
NEW HORIZONS
NASA's Pluto-Kuiper Belt Mission
SwRI NASA JHUAPL

1
00:00:02,080 --> 00:00:05,180
>>> GOOD MORNING AND WELCOME TO
THE JOHN'S HOPKINS APPLIED

2
00:00:05,180 --> 00:00:11,370
PHYSICS LABORATORY.

3
00:00:11,370 --> 00:00:19,420
JOINING ME ON STAGE IS ASTRONAUT
AND ASSOCIATE ADMINISTRATOR ALAN

4
00:00:19,420 --> 00:00:26,970
STERN WHO IS THE PRINCIPLE
INVESTIGATOR IN BOLDER COLORADO

5
00:00:26,970 --> 00:00:30,689
AND ALEX BOWMAN MISSION
OPERATIONS OFFICER AT JOHN'S

6
00:00:30,689 --> 00:00:36,430
HOPKINS APPLIED PHYSICS
LABORATORY.

7
00:00:36,430 --> 00:00:43,659
[APPLAUSE]
>> LADIES AND GENTLEMEN, PLUTO

8
00:00:43,659 --> 00:00:58,050
AS NEVER SEEN BEFORE.
3, 2, 1.

9
00:00:58,050 --> 00:01:06,440
[APPLAUSE]
AND NOW WE HAVE REMARKS FROM DR.

10
00:01:06,440 --> 00:01:10,170
JOHN.

11
00:01:10,170 --> 00:01:11,760

>> IT'S BEEN AN INCREDIBLE
VOYAGE.

12
00:01:11,760 --> 00:01:17,490
I KNOW MANY OF YOU THE LAST FEW
DAYS HAVE BEEN PARTICIPATING BUT

13
00:01:17,490 --> 00:01:22,590
WHAT IT CALL COMES DOWN TO IS AN
ENORMOUS TEAM OF PEOPLE.

14
00:01:22,590 --> 00:01:25,580
LEAD BY ALLEN STERN, THE
PRINCIPLE INVESTIGATOR.

15
00:01:25,580 --> 00:01:32,210
A BIG TEAM HERE AT THE JOHNS
HOPKINS APPLIED PHYSICS LAB,

16
00:01:32,210 --> 00:01:35,330
UNIVERSITY OF COLORADO, THE
HISSELF GOES ON AND ON.

17
00:01:35,330 --> 00:01:38,880
HUNDREDS OF SCIENTISTS,
ENGINEERS, TECHNICIANS, PEOPLE

18
00:01:38,880 --> 00:01:43,050
SEWING BLANKETS TO BE ABLE TO
PREPARE THIS WONDERFUL TREPID

19
00:01:43,050 --> 00:01:44,050
EXPLORER.

20
00:01:44,050 --> 00:01:49,550
THE FIRST TO VISIT PLUTO AND TO
FLY ON BEYOND.

21
00:01:49,550 --> 00:01:51,810
THIS IS TRUE EXPLORATION.

22
00:01:51,810 --> 00:01:56,930
I'M SO GLAD YOU'RE ALL HERE TO
PARTICIPATE IN IT AND THIS†-- IT

23
00:01:56,930 --> 00:02:03,990
DISAPPEARED†-- THAT VIEW IS JUST
THE FIRST OF MANY, MANY REWARDS

24
00:02:03,990 --> 00:02:07,500
THAT THE TEAM WILL GET
ESPECIALLY SINCE PLUTO DIDN'T

25
00:02:07,500 --> 00:02:11,910
TURN OUT TO BE A RELEVENTLY
FEATURELESS PLANET WITH NITROGEN

26
00:02:11,910 --> 00:02:15,459
FOGGY ATMOSPHERE AND WE'RE
SCRATCHING OUR HEADS THINKING

27
00:02:15,459 --> 00:02:17,760
WHAT ARE WE GOING TO DO WITH
THAT?

28
00:02:17,760 --> 00:02:21,720
PLUTO HAS TURNED OUT TO BE A
COMPLEX AND INTERESTING WORLD.

29
00:02:21,720 --> 00:02:25,970
OF COURSE IT WOULD BE BUT THAT
WAS NEVER A CERTAINTY.

30
00:02:25,970 --> 00:02:29,660
BUT NOW FOR THE VERY FIRST TIME
WE KNOW THAT.

31
00:02:29,660 --> 00:02:34,300
AND WITH THAT, FOR HIS FIRST
IMPRESSION, I'D LIKE TO TURN IT

32
00:02:34,300 --> 00:02:36,060
OVER TO ALAN STERN.

33
00:02:36,060 --> 00:02:38,299
>> THANK YOU.

34
00:02:38,299 --> 00:02:44,940
[APPLAUSE]
>> WELL, I WANT TO THANK JOHN

35
00:02:44,940 --> 00:02:48,210
FOR HIS REMARKS AND THANK NASA
FOR MAKING THIS ALL POSSIBLE.

36
00:02:48,210 --> 00:02:51,240
HOW ABOUT THAT?

37
00:02:51,240 --> 00:02:58,650
[APPLAUSE]
>> 50 YEARS AGO TODAY THE UNITED

38
00:02:58,650 --> 00:03:02,920
STATES WAS EMBARKING AT THE
BEGINNING OF AN ERA OF

39
00:03:02,920 --> 00:03:06,290
EXPLORATION OF THE SOLAR SYSTEM
THAT WILL LIVE FOREVER IN

40
00:03:06,290 --> 00:03:09,010
HISTORY.
50 YEARS AGO TODAY THE FIRST

41
00:03:09,010 --> 00:03:12,530
SPACECRAFT FLEW BY MARS.

42
00:03:12,530 --> 00:03:15,510
AND I THINK IT'S FITTING THAT ON

THAT 50th ANNIVERSARY WE

43
00:03:15,510 --> 00:03:21,380
COMPLETE IT WITH THE EXPLORATION
OF PLUTO.

44
00:03:21,380 --> 00:03:25,560
A BIG TEAM OF PEOPLE WORKED 15
YEARS TO DO THIS.

45
00:03:25,560 --> 00:03:28,520
THEY WORKED UNDER THE GUN FOR
TIME.

46
00:03:28,520 --> 00:03:36,110
THEY BROKE RECORDS FOR LOW COST
OUTER PLANET EXPLORATION.

47
00:03:36,110 --> 00:03:38,920
THEY DID SOME AMAZING FEATS AND
WE SAW ONE OF THEM JUST LAST

48
00:03:38,920 --> 00:03:44,860
WEEKEND IN TERMS OF THAT MISSION
OPERATION RESCUE OF THIS FLY BY

49
00:03:44,860 --> 00:03:49,090
THAT PRODUCES IMAGES JUST LIKE
THE ONE YOU SAW AND MANY MORE

50
00:03:49,090 --> 00:03:54,160
RAINING TO THE GROUND BEGINNING
TOMORROW BUT STAY TUNED.

51
00:03:54,160 --> 00:03:56,239
STAY TUNED BECAUSE OUR
SPACECRAFT IS NOT IN

52
00:03:56,239 --> 00:03:57,560
COMMUNICATION WITH THE EARTH.

53
00:03:57,560 --> 00:04:02,180
WE PROGRAMMED IT TO BE SPENDING
IT'S TIME TAKING IMPORTANT DATA

54
00:04:02,180 --> 00:04:06,099
SETS THAT IT CAN ONLY TAKE
TODAY.

55
00:04:06,099 --> 00:04:09,140
AND OVER THE NEXT PERIOD OF
ABOUT 12 OR 13 HOURS THE

56
00:04:09,140 --> 00:04:12,819
SPACECRAFT WILL CONTINUE TO TAKE
THAT DATA AND THEN IT WILL

57
00:04:12,819 --> 00:04:16,250
TRANSMIT A MESSAGE BACK TO THE
EARTH FOR ABOUT 20 MINUTES AT

58
00:04:16,250 --> 00:04:17,250
9:00†P.M.

59
00:04:17,250 --> 00:04:21,229
EASTERN TIME WHICH
WE'LL FIND OUT HOW IT'S DOING.

60
00:04:21,229 --> 00:04:24,120
WHETHER IT SURVIVED THE PASSAGE
THROUGH THE PLUTO SYSTEM AND

61
00:04:24,120 --> 00:04:27,860
HOPEFULLY IT DID AND WE'RE
COUNTING ON THAT BUT THERE'S A

62
00:04:27,860 --> 00:04:31,449
LITTLE BIT OF DRAMA BECAUSE THIS
IS TRUE EXPLORATION.

63
00:04:31,449 --> 00:04:34,979
NEW HORIZONS IS FLYING INTO THE
UNKNOWN.

64
00:04:34,979 --> 00:04:39,580
AND THEN TOMORROW MORNING, WE
SHOULD SEE THE BEGINNING OF A 16

65
00:04:39,580 --> 00:04:42,160
MONTH DATA WATERFALL.

66
00:04:42,160 --> 00:04:45,539
YOU'LL BE SEEING MORE AND MORE
ABOUT PLUTO BEGINNING TOMORROW.

67
00:04:45,539 --> 00:04:51,479
BUT IF WE CAN PUT THAT IMAGE UP
WHICH IS NOW THE BEST IMAGE.

68
00:04:51,479 --> 00:04:55,800
IT HAS A RESOLUTION OF ABOUT 4
KILOMETERS PER PIXEL WHICH IS

69
00:04:55,800 --> 00:05:00,240
1,000 TIMES BETTER THAN WE COULD
DO EVEN WITH THE BIGGEST AND

70
00:05:00,240 --> 00:05:05,240
BADDEST GUN TELESCOPE, THE
HUBBLE SPACE TELESCOPE 3 BILLION

71
00:05:05,240 --> 00:05:07,320
MILES AWAY.

72
00:05:07,320 --> 00:05:09,770
NEW HORIZONS TOOK THAT IMAGE
YESTERDAY.

73
00:05:09,770 --> 00:05:12,039

DOWN LINKED IT TO THE GROUND.

74
00:05:12,039 --> 00:05:16,410
THE BITS FLEW AT THE SPEED OF
LIGHT FOR 4.5 HOURS.

75
00:05:16,410 --> 00:05:20,770
RECEIVED AT THE NETWORK AND
TRANSMITTED HERE AND THE IMAGE

76
00:05:20,770 --> 00:05:23,099
WAS OPENED THIS MORNING.

77
00:05:23,099 --> 00:05:31,369
HOW ABOUT A ROUND OF APPLAUSE
FOR THAT BEAUTIFUL PLANET.

78
00:05:31,369 --> 00:05:38,909
[APPLAUSE]
NOW I'D LIKE TO INVITE OUR

79
00:05:38,909 --> 00:05:41,740
MISSION OPERATIONS MANAGER.

80
00:05:41,740 --> 00:05:44,039
>> DR.

81
00:05:44,039 --> 00:05:48,120
BOWMAN HAS BEEN LEADING
THIS MISSION OPERATION FROM THE

82
00:05:48,120 --> 00:05:53,099
TIME WE WROTE THE PROPOSAL TO
WIN THIS PROJECT ALL THE WAY

83
00:05:53,099 --> 00:05:57,619
THROUGH DEVELOPMENT, THROUGH
LAUNCH AND THROUGH AN EPIC 3

84

00:05:57,619 --> 00:06:10,769
BILLION MILE JOURNEY ACROSS THE
SOLAR SYSTEM.

85
00:06:10,769 --> 00:06:13,819
>> WHAT AN ABSOLUTE HONOR IT IS
TO BE HERE.

86
00:06:13,819 --> 00:06:20,620
TO BE STANDING HERE AND WAITING
FOR THOSE.

87
00:06:20,620 --> 00:06:30,349
I'M THANKFUL THAT NASA ALLOWED
US TO BUILD THIS HERE AT THE

88
00:06:30,349 --> 00:06:33,059
APPLIED PHYSICS LABORATORY.

89
00:06:33,059 --> 00:06:37,889
WE HAVE A LARGE TEAM AND I
HAPPEN TO BE THE MISSION

90
00:06:37,889 --> 00:06:43,889
OPERATIONS MANAGER BUT IN NO WAY
AM I TAKING THE CREDIT FOR THIS

91
00:06:43,889 --> 00:06:44,979
INCREDIBLE JOURNEY.

92
00:06:44,979 --> 00:06:48,050
I MEAN, IT'S DEFINITELY A TEAM
EFFORT.

93
00:06:48,050 --> 00:06:57,330
WE HAD TO EACH DO OUR PART AND
BE THE EXPERTS IN OUR FIELD AND

94
00:06:57,330 --> 00:07:03,240
WHEN I STAND BACK THIS MORNING

AND I JUST THINK†-- I HAVE TO

95
00:07:03,240 --> 00:07:05,229
PINCH MYSELF.

96
00:07:05,229 --> 00:07:07,879
LOOK WHAT WE ACCOMPLISHED.

97
00:07:07,879 --> 00:07:09,639
IT'S TRULY AMAZING.

98
00:07:09,639 --> 00:07:16,719
BUT HUMAN KIND CAN GO OUT AND
EXPLORE THESE WORLDS AND TO SEE

99
00:07:16,719 --> 00:07:23,659
MUY TOE BE REVEALED JUST BEFORE
OUR EYES, IT'S JUST FANTASTIC.

100
00:07:23,659 --> 00:07:27,840
AND I CAN'T WAIT UNTIL WE GET
THESE IMAGES DOWN STARTING EARLY

101
00:07:27,840 --> 00:07:35,240
TOMORROW MORNING AND THIS
SPACECRAFT IS HEALTHY AND HAS

102
00:07:35,240 --> 00:07:38,060
RECORDED ALL OF THAT FANTASTIC
DATA.

103
00:07:38,060 --> 00:07:40,279
SO THANK YOU AGAIN.

104
00:07:40,279 --> 00:07:44,120
THANK YOU VERY MUCH.

105
00:07:44,120 --> 00:07:51,219
[APPLAUSE]

>> OKAY.

106
00:07:51,219 --> 00:07:54,789
IT'S BEEN A GREAT MORNING AND
OBVIOUSLY WE STILL†-- THE STORY

107
00:07:54,789 --> 00:07:55,789
IS NOT OVER YET.

108
00:07:55,789 --> 00:07:57,490
YOU'RE GOING TO HEAR MORE ABOUT
THAT THIS EVENING.

109
00:07:57,490 --> 00:08:01,080
BUT BEFORE WE OPEN IT UP FOR
QUESTIONS I'M GOING TO TOSS THIS

110
00:08:01,080 --> 00:08:02,479
TO ALAN.

111
00:08:02,479 --> 00:08:05,919
ALAN, IF YOU CAN SET UP, WE HAVE
VIDEO OF SOMETHING THAT HAPPENED

112
00:08:05,919 --> 00:08:10,179
THIS MORNING WITH THE SCIENCE
TEAM I BELIEVE.

113
00:08:10,179 --> 00:08:11,179
>> SURE.

114
00:08:11,179 --> 00:08:15,240
JOHN AND I WERE OVER AT THE
BUILDING HERE ON THE APL CAMPUS

115
00:08:15,240 --> 00:08:16,780
WHERE THE SCIENCE TEAM IS
WORKING.

116

00:08:16,780 --> 00:08:20,710
THE SCIENCE TEAM ASSEMBLED AT
5:45 THIS MORNING FOR A CHANCE

117
00:08:20,710 --> 00:08:24,580
TO SEE THAT IMAGE OF PLUTO AND
TO REACT TO IT AND HAVE A LITTLE

118
00:08:24,580 --> 00:08:27,550
BIT OF A SCIENTIFIC DISCUSSION
AND WE'RE GOING TO GIVE YOU A

119
00:08:27,550 --> 00:08:34,409
PEAK INTO IT IF WE CAN QUEUE IT
UP.

120
00:08:34,409 --> 00:08:45,650
[APPLAUSE]
WOW!

121
00:08:45,650 --> 00:09:03,900
>> A LITTLE BEHIND THE SCENES
LOOK BUT IT'S NOT BEHIND THE

122
00:09:03,900 --> 00:09:04,900
SCENES ANYMORE.

123
00:09:04,900 --> 00:09:08,280
YOU'VE SEEN IT ON THIS SCREEN
AND IT'S GOING VIRAL AROUND THE

124
00:09:08,280 --> 00:09:11,250
WORLD ON FACEBOOK AND INSTAGRAM
AND PROBABLY EVERY OTHER SOCIAL

125
00:09:11,250 --> 00:09:13,330
MEDIA AS WELL.

126
00:09:13,330 --> 00:09:15,950
AND WE'RE VERY HAPPY TO BE HERE

AND TO BE ABLE TO ANSWER YOUR

127
00:09:15,950 --> 00:09:18,810
QUESTIONS AS THE REPRESENTATIVES
OF THIS BIG TEAM AND

128
00:09:18,810 --> 00:09:20,090
REPRESENTATIVE OF NASA.

129
00:09:20,090 --> 00:09:21,090
>> EXCELLENT.

130
00:09:21,090 --> 00:09:22,090
CONGRATULATIONS.

131
00:09:22,090 --> 00:09:27,080
>> WE'RE GOING TO OPEN UP FOR
QUESTIONS AND SOCIAL MEDIA, OH

132
00:09:27,080 --> 00:09:28,080
MY GOODNESS.

133
00:09:28,080 --> 00:09:29,320
THE NUMBERS ARE ASTOUNDING.

134
00:09:29,320 --> 00:09:33,580
THE WORLD LADIES AND GENTLEMEN
IS†-- THEY'RE JUST TOTALLY

135
00:09:33,580 --> 00:09:36,070
EXCITED AND THE STORY IS NOT
OVER YET.

136
00:09:36,070 --> 00:09:41,150
SO WHAT WE'RE GOING TO DO HERE
IS RAISE YOUR HAND, THE MEDIA,

137
00:09:41,150 --> 00:09:42,150
WE'RE GOING TO START WITH YOU.

138
00:09:42,150 --> 00:09:44,320
WE'LL GO TO SOCIAL MEDIA AND
WE'RE GOING TO TRY TO GET AS

139
00:09:44,320 --> 00:09:47,440
MANY QUESTIONS IN AS POSSIBLE.

140
00:09:47,440 --> 00:09:49,680
SO RAISE THEM HIGH.

141
00:09:49,680 --> 00:09:52,330
LAST TIME I STAYED OVER HERE A
LOT OF TIME SO LET ME START OUT

142
00:09:52,330 --> 00:09:53,400
WITH JOE.

143
00:09:53,400 --> 00:09:55,870
YOUR NAME AND AFFILIATION.

144
00:09:55,870 --> 00:09:58,270
>> WASHINGTON POST, TELL US
ABOUT PLUTO.

145
00:09:58,270 --> 00:10:00,160
WHAT ARE WE LOOKING AT THERE?

146
00:10:00,160 --> 00:10:02,050
ARE THERE MOUNTAINS?

147
00:10:02,050 --> 00:10:03,050
CRATERS?

148
00:10:03,050 --> 00:10:04,050
TELL US ABOUT WHAT YOU SEE?

149
00:10:04,050 --> 00:10:05,050

>> SURE.

150
00:10:05,050 --> 00:10:08,690
CAN WE QUEUE THAT IMAGE BACK UP?

151
00:10:08,690 --> 00:10:11,980
OKAY.

152
00:10:11,980 --> 00:10:18,940
SO THIS IMAGE IS ORIENTED WITH
PLUTO'S†-- NORTH TO THE TOP SO

153
00:10:18,940 --> 00:10:22,730
THE DARK REGIONS THAT YOU SEE
ARE NEAR PLUTO'S EQUATOR.

154
00:10:22,730 --> 00:10:26,290
THE PLANET IS ABOUT 1500 MILE
ACROSS TO GIVE YOU A SCALE.

155
00:10:26,290 --> 00:10:31,300
IT HAS A THIN NITROGEN
ATMOSPHERE WHICH YOU CAN'T SEE

156
00:10:31,300 --> 00:10:36,030
IN THIS IMAGE BECAUSE IT'S CLEAR
JUST LIKE LOOKING THROUGH OTHER

157
00:10:36,030 --> 00:10:39,900
ATMOSPHERES BUT WHAT YOU CAN SEE
IN THIS IMAGE AND IT'S POSSIBLE

158
00:10:39,900 --> 00:10:42,660
FOR THE FOLKS BEHIND THE SCENES
TO ACTUALLY JUST MAKE IT A

159
00:10:42,660 --> 00:10:46,160
LARGER FRACTION OF THE SCREEN
AND YOU'D BE ABLE TO SEE IT, YOU

160
00:10:46,160 --> 00:10:48,970
CAN SEE REGIONS OF VARIOUS SIGNS
OF BRIGHTNESS.

161
00:10:48,970 --> 00:10:54,840
DARK NEAR THE EQUATOR AND BRIGHT
REGIONS TO THE NORTH OF THAT.

162
00:10:54,840 --> 00:10:58,590
BROAD INTERMEDIATE ZONES OVER
THE POLE.

163
00:10:58,590 --> 00:11:02,690
WHAT WE KNOW IS THAT ON THE
SURFACE WE SEE THE HISTORY OF

164
00:11:02,690 --> 00:11:03,830
IMPACT.

165
00:11:03,830 --> 00:11:06,730
WE SEE A HISTORY OF SURFACE
ACTIVITY IN TERMS OF SOME

166
00:11:06,730 --> 00:11:11,330
FEATURES THAT WE MIGHT BE ABLE
TO IDENTIFY INDICATING INTERNAL

167
00:11:11,330 --> 00:11:15,070
ACTIVITY IN THE PLANET AT SOME
POINT IN THE PAST OR MAYBE EVEN

168
00:11:15,070 --> 00:11:19,680
IN IT'S PRESENCE AND WHAT WE
ALSO KNOW IS THAT THIS IS

169
00:11:19,680 --> 00:11:24,990
CLEARLY A WORLD WHERE GEOLOGY
AND ATMOSPHERE CLIMATOLOGY PLAY

170

00:11:24,990 --> 00:11:26,190
A ROLE.

171
00:11:26,190 --> 00:11:28,650
IT HAS STRONG ATMOSPHERIC
CYCLES.

172
00:11:28,650 --> 00:11:30,890
IT SNOWS ON THE SURFACE.

173
00:11:30,890 --> 00:11:36,050
THEY GO BACK INTO THE ATMOSPHERE
EACH 248 YEAR ORBIT.

174
00:11:36,050 --> 00:11:40,130
THEY HAVE BEEN OBSERVED TO MOVE
AROUND ON THE SURFACE SEEN FROM

175
00:11:40,130 --> 00:11:42,970
3 BILLION MILES AWAY.

176
00:11:42,970 --> 00:11:46,070
WE LOOK AT THAT IMAGE AND
FRANKLY IF YOU'RE A SCIENTIST

177
00:11:46,070 --> 00:11:48,770
LIKE I AM, YOU WANT TO SEE ALL
THE SUPPORTING DATA.

178
00:11:48,770 --> 00:11:53,510
YOU WANT TO SEE THE TYPOGRAPHY
SO WE CAN DETERMINE WHAT'S HIGH

179
00:11:53,510 --> 00:11:55,330
AND WHAT'S LOW.

180
00:11:55,330 --> 00:12:00,660
YOU WANT TO SEE COLOR DATA.

181

00:12:00,660 --> 00:12:05,120
YOU WANT TO SEE THE COMPOSITION
SO WE CAN DETERMINE WHAT THE

182
00:12:05,120 --> 00:12:07,070
TIRGET AREAS ARE MADE FROM.

183
00:12:07,070 --> 00:12:11,150
YOU WANT TO SEE THE THERMAL MASS
SO WE CAN UNDERSTAND THE

184
00:12:11,150 --> 00:12:15,290
BRIGHTEST AREAS AND COLDEST
AREAS FOR EXAMPLE WHERE THE SNOW

185
00:12:15,290 --> 00:12:18,150
PLAYED IT OUT OR IS IT SOME
OTHER STORY PLUTO IS TRYING TO

186
00:12:18,150 --> 00:12:19,150
TELL US.

187
00:12:19,150 --> 00:12:22,140
YOU ALSO WANT TO SEE HIGHER
RESOLUTION IMAGES.

188
00:12:22,140 --> 00:12:26,410
TOMORROW WE'LL SHOW YOU IMAGERY
WITH TEN TIMES THE RESOLUTION OF

189
00:12:26,410 --> 00:12:29,840
THAT IMAGE AND AS THE DATA
CONTINUES TO COME TO THE GROUND

190
00:12:29,840 --> 00:12:32,370
WE'LL HAVE IMAGES THAT ARE
BETTER STILL.

191
00:12:32,370 --> 00:12:34,470
DRAMATICALLY BETTER STILL.

192
00:12:34,470 --> 00:12:39,120
A LOT MORE WITH THE DATA COMING
DOWN AND WE COULDN'T BE HAPPIER

193
00:12:39,120 --> 00:12:42,250
ABOUT THE PERFORMANCE OF THE
SPACECRAFT AND FRANKLY ABOUT THE

194
00:12:42,250 --> 00:12:44,709
PERFORMANCE OF THE PLUTO SYSTEM.

195
00:12:44,709 --> 00:12:46,540
>> OTHER QUESTIONS?

196
00:12:46,540 --> 00:12:48,860
>> I'M WITH THE PLANETARY
SOCIETY.

197
00:12:48,860 --> 00:12:51,890
I NOTICE THERE'S ALSO COLOR
INFORMATION IN THAT PICTURE.

198
00:12:51,890 --> 00:12:54,360
I'M WONDERING IF YOU CAN TELL ME
A LITTLE BIT ABOUT THE COLOR

199
00:12:54,360 --> 00:12:59,170
DATA THAT YOU GOT AND IF YOU SEE
ANY EVIDENCE FOR CLOUDS OR

200
00:12:59,170 --> 00:13:01,760
ANYTHING IN THE ATMOSPHERE THAT
YOU CAN SEE IN THE IMAGES.

201
00:13:01,760 --> 00:13:02,760
>> SURE.

202
00:13:02,760 --> 00:13:03,760

ABSOLUTELY.

203
00:13:03,760 --> 00:13:04,760
CAN WE PUT UP THE COLOR IMAGE?

204
00:13:04,760 --> 00:13:07,779
IS THAT POSSIBLE?

205
00:13:07,779 --> 00:13:13,250
>> THERE'S ANOTHER IMAGE I'M
LOOKING FOR AND IF THEY DON'T

206
00:13:13,250 --> 00:13:17,410
HAVE IT BACKSTAGE I'M NOT ABLE
TO SHOW IT TO YOU.

207
00:13:17,410 --> 00:13:19,220
OKAY.

208
00:13:19,220 --> 00:13:22,510
SO ON THE MONITOR IT'S A LITTLE
HARD FOR ME TO SEE BUT WE KNOW

209
00:13:22,510 --> 00:13:26,300
THAT PLUTO HAS COLOR VARIATIONS
ACROSS THE SURFACE.

210
00:13:26,300 --> 00:13:29,010
WHEN WE STRETCH THOSE, WHICH IS
SOMETHING THAT OUR TEAM IS

211
00:13:29,010 --> 00:13:32,790
WORKING ON RIGHT NOW WE'LL HAVE
A BETTER HANDLE ON HOW STRONG

212
00:13:32,790 --> 00:13:35,560
THOSE VARIATIONS ARE AND WE
EXPECT TO BE ABLE TO SHOW YOU

213

00:13:35,560 --> 00:13:37,080
SOME OF THAT LATER IN THE DAY.

214
00:13:37,080 --> 00:13:42,220
I HAVE LOOKED AT THAT IMAGE JUST
VERY BRIEFLY WHEN WE WERE FIRST

215
00:13:42,220 --> 00:13:46,260
OVER IN THE SCIENCE WORK AREA
AND I WAS LOOKING FOR EVIDENCE

216
00:13:46,260 --> 00:13:50,490
OF PLUMES AND ATMOSPHERIC HAZING
AND I COULDN'T SEE THEM.

217
00:13:50,490 --> 00:13:52,030
THAT DOESN'T MEAN THAT THEY'RE
NOT THERE.

218
00:13:52,030 --> 00:13:57,100
A REAL PROPER ANALYSIS OF IT
WILL REQUIRE SOME TIME AND MAYBE

219
00:13:57,100 --> 00:14:05,240
HIGHER RESOLUTION IMAGES.

220
00:14:05,240 --> 00:14:09,080
>> FIRST OF ALL, THIS IS VERY
EXCITING FOR EVERYBODY I'M SURE.

221
00:14:09,080 --> 00:14:13,140
BUT I AM WONDERING, SPECIFICALLY
FOR ALICE, HOW ARE YOU FEELING

222
00:14:13,140 --> 00:14:20,170
RIGHT NOW KNOWING THAT YOUR
CRAFT IS OUT THERE, YOU KNOW,

223
00:14:20,170 --> 00:14:22,660
FLYING BY THE PLUTO SYSTEM AND

YOU WON'T HEAR FROM IT FOR

224
00:14:22,660 --> 00:14:23,880
AWHILE.

225
00:14:23,880 --> 00:14:25,100
THANKS.

226
00:14:25,100 --> 00:14:28,850
>> THAT'S A REALLY GOOD
QUESTION.

227
00:14:28,850 --> 00:14:33,310
I HAVEN'T HAD VERY MUCH SLEEP.

228
00:14:33,310 --> 00:14:38,020
AND YOU KNOW, WE ALWAYS TALK
ABOUT THE SPACECRAFT AS BEING A

229
00:14:38,020 --> 00:14:40,900
CHILD, A BABY, A TEENAGER.

230
00:14:40,900 --> 00:14:45,940
AND WE LOST SIGNAL AS PLANNED
LAST NIGHT AT 11:17 AND IT WAS

231
00:14:45,940 --> 00:14:49,900
ABSOLUTELY NOTHING ANYBODY ON
THE OPERATIONS TEAM COULD DO.

232
00:14:49,900 --> 00:14:54,530
IT WAS JUST TO TRUST THAT WE HAD
PREPARED IT WELL TO SET OFF ON

233
00:14:54,530 --> 00:14:58,450
ITS JOURNEY ON ITS OWN AND DO
WHAT IT NEEDED TO DO.

234
00:14:58,450 --> 00:15:00,810

BUT, YEAH.

235
00:15:00,810 --> 00:15:05,180
THERE WERE A LOT OF US IN THE OP
CENTER EVEN THOUGH WE KNEW THAT

236
00:15:05,180 --> 00:15:08,640
SPACECRAFT WASN'T GOING TO BE
TALKING TO US BUT WE WERE THERE.

237
00:15:08,640 --> 00:15:14,900
WE WANTED TO BE WITH IT AS IT
WENT THROUGH THIS JOURNEY AND I

238
00:15:14,900 --> 00:15:17,930
AM FEELING A LITTLE BIT NERVOUS
JUST LIKE YOU DO WHEN YOU SET

239
00:15:17,930 --> 00:15:22,070
YOUR CHILD OFF BUT I HAVE
ABSOLUTE CONFIDENCE THAT IT'S

240
00:15:22,070 --> 00:15:25,060
GOING TO DO WHAT IT NEEDS TO DO
TO COLLECT THAT SCIENCE AND IT'S

241
00:15:25,060 --> 00:15:29,140
GOING TO TURN AROUND AND SEND US
THAT BURST OF DATA AND TELL US

242
00:15:29,140 --> 00:15:30,430
THAT IT'S OKAY.

243
00:15:30,430 --> 00:15:35,080
I GUESS IT'S A MIX OF FEELING
NERVOUS AND PROUD AT THE SAME

244
00:15:35,080 --> 00:15:36,430
TIME.

245
00:15:36,430 --> 00:15:43,660
>> OKAY IF YOU CAN PLEASE RAISE
YOUR HAND HIGH, A LOT OF FOLKS

246
00:15:43,660 --> 00:15:45,880
HERE.

247
00:15:45,880 --> 00:15:50,339
GO AHEAD.

248
00:15:50,339 --> 00:15:52,830
>> I HAVE A QUESTION FROM ONE OF
OUR LISTENERS.

249
00:15:52,830 --> 00:15:56,690
HOW LONG CAN NEW HORIZONS
CONTINUE TO TRANSMIT BEFORE IT'S

250
00:15:56,690 --> 00:15:58,040
POWER EXPIRES?

251
00:15:58,040 --> 00:16:01,150
>> I'LL TAKE A CRACK AT THAT?

252
00:16:01,150 --> 00:16:05,090
NEW HORIZONS IS POWERED BY RTG.

253
00:16:05,090 --> 00:16:17,830
THAT STANDS FOR RADIO
ISOSCOPE†THERMO GENERATOR.

254
00:16:17,830 --> 00:16:19,100
THAT'S WHAT WE ALL USE.

255
00:16:19,100 --> 00:16:21,280
THAT'S A TECHNOLOGY DEVELOPED
JOINTLY BY NASA AND THE

256

00:16:21,280 --> 00:16:25,600
DEPARTMENT OF ENERGY AND THE
ACTUAL POWER SOURCE INSIDE THE

257
00:16:25,600 --> 00:16:31,060
RTG IS THE ELEMENT PLUTONIUM
WHICH WAS NAMED FOR THE PLANET

258
00:16:31,060 --> 00:16:33,460
PLUTO IN THE 1930s.

259
00:16:33,460 --> 00:16:37,480
SO WE SENT A LITTLE PLUTONIUM
BACK TO PLUTO.

260
00:16:37,480 --> 00:16:43,270
THAT PRODUCES HEAT AND FROM THE
HEAT THERMO COUPLES TURN THAT

261
00:16:43,270 --> 00:16:46,530
INTO POWER FOR THE SPACECRAFT.

262
00:16:46,530 --> 00:16:54,980
IT WAS PRODUCING ABOUT 250 WATTS
BUT THAT DECLINES EVERY YEAR AS

263
00:16:54,980 --> 00:17:00,360
THE PLUTONIUM DECAYS AND
CURRENTLY PRODUCING ABOUT 202

264
00:17:00,360 --> 00:17:02,580
WATTS TO POWER THE SPACECRAFT
AND ALL THE INSTRUMENTS.

265
00:17:02,580 --> 00:17:07,789
BUT EVERY YEAR 3 LESS WATTS AND
AS THAT DECLINES EVENTUALLY

266
00:17:07,789 --> 00:17:10,230
WE'LL GET TO A POINT WHERE WE

CAN'T OPERATE THE PRIMARY

267
00:17:10,230 --> 00:17:13,470
SPACECRAFT COMPUTER AND
COMMUNICATION SYSTEM.

268
00:17:13,470 --> 00:17:17,970
WE ESTIMATED THAT THAT POINT
WILL BE REACHED SOMETIME IN THE

269
00:17:17,970 --> 00:17:19,779
MID 2030s.

270
00:17:19,779 --> 00:17:21,819
ROUGHLY 20 YEARS FROM NOW.

271
00:17:21,819 --> 00:17:25,269
AT THAT POINT THE SPACECRAFT
WILL BE 100 ASTRONO MIRKS CAL

272
00:17:25,269 --> 00:17:29,220
†-- FROM THE SUN.

273
00:17:29,220 --> 00:17:39,809
IT COULD DO A FLY BALL OF THE
BUILDING BLOCKS OF PLANETS LIKE

274
00:17:39,809 --> 00:17:44,029
MUY TOE AND THEN WE HAVE A
CHANCE TO GO FURTHER TO OBSERVE

275
00:17:44,029 --> 00:17:49,710
THE DEEP REACHES LIKE VOYAGER
DID AND DO THAT WITH MUCH MORE

276
00:17:49,710 --> 00:17:54,710
SENSITIVE INSTRUMENTS ABOARD
THIS SPACECRAFT AND HOPEFULLY

277

00:17:54,710 --> 00:17:58,231
RETURN DATA THAT WILL REALLY ADD
TO THE STOREHOUSE OF WHAT WE

278
00:17:58,231 --> 00:18:02,200
KNOW ABOUT OUR ENVIRONMENT IN
THE SOLAR SYSTEM AND POTENTIALLY

279
00:18:02,200 --> 00:18:07,990
EVEN TO CROSS THAT INTERSTELLAR
BOUNDARY WITH MUCH MORE MODERN

280
00:18:07,990 --> 00:18:12,420
INSTRUMENTATION.

281
00:18:12,420 --> 00:18:14,320
>> BEFORE YOU ASK THE QUESTION
I'M GOING TO TRY TO GET TO AS

282
00:18:14,320 --> 00:18:16,059
MANY MEDIA AS I CAN.

283
00:18:16,059 --> 00:18:19,440
IF YOU CAN HELP ME OUT HERE AND
JUST ASK ONE QUESTION.

284
00:18:19,440 --> 00:18:21,970
DON'T TRY TO SNEAK A FOLLOW UP
IN, OKAY?

285
00:18:21,970 --> 00:18:25,139
WE CAN GET TO AS MANY OF THESE
FOLKS AVAILABLE THROUGHOUT THE

286
00:18:25,139 --> 00:18:26,139
DAY FOR ONE-ON-ONE INTERVIEWS.

287
00:18:26,139 --> 00:18:28,400
>> NAME AND AFFILIATION.

288
00:18:28,400 --> 00:18:32,899
>> YEAH, I'M JUST WONDERING HOW
WHEN THE DATA COMES IN IT WILL

289
00:18:32,899 --> 00:18:34,360
BE PRIORITIZED.

290
00:18:34,360 --> 00:18:39,049
THERE'S A PRIORITIZATION BECAUSE
IT'S SUCH A SLOW, ALMOST 56K

291
00:18:39,049 --> 00:18:41,619
CONNECTION COMING BACK FROM
PLUTO.

292
00:18:41,619 --> 00:18:44,950
HOW IS IT GOING PRIORITIZED AS
IT COMES BACK IN OVER THE NEXT

293
00:18:44,950 --> 00:18:46,240
FEW MONTH?

294
00:18:46,240 --> 00:18:48,760
S.
>> WELL, THAT'S ACTUALLY A

295
00:18:48,760 --> 00:18:53,360
NUISANCE STORY.

296
00:18:53,360 --> 00:18:56,330
LET ME START BY SAYING OVER THE
NEXT COUPLE OF MONTHS THE

297
00:18:56,330 --> 00:18:59,200
SPACECRAFT†-- WELL, FOR THE NEXT
COUPLE OF WEEKS THE SPACECRAFT

298
00:18:59,200 --> 00:19:01,710
IS GOING TO BE SENDING SOME OF

THE HIGHEST PRIORITY DATA BACK

299
00:19:01,710 --> 00:19:06,140
ON THE GROUND BUT THEN AROUND
THE FIRST OF AUGUST WE'LL

300
00:19:06,140 --> 00:19:09,640
TRANSITION TO A MODE WHERE THE
SPACECRAFT IS SENDING WHAT WE

301
00:19:09,640 --> 00:19:11,850
CALL OUR LOW SPEED DATA SETS TO
THE GROUND.

302
00:19:11,850 --> 00:19:14,529
NOT COMING TO THE GROUND AT A
LOWER SPEED BUT TAKEN AND

303
00:19:14,529 --> 00:19:16,460
RECORDED AT A LOWER SPEED.

304
00:19:16,460 --> 00:19:21,139
THOSE ARE EASIER TO PLAN FOR.

305
00:19:21,139 --> 00:19:23,929
AND WE CHOSE THOSE TO COME TO
THE GROUND FIRST TO GIVE ALICE

306
00:19:23,929 --> 00:19:28,490
AND HER TEAM A MUCH NEEDED BREAK
FROM WHAT HAS BEEN A SIX MONTH

307
00:19:28,490 --> 00:19:32,230
HISTORIC ENCOUNTER OF SEVEN DAYS
AROUND THE CLOCK OPERATIONS.

308
00:19:32,230 --> 00:19:34,499
SO WE WANTED TO GIVE THEM A
BREAK AND THAT'S WHY WE'RE GOING

309
00:19:34,499 --> 00:19:37,429
TO SEND THE LOW SPEED TO THE
GROUND IN AUGUST AND SEPTEMBER

310
00:19:37,429 --> 00:19:39,649
AND THEN THEY'RE GOING TO CRANK
IT BACK UP.

311
00:19:39,649 --> 00:19:42,590
WE'LL START THE PLANNING FOR
THAT IN A COUPLE OF WEEKS.

312
00:19:42,590 --> 00:19:47,241
WE HAVE AGREED WITH NASA A LONG
TIME AGO WHICH DATA SETS FOR

313
00:19:47,241 --> 00:19:50,139
FIRST PRIORITY, SECOND PRIORITY
AND THIRD PRIORITY AND WE'LL

314
00:19:50,139 --> 00:19:52,600
SEND THEM DOWN IN THAT ORDER.

315
00:19:52,600 --> 00:19:55,369
INITIALLY WE'RE GOING TO SEND
ALL THE DATA DOWN AS THE BROWSE

316
00:19:55,369 --> 00:20:00,830
DATA SET THAT'S COMPRESSED ON
BOARD THE SPACECRAFT BY A FACTOR

317
00:20:00,830 --> 00:20:06,629
OF SEVERAL SO THAT WE CAN GET IT
DOWN MUCH MORE QUICKLY AND THEN

318
00:20:06,629 --> 00:20:09,570
WE'LL GO BACK AND SEND
EVERYTHING A SECOND TIME IN AN

319

00:20:09,570 --> 00:20:11,139
UNCOMPRESSED MANNER.

320
00:20:11,139 --> 00:20:16,570
THE ENTIRE PROCESS WILL TAKE A
PERIOD OF 16 MONTHS SO WE EXPECT

321
00:20:16,570 --> 00:20:20,460
TO FINISH THE LAST OF THE DATA
TRANSMIT IN OCTOBER OR NOVEMBER

322
00:20:20,460 --> 00:20:26,099
OF LAST YEAR.

323
00:20:26,099 --> 00:20:27,340
>> WHAT IS THE ACTUAL DATA RATE?

324
00:20:27,340 --> 00:20:30,320
I THINK 56K IS MUCH TOO HIGH.

325
00:20:30,320 --> 00:20:36,690
>> YEAH WE WISH IT WAS 56K.

326
00:20:36,690 --> 00:20:37,809
>> WE CALL IT RATE STEPPING.

327
00:20:37,809 --> 00:20:43,649
SO AS THE SPACECRAFT IS VIEWED
FROM THE GROUND AND GETS HIGHER

328
00:20:43,649 --> 00:20:50,429
IN THE SKY AND AS THAT INCREASES
IN ELEVATION FOLLOWING THAT WE

329
00:20:50,429 --> 00:20:54,130
CAN INCREASE THE DATA RATE SO AT
THE LOWEST RATE AT 10 DEGREE

330
00:20:54,130 --> 00:21:00,590

ELEVATION WE'RE AT ABOUT 1,000
BITS PER SECOND.

331
00:21:00,590 --> 00:21:04,740
NOW WHEN WE TRANSITION INTO A
SPIN MODE WE CAN ACTUALLY GET

332
00:21:04,740 --> 00:21:05,860
HIGHER RATES.

333
00:21:05,860 --> 00:21:13,730
ON TOP OF THAT, THE MASS DATA
RATE IS ABOUT 4,000 BITS PER

334
00:21:13,730 --> 00:21:16,679
SECOND DOWN LINK.

335
00:21:16,679 --> 00:21:19,549
>> WE'LL TAKE TWO QUESTIONS AND
THEN WE'LL GO TO SOCIAL MEDIA

336
00:21:19,549 --> 00:21:23,249
WHICH NO SURPRISE IS EXPLODING
WITH EXCITEMENT.

337
00:21:23,249 --> 00:21:28,720
SO THEN I'LL COME OVER HERE
BECAUSE I HAVEN'T HIT THIS SIDE

338
00:21:28,720 --> 00:21:29,770
YET.

339
00:21:29,770 --> 00:21:37,350
>> KEN CRAMER FOR NORTHEAST
ASTRONOMY FORUM IN NEW YORK.

340
00:21:37,350 --> 00:21:39,340
I'M VERY EXCITED TO BE HERE.

341

00:21:39,340 --> 00:21:46,149
THE QUESTION IS ABOUT THE
CRATERING.

342
00:21:46,149 --> 00:21:49,799
LOOKS LIKE NIT IMAGES YOU
RELEASED A DAY OR SO AGO WERE A

343
00:21:49,799 --> 00:21:57,009
LOT OF CRATERS AND THIS IMAGE
THAT YOU JUST SHOWED HERE SHOWS

344
00:21:57,009 --> 00:21:58,289
MAYBE ONE CRATER.

345
00:21:58,289 --> 00:22:00,289
I WONDER IF THAT IS†-- IS THAT
REAL?

346
00:22:00,289 --> 00:22:02,759
DO YOU SEE A LOT LESS CRATERS?

347
00:22:02,759 --> 00:22:03,820
AND WHY WOULD THAT BE?

348
00:22:03,820 --> 00:22:09,780
WHY IS THERE SUCH A DIFFERENCE?

349
00:22:09,780 --> 00:22:10,909
>> PLUTO AND SHARON LOOK
DIFFERENT.

350
00:22:10,909 --> 00:22:13,840
WE'VE KNOWN THAT FROM THE EARTH
BUT NOW WE CAN SEE HOW

351
00:22:13,840 --> 00:22:23,489
DRAMATICALLY DIFFERENT THEY ARE.

352

00:22:23,489 --> 00:22:26,960
MORE BATTERED SURFACE ON SHARON.

353
00:22:26,960 --> 00:22:31,540
WE CAN PUT NUMBERS COUNTING THE
CRATERS AS A FUNCTION OF THEIR

354
00:22:31,540 --> 00:22:32,679
SIZE.

355
00:22:32,679 --> 00:22:39,380
I HOPE THAT WE'LL BE ABLE TO
ESTABLISH THE SURFACE UNITS ON

356
00:22:39,380 --> 00:22:41,270
PLUTO AND SHARON.

357
00:22:41,270 --> 00:22:46,190
AS TO WHY IT LOOKS YOUNGER
EITHER IT'S INTERNAL ENGINE

358
00:22:46,190 --> 00:22:51,539
CONTINUES TO RUN AND THERE'S
ACTIVE PROCESSES TAKING PLACE OR

359
00:22:51,539 --> 00:22:58,460
THOSE ATMOSPHERIC PROCESSES ARE
THEMSELVES COVERING UP THE

360
00:22:58,460 --> 00:23:01,100
GEOLOGY AND COVERING UP THE
CRATER.

361
00:23:01,100 --> 00:23:06,490
WE'LL BE ABLE TO KNOW THAT IN
THE COMPETITIONAL DATA AND OTHER

362
00:23:06,490 --> 00:23:10,940
DATA SETS THAT I MENTIONED
BECAUSE WITH THOSE VARIOUS DATA

363
00:23:10,940 --> 00:23:14,669
SYSTEMS, YOU CAN REALLY READ THE
WHOLE STORY AND IT'S AMBIGUOUS

364
00:23:14,669 --> 00:23:16,760
TODAY FOR A COUPLE OF REASONS.

365
00:23:16,760 --> 00:23:19,399
ONE WE JUST GOT THE DATA AND
SECOND WE DON'T HAVE THE

366
00:23:19,399 --> 00:23:22,779
SUPPORTING DATA SETS TO REALLY
UNRAVEL THE WHOLE STORY.

367
00:23:22,779 --> 00:23:25,309
SO STAY TUNED.

368
00:23:25,309 --> 00:23:28,460
>> LET'S TAKE A COUPLE OF
QUESTIONS FROM SOCIAL MEDIA AND

369
00:23:28,460 --> 00:23:31,860
TWO QUESTIONS THAT ARE
REOCCURRING WHAT'S GOING ON?

370
00:23:31,860 --> 00:23:33,870
I'M HEARING A LOT OF BUZZ ON
THAT.

371
00:23:33,870 --> 00:23:34,940
>> THANK YOU.

372
00:23:34,940 --> 00:23:36,549
I APPRECIATE IT.

373
00:23:36,549 --> 00:23:38,840
NASA MARSHALL SPACE FLIGHT

CENTER AS WE MONITOR ALL THE

374
00:23:38,840 --> 00:23:42,299
GREAT QUESTIONS FROM ALL THE
FANS ON THE LINE WITH US.

375
00:23:42,299 --> 00:23:47,450
FIRST QUESTION IS DOES ANY OF
THE SURFACE FEATURES ON PLUTO

376
00:23:47,450 --> 00:23:56,210
SUGGEST POSSIBLE TECTONICS?

377
00:23:56,210 --> 00:23:57,270
>> I'M NOT SURE.

378
00:23:57,270 --> 00:23:59,039
THAT'S AN HONEST ANSWER.

379
00:23:59,039 --> 00:24:01,190
I THINK WE REALLY HAVE TO HAVE A
LITTLE TIME TO WORK WITH THE

380
00:24:01,190 --> 00:24:05,350
DATA AND LOOK AT IT CAREFULLY ON
A COMPUTER VERSUS SEEING IT ON

381
00:24:05,350 --> 00:24:09,169
THE SCREEN FOR A FEW SECONDS OR
ON THE SCREENS OVER IN THE

382
00:24:09,169 --> 00:24:12,179
SCIENCE ANALYSIS AREA FOR JUST A
FEW SECONDS BUT WE'RE GOING TO

383
00:24:12,179 --> 00:24:16,360
HAVE A CHANCE TO DO THAT TODAY
AND I THEY BY THE TIME THE

384

00:24:16,360 --> 00:24:20,000
EXPERTDS TAKE A LOOK WE CAN
REPORT BACK TO YOU TOMORROW FOR

385
00:24:20,000 --> 00:24:21,190
THE FIRST ANALYSIS.

386
00:24:21,190 --> 00:24:22,970
>> ONE MORE QUESTION, CHRIS.

387
00:24:22,970 --> 00:24:23,970
>> EXCELLENT.

388
00:24:23,970 --> 00:24:24,970
THANK YOU.

389
00:24:24,970 --> 00:24:26,590
HAS THE IS A IS ALWAYS
ENCOURAGING OUR YOUTH TO STUDY,

390
00:24:26,590 --> 00:24:31,039
THIS QUESTION COMES FROM ONE OF
OUR YOUNGER FANS.

391
00:24:31,039 --> 00:24:34,039
MY 9-YEAR-OLD SON WANTS TO KNOW
HOW LONG DID IT TAKE TO BUILD

392
00:24:34,039 --> 00:24:37,289
THE SPACECRAFT NEW HORIZONS?

393
00:24:37,289 --> 00:24:40,639
>> NEW HORIZONS WAS BUILT IN A
PERIOD OF FOUR YEARS AND TWO

394
00:24:40,639 --> 00:24:44,280
MONTHS BUT THAT INCLUDES THE
DESIGN PHASE AS WELL AS THE

395

00:24:44,280 --> 00:24:45,770
CONSTRUCTION AND TESTING.

396
00:24:45,770 --> 00:24:48,749
THE ENTIRE PROJECT FROM THE TIME
THAT WE GOT AUTHORITY RECEIVED

397
00:24:48,749 --> 00:24:53,359
FROM NASA UNTIL WE LAUNCHED WAS
4 YEARS AND TWO MONTHS WHICH IS

398
00:24:53,359 --> 00:24:57,249
PRETTY SHORT FOR OUTER PLANET
MISSIONS AND EVEN PLANETARY

399
00:24:57,249 --> 00:25:00,070
MISSIONS IN GENERAL BUT WE WERE
UNDER THE GUN TO MAKE THE

400
00:25:00,070 --> 00:25:05,750
JUPITER GRAVITY ASSIST LAUNCH
WINDOW IN EARLY 2006 AND WE WERE

401
00:25:05,750 --> 00:25:06,750
ABLE TO DO THAT.

402
00:25:06,750 --> 00:25:10,120
AND AS A RESULT WE WERE ABLE TO
MAKE THE ENCOUNTER TODAY.

403
00:25:10,120 --> 00:25:13,230
HAD WE NOT MADE THAT LAUNCH
WINDOW WE WOULD HAVE HAD TO FLY

404
00:25:13,230 --> 00:25:18,200
ANOTHER FOUR YEARS AND NOT
ENCOUNTERED PLUTO UNTIL 2019.

405
00:25:18,200 --> 00:25:22,110
SO WE WERE VERY WELL AWARE

DURING THIS PERIOD THAT WE WERE

406
00:25:22,110 --> 00:25:25,299
DESIGNING AND BUILDING NEW
HORIZONS THAT THERE WAS A BIG

407
00:25:25,299 --> 00:25:29,809
INCENTIVE TO MAKE THAT LAUNCH
WINDOW AND THE HOPKINS APPLIED

408
00:25:29,809 --> 00:25:34,149
PHYSICS LABORATORY TEAM AND
CONTRACTOR TEAM, THOSE OF US ON

409
00:25:34,149 --> 00:25:37,820
SCIENCE AND SOUTHWEST RESEARCH
RESPONSIBLE FOR PAYLOAD

410
00:25:37,820 --> 00:25:38,820
DEVELOPMENT.

411
00:25:38,820 --> 00:25:41,679
I THINK EVERYBODY KNEW THAT IT
WAS VERY IMPORTANT.

412
00:25:41,679 --> 00:25:44,989
A LOT OF PEOPLE THAT REALLY
SACRIFICED FAMILY TIME, NIGHTS

413
00:25:44,989 --> 00:25:46,070
AND WEEKENDS.

414
00:25:46,070 --> 00:25:50,070
A LOT OF OTHER PEOPLE DIDN'T
THINK IT COULD BE DONE BUT THIS

415
00:25:50,070 --> 00:25:53,730
TEAM MANAGED TO DO IT AND THEY
DESERVE A HUGE AMOUNT OF CREDIT.

416
00:25:53,730 --> 00:25:56,489
THEY NOT ONLY BUILT THAT
SPACECRAFT AND GOT IT LAUNCHED

417
00:25:56,489 --> 00:26:01,639
IN THAT UNBELIEVABLY SHORT TIME
BUT IT'S WORKED ESSENTIALLY

418
00:26:01,639 --> 00:26:07,960
FLAWLESSLY FOR THE WHOLE 9.5
YEARS.

419
00:26:07,960 --> 00:26:10,590
>> I'LL GIVE YOU THE LAST
QUESTION AND WE'LL TAKE A FEW

420
00:26:10,590 --> 00:26:16,209
MORE HERE AND WE'LL HAVE TO WRAP
UP.

421
00:26:16,209 --> 00:26:18,919
>> WHAT IS THE MAXIMUM
RESOLUTION YOU HOPE TO GET FROM

422
00:26:18,919 --> 00:26:23,090
THE PICTURES YOU'RE TAKING IN
THE SHADOWED AREAS WHERE SHARON

423
00:26:23,090 --> 00:26:25,770
LIES?

424
00:26:25,770 --> 00:26:27,799
>> THAT'S A LITTLE BIT OF A
DIFFICULT QUESTION TO ANSWER

425
00:26:27,799 --> 00:26:31,899
BECAUSE IT DEPENDS ON SOME OF
THE SUBTLETIES OF THE DATA

426

00:26:31,899 --> 00:26:34,149
ANALYSIS.

427
00:26:34,149 --> 00:26:37,029
FOR THOSE THAT DON'T KNOW WHAT
THE QUESTION IS ABOUT, NOW THAT

428
00:26:37,029 --> 00:26:40,919
THE SPACECRAFT IS BEYOND PLUTO
WHEN IT LOOKS BACK AT THE PLANET

429
00:26:40,919 --> 00:26:47,150
IT'S SEEING THE NIGHT SIDE AND
JUST A THIN CRESCENT.

430
00:26:47,150 --> 00:26:50,120
BUT WE ARRANGED THE FLY BY TO
OCCUR ON A DAY WHEN PLUTO'S

431
00:26:50,120 --> 00:26:58,499
LARGEST MOON SHARON IS ON THE
OTHER SIDE AND SUNLIGHT IS

432
00:26:58,499 --> 00:27:00,889
REFLECTING OFF SHARON AND
ILLUMINATING THE NIGHT SIDE

433
00:27:00,889 --> 00:27:01,999
TERRAIN.

434
00:27:01,999 --> 00:27:05,779
SO WE LOOK BACK WITH OUR CAMERAS
AT THOSE NIGHT SIDE TERRAINS

435
00:27:05,779 --> 00:27:10,590
ILLUMINATED BY SHARON LIGHT AND
WE CAN SEE IN THOSE TERRAINS.

436
00:27:10,590 --> 00:27:15,230
HOWEVER WE'RE LOOKING BACK INTO

THE GLARE OF THE SUN AND THE

437
00:27:15,230 --> 00:27:20,860
SUNLIGHT CREATES VARIOUS OPTICAL
EFFECTS ON THE IMAGES THAT CAN

438
00:27:20,860 --> 00:27:24,869
MAKE IT DIFFICULT TO SEE THE
DETAILS THAT ARE IN THEM.

439
00:27:24,869 --> 00:27:28,700
THE NATIVE RESOLUTION OF THE
IMAGES IS PRETTY GOOD BUT

440
00:27:28,700 --> 00:27:33,919
BECAUSE IT'S SO DARK, THE SIGNAL
TO NOISE IS LOW AND WE'LL HAVE

441
00:27:33,919 --> 00:27:38,609
TO ACTUALLY ADD THE PIXELS
TOGETHER IN A WAY THAT REDUCES

442
00:27:38,609 --> 00:27:43,419
RESOLUTION UNTIL WE BUILD UP THE
SIGNAL WELL ENOUGH THAT WE CAN

443
00:27:43,419 --> 00:27:45,919
ACTUALLY PICK OUT INDIVIDUAL
SURFACE UNITS.

444
00:27:45,919 --> 00:27:49,169
HOW FAR WE'LL HAVE TO DEGRADE
THAT RESOLUTION IN ORDER TO GET

445
00:27:49,169 --> 00:27:53,690
THE GOOD SIGNAL TO NOISE IS
DIFFICULT TO PREDICT IN ADVANCE

446
00:27:53,690 --> 00:27:57,799
BECAUSE WE'VE NEVER TURNED THE

CAMERAS BACK TO LOOK AT THE SUN.

447
00:27:57,799 --> 00:28:00,859
WE DIDN'T WANT TO RISK THAT
DURING THE FLIGHT OUT TO PLUTO.

448
00:28:00,859 --> 00:28:04,580
SO WE'LL HAVE TO SEE WHAT THE
OPTICAL EFFECTS ARE AND THEN SEE

449
00:28:04,580 --> 00:28:08,379
HOWELL WE CAN PRODUCE HIGH
RESOLUTION VERSUS MEDIUM

450
00:28:08,379 --> 00:28:10,769
RESOLUTION IMAGERY.

451
00:28:10,769 --> 00:28:14,509
>> ALL RIGHT.

452
00:28:14,509 --> 00:28:16,499
I KNOW THE SCIENTISTS HAVE BEEN
WORRIED THAT WHAT LITTLE

453
00:28:16,499 --> 00:28:20,169
ATMOSPHERE PLUTO HAS MIGHT HAVE
FROZEN OUT AND YOU WERE EAGER TO

454
00:28:20,169 --> 00:28:21,169
GET THERE.

455
00:28:21,169 --> 00:28:26,080
YOU MENTIONED YESTERDAY THAT
YOU'VE SEEN DATA FOR NITROGEN

456
00:28:26,080 --> 00:28:27,549
AND METHANE.

457
00:28:27,549 --> 00:28:29,479

NOW THAT YOU'VE SEEN THE
PICTURES IS IT FAIR TO SAY THAT

458
00:28:29,479 --> 00:28:32,230
IT SNOWS ON PLUTO?

459
00:28:32,230 --> 00:28:33,679
>> IT SURE LOOKS THAT WAY.

460
00:28:33,679 --> 00:28:36,889
>> PASS IT DOWN THIS WAY.

461
00:28:36,889 --> 00:28:40,110
PASS IT DOWN THIS WAY.

462
00:28:40,110 --> 00:28:44,610
>> THEN WE'RE GOING TO WRAP UP
HERE.

463
00:28:44,610 --> 00:28:48,509
>> ASTRONOMY NOW MAGAZINE, COULD
YOU TELL US A LITTLE BIT ABOUT

464
00:28:48,509 --> 00:28:50,979
THE OTHER DATA YOU GOT DOWN LAST
NIGHT?

465
00:28:50,979 --> 00:28:55,459
ARE THE MEMORY CHIPS FILLING UP,
FOR EXAMPLE?

466
00:28:55,459 --> 00:29:01,779
>> WELL, LAST NIGHT WE DOWN
LINKED THAT IMAGE WHICH YOU SAW

467
00:29:01,779 --> 00:29:04,350
ON THE SCREEN HERE.

468
00:29:04,350 --> 00:29:09,350

AND WE DID MONITOR HOW THAT
RECORDER WAS DOING AND IT

469
00:29:09,350 --> 00:29:14,850
ACTUALLY HAD FILLED UP A COUPLE
OF SEGMENTS SO EACH SEGMENT IS 4

470
00:29:14,850 --> 00:29:18,929
GIGABITS SO SINCE THE LAST
CONTACT WE HAD WITH IT IT WAS

471
00:29:18,929 --> 00:29:23,070
STARTING TO FILL UP THAT
RECORDER SO ONE OF THE THINGS

472
00:29:23,070 --> 00:29:26,929
THAT WE'LL DO TONIGHT IS GET
ANOTHER LOOK AT HOW MUCH DATA

473
00:29:26,929 --> 00:29:29,989
HAS BEEN RECORDED ON THAT
RECORDER AND HAVE A GOOD MEASURE

474
00:29:29,989 --> 00:29:34,609
OF HOW THE OBSERVATIONS ARE
GOING ON BOARD THE SPACECRAFT.

475
00:29:34,609 --> 00:29:42,979
>> I'M SORRY I WAS BROADCASTING
SO I HOPE THIS ISN'T A QUESTION

476
00:29:42,979 --> 00:29:47,229
THAT'S ALREADY BEEN ASKED BUT
THE LARGE SCALE PICTURE THAT

477
00:29:47,229 --> 00:29:53,789
WE'RE LOOKING AT HERE, I'M
SEEING MAYBE FIVE OR SIX

478
00:29:53,789 --> 00:29:58,230

DIFFERENT TERRAINS, REGIONS ON
THE BROADER SCALE.

479
00:29:58,230 --> 00:30:00,049
IS THAT ROUGHLY RIGHT?

480
00:30:00,049 --> 00:30:06,570
AND THE HEART FEATURE, THAT
APPEARS TO BE SLIGHTLY

481
00:30:06,570 --> 00:30:09,609
DIFFERENT, THE LEFT SIDE AND THE
RIGHT SIDE BUT I'M WONDERING IS

482
00:30:09,609 --> 00:30:14,350
THAT AN EFFECT OF THE SUB SOLAR
POINT OR IS THERE A DIFFERENCE

483
00:30:14,350 --> 00:30:15,929
WITHIN THE HEART FEATURE?

484
00:30:15,929 --> 00:30:20,440
>> I WOULD SAY WE'RE SEEING THE
SAME THING THAT YOU'RE SEEING

485
00:30:20,440 --> 00:30:21,440
LEO.

486
00:30:21,440 --> 00:30:25,350
HAND FULL OF INDIVIDUAL BROAD
SURFACE UNITS ACROSS THIS HEMS

487
00:30:25,350 --> 00:30:29,679
FEAR AND WE ARE SEEING A BIT OF
A LEFT RIGHT DICOTOMY ON THE

488
00:30:29,679 --> 00:30:30,679
HEART.

489

00:30:30,679 --> 00:30:35,200
WHEN WE GET COLOR DATA AND OTHER
DATA SETS WE'LL BE ABLE TO SAY

490
00:30:35,200 --> 00:30:44,619
MORE THINGS ABOUT THAT BUT
YOU'RE MAKING

491
00:30:44,619 --> 00:30:51,229
THE RIGHT
CONCLUSION.

492
00:30:51,229 --> 00:30:54,809
>> CAN YOU DESCRIBE WHAT EXACTLY
YOU'LL SEE ON THE MONITORS

493
00:30:54,809 --> 00:30:56,510
TONIGHT WHEN THE SIGNAL COMES
IN?

494
00:30:56,510 --> 00:31:00,399
WHAT'S THE HELLO EARTH DATA THAT
YOU'RE GOING TO BE GETTING IN?

495
00:31:00,399 --> 00:31:03,139
WHAT WILL POP UP FIRST?

496
00:31:03,139 --> 00:31:04,139
>> WHAT WILL POP FIRST.

497
00:31:04,139 --> 00:31:08,029
>> WHAT WILL SHOW UP ON THE
SCREEN FIRST.

498
00:31:08,029 --> 00:31:10,679
>> WHEN YOU ESTABLISH THE
HANDSHAKE BETWEEN THE GROUND

499
00:31:10,679 --> 00:31:16,879
STATION OR THE ANTENNA AND THE

SPACECRAFT THE FIRST THING THAT

500
00:31:16,879 --> 00:31:21,029
WE TRY TO LOCK IS CARRIER AND
THAT WILL TELL US THAT THE

501
00:31:21,029 --> 00:31:23,129
SPACECRAFT IS THERE.

502
00:31:23,129 --> 00:31:34,179
THE FIRST IS TURBO WHICH IS
TELEMITRY AND WE KNOW THAT IT'S

503
00:31:34,179 --> 00:31:36,090
TRANSMITTING AT THE EXPECTED
DATA RATE.

504
00:31:36,090 --> 00:31:41,289
IT HASN'T SWITCHED TO ANOTHER
DATA RATE SO THAT'S WHAT WE WILL

505
00:31:41,289 --> 00:31:42,289
SEE.

506
00:31:42,289 --> 00:31:46,169
IT'S JUST ONES AND ZEROS BUT IN
OUR DATA BASE ON THE GROUND WE

507
00:31:46,169 --> 00:31:52,049
MAP THAT SEQUENCE OF 1S AND 0S
TO STAY OUT OF LOCK OR LOCKED SO

508
00:31:52,049 --> 00:31:55,840
WE'LL ACTUALLY SEE THOSE WORDS
APPEAR ON THE SCREEN AND THEN

509
00:31:55,840 --> 00:32:00,289
WE'LL START TO GET REAL TIME
DATA FROM THE SPACECRAFT, NOT

510
00:32:00,289 --> 00:32:05,570
RECORDED BUT REAL TIME DATA AND
THAT CONSISTS OF THE MOST

511
00:32:05,570 --> 00:32:10,340
CRITICAL POINT FROM ALL THE
SUBSYSTEMS ON BOARD THE

512
00:32:10,340 --> 00:32:11,340
SPACECRAFT.

513
00:32:11,340 --> 00:32:16,349
SINCE THERE'S NOT ENOUGH ROOM.

514
00:32:16,349 --> 00:32:20,960
THERE'S THE CYCLE THAT THAT
TABLE WILL GO THROUGH.

515
00:32:20,960 --> 00:32:25,330
FIRST YOU MIGHT SEE POINTS THAT
ARE DEVOTED TO THE MAIN COMPUTER

516
00:32:25,330 --> 00:32:29,080
STATUS AND THEN YOU MIGHT SEE
POINTS DEVOTED TO GUIDANCE AND

517
00:32:29,080 --> 00:32:30,080
CONTROL.

518
00:32:30,080 --> 00:32:35,619
SO WE DON'T KNOW EXACTLY WHERE
IN THAT ROTATION WE WILL

519
00:32:35,619 --> 00:32:40,080
INTERCEPT SO WE'LL HAVE TO WAIT
AND WATCH THAT CYCLE THROUGH.

520
00:32:40,080 --> 00:32:44,210
WE SHOULD HAVE ENOUGH TIME TO

CYCLE THROUGH A FEW TIMES ON

521
00:32:44,210 --> 00:32:47,099
THAT TABLE.

522
00:32:47,099 --> 00:32:49,019
>> FOUR QUICK QUESTIONS, PLEASE.

523
00:32:49,019 --> 00:32:50,019
ONE.

524
00:32:50,019 --> 00:32:51,729
>> BOBBY RUSSELL WITH QUEST FOR
STARS.

525
00:32:51,729 --> 00:32:54,539
MY SOCIAL MEDIA COUNTER GOING
UP.

526
00:32:54,539 --> 00:32:58,349
WHEN WILL WE SEE COLOR DATA IN
PICTURES?

527
00:32:58,349 --> 00:33:01,010
>> WE HAVE COLOR DATA ON THE
GROUND RIGHT NOW.

528
00:33:01,010 --> 00:33:04,210
AND SO THE SCIENCE TEAM HAS BEEN
WORKING WITH THAT AND I BELIEVE

529
00:33:04,210 --> 00:33:06,720
THAT WE'RE GOING TO BE ABLE TO
SHOW YOU SOME OF THAT LATER IN

530
00:33:06,720 --> 00:33:12,399
THE DAY BUT WE'LL GET BACK TO
YOU WHEN WE CAN.

531

00:33:12,399 --> 00:33:14,700
>> BOB McDONALD FROM THE
CANADIAN BROADCASTING

532
00:33:14,700 --> 00:33:15,700
CORPORATION.

533
00:33:15,700 --> 00:33:18,489
CONGRATULATIONS ON CLOSEST
APPROACH BUT THAT WAS ALSO THE

534
00:33:18,489 --> 00:33:20,700
MOST DANGEROUS TIME FOR THE
SPACECRAFT.

535
00:33:20,700 --> 00:33:23,679
IF ANYTHING WAS GOING TO GO
WRONG THAT WAS IT.

536
00:33:23,679 --> 00:33:27,340
IF YOU DON'T HEAR FROM IT
TONIGHT HOW MUCH SCIENCE DO YOU

537
00:33:27,340 --> 00:33:30,499
HAVE AT THIS POINT?

538
00:33:30,499 --> 00:33:34,580
>> I DON'T THINK THAT WE'RE
GOING TO LOSE THE SPACECRAFT.

539
00:33:34,580 --> 00:33:40,570
WE HAVE ESTIMATED BASED UPON A
VARIETY OF DIFFERENT EXPERTS

540
00:33:40,570 --> 00:33:43,909
MAKING NUMERICAL MODELS OF HOW
MUCH DUST AND DEBRIS MIGHT BE IN

541
00:33:43,909 --> 00:33:47,799
THE SYSTEM AND PROBABILITY OF

LOSS OF MISSION.

542
00:33:47,799 --> 00:33:55,379
WE SET THAT AT AROUND 2 PARTS IN
10,000.

543
00:33:55,379 --> 00:34:00,149
SO YOU COULD FLY HUNDREDS OF NEW
HORIZONS THROUGH THE SYSTEM AND

544
00:34:00,149 --> 00:34:02,099
EXPECT ALL OF THEM TO SURVIVE.

545
00:34:02,099 --> 00:34:05,129
SO IT'S A VERY LOW PROBABILITY
BUT WE ALWAYS CAUTION THAT WE

546
00:34:05,129 --> 00:34:06,779
HAVE FLYING INTO THE UNKNOWN.

547
00:34:06,779 --> 00:34:10,050
AS YOU KNOW, WE HAVE BEEN
FURIOUSLY TRANSMITTING DATA TO

548
00:34:10,050 --> 00:34:11,530
THE GROUND THE LAST FEW DAYS.

549
00:34:11,530 --> 00:34:18,460
THOSE ARE FAIL SAFE DATA SETS
AND THE CONCEPT IS IDENTICAL TO

550
00:34:18,460 --> 00:34:21,460
THE CONCEPT USED ON THE APOLLO
MISSION.

551
00:34:21,460 --> 00:34:26,970
AS SOON AS THE MISSION COMMANDER
WOULD STEP TO THE SURFACE OF THE

552

00:34:26,970 --> 00:34:31,880
MOON AND SAY A FEW WORDS FOR
HISTORY, THEY WOULD IMMEDIATELY

553
00:34:31,880 --> 00:34:33,090
COLLECT THE FIRST SAMPLE.

554
00:34:33,090 --> 00:34:36,340
IT WAS CALLED A CONTINGENCY
SAMPLE IN CASE SOMETHING WENT

555
00:34:36,340 --> 00:34:40,390
WRONG AND THEY HAD TO TERMINATE
THE REST OF THE SPACE WALK AND

556
00:34:40,390 --> 00:34:43,440
COME BACK INTO THE LANDER AND
LEAVE.

557
00:34:43,440 --> 00:34:45,620
SO THEY HAD A LITTLE BIT OF
SOMETHING GUARENTEED.

558
00:34:45,620 --> 00:34:48,470
THAT'S WHAT WE HAVE BEEN DOING
OVER THE LAST FEW DAYS.

559
00:34:48,470 --> 00:34:52,320
WE DESIGNED THIS MORE THAN ABOUT
FOUR YEARS AGO.

560
00:34:52,320 --> 00:34:54,800
WE WENT THROUGH AND LOOKED AT
THE DATA SETS THAT HAD BEEN

561
00:34:54,800 --> 00:34:59,990
COLLECTED ON FINAL APPROACH AND
SELECTED FOR EACH OF OUR PRIMARY

562
00:34:59,990 --> 00:35:04,380

MISSION OBJECTIVES SOME SAMPLES
OF THAT DATA LIKE THE WONDERFUL

563
00:35:04,380 --> 00:35:09,590
IMAGE YOU JUST SAW BUT ALSO SOME
COLOR DATA AND COMPOSITIONAL,

564
00:35:09,590 --> 00:35:14,930
ULTRA VIOLENT, LOOKING AT THE
SURFACES AND ATMOSPHERES AND

565
00:35:14,930 --> 00:35:18,120
PARTICLES AND PLASMA DATA WAS
ALL SENT TO THE GROUND.

566
00:35:18,120 --> 00:35:22,440
THEY REVOLUTIONIZED OUR
KNOWLEDGE ABOUT PLUTO AND IT'S

567
00:35:22,440 --> 00:35:23,810
SATELLITES ALREADY.

568
00:35:23,810 --> 00:35:28,510
HOWEVER, IT WOULD BE GUILDING
THE LILY A LITTLE BIT IF I

569
00:35:28,510 --> 00:35:31,940
DIDN'T TELL YOU THAT 99% OF THE
DATA IS STILL IN THE SPACECRAFT

570
00:35:31,940 --> 00:35:35,430
AND SOME OF THE MOST IMPORTANT
STUFF IS IN THAT SO IT WOULD BE

571
00:35:35,430 --> 00:35:38,930
A GREAT DISAPPOINTMENT IN NEW
HORIZONS HAD BEEN LOST TO A

572
00:35:38,930 --> 00:35:50,540
DEBRIS STRIKES BUT I THINK HE

WILL BE FINE AT 9:00 TONIGHT.

573
00:35:50,540 --> 00:35:57,730
>> BASED ON THE INFORMATION LAST
NIGHT AND THE READJUSTED

574
00:35:57,730 --> 00:36:03,490
DIAMETER OF PLUTO, HOW
EXACTLY†-- HOW CLOSE DID NEW

575
00:36:03,490 --> 00:36:07,940
HORIZONS COME AT CLOSEST
APPROACH THIS MORNING DO YOU

576
00:36:07,940 --> 00:36:08,940
THINK?

577
00:36:08,940 --> 00:36:13,290
>> WELL, THAT'S REALLY A
NAVIGATION QUESTION.

578
00:36:13,290 --> 00:36:20,020
I CAN TELL YOU THAT WE WERE 72
SECONDS EARLY FOR THAT†--

579
00:36:20,020 --> 00:36:22,060
HITTING THAT AIM POINT.

580
00:36:22,060 --> 00:36:25,850
AND ALLEN, DO YOU KNOW EXACTLY
HOW†-- WHAT THE DISTANCE WAS?

581
00:36:25,850 --> 00:36:30,760
THE PLAN WAS 7750 MILES.

582
00:36:30,760 --> 00:36:35,270
>> OUR VERY LATEST ORBIT
DETERMINATION INDICATED THAT WE

583

00:36:35,270 --> 00:36:44,580
WERE GOING TO BE SOMEWHERE IN
THE VOIR DIRE TINTY OF 70

584
00:36:44,580 --> 00:36:45,830
KILOMETERS CLOSER.

585
00:36:45,830 --> 00:36:48,450
WE DID FLY THROUGH IT BUT A
LITTLE BIT OFF CENTER.

586
00:36:48,450 --> 00:36:49,650
WELL WITHIN SPECS.

587
00:36:49,650 --> 00:36:50,990
>> HEY, EVERYBODY.

588
00:36:50,990 --> 00:36:53,650
DAN WITH SPACE NEWS.

589
00:36:53,650 --> 00:36:59,520
I SUPPOSE THIS IS A QUESTION FOR
ALAN.

590
00:36:59,520 --> 00:37:07,990
WHEN CAN WE GO BACK TO PLUTO?

591
00:37:07,990 --> 00:37:10,060
>> I HAVE SECRETLY BEEN WORKING
ON A LANDER.

592
00:37:10,060 --> 00:37:15,060
I HAD A PRETTY GOOD BET SOMEBODY
WOULD ASK ME A QUESTION LIKE

593
00:37:15,060 --> 00:37:16,060
THAT.

594
00:37:16,060 --> 00:37:17,060

>> HAVE YOU REALLY?

595
00:37:17,060 --> 00:37:18,060
>> YEAH.

596
00:37:18,060 --> 00:37:21,800
I DO THINK THAT WE'LL RETURN TO
THE PLUTO SYSTEM.

597
00:37:21,800 --> 00:37:24,740
IT'S SO SCIENTIFICALLY
INTERESTING AND COMPELLING THAT

598
00:37:24,740 --> 00:37:28,100
WE'LL WANT TO SEND AN ORBITER OR
LANDER IN THE FUTURE.

599
00:37:28,100 --> 00:37:32,300
BUT DOING A MISSION LIKE THAT
WILL BE TOUGHER THAN NEW

600
00:37:32,300 --> 00:37:34,730
HORIZONS BECAUSE WE'LL WANT TO
COME TO A STOP.

601
00:37:34,730 --> 00:37:39,130
WE'LL WANT TO DEVELOP NEW
TECHNOLOGY TO DO THAT.

602
00:37:39,130 --> 00:37:43,070
PARTICULARLY WHEN WE WANT IT TO
CROSS IN A REASONABLE AMOUNT OF

603
00:37:43,070 --> 00:37:44,310
TIME.

604
00:37:44,310 --> 00:37:49,770
BE ABLE TO TRAVEL FAST AND THEN
ALSO COME TO A STOP.

605
00:37:49,770 --> 00:37:53,090
THERE ARE VERY GOOD CONCEPTS
THAT PEOPLE HAVE.

606
00:37:53,090 --> 00:37:57,660
PRELIMINARY CONCEPTS FOR HOW WE
DO FOLLOW UP MISSIONS BUT FIRST

607
00:37:57,660 --> 00:38:02,551
WE NEED TO SEE THIS DATA COME TO
THE GROUND AND ANALYZE IT FOR A

608
00:38:02,551 --> 00:38:04,810
PERIOD OF SOME YEARS.

609
00:38:04,810 --> 00:38:06,740
WE DON'T KNOW THE RIGHT
QUESTIONS TO ASK AND THEREFORE

610
00:38:06,740 --> 00:38:11,240
THE RIGHT INSTRUMENTS TO PUT ON
A LANDER OR ORBITER.

611
00:38:11,240 --> 00:38:14,160
SO I THINK IT'S A LITTLE
PREMATUREFUL WE'RE ALL EXCITED

612
00:38:14,160 --> 00:38:20,180
TOO AND WE'LL WANT TO SEE
POWERFUL INSTRUMENTS THERE BUT

613
00:38:20,180 --> 00:38:24,680
THE RIGHT THING TO DO IS ANALYZE
THE DATA WE HAVE ON THE GROUND

614
00:38:24,680 --> 00:38:28,250
AND THEN COME TO THAT QUESTION A
LITTLE BIT DOWN THE ROAD.

615

00:38:28,250 --> 00:38:29,250
>> OKAY.

616
00:38:29,250 --> 00:38:31,630
SO WE'RE GOING TO HAVE TO CLOSE
OUT HERE.

617
00:38:31,630 --> 00:38:34,830
I WILL REMIND THE MEDIA, THESE
FOLKS AND MANY OTHERS WILL BE

618
00:38:34,830 --> 00:38:36,610
AVAILABLE THROUGHOUT THE DAY FOR
INTERVIEWS.

619
00:38:36,610 --> 00:38:38,170
JUST CHECK IN WITH THE NEWSROOM.

620
00:38:38,170 --> 00:38:41,800
I'M GOING TO TURN IT OVER FOR
CLOSING REMARKS AND THEN I'LL DO

621
00:38:41,800 --> 00:38:44,780
SOME PROGRAMMING NOTES.

622
00:38:44,780 --> 00:38:47,150
>> I THINK YOU HAVE GOTTEN A
LITTLE BIT OF A SENSE OF THIS

623
00:38:47,150 --> 00:38:50,400
GREAT ADVENTURE OF SCIENCE THAT
WE'RE ON.

624
00:38:50,400 --> 00:38:54,070
WE HAVE A LONG DAY BEFORE WE GET
TO THE PHONE HOME SIGNAL.

625
00:38:54,070 --> 00:38:58,360
I'LL JUST MENTION BECAUSE I HAVE
BEEN WATCHING IT, IF YOU GO TO

626
00:38:58,360 --> 00:39:04,100
EYES.NASA.GOV YOU CAN SEE THE
DEEP SPACE NETWORK SIGNAL.

627
00:39:04,100 --> 00:39:08,790
SO YOU'LL BE ABLE TO SEE WHEN†--
ALMOST LIVE, WHEN THE DEEP SPACE

628
00:39:08,790 --> 00:39:13,220
NETWORK IS LOOKING AND THEN, YOU
KNOW, FOLLOW OUR STORY BECAUSE

629
00:39:13,220 --> 00:39:16,600
WE'LL CERTAINLY KEEP YOU
INFORMED WHEN NEW HORIZONS

630
00:39:16,600 --> 00:39:18,390
PHONES HOME.

631
00:39:18,390 --> 00:39:21,510
THROUGHOUT THE DAY, THOUGH, WE
HAVE A SERIES OF PANELS.

632
00:39:21,510 --> 00:39:24,560
SO YOU'LL BE ABLE TO HEAR THE
SCIENTISTS ACTUALLY TALKING

633
00:39:24,560 --> 00:39:26,380
ABOUT THEIR FIRST IMPRESSIONS.

634
00:39:26,380 --> 00:39:30,450
YOU'VE HEARD ALAN'S FIRST
IMPRESSIONS AND A FEW FROM THE

635
00:39:30,450 --> 00:39:35,330
PRESS HERE ON YOUR FIRST
IMPRESSIONS.

636

00:39:35,330 --> 00:39:37,910
WE ALL HAVE THEM AND IT'S JUST
INCREDIBLE THAT WE'RE GETTING

637
00:39:37,910 --> 00:39:41,760
OUR FIRST VIEWS OF PLUTO AND THE
PLUTO SYSTEM IN THIS HIGH

638
00:39:41,760 --> 00:39:42,970
RESOLUTION.

639
00:39:42,970 --> 00:39:47,410
BUT I CAN GUARANTEE WITH AS MUCH
CERTAINLY AS ANY OF US CAN THAT

640
00:39:47,410 --> 00:39:49,090
THE BEST IS YET TO COME.

641
00:39:49,090 --> 00:39:53,240
BOTH FROM IMAGES THAT YOU'LL SEE
LATER TODAY BEING WORKED ON AND

642
00:39:53,240 --> 00:39:55,620
WITH ALL OF OUR FINGERS AND TOES
CROSSED.

643
00:39:55,620 --> 00:39:59,880
THE GREAT IMAGES THAT NEW
HORIZONS IS TAKING RIGHT NOW

644
00:39:59,880 --> 00:40:04,390
THAT WILL BE OVER THE NEXT DAYS,
WEEKS AND MONTHS AND FOR THE

645
00:40:04,390 --> 00:40:06,480
NEXT 15 MONTHS.

646
00:40:06,480 --> 00:40:08,270
AND THAT'S ONLY PART OF THE
STORY.

647
00:40:08,270 --> 00:40:11,110
YOU KNOW WHAT WE HAVE SEEN
ALREADY FROM PLUTO IS THAT IT'S

648
00:40:11,110 --> 00:40:19,990
A COMPLEX, INTERESTING WORLD.

649
00:40:19,990 --> 00:40:21,420
WE FOUND IT'S INTERESTING.

650
00:40:21,420 --> 00:40:24,170
YOU HAVE ALL BEEN FOLLOWING
CURIOSITY.

651
00:40:24,170 --> 00:40:30,110
THERE WAS A LOT OF DISCUSSION,
IS MARS RELATIVELY

652
00:40:30,110 --> 00:40:35,010
STRAIGHTFORWARD OR VERY COMPLEX.

653
00:40:35,010 --> 00:40:38,430
NOW CURIOSITY IS SHOWING US THAT
MARS IS VERY COMPLEX.

654
00:40:38,430 --> 00:40:41,840
A WHOLE WORLD, MUCH LIKE THE
EARTH.

655
00:40:41,840 --> 00:40:45,180
WE HAVE SPACECRAFT ORBITING THE
EARTH TRYING TO TELL OUR STORY

656
00:40:45,180 --> 00:40:46,900
WHICH IS EVEN MORE COMPLEX.

657
00:40:46,900 --> 00:40:50,110
OUR ATMOSPHERE IS REALLY TOUGH

TO UNDERSTAND.

658
00:40:50,110 --> 00:40:54,580
AND OF COURSE EXISTENCE OF LIFE
ON EARTH FOREVER CHANGED THE

659
00:40:54,580 --> 00:40:58,240
ATMOSPHERE AND THE GEOLOGY OF
EARTH.

660
00:40:58,240 --> 00:41:01,670
SO WE'RE SCRATCHING THE SURFACE
OF OUR SOLAR SYSTEM AND MUCH,

661
00:41:01,670 --> 00:41:07,010
MUCH MORE, JUNO WILL ARRIVE NEXT
YEAR AT JUPITER.

662
00:41:07,010 --> 00:41:12,600
WE'LL LAUNCH THE GEO MONITORING
STATION ON MARS AN THE MISSION

663
00:41:12,600 --> 00:41:17,060
TO ACTUALLY DO A TOUCH AND GO
AND BRING SAMPLES BACK.

664
00:41:17,060 --> 00:41:20,500
SO THIS IS JUST THE MOST
INCREDIBLE TIME FOR PLANETARY

665
00:41:20,500 --> 00:41:25,720
SCIENCE AND I THINK IT'S FITTING
THAT YOU'RE ALL HERE SHOWING

666
00:41:25,720 --> 00:41:29,490
THIS GREAT INTEREST FOR THIS
INCREDIBLE ACHIEVEMENT.

667
00:41:29,490 --> 00:41:34,730
THE CAPSTONE EVENT.

668
00:41:34,730 --> 00:41:36,750
CONGRATULATIONS ELLEN AND ALAN.

669
00:41:36,750 --> 00:41:40,350
I HOPE YOU ENJOY THE DAY AND
LEARN A LOT AND COMMUNICATE IT

670
00:41:40,350 --> 00:41:44,250
TO ALL OF YOUR SUBSCRIBERS AND
READERS BECAUSE THIS IS AN

671
00:41:44,250 --> 00:41:46,960
INCREDIBLE JOURNEY AND TRUE
EXPLORATION.

672
00:41:46,960 --> 00:41:49,110
I'M THRILLED TO BE HERE.

673
00:41:49,110 --> 00:41:50,110
>> OKAY.

674
00:41:50,110 --> 00:41:54,730
SO SOCIAL MEDIA, FOLLOW IT ON
TWITTER.

675
00:41:54,730 --> 00:41:58,050
THIS MISSION, FACEBOOK, YOUTUBE,
AND OTHERS.

676
00:41:58,050 --> 00:42:00,590
THE CONVERSATION IS ASTOUNDING.

677
00:42:00,590 --> 00:42:02,960
AND ALL THE INFORMATION YOU
HEARD TODAY AND YOU WILL BE

678
00:42:02,960 --> 00:42:09,430
HEARING WEEKS, MONTHS, YEARS

PROBABLY.

679
00:42:09,430 --> 00:42:12,500
NASA.GOV/NEW HORIZONS.

680
00:42:12,500 --> 00:42:16,000
LADIES AND GENTLEMEN, AMERICA'S
SPACE PROGRAM HAS WRITTEN A NEW

681
00:42:16,000 --> 00:42:19,530
CHAPTER IN SCIENCE AND
EXPLORATION.