM

1457

01:09:24,527 --> 01:09:26,495

TO REALLY START MAKING PLANS SO

1458

01:09:26,495 --> 01:09:29,164

WE CAN CREATE A CONSENSUS AS TO

1459

01:09:29,164 --> 01:09:30,733

WHAT DIRECTION WE WANT TO GO IN.

1460

01:09:30,733 --> 01:09:33,102

YES, WE WANT TO REALLY GO BACK.

1461

01:09:33,102 --> 01:09:34,770

THIS IS SUCH A WONDERFUL SYSTEM.

1462

01:09:34,770 --> 01:09:36,639

WE DON'T WANT TO LEAVE IT ALONE.

1463

01:09:36,639 --> 01:09:39,141

>> AND SUCH A BEAUTIFUL ONE THAT

1464

01:09:39,141 --> 01:09:40,609

HAS AFFECTED SO MANY PEOPLE.

1465

01:09:40,609 --> 01:09:43,512

THANK YOU SO MUCH FOR SHARING

1466

01:09:43,512 --> 01:09:51,053

THIS MOMENT WITH US.

1467

01:09:51,053 --> 01:09:53,155

>> THIS WAS A MULTINATIONAL

1468

01:09:53,155 --> 01:09:54,924

TEAM, AND IN A FEW MOMENTS, WE

1469

01:09:54,924 --> 01:10:01,897

WILL BE SPEAKING TO MEMBERS OF

1470

01:10:01,897 --> 01:10:05,935

OUR PARTNER NATIONS ABOUT THEIR

1471

01:10:05,935 --> 01:11:37,726

FEELINGS ABOUT THIS MISSION.

1472

01:11:39,061 --> 01:11:39,328

■■

1473

01:12:08,624 --> 01:12:10,626

>> AS WE TOLD YOU EARLIER, THIS

1474

01:12:10,626 --> 01:12:12,327

WAS A MULTINATIONAL ENDEAVOR

1475

01:12:12,327 --> 01:12:14,396

FROM THE VERY, VERY START, A

1476

01:12:14,396 --> 01:12:16,598

PARTNERSHIP BETWEEN NASA, THE

1477

01:12:16,598 --> 01:12:18,701

EUROPEAN SPACE AGENCY, AND THE

1478

01:12:18,701 --> 01:12:22,438

ITALIAN SPACE AGENCY THIS IS AN

1479

01:12:22,438 --> 01:12:26,442

EQUALLY PROUD MOMENT FOR ALL

1480

01:12:26,442 --> 01:12:32,815

INVOLVED.

1481

01:12:32,815 --> 01:12:35,684

THANK YOU SO MUCH FOR COMING.

1482

01:12:35,684 --> 01:12:37,319

WAS THIS SOMETHING THAT YOU

1483

01:12:37,319 --> 01:12:39,288

DECIDED YOU WOULDN'T MISS IT FOR

1484

01:12:39,288 --> 01:12:40,022

THE WORLD?

1485

01:12:40,022 --> 01:12:41,690

>> OF COURSE WE COULDN'T MISS

1486

01:12:41,690 --> 01:12:43,392

IT, BECAUSE WE KNEW THIS MOMENT

1487

01:12:43,392 --> 01:12:44,626

WAS GOING TO COME.

1488

01:12:44,626 --> 01:12:46,361

IT'S A LITTLE BIT SAD, BECAUSE

1489

01:12:46,361 --> 01:12:49,898

WE WANTED TO DELAY IT AS MUCH AS

1490

01:12:49,898 --> 01:12:50,666

POSSIBLE AND GET AS MUCH SCIENCE

1491

01:12:50,666 --> 01:12:53,001

AS POSSIBLE, BUT WE KNEW IT WAS

1492

01:12:53,001 --> 01:12:53,335

COMING.

1493

01:12:53,335 --> 01:12:55,037

IN THAT SENSE IT WAS SAD, BUT

1494

01:12:55,037 --> 01:12:57,172

ALSO VERY NICE TO SEE THAT WE

1495

01:12:57,172 --> 01:13:00,209

HAVE OPENED THE POSSIBILITY FOR

1496

01:13:00,209 --> 01:13:02,811

THE FUTURE SCIENCE, ALSO, AND

1497

01:13:02,811 --> 01:13:04,513

FOR THE SCIENTISTS WHO ARE

1498

01:13:04,513 --> 01:13:06,281

WORKING ON THE DATA THAT CASSINI

1499

01:13:06,281 --> 01:13:08,584

HAS COLLECTED.

1500

01:13:08,584 --> 01:13:10,719

AND ALSO AS AN EXAMPLE, I THINK

1501

01:13:10,719 --> 01:13:13,956

WE HAVE TO BUILD ON THIS

1502

01:13:13,956 --> 01:13:16,759

COOPERATION BETWEEN U.S. AND

1503

01:13:16,759 --> 01:13:18,360

EUROPE IN AMBITIOUS MISSIONS

1504

01:13:18,360 --> 01:13:19,094

LIKE THIS.

1505

01:13:19,094 --> 01:13:20,562

WE ARE VERY PROUD OF HAVING

1506

01:13:20,562 --> 01:13:21,697

WORKED TOGETHER, AND WE HAVE TO

1507

01:13:21,697 --> 01:13:23,966

MAKE SURE THAT WE CONTINUE THIS

1508

01:13:23,966 --> 01:13:26,969

WAY, BECAUSE TOGETHER WE CAN DO

1509

01:13:26,969 --> 01:13:30,973

MUCH BETTER.

1510

01:13:30,973 --> 01:13:33,408

>> AND ROBERTO, YOUR FEELINGS TO

1511

01:13:33,408 --> 01:13:34,610

BE A PART OF THIS?

1512

01:13:34,610 --> 01:13:36,512

>> IT'S A VERY HISTORICAL

1513

01:13:36,512 --> 01:13:38,781

MOMENT, AND TO BE A PART OF THAT

1514

01:13:38,781 --> 01:13:43,685

IS EMOTIONALLY INTENSE.

1515

01:13:43,685 --> 01:13:45,854

I KNOW THE STORY OF MY FRIENDS

1516

01:13:45,854 --> 01:13:47,556

AND COLLEAGUES, AND CASSINI

1517

01:13:47,556 --> 01:13:49,024

DEMONSTRATED WE CAN DO THAT.

1518

01:13:49,024 --> 01:13:50,659

WE CAN CREATE A CONDITION FOR

1519

01:13:50,659 --> 01:13:53,962

THE INTERNATIONAL COLLABORATION

1520

01:13:53,962 --> 01:13:55,697

AND MISSION.

1521

01:13:55,697 --> 01:13:57,332

LEARNING A TREMENDOUS AMOUNT OF

1522

01:13:57,332 --> 01:13:59,902

THINGS FOR THE FUTURE IS ONE

1523

01:13:59,902 --> 01:14:00,803

GIGANTIC STEP TOWARDS THE

1524

01:14:00,803 --> 01:14:01,136

FUTURE.

1525

01:14:01,136 --> 01:14:02,471

MAYBE WE CAN HOPE THIS IS NOT

1526
01:14:02,471 --> 01:14:05,240
THE LAST ONE, BUT ONLY THE FIRST

1527
01:14:05,240 --> 01:14:05,507
ONE.

1528
01:14:05,507 --> 01:14:07,409
>> WERE YOU SURPRISED AT HOW

1529
01:14:07,409 --> 01:14:10,746
LONG THIS MISSION HAS LASTED?

1530
01:14:10,746 --> 01:14:12,881
AND THE AMOUNT OF INFORMATION

1531
01:14:12,881 --> 01:14:16,218
AND SCIENCE THAT IT HAS BROUGHT

1532
01:14:16,218 --> 01:14:16,685
BACK?

1533
01:14:16,685 --> 01:14:19,388
>> NOT SO MUCH THE LENGTH.

1534
01:14:19,388 --> 01:14:21,223
I THINK WE ALL DREAMT ABOUT IT,

1535
01:14:21,223 --> 01:14:23,692
BUT THE DISCOVERIES AND THE --

1536
01:14:23,692 --> 01:14:26,962
WHAT WE HAVE FOUND IN THE

1537
01:14:26,962 --> 01:14:29,865
CASSINI -- IN THE SATURN SYSTEM

1538
01:14:29,865 --> 01:14:33,268

IS SIMPLY AMAZING.

1539

01:14:33,268 --> 01:14:33,969

WE WERE SURPRISED BY THAT.

1540

01:14:33,969 --> 01:14:36,338

>> AND WORKING ON TITAN.

1541

01:14:36,338 --> 01:14:38,307

I MEAN, WHAT WAS THE HIGH POINTS

1542

01:14:38,307 --> 01:14:39,208

FOR YOU?

1543

01:14:39,208 --> 01:14:42,878

>> WELL, FOR ME, HOIGANS WAS

1544

01:14:42,878 --> 01:14:43,946

GETTING TO TITAN.

1545

01:14:43,946 --> 01:14:59,061

WE LANDED THERE IN 2005.

1546

01:14:59,061 --> 01:15:01,930

THIS IS WHAT WE THOUGHT THAT

1547

01:15:01,930 --> 01:15:05,200

THIS BODIES OUT OF THE SOLAR

1548

01:15:05,200 --> 01:15:07,436

SYSTEM WHERE THE FULL LIFE COULD

1549

01:15:07,436 --> 01:15:08,570

APPEAR. AND WE WANTED TO

1550

01:15:08,570 --> 01:15:09,104

ANALYZE THAT.

1551
01:15:09,104 --> 01:15:12,908
BUT THEN WE FOUND THAT WE COULD

1552
01:15:12,908 --> 01:15:15,978
EVEN LAND.

1553
01:15:15,978 --> 01:15:17,679
WE DIDN'T KNOW HOW THE SURFACE

1554
01:15:17,679 --> 01:15:18,013
WAS.

1555
01:15:18,013 --> 01:15:19,915
WE DIDN'T KNOW IF IT WAS GOING

1556
01:15:19,915 --> 01:15:21,516
TO SINK OR LAND OR WHATEVER.

1557
01:15:21,516 --> 01:15:23,252
>> AND IT WAS ALIVE FOR SOMETIME

1558
01:15:23,252 --> 01:15:24,152
WHEN IT LANDED.

1559
01:15:24,152 --> 01:15:26,588
>> AND THAT WAS AMAZING.

1560
01:15:26,588 --> 01:15:28,457
ALSO WE COULD SEE FIRST THIS WAS

1561
01:15:28,457 --> 01:15:31,293
THE FURTHEST AWAY LANDING EVER

1562
01:15:31,293 --> 01:15:34,596
OF A HUMAN-MADE PROBE.

1563
01:15:34,596 --> 01:15:38,033

BUT ALSO WE HAVE A LANDSCAPE,

1564

01:15:38,033 --> 01:15:41,570

TOTALLY UNEXPECTED, OF TITAN.

1565

01:15:41,570 --> 01:15:44,873

SOMETHING SIMILAR TO EARTH,

1566

01:15:44,873 --> 01:15:54,349

ACTUALLY.

1567

01:15:54,349 --> 01:15:57,352

WE HAVE A TOTALLY DIFFERENT

1568

01:15:57,352 --> 01:16:00,555

COMPOSITION, SIGNS OF METHANE

1569

01:16:00,555 --> 01:16:01,189

RATHER THAN WATER.

1570

01:16:01,189 --> 01:16:04,760

>> BUT LOOKING AT IT, IT DOES

1571

01:16:04,760 --> 01:16:08,664

LOOK VERY, VERY FAMILIAR.

1572

01:16:08,664 --> 01:16:10,599

AND LET'S TALK ABOUT YOUR ROLE

1573

01:16:10,599 --> 01:16:12,401

AND THE HIGH GAIN ANTENNA.

1574

01:16:12,401 --> 01:16:15,237

SO OFTEN THE PROJECT RELIED ON

1575

01:16:15,237 --> 01:16:17,172

THE HIGH GAIN ANTENNA AS

1576
01:16:17,172 --> 01:16:22,511
PROTECTION FOR THE REST OF THE

1577
01:16:22,511 --> 01:16:22,911
SPACECRAFT.

1578
01:16:22,911 --> 01:16:24,279
WAS THAT SOMETHING THAT WAS

1579
01:16:24,279 --> 01:16:25,681
PLANNED, AND YOU THOUGHT THIS IS

1580
01:16:25,681 --> 01:16:27,416
THE WAY TO USE THE ANTENNA?

1581
01:16:27,416 --> 01:16:33,689
>> THE ANTENNA IS AMAZING.

1582
01:16:33,689 --> 01:16:35,857
ITE IT'S THE MOST SOPHISTICATED

1583
01:16:35,857 --> 01:16:39,661
ANTENNA, OPERATING FOR 20 YEARS

1584
01:16:39,661 --> 01:16:42,898
ALMOST CONTINUALLY.

1585
01:16:42,898 --> 01:16:47,669
IT WAS DESIGNED TO BE A PASSIVE

1586
01:16:47,669 --> 01:16:50,105
PROTECTION SYSTEM.

1587
01:16:50,105 --> 01:16:52,474
SHIELDING THE SATELLITE FROM THE

1588
01:16:52,474 --> 01:16:55,811

INTENSE SOLAR RADIATION.

1589

01:16:55,811 --> 01:16:59,948

AND GETTING INTO THE SATURN

1590

01:16:59,948 --> 01:17:01,883

ENVIRONMENT, IT WAS SHIELDING

1591

01:17:01,883 --> 01:17:04,419

AGAIN, MEASURING BY THE

1592

01:17:04,419 --> 01:17:08,423

VIBRATION OF THE ANTENNA ITSELF

1593

01:17:08,423 --> 01:17:11,593

THE AMOUNT OF MICROWAVES, AND

1594

01:17:11,593 --> 01:17:14,896

USE THAT AS PROTECTION IN THE

1595

01:17:14,896 --> 01:17:17,165

SPACE BETWEEN THE SATURN PLANET,

1596

01:17:17,165 --> 01:17:21,303

WHICH WAS UNKNOWN, TOTALLY

1597

01:17:21,303 --> 01:17:21,703

UNKNOWN.

1598

01:17:21,703 --> 01:17:26,675

I THINK THIS IS AMAZING, SUCH A

1599

01:17:26,675 --> 01:17:28,210

SOPHISTICATED INSTRUMENT AS A

1600

01:17:28,210 --> 01:17:29,144

SHIELD.

1601
01:17:29,144 --> 01:17:31,413
>> AND CASSINI WAS SUCH A

1602
01:17:31,413 --> 01:17:34,149
WELL-MADE MACHINE, AND SERVED SO

1603
01:17:34,149 --> 01:17:34,449
WELL.

1604
01:17:34,449 --> 01:17:38,553
I THINK IN ITS ENTIRE FLIGHT, IT

1605
01:17:38,553 --> 01:17:42,224
WAS -- IT HAD ONLY SAVED THREE

1606
01:17:42,224 --> 01:17:42,791
TIMES.

1607
01:17:42,791 --> 01:17:44,693
COULD NOT HAVE DONE IT WITHOUT

1608
01:17:44,693 --> 01:17:46,361
BOTH OF YOUR ORGANIZATIONS.

1609
01:17:46,361 --> 01:17:47,829
AND WE ARE SO PLEASED THAT YOU

1610
01:17:47,829 --> 01:17:48,997
ARE HERE AND JOINING US.

1611
01:17:48,997 --> 01:17:52,567
>> THESE ARE THE KIND OF STORIES

1612
01:17:52,567 --> 01:17:54,302
ABOUT SPACE MISSIONS THAT SHOULD

1613
01:17:54,302 --> 01:17:55,737

BE TOLD, BECAUSE THE FACT THAT

1614

01:17:55,737 --> 01:17:59,207

IT WAS SMOOTH AND PERFECTLY

1615

01:17:59,207 --> 01:18:01,710

DESIGNED WITHOUT TROUBLE IS A

1616

01:18:01,710 --> 01:18:03,245

TREMENDOUS GIANT BOND THAT

1617

01:18:03,245 --> 01:18:04,046

SHOULD BE KNOWN.

1618

01:18:04,046 --> 01:18:04,980

>> THANK YOU AGAIN FOR COMING

1619

01:18:04,980 --> 01:18:07,282

OUT AND BEING WITH US ON THIS

1620

01:18:07,282 --> 01:18:09,484

VERY, VERY SPECIAL DAY.

1621

01:18:09,484 --> 01:18:10,018

>> THANK YOU.

1622

01:18:10,018 --> 01:18:54,996

>> ALL RIGHT.

1623

01:18:56,731 --> 01:20:35,463

■■

1624

01:20:35,463 --> 01:20:38,767

>> THAT VIDEO WAS CALLED CASSINI

1625

01:20:38,767 --> 01:20:40,802

INSPIRES, MADE UP OF IMAGES THAT

1626
01:20:40,802 --> 01:20:43,572
THE PUBLIC SENT IN USING SOME OF

1627
01:20:43,572 --> 01:20:47,642
CASSINI'S RAW IMAGES AS WELL AS

1628
01:20:47,642 --> 01:20:48,143
YOUR OWN ARTWORK.

1629
01:20:48,143 --> 01:20:48,677
THANK YOU SO MUCH.

1630
01:20:48,677 --> 01:20:51,146
THAT WRAPS IT UP FROM HERE, A

1631
01:20:51,146 --> 01:20:52,881
BITTERSWEET DAY FOR THE CASSINI

1632
01:20:52,881 --> 01:20:54,416
TEAM, BUT WE CAN'T HELP BUT FEEL

1633
01:20:54,416 --> 01:20:56,885
PROUD OF THE FANTASTIC PEOPLE

1634
01:20:56,885 --> 01:20:59,020
THAT MADE THESE ACCOMPLISHMENTS

1635
01:20:59,020 --> 01:21:00,755
POSSIBLE.

1636
01:21:00,755 --> 01:21:03,124
THESE LAST 20 YEARS.

1637
01:21:03,124 --> 01:21:05,961
ABOUT AN HOUR FROM NOW AT 6:30

1638
01:21:05,961 --> 01:21:09,164

A.M. PACIFIC, 9:30 A.M. EASTERN,

1639

01:21:09,164 --> 01:21:10,999

THERE WILL BE A NEWS BRIEFING.

1640

01:21:10,999 --> 01:21:14,903

IT WILL BE LIVE ON NASA TV AND

1641

01:21:14,903 --> 01:21:17,405

ALSO STREAMED.

1642

01:21:17,405 --> 01:21:18,573

FIR MORE INFORMATION, YOU CAN

1643

01:21:18,573 --> 01:21:22,177

CHECK OUT THE URLs YOU SEE ON

1644

01:21:22,177 --> 01:21:23,078

THE SCREEN.

1645

01:21:23,078 --> 01:21:25,513

JIM GREEN TOLD YOU ABOUT THE E

1646

01:21:25,513 --> 01:21:27,415

BOOKS, SOME OF THE MOST

1647

01:21:27,415 --> 01:21:29,751

MEMORABLE GIFTS FROM CASSINI ARE

1648

01:21:29,751 --> 01:21:33,388

THOSE SPECTACULAR IMAGES.

1649

01:21:33,388 --> 01:21:35,523

AN E BOOK HAS BEEN MADE, AND YOU

1650

01:21:35,523 --> 01:21:36,858

CAN FIND IT BY GOING TO THAT

1651

01:21:36,858 --> 01:21:41,930

LINK YOU SEE ON THE SCREEN.

1652

01:21:41,930 --> 01:21:44,666

BEFORE WE GO, A PARTING LOOK AT

1653

01:21:44,666 --> 01:21:48,903

THE DSN NOW IMAGE, THE DISPLAY

1654

01:21:48,903 --> 01:21:54,075

YOU SEE THERE.

1655

01:21:54,075 --> 01:21:56,478

IT'S NOW DARK AND COMMUNICATION

1656

01:21:56,478 --> 01:21:58,113

WITH THE SPACECRAFT IS NOW

1657

01:21:58,113 --> 01:21:58,546

SILENT.