



Alan Stern

New Horizons Principal Investigator



1
00:00:21,939 --> 00:00:24,339
LIVE FROM THE JOHNS HOPKINS
APPLIED PHYSICS LABORATORY IN

2
00:00:24,339 --> 00:00:28,210
LAUREL, MARYLAND, WELCOME TO
"LIVE COUNTDOWN TO PLUTO."

3
00:00:28,210 --> 00:00:33,640
I'M MIKE BUCKLEY JOINED BY MY
COLLEAGUE, DWAYNE BROWN, FROM

4
00:00:33,640 --> 00:00:35,320
NASA'S OFFICE OF COMMUNICATIONS.

5
00:00:35,320 --> 00:00:36,820
WE'RE ON A RIDE.

6
00:00:36,820 --> 00:00:38,120
>> IT'S GETTING CLOSE.

7
00:00:38,120 --> 00:00:40,410
THIS IS WHAT I CALL AN S.T.

8
00:00:40,410 --> 00:00:41,540
MISSION.

9
00:00:41,540 --> 00:00:43,370
WHAT'S S.T.?

10
00:00:43,370 --> 00:00:44,640
WORDS THAT ENDS IN S-T.

11
00:00:44,640 --> 00:00:49,699
FASTEST, MOST, FARTHEST.

12
00:00:49,699 --> 00:00:53,059
THIS HISTORIC MISSION IS ONE OF

MANY FIRSTS.

13

00:00:53,059 --> 00:00:55,559

LET'S LOOK AT SOME EXAMPLES OF
THOSE S.T.

14

00:00:55,559 --> 00:00:56,559

WORDS.

15

00:00:56,559 --> 00:00:58,700

THE FASTEST SPACECRAFT EVER
LAUNCHED.

16

00:00:58,700 --> 00:01:01,499

THE FARTHEST DESTINATION EVER
EXPLORED.

17

00:01:01,499 --> 00:01:04,500

FIRST MISSION TO PLUTO IN A
BINARY PLANET SYSTEM.

18

00:01:04,500 --> 00:01:06,930

FIRST MISSION IN NASA'S NEW
FRONTIERS PROGRAM.

19

00:01:06,930 --> 00:01:13,240

MIKE, I HAVE TO TELL YOU, THE
MEDIA AND THE PUBLIC LOVE S.T.

20

00:01:13,240 --> 00:01:14,240

MISSIONS.

21

00:01:14,240 --> 00:01:15,240

THIS IS A GOLD MINE.

22

00:01:15,240 --> 00:01:16,409

THEY'RE LOVING IT.

23

00:01:16,409 --> 00:01:19,550

>> YOU CAN SEE IT IN THE
ATTENTION AND COVERAGE ON LINE,

24

00:01:19,550 --> 00:01:21,080
EVERYPLACE YOU LOOK.

25

00:01:21,080 --> 00:01:22,080
GREAT.

26

00:01:22,080 --> 00:01:25,210
WE'RE COUNTING DOWN TO NEW
HORIZONS' HISTORIC FLY-BY.

27

00:01:25,210 --> 00:01:29,380
WE'RE A DAY AWAY AND A MILLION
MILES TO PLUTO.

28

00:01:29,380 --> 00:01:32,190
WHEN NEW HORIZONS GETS THERE, AS
YOU'D EXPECT, OUR SPACECRAFT IS

29

00:01:32,190 --> 00:01:44,660
IN FOR A VERY BUSY DAY.

30

00:01:44,660 --> 00:01:47,390
>> SO JULY 14th'S GOING TO BE
EXCITING.

31

00:01:47,390 --> 00:01:50,410
WE WILL A WHOLE SUITE OF
INSTRUMENTS.

32

00:01:50,410 --> 00:01:54,300
THINGS HEAT UP THREE HOURS TO
APPROACH.

33

00:01:54,300 --> 00:01:58,770
AS WE'RE FLYING BY, MY HAND IS
PLUTO, THE SPACECRAFT WILL FLY

34
00:01:58,770 --> 00:02:04,000
BY AND SCAN THE INSTRUMENT CRASS
THE SURFACE OF PLUTO TO BUILD A

35
00:02:04,000 --> 00:02:06,410
SPECTRAL IMAGE OF WHAT THE
SURFACE LOOKS LIKE.

36
00:02:06,410 --> 00:02:10,860
THEN AS WE GET AROUND TOWARD
PLUTO'S TERMINATOR, WE TAKE OUR

37
00:02:10,860 --> 00:02:15,600
LONG, HIGH-RESOLUTION SCANS IN
BLACK AND WHITE WHICH MEANS THAT

38
00:02:15,600 --> 00:02:19,700
WE CAN USE THE VERY WIDE FIELD.

39
00:02:19,700 --> 00:02:24,200
AND AT THE SAME TIME USE THE
NARROW FIELD LAURIE SO WE GET

40
00:02:24,200 --> 00:02:29,700
5,000 PIXELS ACROSS PLUTO, HALF
A KILOMETER RESOLUTION AT

41
00:02:29,700 --> 00:02:30,880
CLOSEST APPROACH.

42
00:02:30,880 --> 00:02:35,970
AT THE SAME TIME, WE HAVE THIS
VERY SKINNY INSET OF THE LORI

43
00:02:35,970 --> 00:02:37,010
FIELD OF VIEW.

44
00:02:37,010 --> 00:02:41,200
AND ONLY ABOUT 100 METERS PER

PIXEL.

45

00:02:41,200 --> 00:02:44,860
SO WE TAKE OUR LORI IMAGES ONE
AFTER ANOTHER, OVERLAPPING

46

00:02:44,860 --> 00:02:50,890
IMAGES SO IT LOOKS LIKE THIS BIG
PLATE OF PLUTO AND THE SKINNY

47

00:02:50,890 --> 00:02:55,810
LITTLE NOODLE OF LORI RUNNING
ACROSS.

48

00:02:55,810 --> 00:02:59,440
FOR THE FIRST TIME IN THE
HISTORY WE ARE BEHIND PLUTO,

49

00:02:59,440 --> 00:03:01,620
TAKING PICTURE BACK ON THE FAR
SIDE.

50

00:03:01,620 --> 00:03:06,710
THE ALICE INSTRUMENT WILL DO
WATCHING THE SUN SET BEHIND

51

00:03:06,710 --> 00:03:07,710
PLUTO.

52

00:03:07,710 --> 00:03:10,490
THE DEEP SPACE NETWORK WILL BE
TRANSMITTING A SIGNAL.

53

00:03:10,490 --> 00:03:16,020
AND THAT SIGNAL WILL BE PICKED
UP BY THE ANTENNA AND CHANGE THE

54

00:03:16,020 --> 00:03:18,460
ATMOSPHERE OF PLUTO IT GOES
THROUGH.

55
00:03:18,460 --> 00:03:20,350
THAT'S HOW WE PROBE THE
ATMOSPHERE.

56
00:03:20,350 --> 00:03:23,459
THE PRESSURE AND TEMPERATURE
RIGHT NEAR THE SURFACE.

57
00:03:23,459 --> 00:03:26,700
JULY 14th IS THE APEX OF WHAT
WE'VE BEEN LOOKING FOR.

58
00:03:26,700 --> 00:03:29,960
WE LAUNCHED MORE THAN NINE YEARS
AGO.

59
00:03:29,960 --> 00:03:33,810
EVER SINCE WE'VE BEEN TRYING TO
SHEPHERD IT ACROSS THE SOLAR

60
00:03:33,810 --> 00:03:35,620
SYSTEM.

61
00:03:35,620 --> 00:03:38,260
>> NEW HORIZONS IS A SMALL TEAM.

62
00:03:38,260 --> 00:03:42,370
STILL, WE'VE BEEN WORKING ON
THIS FOR OVER A DECADE.

63
00:03:42,370 --> 00:03:48,400
YOU ADD IT UP AND IT'S 2.5
MILLION WORK HOURS TO GET TO

64
00:03:48,400 --> 00:03:49,400
PLUTO.

65
00:03:49,400 --> 00:03:53,099

>> WE CAN'T WAIT TO GET TO PLUTO
AND JULY 14th TO SEE WHAT THE

66

00:03:53,099 --> 00:03:54,340
SURFACE LOOKS LIKE.

67

00:03:54,340 --> 00:04:05,410
WE'RE READY TO GO, AND IT'S SHOW
TIME.

68

00:04:05,410 --> 00:04:08,130
\\MM
>> COMING TO US FROM THE REMOTE

69

00:04:08,130 --> 00:04:11,190
SET OUTSIDE MISSION OPERATIONS
AT THE APPLIED PHYSICS LAB IS

70

00:04:11,190 --> 00:04:14,160
NEW HORIZONS MISSION OPERATIONS
MANAGER ALICE BOWMAN.

71

00:04:14,160 --> 00:04:17,320
ALICE, CAN YOU AND THE TEAM
START TO FEEL HOW CLOSE TO PLUTO

72

00:04:17,320 --> 00:04:18,320
WE ARE?

73

00:04:18,320 --> 00:04:21,150
>> MIKE, IT'S JUST WONDERFUL.

74

00:04:21,150 --> 00:04:24,620
WE ARE JUST SIMPLY AMAZED AT THE
DATA THAT THE SPACECRAFT IS

75

00:04:24,620 --> 00:04:25,680
RETURNING.

76

00:04:25,680 --> 00:04:28,860
>> BUT FIRST QUESTION, SO HOW
NEW HORIZONS?

77
00:04:28,860 --> 00:04:32,030
>> WELL, WE'VE BEEN MONITORING
ALL THE SUBSYSTEMS AND

78
00:04:32,030 --> 00:04:33,460
INSTRUMENTS.

79
00:04:33,460 --> 00:04:34,590
EVERYTHING IS HEALTHY.

80
00:04:34,590 --> 00:04:37,410
WE'RE READY FOR THE CLOSEST
APPROACH SCIENCE.

81
00:04:37,410 --> 00:04:41,340
>> LET'S LOOK INSIDE THE MISSION
OPERATIONS CENTER AT APL AND THE

82
00:04:41,340 --> 00:04:43,080
ACTIVITY HAPPENING THERE NOW.

83
00:04:43,080 --> 00:04:45,870
ALICE, IF YOU COULD LOOK FORWARD
FOR A COUPLE OF DAYS AND LET US

84
00:04:45,870 --> 00:04:49,680
KNOW ON THE MORNING OF THE 14th
WHEN NEW HORIZONS IS FLYING PAST

85
00:04:49,680 --> 00:04:52,220
PLUTO, WHAT WILL THIS ROOM LOOK
LIKE?

86
00:04:52,220 --> 00:04:55,960
>> MIKE, AS YOU KNOW, THE
SPACECRAFT CAN'T BE

87
00:04:55,960 --> 00:04:58,910
COMMUNICATING WITH EARTH AT THE
SAME TIME THAT IT'S TAKING

88
00:04:58,910 --> 00:04:59,910
SCIENCE.

89
00:04:59,910 --> 00:05:03,690
BUT AS YOU ALSO KNOW, WE HAVE AN
INSTRUMENT ON BOARD THE

90
00:05:03,690 --> 00:05:09,210
SPACECRAFT THAT REQUIRES AN
UPLINK SIGNAL FROM THE EARTH.

91
00:05:09,210 --> 00:05:12,790
IF YOU WERE TO LOOK IN THE
MISSION OPERATIONS CENTER

92
00:05:12,790 --> 00:05:16,110
BETWEEN MAYBE 4:30 AND 6:30 A.M.

93
00:05:16,110 --> 00:05:19,430
EASTERN TIME, YOU WOULD SEE THAT
WE WOULD HAVE OUR FLIGHT

94
00:05:19,430 --> 00:05:25,350
CONTROLLERS AND MEMBERS OF THE
REX TEAM CONFIGURING THE

95
00:05:25,350 --> 00:05:26,350
ANTENNAS.

96
00:05:26,350 --> 00:05:29,470
WE WILL BE UP WITH SEVEN OF THE
DEEP SPACE NETWORK ANTENNAS

97
00:05:29,470 --> 00:05:31,210

SIMULTANEOUSLY.

98
00:05:31,210 --> 00:05:35,650
AND YOU WILL SEE THEM
CONFIGURING THOSE ANTENNAS AND

99
00:05:35,650 --> 00:05:38,680
SENDING THE UPLINK SIGNAL TO THE
SPACECRAFT.

100
00:05:38,680 --> 00:05:42,900
THEN 4.5 HOURS LATER WHEN THAT
SIGNAL ARRIVES TO THE

101
00:05:42,900 --> 00:05:48,650
SPACECRAFT, THAT'S WHEN THE
OBSERVATION WILL OCCUR.

102
00:05:48,650 --> 00:05:49,730
>> THIS IS DWAYNE.

103
00:05:49,730 --> 00:05:51,240
THAT'S THE MORNING EVENT.

104
00:05:51,240 --> 00:05:54,229
FOLKS HAVE TO REMEMBER THAT THIS
IS A TWO-PART AFFAIR.

105
00:05:54,229 --> 00:05:57,270
THERE'S THING HAPPENING ON THE
EVENING OF JULY 14th.

106
00:05:57,270 --> 00:05:58,830
TELL US ABOUT THAT.

107
00:05:58,830 --> 00:05:59,830
>> YES.

108
00:05:59,830 --> 00:06:02,470

THE EVENING IS GOING TO BE
PRETTY EXCITING.

109

00:06:02,470 --> 00:06:07,530
WE WILL HAVE A SLIGHT BREAK IN
THE SCIENCE OBSERVATIONS ON

110

00:06:07,530 --> 00:06:08,530
BOARD THE SPACECRAFT.

111

00:06:08,530 --> 00:06:13,070
AND THE SPACECRAFT WILL TURN AND
POINT TO EARTH AND SEND 15

112

00:06:13,070 --> 00:06:15,260
MINUTES OF TELEMETRY TOWARD
EARTH.

113

00:06:15,260 --> 00:06:19,780
WE'LL RECEIVE THAT TELEMETRY
ABOUT 4.5 HOURS LATER WHICH WILL

114

00:06:19,780 --> 00:06:22,300
BE AT ABOUT -- A LITTLE BEFORE
9:00 P.M.

115

00:06:22,300 --> 00:06:25,560
EASTERN TIME.
8:53 TO BE EXACT.

116

00:06:25,560 --> 00:06:29,330
THE MOCK WILL HAVE SUBSYSTEM
ENGINEERS ANXIOUSLY AWAITING

117

00:06:29,330 --> 00:06:30,330
THAT DATA.

118

00:06:30,330 --> 00:06:35,580
WE'LL BE UP WITH MADRID STATION
AND WILL LOCK ON TO THAT SIGNAL.

119

00:06:35,580 --> 00:06:39,410

AND OUR SUBSYSTEM ENGINEERS WILL
BE ABLE TO EVALUATE THE HEALTH

120

00:06:39,410 --> 00:06:43,410

OF THE SPACECRAFT AND HOPEFULLY
TELL HOW MUCH DATA HAS BEEN

121

00:06:43,410 --> 00:06:45,550

RECORDED TO THE RECORDERS.

122

00:06:45,550 --> 00:06:51,130

>> ALICE, I KNOW IT'S A LOT OF
INTENSITY AND EXCITEMENT.

123

00:06:51,130 --> 00:06:55,710

HOW DO YOU RELAX, SORT OF JUST
TO SETTLE DOWN BEFORE YOU REALLY

124

00:06:55,710 --> 00:06:59,509

GET INTO ALL OF THE ENGINEERING
AND ALL OF THE MISSION OPS?

125

00:06:59,509 --> 00:07:01,949

HOW DO YOU DO THAT?

126

00:07:01,949 --> 00:07:06,270

>> WELL, MANY OF US WILL BE
TAKING MAYBE CATNAPS IN OUR

127

00:07:06,270 --> 00:07:07,270

OFFICES.

128

00:07:07,270 --> 00:07:12,330

WE'RE ALSO EXCITED TO BE PART OF
THIS MISSION TO SEE THAT DATA

129

00:07:12,330 --> 00:07:13,620

FOR THE FIRST TIME.

130

00:07:13,620 --> 00:07:19,140

IT'S GOING TO BE HARD FOR US TO
RELAX UNTIL AFTER THAT CLOSEST

131

00:07:19,140 --> 00:07:20,810

APPROACH FLY-BY TELEMETRY.

132

00:07:20,810 --> 00:07:24,669

>> ALICE, I GUESS AT LEAST THEN
YOU'VE GOT THINGS TO KEEP YOU

133

00:07:24,669 --> 00:07:25,669

BUSY.

134

00:07:25,669 --> 00:07:27,270

WHAT'S HAPPENING WITH THE
OPERATIONS TEAM OVER THE NEXT

135

00:07:27,270 --> 00:07:28,810

DAY OR TWO?

136

00:07:28,810 --> 00:07:29,810

>> YES.

137

00:07:29,810 --> 00:07:34,270

IN FACT, THIS MORNING WE GOT
SOME OPTICAL NAVIGATION DATA

138

00:07:34,270 --> 00:07:35,710

DOWN FROM THE SPACECRAFT.

139

00:07:35,710 --> 00:07:39,180

WE WERE UP WITH THE GOLDSTONE
ANTENNAS.

140

00:07:39,180 --> 00:07:42,430

THAT DATA IS NOW BEING PROCESSED

BY THE NAVIGATION GUIDANCE AND

141

00:07:42,430 --> 00:07:46,480

CONTROL AND SCIENCE OPERATIONS
TEAM.

142

00:07:46,480 --> 00:07:50,630

ABOUT 1:30 THIS AFTERNOON WE'LL
GET ANOTHER AND FINAL SET OF

143

00:07:50,630 --> 00:07:52,300

OPTICAL NAVIGATION DATA.

144

00:07:52,300 --> 00:07:54,800

AND THIS IS DATA THAT'S GOING TO
BE USED TO DETERMINE WHETHER OR

145

00:07:54,800 --> 00:07:58,680

NOT WE NEED TO DO A SLIGHT TIME
ADJUSTMENT TO THE SCIENCE

146

00:07:58,680 --> 00:07:59,900

OBSERVATIONS.

147

00:07:59,900 --> 00:08:04,380

ADDITIONALLY, WE'RE GOING TO BE
BRINGING DOWN MORE SCIENCE DATA

148

00:08:04,380 --> 00:08:08,810

AND ALSO IN THE EVENING, WE'LL
BE DOING AN UPLINK TO THE REX

149

00:08:08,810 --> 00:08:09,810

INSTRUMENT.

150

00:08:09,810 --> 00:08:14,669

>> SOUNDS LIKE A BUSY ENOUGH DAY
LEADING UP TO THIS.

151

00:08:14,669 --> 00:08:15,919

THANKS, ALICE.

152

00:08:15,919 --> 00:08:16,919

>> THANKS.

153

00:08:16,919 --> 00:08:19,570

>> NOW HOW MUCH TIME WOULD IT
TAKE TO FIND YOUR PLUTO TIME?

154

00:08:19,570 --> 00:08:24,300

IF YOU HAVE A MINUTE, WE'VE GOT
AN ANSWER.

155

00:08:24,300 --> 00:08:28,830

>> PLUTO IS WAY FAR AWAY, BUT
IT'S WAY BRIGHTER UP THERE THAN

156

00:08:28,830 --> 00:08:29,830

YOU'D THINK.

157

00:08:29,830 --> 00:08:38,229

THIS IS "PLUTO IN
A MINUTE."

158

00:08:38,229 --> 00:08:40,990

PLUTO ROTATES ON ITS AXIS JUST
LIKE THE EARTH DOES WHICH MEANS

159

00:08:40,990 --> 00:08:43,430

PLUTO HAS DAYS JUST LIKE THE
EARTH.

160

00:08:43,430 --> 00:08:45,329

HOWEVER, THEY ARE SLIGHTLY
LONGER DAYS.

161

00:08:45,329 --> 00:08:50,380

EACH DAY ON PLUTO LASTS FOR 6.4
EARTH DAYS, 153 HOURS.

162

00:08:50,380 --> 00:08:52,839

AND JUST LIKE ON EARTH, THE
LENGTH OF THE DAYS ON PLUTO VARY

163

00:08:52,839 --> 00:08:56,170

DEPENDING ON LATITUDE, THAT IS
HOW CLOSE TO ONE OF THE POLES

164

00:08:56,170 --> 00:08:57,170

YOU ARE.

165

00:08:57,170 --> 00:08:58,860

PLUTO'S AXIS IS TILTED.

166

00:08:58,860 --> 00:09:01,680

FROM NEW HORIZONS'S PERSPECTIVE
AND THE PICTURES YOU'RE SEEING,

167

00:09:01,680 --> 00:09:04,860

THE NORTH POLE IS TILTED TOWARD
THE SPACECRAFT.

168

00:09:04,860 --> 00:09:08,690

YOU SEE IT $\frac{1}{3}$ OR A QUARTER WAY
DOWN IN THE PICTURES.

169

00:09:08,690 --> 00:09:12,980

THAT MEANS THERE ARE LONGER
CONTINUOUS DAYS, AND OTHER SPOTS

170

00:09:12,980 --> 00:09:15,500

HAVE SHORT DAYS OR NO DAY AT
ALL.

171

00:09:15,500 --> 00:09:18,100

THE CONSTANT LIGHT AND CONSTANT
DARK AREAS CHANGE DEPENDING

172

00:09:18,100 --> 00:09:19,910
WHERE PLUTO IS IN ITS ORBIT.

173

00:09:19,910 --> 00:09:23,150
ALTHOUGH IT'S THREE MILLION
MILES FROM EARTH, IT'S BRIGHTER

174

00:09:23,150 --> 00:09:25,120
AT MID PLUTO DAY THAN YOU THINK.

175

00:09:25,120 --> 00:09:26,250
GO TO [SOLAR.NASA.GOV/PLUTOTIME](https://solar.nasa.gov/plutotime).

176

00:09:26,250 --> 00:09:33,720
IT WILL TAKE YOU
WHAT THE

177

00:09:33,720 --> 00:09:36,270
EQUIVALENT BRIGHTNESS OF YOUR
TIME IS ON PLUTO.

178

00:09:36,270 --> 00:09:41,370
CHECK ON WHAT PLUTO TIME WILL BE
IN YOUR TIME ZONE.

179

00:09:41,370 --> 00:09:42,370
SET AN ALARM ON YOUR PHONE.

180

00:09:42,370 --> 00:09:46,540
WHEN IT GOES OFF, HOP OUTSIDE,
TAKE A SELFIE AND TWEET IT.

181

00:09:46,540 --> 00:09:49,649
AND OF COURSE, TWEET YOUR
QUESTIONS WITH THOSE HASH TAGS,

182

00:09:49,649 --> 00:09:50,649
AS WELL.

183

00:09:50,649 --> 00:09:53,430
FOR MORE NEWS ON PLUTO, CHECK
OUT THE NEW HORIZONS WEBSITES

184
00:09:53,430 --> 00:10:03,970
AND BE SURE TO COME BACK
TOMORROW FOR MORE "PLUTO IN A

185
00:10:03,970 --> 00:10:06,810
MINUTE."

186
00:10:06,810 --> 00:10:10,339
\\MM
>>> JOINING US FROM THE REMOTE

187
00:10:10,339 --> 00:10:13,440
SET OUTSIDE THE SCIENCE TEAM
WORKING AREA IS ALAN STERN, THE

188
00:10:13,440 --> 00:10:15,510
NEW HORIZONS PRINCIPAL
INVESTIGATOR FROM SOUTHWEST

189
00:10:15,510 --> 00:10:16,790
RESEARCH INSTITUTE.

190
00:10:16,790 --> 00:10:19,520
ALAN, I'D WELCOME YOU TO THE
COUNTDOWN, BUT I THINK YOU'VE

191
00:10:19,520 --> 00:10:21,720
BEEN IN THE COUNTDOWN FOR QUITE
SOME TIME.

192
00:10:21,720 --> 00:10:22,720
>> HI, MIKE.

193
00:10:22,720 --> 00:10:23,720
GOOD MORNING.

194

00:10:23,720 --> 00:10:25,760

YEAH, WE'VE BEEN WORKING ON THIS
FOR A LONG TIME.

195

00:10:25,760 --> 00:10:28,300

IT'S FINALLY GOING TO PAY OFF.

196

00:10:28,300 --> 00:10:32,999

>> AFTER MONTHS AS A DOT IN THE
CAMERA'S LENS, PLUTO HAS STARTED

197

00:10:32,999 --> 00:10:34,620

TO EVOLVE INTO A REAL WORLD.

198

00:10:34,620 --> 00:10:37,250

ESPECIALLY OVER THE LAST COUPLE
OF WEEKS, REALLY GETTING INTO

199

00:10:37,250 --> 00:10:39,850

THE REAL WORLD WITH LOTS OF
DETAIL.

200

00:10:39,850 --> 00:10:42,730

WONDER FROM YOUR POINT OF VIEW,
WHAT'S IT BEEN LIKE TO WATCH THE

201

00:10:42,730 --> 00:10:44,290

PLANET EVOLVE?

202

00:10:44,290 --> 00:10:45,290

>> IT'S BEEN FABULOUS.

203

00:10:45,290 --> 00:10:47,120

I THINK I SPEAK FOR THE SCIENCE
TEAM.

204

00:10:47,120 --> 00:10:51,519

AFTER WORKING ON THERE FOR SO
LONG AND HAVING A FEW BEFORE WE

205

00:10:51,519 --> 00:10:55,730

GOT THERE, PIXELS FROM THE EARTH
SURFACE.

206

00:10:55,730 --> 00:10:58,991

TO SEE THAT DOUBLE AND
QUADRUPLE.

207

00:10:58,991 --> 00:11:00,290

THEN A FACTOR OF TEN.

208

00:11:00,290 --> 00:11:03,640

WE'VE HAD A FACTOR OF 30
IMPROVEMENTS.

209

00:11:03,640 --> 00:11:06,630

NOW WHEN YOU LOOK AT AN IMAGE OF
PLUTO YOU SEE A REAL PLANET

210

00:11:06,630 --> 00:11:07,630

THERE.

211

00:11:07,630 --> 00:11:12,180

YOU SEE A COMPLEX WORLD THAT
JUST BEGS FOR EXPLORATION.

212

00:11:12,180 --> 00:11:16,300

AND YET, WE'RE GOING TO DO 100
TIMES BETTER THAN THAT WITH THE

213

00:11:16,300 --> 00:11:17,370

IMAGES MADE TUESDAY.

214

00:11:17,370 --> 00:11:23,029

IN FACT, THE IMAGES MADE WILL
HAVE 10,000 TIMES AS MANY PIXELS

215

00:11:23,029 --> 00:11:25,950

IN EACH AS WE SEE NOW.

216

00:11:25,950 --> 00:11:27,240

HOW'S THAT?

217

00:11:27,240 --> 00:11:29,970

>> I'M BLOWN AWAY.

218

00:11:29,970 --> 00:11:32,400

>> WELL, THIS LEADS TO MY QUESTION.

219

00:11:32,400 --> 00:11:37,220

YOU HAVE WORKED ON THIS FOR YEARS, THE PLANNING, THE WORK.

220

00:11:37,220 --> 00:11:39,709

HOW DOES IT FEEL TO BE THIS CLOSE?

221

00:11:39,709 --> 00:11:41,290

>> HEY, DWAYNE.

222

00:11:41,290 --> 00:11:42,300

IT FEELS FANTASTIC.

223

00:11:42,300 --> 00:11:45,940

AGAIN, I THINK I SPEAK FOR THE WHOLE TEAM.

224

00:11:45,940 --> 00:11:48,860

PEOPLE HAVE POURED THEIR LIVES, BIG PORTIONS OF THEIR CAREERS,

225

00:11:48,860 --> 00:11:54,910

NIGHTS AND WEEKENDS, VERY LONG NUMBER OF HOURS, GREAT DEVOTION.

226

00:11:54,910 --> 00:11:56,339

WE ONLY HAVE ONE SPACECRAFT.

227

00:11:56,339 --> 00:11:57,450

WE HAVE TO GET THIS RIGHT.

228

00:11:57,450 --> 00:11:59,710

NOW WE'RE ON PLUTO'S DOORSTEP.

229

00:11:59,710 --> 00:12:01,899

IT'S THRILLING TO ALL OF US.

230

00:12:01,899 --> 00:12:05,630

AND I CAN'T IMAGINE WHAT IT WILL
BE LIKE THE DAY AFTER TOMORROW

231

00:12:05,630 --> 00:12:08,920

WHEN WE GET THERE AND ACCOMPLISH
THIS.

232

00:12:08,920 --> 00:12:12,710

>> I DON'T NEED TO TELL YOU THE
WORLD IS WATCHING, AND THEY'RE

233

00:12:12,710 --> 00:12:13,710

EXCITED.

234

00:12:13,710 --> 00:12:15,950

TAKE US INTO THE MINDS OF THE
TEAM.

235

00:12:15,950 --> 00:12:19,370

OBVIOUSLY THEY'RE FOCUSED, BUT
WHAT ARE THEY THINKING?

236

00:12:19,370 --> 00:12:20,370

WHAT'S ON THEIR MINDS?

237

00:12:20,370 --> 00:12:21,370

WHAT'S GOING THROUGH THEIR HEADS

NOW?

238

00:12:21,370 --> 00:12:24,040

>> WELL, A LOT OF THING ARE
GOING THROUGH PEOPLE'S HEADING

239

00:12:24,040 --> 00:12:25,040

ACTUALLY.

240

00:12:25,040 --> 00:12:27,560

THERE'S THIS ELECTRIC ATMOSPHERE
THAT I TALK ABOUT.

241

00:12:27,560 --> 00:12:30,779

PEOPLE ARE THRILLED, THEY'RE
WORKING LONG HOURS.

242

00:12:30,779 --> 00:12:32,150

THEY'RE RUNNING ON ADRENALINE.

243

00:12:32,150 --> 00:12:34,890

I SEE PEOPLE IN THE GYM IN THE
MORNING, THEY SAY, "I GOT FOUR

244

00:12:34,890 --> 00:12:35,890

HOURS' SLEEP.

245

00:12:35,890 --> 00:12:37,110

I FEEL LIKE A MILLION DOLLARS."

246

00:12:37,110 --> 00:12:41,290

YOU KNOW, PEOPLE ARE HAPPY
BECAUSE THEY KNOW THEIR

247

00:12:41,290 --> 00:12:42,680

SPACECRAFT IS WORKING WELL.

248

00:12:42,680 --> 00:12:44,690

THEY KNOW THEIR INSTRUMENTS ARE

WORKING WELL.

249

00:12:44,690 --> 00:12:46,100

THEY SEE DATA COMING DOWN.

250

00:12:46,100 --> 00:12:48,900

AND PLUTO IS NOT DISAPPOINTING,
AND NEITHER IS THE SATELLITE

251

00:12:48,900 --> 00:12:49,900

SYSTEM.

252

00:12:49,900 --> 00:12:53,089

SO THE FEELING AROUND HERE IS
ONE OF REAL JOY AND ELATION.

253

00:12:53,089 --> 00:12:57,550

IT'S VERY HUMAN EXPERIENCE FOR
OUR TEAM THAT WAITED SO LONG

254

00:12:57,550 --> 00:13:01,750

ANTICIPATING THIS APPROACH TO
THIS FAR AWAY FRONTIER.

255

00:13:01,750 --> 00:13:02,750

AND NOW WE'RE THERE.

256

00:13:02,750 --> 00:13:03,750

>> ALL RIGHT.

257

00:13:03,750 --> 00:13:06,470

ARE YOU STARTING TO SEE THINGS
THAT EITHER HAVE SURPRISES OR

258

00:13:06,470 --> 00:13:07,830

THINGS STARTING TO EXCITE YOU?

259

00:13:07,830 --> 00:13:10,279

WHEN WE TALK ABOUT THE DETAILS

WE'VE SEEN IN THE PICTURES OF

260

00:13:10,279 --> 00:13:13,399

PLUTO AND SHARON, THINGS THAT
HAVE GOT YOU EXCITED FOR THE

261

00:13:13,399 --> 00:13:14,399

NEXT COMING DAYS?

262

00:13:14,399 --> 00:13:15,399

>> YEAH.

263

00:13:15,399 --> 00:13:18,410

WE'RE SEEING REAL COMPLEXITY ON
PLUTO'S SURFACE.

264

00:13:18,410 --> 00:13:21,660

WE'RE SEEING EVIDENCE OF A VERY
COMPLICATED HISTORY THAT WE CAN

265

00:13:21,660 --> 00:13:25,200

READ THROUGH THE GEOLOGY AND THE
OTHER TECHNIQUES LIKE

266

00:13:25,200 --> 00:13:27,890

COMPOSITION AND THERMAL MAPPING
TOPOGRAPHY THAT WE'LL BE ABLE

267

00:13:27,890 --> 00:13:28,890

TO.

268

00:13:28,890 --> 00:13:32,510

DO WE LOOK AT THE OTHER HALF OF
THE DOUBLE PLANET, SHARON.

269

00:13:32,510 --> 00:13:33,880

IT'S A RISING STAR.

270

00:13:33,880 --> 00:13:38,130

IT TURNS OUT TO BE SUPER INTERESTING.

271

00:13:38,130 --> 00:13:40,459
PERHAPS A LOT MORE INTERESTING
THAN ANYBODY GUESSED.

272

00:13:40,459 --> 00:13:41,731
SO WE'RE GOING TO GET CLOSER.

273

00:13:41,731 --> 00:13:44,310
WE'RE GOING TO BE ABLE TO SEE
THEM IN MORE DETAIL.

274

00:13:44,310 --> 00:13:48,510
THROUGH NEW DATA SETS, THROW
ATMOSPHERIC DATA ON TOP OF THIS,

275

00:13:48,510 --> 00:13:52,230
THERMAL DATA ON TOP OF THIS, THE
RADIO SCIENCE DATA ON TOP OF

276

00:13:52,230 --> 00:13:53,230
THIS.

277

00:13:53,230 --> 00:13:54,580
IT'S JUST GETTING BETTER AND
BETTER.

278

00:13:54,580 --> 00:13:57,980
>> AND CAN YOU GIVE US AN IDEA
THEN WHAT ARE WE IN FOR OVER THE

279

00:13:57,980 --> 00:13:58,980
NEXT COUPLE OF DAYS?

280

00:13:58,980 --> 00:14:02,260
I MEAN, WHETHER IT'S JUST THE
PICTURES OR THE ATMOSPHERE

281
00:14:02,260 --> 00:14:03,660
AROUND HERE, WHAT ARE WE IN FOR?

282
00:14:03,660 --> 00:14:04,660
>> YEAH.

283
00:14:04,660 --> 00:14:07,590
AS I SAID, WE'RE GOING TO REALLY
BLANKET THE PLANET AND BLANKET

284
00:14:07,590 --> 00:14:09,880
THE SATELLITES WITH IMAGERY.

285
00:14:09,880 --> 00:14:13,089
AND WITH IMAGING SPECTROSCOPY SO
WITH EVERY PIXEL WE HAVE A

286
00:14:13,089 --> 00:14:14,880
COMPOSITION SYSTEM.

287
00:14:14,880 --> 00:14:19,240
WE'LL START DETECTING THE
ATMOSPHERE AND DETERMINE ITS

288
00:14:19,240 --> 00:14:21,690
ATMOSPHERE AND PRESSURE TO
MEASURE ITS COMPOSITION AS A

289
00:14:21,690 --> 00:14:23,220
FUNCTION OF ALTITUDE.

290
00:14:23,220 --> 00:14:25,430
AND DO MANY MORE THINGS
INCLUDING LOOK FOR SATELLITES

291
00:14:25,430 --> 00:14:26,490
AND RINGS.

292

00:14:26,490 --> 00:14:29,350
NOW I IS A GRAPHIC HERE THAT I'D
LIKE TO SHOW.

293
00:14:29,350 --> 00:14:32,080
IT SHOWS THAT WHAT OUR BEST
RESOLUTION ON PLUTO WOULD BE

294
00:14:32,080 --> 00:14:35,220
LIKE IF INSTEAD WE WERE FLYING
OVER THE EARTH AT THE SAME

295
00:14:35,220 --> 00:14:37,200
ALTITUDE AND LOOKING DOWN ON NEW
YORK CITY.

296
00:14:37,200 --> 00:14:40,350
AND IF WE WERE TO DO THAT, YOU
CAN SEE IN THAT GRAPHIC WHICH

297
00:14:40,350 --> 00:14:43,680
WE'VE TAKEN A SATELLITE IMAGE OF
THE EARTH, PIXILATED IT TO ABOUT

298
00:14:43,680 --> 00:14:45,480
OUR BEST RESOLUTION.

299
00:14:45,480 --> 00:14:48,140
AND YOU CAN SEE MANHATTAN
BETWEEN THE HUDSON RIVER ON THE

300
00:14:48,140 --> 00:14:50,510
LEFT AND THE EAST RIVER ON THE
RIGHT.

301
00:14:50,510 --> 00:14:54,290
YOU CAN EASILY PICK OUT CENTRAL
PARKS, CENTRAL PARK, EXCUSE ME.

302
00:14:54,290 --> 00:14:56,220

YOU CAN PICK OUT THE PONDS IN
CENTRAL PARK.

303

00:14:56,220 --> 00:14:57,769

IT'S JUST FANTASTIC.

304

00:14:57,769 --> 00:15:03,089

YOU CAN COUNT THE WHARFS ON THE
HUDSON, THE RUNWAYS AT THE MAJOR

305

00:15:03,089 --> 00:15:04,089

AIRPORTS.

306

00:15:04,089 --> 00:15:06,200

THAT'S THE RESOLUTION WE'LL
HAVE.

307

00:15:06,200 --> 00:15:11,050

TODAY OUR BEST PIXELS TODAY, ON
SUNDAY, THE 12th, ARE ABOUT THE

308

00:15:11,050 --> 00:15:12,850

SIZE OF MANHATTAN.

309

00:15:12,850 --> 00:15:15,310

THEY'RE GOING TO GET ALL THE WAY
DOWN TO THE WHARFS IN CENTRAL

310

00:15:15,310 --> 00:15:19,500

PARK -- EXCUSE ME, THE WHARFS ON
THE HUDSON AND PONDS IN CENTRAL

311

00:15:19,500 --> 00:15:21,630

PARK.

312

00:15:21,630 --> 00:15:22,630

>> JUST THE ATMOSPHERE AROUND
HERE.

313

00:15:22,630 --> 00:15:23,630

WE CAN FEEL IT.

314

00:15:23,630 --> 00:15:26,700

EVEN HERE AND OUTSIDE THE
STUDIO, PEOPLE STARTING TO COME

315

00:15:26,700 --> 00:15:28,180

IN AND GET EXCITED.

316

00:15:28,180 --> 00:15:30,380

THINK ABOUT ALL THE EXCITEMENT
AND WHAT'S GOING TO BE HAPPENING

317

00:15:30,380 --> 00:15:32,179

THE NEXT COUPLE OF DAYS.

318

00:15:32,179 --> 00:15:33,179

>> IT'S AMAZING.

319

00:15:33,179 --> 00:15:40,000

WE HAVE HUNDREDS OF MEDIA, BY MY
COUNT, FROM AROUND THE WORLD.

320

00:15:40,000 --> 00:15:42,720

THERE'S A LOVE OF EXPLORATION.

321

00:15:42,720 --> 00:15:45,850

PEOPLE LOVE THE THINGS NASA
DOES, THEY'RE INSPIRED BY IT.

322

00:15:45,850 --> 00:15:49,190

I BELIEVE EVERY CONTINENT IS
REPRESENTED EXCEPT ANTARCTICA,

323

00:15:49,190 --> 00:15:51,760

AND I DON'T THINK ANTARCTICA HAS
MEDIA.

324

00:15:51,760 --> 00:15:54,210
IT'S AMAZING.

325
00:15:54,210 --> 00:15:55,680
>> ONE WORD, WOW.

326
00:15:55,680 --> 00:15:56,680
WOW.

327
00:15:56,680 --> 00:15:57,680
>> THANKS.

328
00:15:57,680 --> 00:15:58,680
>> YOU BET.

329
00:15:58,680 --> 00:16:03,699
>> YOU KNOW, NASA MISSIONS AND
THE SOLAR SYSTEM AND BEYOND NOT

330
00:16:03,699 --> 00:16:07,070
ONLY RETURN UNPRESS DENNED
SCIENCE, THEY -- UNPRECEDENTED

331
00:16:07,070 --> 00:16:09,500
SCIENCE, THEY EXPLORE THE NEXT
GENERATION.

332
00:16:09,500 --> 00:16:14,260
ONE PRIME EXAMPLE, NEW HORIZONS
IS ONE MISSION CARRYING A

333
00:16:14,260 --> 00:16:16,760
STUDENT-BUILT INSTRUMENT.

334
00:16:16,760 --> 00:16:18,230
STUDENT CAMERA.

335
00:16:18,230 --> 00:16:22,060
LET'S HEAR FROM SOMEONE ON THE

TEAM WHO CAN'T WAIT TO SEE PLUTO

336

00:16:22,060 --> 00:16:29,410

UP CLOSE.

337

00:16:29,410 --> 00:16:46,510

>> MY NAME IS JAMIE, AND I'M THE
LEAD GRAD STUDENT WITH THE DUST

338

00:16:46,510 --> 00:16:48,699

COUNTER ABOARD NEW HORIZONS.

339

00:16:48,699 --> 00:16:54,269

THE DUST COUNTER IS THE ONLY
PLANETARY INSTRUMENT MADE AND

340

00:16:54,269 --> 00:16:55,269

OPERATED BY STUDENTS.

341

00:16:55,269 --> 00:16:58,510

WHEN IT WAS BEING BUILT, WERE
THERE A LOT OF STUDENTS.

342

00:16:58,510 --> 00:17:02,480

THE LARGEST UP TO ABOUT 25 THAT
WERE INVOLVED WITH THIS

343

00:17:02,480 --> 00:17:03,480

INSTRUMENT.

344

00:17:03,480 --> 00:17:07,059

AND THEY HAD JOBS THAT RANGED
FROM SOFTWARE ENGINEERING TO

345

00:17:07,059 --> 00:17:16,549

MECHANICAL TO THERMAL DESIGN.

346

00:17:16,549 --> 00:17:19,339

WHAT THE STUDENT DUST COUNTER

DOES, IT'S A MICRO METEORITE

347

00:17:19,339 --> 00:17:20,380

DETECTOR.

348

00:17:20,380 --> 00:17:23,909

IT COUNT THROUGHOUT THE SOLAR
SYSTEM.

349

00:17:23,909 --> 00:17:28,409

THE DUST COUNTER ALONG THE WAY
THAT NEW HORIZONS IS TAKING TO

350

00:17:28,409 --> 00:17:32,809

GET TO PLUTO IS DETECTING LITTLE
IMPACTS OF THESE TINY GRAINS.

351

00:17:32,809 --> 00:17:35,090

AND WHAT THIS DOES IS HELP US TO
UNDERSTAND THE DISTRIBUTION OF

352

00:17:35,090 --> 00:17:38,109

THIS DEBRIS THROUGHOUT THE SOLAR
SYSTEM.

353

00:17:38,109 --> 00:17:42,149

ALL THE SENSORS EXCEPT TWO ARE
FACING THE RAM DIRECTION OR

354

00:17:42,149 --> 00:17:44,619

ROUGHLY ON THE WINDSHIELD OF NEW
HORIZONS.

355

00:17:44,619 --> 00:17:49,369

TINY PIECES OF DUST ARE ABOUT A
FRACTION OF THE SIZE OF A HUMAN

356

00:17:49,369 --> 00:17:52,750

HAIR WHILE THE INSTRUMENT IS
ABOUT THE SIZE OF A PIZZA BOX.

357

00:17:52,750 --> 00:17:57,059

SO THERE'S NO DANGER OF IT
RUNNING OUT OF SPACE TO COLLECT

358

00:17:57,059 --> 00:17:58,059

IT.

359

00:17:58,059 --> 00:18:00,820

SO THE STUDENT DUST COUNTER WAS
MADE BY STUDENTS BUT HAD TO

360

00:18:00,820 --> 00:18:04,210

FULFILL ALL THE REQUIREMENTS
THAT NASA NEEDS TO BE ON A

361

00:18:04,210 --> 00:18:05,210

MISSION.

362

00:18:05,210 --> 00:18:07,090

THAT MEANS THAT IT IS A REAL
INSTRUMENT AND DOING REAL

363

00:18:07,090 --> 00:18:11,580

SCIENCE ABOARD NEW HORIZONS JUST
LIKE EVERY OTHER INSTRUMENT.

364

00:18:11,580 --> 00:18:15,519

SO FAR, AS OF OCTOBER, 2010, IN
FACT, IT BECAME THE FARTHEST

365

00:18:15,519 --> 00:18:19,989

REACHING DUST DETECTOR, STUDENT
BUILT OR NOT, AND SO EVERY DAY

366

00:18:19,989 --> 00:18:23,030

IT'S CONTINUING TO BREAK THAT
RECORD AND COLLECT NEW DATA.

367

00:18:23,030 --> 00:18:26,080
WE'VE ALREADY BEEN ABLE TO
REFINE OUR MODEL OF THE SOLAR

368
00:18:26,080 --> 00:18:28,850
SYSTEM DUST DISTRIBUTION BECAUSE
OF THIS INSTRUMENT.

369
00:18:28,850 --> 00:18:31,169
THIS IS AN INCREDIBLE
EXPERIENCE.

370
00:18:31,169 --> 00:18:34,389
THERE'S NO OTHER INSTRUMENT LIKE
IT.

371
00:18:34,389 --> 00:18:36,350
STUDENTS HAVE BEEN SO EXCITED TO
GET THEIR HANDS ON THIS.

372
00:18:36,350 --> 00:18:37,629
I KNOW PERSONALLY I WAS.

373
00:18:37,629 --> 00:18:41,370
THIS IS AN INCREDIBLY UNIQUE
EXPERIENCE FOR A GRAD STUDENT TO

374
00:18:41,370 --> 00:18:45,769
BE ABLE TO OPERATE AND PRETTY
MUCH RUN THE SHOW FOR AN

375
00:18:45,769 --> 00:18:48,299
INSTRUMENT THAT'S ABOARD A NASA
MISSION.

376
00:18:48,299 --> 00:18:51,340
A LOT OF THE STUDENTS THAT HAVE
WORKED ON THIS HAVE GONE ON TO

377
00:18:51,340 --> 00:18:53,429

GREAT CAREERS IN SPACE SCIENCE.

378

00:18:53,429 --> 00:18:58,690

MY NAME'S JAMIE, AND I'M A
PLUTO-FILE BECAUSE I CAN'T WAIT

379

00:18:58,690 --> 00:19:06,159

TO LEARN ABOUT A WHOLE NEW CLASS
OF OBJECTS IN THE SOLAR SYSTEM.

380

00:19:06,159 --> 00:19:10,251

>> NOW JUST AS JAMIE SHOWED
PLUTO TIME ON PLUTO, LET'S LOOK

381

00:19:10,251 --> 00:19:23,779

AT YOUR VIEWS OF PLUTO TIME HERE
ON EARTH.

382

00:19:23,779 --> 00:19:36,559

\\MM
>> KEEP SENDING THOSE IMAGES IN

383

00:19:36,559 --> 00:19:39,240

AND DON'T FORGET, YOU CAN GET
THE LATEST IMAGES, SCIENCE

384

00:19:39,240 --> 00:19:42,520

FINDINGS, AND UPDATES HERE ON
NASA TELEVISION OVER THE NEXT

385

00:19:42,520 --> 00:19:43,789

SEVERAL DAYS.

386

00:19:43,789 --> 00:19:47,570

AND JOIN THE CONVERSATION VIA
TWITTER, FACEBOOK, AND OTHER

387

00:19:47,570 --> 00:19:51,399

SOCIAL MEDIA PLATFORMS TALKING
ABOUT THE HISTORIC JULY 14th

388

00:19:51,399 --> 00:19:52,399

FLY-BY.

389

00:19:52,399 --> 00:19:56,999

YES, SEND IN YOUR QUESTIONS AT
#PLUTOFLYBY.

390

00:19:56,999 --> 00:20:06,340

AND THE INFORMATION IS AVAILABLE
AT WWW.NASA.GOV/NEWHORIZONS.

391

00:20:06,340 --> 00:20:08,729

>> THAT'S THE LATEST FROM NASA'S
NEW HORIZONS MISSION ON PLUTO'S

392

00:20:08,729 --> 00:20:09,729

DOORSTEP.

393

00:20:09,729 --> 00:20:13,249

TWO DAYS AND JUST OVER A MILLION
MILES UNTIL NEW HORIZONS MAKE

394

00:20:13,249 --> 00:20:15,169

EXPLORATION HISTORY.

395

00:20:15,169 --> 00:20:18,470

OUR OWN COUNTDOWN TO PLUTO HAS
WOUND DOWN.

396

00:20:18,470 --> 00:20:21,910

STAY TUNED TO NASA TV AND THE
WEB FOR SPECIAL COVERAGE OF THE

397

00:20:21,910 --> 00:20:23,740

PLUTO FLY-BY ACTIVITY.

398

00:20:23,740 --> 00:20:25,799

YOU READY FOR THE RIDE?

399

00:20:25,799 --> 00:20:26,799

>> I'M READY.

400

00:20:26,799 --> 00:20:27,799

>> I'M MIKE BUCKLEY.

401

00:20:27,799 --> 00:20:28,799

>> I'M DWAYNE BROWN.