



1

00:00:21,590 --> 00:00:25,220

>>> FROM THE JOHNS HOPKINS  
PHYSICS LABORATORY, WELCOME TO

2

00:00:25,220 --> 00:00:28,860

NASA'S NEW HORIZON'S COUNT DOWN.

3

00:00:28,860 --> 00:00:35,520

WE'RE ON PLUTO'S DOORSTEP  
GETTING READY FOR THE FLY BY ON

4

00:00:35,520 --> 00:00:36,840

JULY 14th.

5

00:00:36,840 --> 00:00:39,180

ON JULY 9th, WE'RE FIVE DAYS  
AWAY.

6

00:00:39,180 --> 00:00:43,300

ABOUT 3.5 MILLION MILES FROM  
PLUTO.

7

00:00:43,300 --> 00:00:53,890

LET'S START WITH OUR OPERATIONS  
UPDATE.

8

00:00:53,890 --> 00:00:56,370

>>> THIS IS A LIVE LOOK INSIDE  
THE NEW HORIZONS MISSION

9

00:00:56,370 --> 00:00:59,440

OPERATIONS CENTER AT THE APPLIED  
PHYSICS LABORATORY.

10

00:00:59,440 --> 00:01:03,170

JOINING US IS NEW HORIZONS  
PROJECT MANAGER, GLENN.

11

00:01:03,170 --> 00:01:09,560

LET'S TAKE A LOOK TAT OVERALL  
OPERATIONS ON NEW HORIZONS.

12

00:01:09,560 --> 00:01:13,220  
THE TEAM DOES A LOT TO KEEP NEW  
HORIZONS MOVING AND MOVING ON

13

00:01:13,220 --> 00:01:14,220  
TARGET.

14

00:01:14,220 --> 00:01:15,220  
TAKE US THROUGH AN OPERATION  
DAY.

15

00:01:15,220 --> 00:01:17,220  
WHAT ARE THOSE TEAMS DOING NOW?

16

00:01:17,220 --> 00:01:20,220  
>> OKAY, BUT FIRST, LET'S TALK  
ABOUT WHAT THE SPACECRAFT DOES

17

00:01:20,220 --> 00:01:23,830  
BECAUSE THERE IS A DANCE BETWEEN  
THE SPACECRAFT AND WHAT'S

18

00:01:23,830 --> 00:01:25,390  
HAPPENING ON THE GROUND.

19

00:01:25,390 --> 00:01:29,200  
SO, THE SPACECRAFT DOES TWO  
MAJOR THINGS.

20

00:01:29,200 --> 00:01:33,910  
ONE IS IT POINTS THE INSTRUMENTS  
AT PLUTO AND THEN IT POINTS THE

21

00:01:33,910 --> 00:01:38,200  
ANTENNA AT THE EARTH, SO, WE CAN  
COMMUNICATE AND WE CAN'T DO BOTH

22

00:01:38,200 --> 00:01:39,979

AT THE SAME TIME.

23

00:01:39,979 --> 00:01:45,479

SO, EARLIER, WE ACTUALLY HAD  
TAKEN AN IMAGE OF PLU TOE.

24

00:01:45,479 --> 00:01:49,580

WE TURNED THE ANTENNA TO THE  
GROUND TO POINT TOWARDS EARTH

25

00:01:49,580 --> 00:01:51,440

AND TRANSITED THAT SIGNAL.

26

00:01:51,440 --> 00:01:54,480

SO, WE GOT THE IMAGE DOWN HERE  
EARLY.

27

00:01:54,480 --> 00:01:57,700

IT'S BEEN PROCESSED TWO  
DIFFERENT WAYS.

28

00:01:57,700 --> 00:01:59,560

FIRST, THE SCIENTISTS LOOK AT  
IT.

29

00:01:59,560 --> 00:02:03,480

WE GET REALLY EXCITED ABOUT  
THAT.

30

00:02:03,480 --> 00:02:08,069

THE NAVIGATORS USE THAT IMAGE TO  
DETERMINE WHERE THE SPACECRAFT

31

00:02:08,069 --> 00:02:15,000

IS RELATIVE TO PLUTO, SO WE CAN  
DETERMINE IF WE ARE ON OUR PASS

32

00:02:15,000 --> 00:02:20,040

BY PLU E TOE WHERE WE WANT TO  
PASS BY IT.

33

00:02:20,040 --> 00:02:25,810  
AFTER TRAVELING 3 BILLION MILE,  
WE HAVE TO HIT A BOX, A VERY

34

00:02:25,810 --> 00:02:32,200  
CERTAIN DISTANCE FROM PLUTO AND  
THAT BOX IS ONLY 60 MILES BY 90

35

00:02:32,200 --> 00:02:33,200  
MILES.

36

00:02:33,200 --> 00:02:37,420  
SO THINK OF A PIECE OF THE SKY  
AND AFTER 3 BILLION MILES,

37

00:02:37,420 --> 00:02:39,680  
YOU'VE GOT TO HIT THAT TARGET.

38

00:02:39,680 --> 00:02:42,159  
WE ARE GOING RIGHT DOWN TO  
CENTER OF THAT.

39

00:02:42,159 --> 00:02:44,950  
THAT'S WHAT THE NAVIGATORS HAVE  
DONE FOR US.

40

00:02:44,950 --> 00:02:47,349  
SO THEIR DOING THAT.

41

00:02:47,349 --> 00:02:49,620  
THEY ANALYZE THAT DATA.

42

00:02:49,620 --> 00:02:54,140  
AND THEN WE GET TOGETHER IN THE  
AFTERNOON AND DETERMINE IF WE

43

00:02:54,140 --> 00:02:56,730  
MAY NEED TO MAKE ANY OTHER  
ADJUSTMENTS.

44  
00:02:56,730 --> 00:03:01,330  
FOR INSTANCE, WE CARRY ON BOARD  
THE SPACECRAFT A KNOWLEDGE OF

45  
00:03:01,330 --> 00:03:06,230  
WHERE PLUTO IS SO AS THEY GO DPO  
TO TIMELINE, THE SPACECRAFT

46  
00:03:06,230 --> 00:03:11,459  
KNOWS WHERE TO POINT SO WE'RE  
TAKING PICTURES OF PLUTO AND NOT

47  
00:03:11,459 --> 00:03:12,730  
A BLANK PACE.

48  
00:03:12,730 --> 00:03:13,730  
VERY IMPORTANT.

49  
00:03:13,730 --> 00:03:17,180  
>> ON OPERATION WITH A LOT OF  
TIMING AND PRECISION.

50  
00:03:17,180 --> 00:03:20,950  
SO AFTER TRAVELING NINE AND A  
HALF YEAR, WE HAVE TO KNOW

51  
00:03:20,950 --> 00:03:24,019  
WITHIN 100 SECONDS OF WHEN WE GO  
BY PLUTO.

52  
00:03:24,019 --> 00:03:29,490  
>> YOU SEE, TOO, THAT THE  
INTERACTION BETWEEN TWO TEAMS,

53  
00:03:29,490 --> 00:03:30,639  
THEY OFTEN COME TOGETHER.

54

00:03:30,639 --> 00:03:33,579

>> IT IS A DANCE.

55

00:03:33,579 --> 00:03:37,269

THE NAVIGATORS FORM THEIR  
ANALYSIS.

56

00:03:37,269 --> 00:03:41,319

THEY COMMUNICATE WITH THE TEAM  
ITSELF AND THAT INFORMATION GOES

57

00:03:41,319 --> 00:03:45,270

TO THE OPERATIONS TEAM AND THEY  
THEN SEND UP THE COMMANDS.

58

00:03:45,270 --> 00:03:48,230

FIRST, THEY TEST THEM AND THEN  
THEY SEND THEM TO THE

59

00:03:48,230 --> 00:03:51,180

SPACECRAFT, THEN WE GET MORE  
DATA.

60

00:03:51,180 --> 00:03:53,760

WE GO BACK THERE THAT CYCLE  
AGAIN.

61

00:03:53,760 --> 00:03:57,379

>> EARLIER THIS WEEK, THERE WAS  
I THINK TIM WAS VERY EXCITED TO

62

00:03:57,379 --> 00:04:01,919

FIND OUT NEW HORIZONS WAS IN  
ENCOUNTER MODE.

63

00:04:01,919 --> 00:04:05,749

>> ENCOUNTER MODE IS A SPECIAL  
MODE THAT'S BEEN SET UP FOR THE

64

00:04:05,749 --> 00:04:07,060

ENCOUNTER.

65

00:04:07,060 --> 00:04:09,689

WE'VE BEEN TRAVELING NINE AND A  
HALF YEARS ACROSS THE SOLAR

66

00:04:09,689 --> 00:04:10,889

SYSTEM.

67

00:04:10,889 --> 00:04:14,609

IF SOMETHING SHOULD GO WRONG  
WITH THE SPACECRAFT AND IT NEEDS

68

00:04:14,609 --> 00:04:19,579

HELP, UNTIL THIS TIME, IT WOULD  
POINT BACK TO EARTH, SEND THE

69

00:04:19,579 --> 00:04:23,310

ANTENNA POINTING TO THE EARTH  
AND BASICALLY PHONE HOME AND SAY

70

00:04:23,310 --> 00:04:28,720

I DON'T KNOW WHAT TO DO, I NEED  
THE GROUND PEOPLE TO INTERVENE

71

00:04:28,720 --> 00:04:31,000

AND TAKE ACTION.

72

00:04:31,000 --> 00:04:34,000

ONCE WE'RE IN ENCOUNTER MODE, WE  
DO THINGS DIFFERENTLY AND THE

73

00:04:34,000 --> 00:04:37,780

REASON FOR THAT IS GIVEN THAT  
IT'S NINE AND A HALF HOURS ROUND

74

00:04:37,780 --> 00:04:41,470

TRIP LIFETIME, YOU CAN'T SIT

THERE AND JOY STICK IT.

75

00:04:41,470 --> 00:04:45,620  
YOU'VE GOT TO RUN AUTOMATICALLY  
AND THE DATA DURING THESE NINE

76

00:04:45,620 --> 00:04:51,970  
DAYS IS TO IMPORTANT, WE'RE  
BETTER TRUSTING THE SPACECRAFT

77

00:04:51,970 --> 00:04:55,060  
TO BRING IT BACK ON TO THE  
TIMELINE AND CONTINUE WITH THE

78

00:04:55,060 --> 00:04:56,060  
OPERATIONS.

79

00:04:56,060 --> 00:05:00,460  
SO, ONCE WE GET INTO ENCOUNTER  
MODE, WE DO NOT TURN BACK TO THE

80

00:05:00,460 --> 00:05:02,110  
EARTH IF SOMETHING SHOULD GO  
WRONG.

81

00:05:02,110 --> 00:05:05,950  
IT REPAIRS ITSELF THROUGH THE  
AUTONOMY SYSTEM AND CONTINUES TO

82

00:05:05,950 --> 00:05:06,950  
OPERATE.

83

00:05:06,950 --> 00:05:11,979  
WE THINK THAT'S THE BEST MODE OF  
OPERATING AND IT WILL BE FINE.

84

00:05:11,979 --> 00:05:14,680  
>> IT'S LIKE FULL STEAM AHEAD.

85

00:05:14,680 --> 00:05:15,680  
HOW IS THE SPACECRAFT?

86

00:05:15,680 --> 00:05:16,680  
EVERYTHING HEALTHY?

87

00:05:16,680 --> 00:05:17,680  
>> IT IS PERFECT.

88

00:05:17,680 --> 00:05:22,370  
AFTER NINE AND A HALF YEAR,  
EVERYTHING.

89

00:05:22,370 --> 00:05:24,639  
BOTH SYSTEMS WORKING.

90

00:05:24,639 --> 00:05:26,150  
EVERYTHING'S WORKING PERFECTLY  
FINE.

91

00:05:26,150 --> 00:05:27,650  
>> GLENN, THANKS FOR JOINING US.

92

00:05:27,650 --> 00:05:28,650  
>> MY PLEASURE.

93

00:05:28,650 --> 00:05:31,680  
>> NOW, A CHALLENGE OF THIS  
MISSION IS THE DISTANCE.

94

00:05:31,680 --> 00:05:35,449  
RIGHT NOW, NEW HORIZONS ALMOST 3  
BILLION MILES AWAY, IT TAKES

95

00:05:35,449 --> 00:05:38,259  
NINE HOURS FOR OPERATORS TO HAVE  
A TWO-WAY CONVERSATION WITH THE

96

00:05:38,259 --> 00:05:39,770

SPACECRAFT.

97

00:05:39,770 --> 00:05:42,259

JUST HOW FAR IS 3 BILLION MILES?

98

00:05:42,259 --> 00:05:48,620

IF DAYTONA INTERNATIONAL SPEED  
WAY IT WOULD TAKE 1 BILLION 200

99

00:05:48,620 --> 00:05:51,229

MILLION LAPS TO EQUAL 3 BILLION  
MILES.

100

00:05:51,229 --> 00:05:55,970

HERE FROM NEW YORK TO LOS  
ANGELES, WHICH IS 2,248 MILE,

101

00:05:55,970 --> 00:06:00,190

YOU WOULD HAVE TO MAKE THE TRIP  
1 MILLION, 294,000 TIMES.

102

00:06:00,190 --> 00:06:07,600

IF YOU WERE TO FLY AROUND THE  
EQUATOR, 24,901 MILES, YOU WOULD

103

00:06:07,600 --> 00:06:13,310

HAVE TO MAKE THE TRIP 120,477  
TIMES TO EQUAL 3 BILLION MILES.

104

00:06:13,310 --> 00:06:16,500

THAT'S A LOT OF FREQUENT FLIER  
MILES.

105

00:06:16,500 --> 00:06:21,080

BECAUSE NEW HORIZONS WAS  
DESTINED TO TRAVEL SO FAR, IT

106

00:06:21,080 --> 00:06:26,630

NEEDED A POWER SOURCE DESIGNED  
FOR DEEP SPACE.

107

00:06:26,630 --> 00:06:31,539

SCIENCE SFRUMT INSTRUMENTS IS  
PROVIDED BY A GENERATOR SIMPLIED

108

00:06:31,539 --> 00:06:34,000

BY THE DEPARTMENT OF ENERGY.

109

00:06:34,000 --> 00:06:41,870

FROM DOA IS RYAN, POWER SYSTEMS  
SAFETY MANAGER.

110

00:06:41,870 --> 00:06:43,150

WHAT IS AN RTG.

111

00:06:43,150 --> 00:06:47,810

>> IT IS A POWER SYSTEM WHICH  
USES THE NATURAL HEAT OF

112

00:06:47,810 --> 00:06:51,800

PLUTONIUM DOCK SIDE TO GENERATE  
ELECTRICITY BY USING THERMO

113

00:06:51,800 --> 00:06:54,370

COUPLES.

114

00:06:54,370 --> 00:06:58,400

BETWEEN THE VERY HOT FUEL AND  
COLDEST SPACE TO PASSIVELY

115

00:06:58,400 --> 00:06:59,419

GENERATE ELECTRICITY.

116

00:06:59,419 --> 00:07:02,300

THE KIND OF THINGS THAT WORKS IN  
AREAS WHERE SOLAR POWER MIGHT

117

00:07:02,300 --> 00:07:06,020

NOT BE ABLE TO REACH.

118

00:07:06,020 --> 00:07:08,629

>> HOW LONG HAVE RTGs BEEN IN SERVICE?

119

00:07:08,629 --> 00:07:11,580

HOW LONG HAVE THEY BEEN POWERING SPACECRAFT?

120

00:07:11,580 --> 00:07:17,250

>> THEY'VE BEEN USED FOR OVER 50 YEARS ON 27 U.S. MISSIONS.

121

00:07:17,250 --> 00:07:22,199

THE FIRST NUCLEAR POWER MISSION WAS THE TRANSIT 480 SPACECRAFT,

122

00:07:22,199 --> 00:07:25,720

WHICH IS THE NAVIGATION SATELLITE AND WAS AN APL

123

00:07:25,720 --> 00:07:26,720

MISSION.

124

00:07:26,720 --> 00:07:29,259

THAT WAS LAUNCHED IN JUNE OF 1961.

125

00:07:29,259 --> 00:07:31,620

SINCE THEN, SOME OF THE MOST EXCITING SPACE MISSIONS HAVE

126

00:07:31,620 --> 00:07:33,160

USED RTGs.

127

00:07:33,160 --> 00:07:42,840

THEY'VE GONE TO THE MOON WITH THE ASTRONAUTS.

128

00:07:42,840 --> 00:07:45,889  
AND IN 2020, THE NEXT NUCLEAR  
POWER MISSION WILL BE THE MARS

129  
00:07:45,889 --> 00:07:47,250  
2020 ROVER.

130  
00:07:47,250 --> 00:07:50,160  
RTGs HAVE BEEN USED TO POWER  
MISSIONS THAT HAVE EXPLORED

131  
00:07:50,160 --> 00:07:59,441  
VENUS, MARS, EARTH, SATURN AND  
NEXT WEEK, WE'RE GOING TO ADD

132  
00:07:59,441 --> 00:08:00,441  
PLUTO.

133  
00:08:00,441 --> 00:08:02,050  
>> WHAT IS THE RTG ON NEW  
HORIZONS DO FOR THE SPACECRAFT?

134  
00:08:02,050 --> 00:08:07,060  
HOW DOES IT HELP IT WORK AND HOW  
MUCH POWER DOES IT GIVE IT?

135  
00:08:07,060 --> 00:08:10,430  
?  
>> IT'S LIFELINE FOR THE

136  
00:08:10,430 --> 00:08:11,919  
SPACECRAFT.

137  
00:08:11,919 --> 00:08:15,020  
IT PROVIDES ENOUGH HEAT TO KEEP  
ALL THE INSTRUMENTS WARM.

138  
00:08:15,020 --> 00:08:17,660  
IN THE COLDNESS OF SPACE.

139

00:08:17,660 --> 00:08:20,449

IT ALSO PRODUCES ALL THE POWER,  
THIS IS FOR EVERYTHING FOR THE

140

00:08:20,449 --> 00:08:23,910

COMPUTER, COMMUNICATIONS AND ALL  
THE SCIENCE INSTRUMENTS.

141

00:08:23,910 --> 00:08:26,440

AND DURING THE PLUTO ENCOUNTER  
NEXT WEEK, IT WILL PRODUCE ABOUT

142

00:08:26,440 --> 00:08:31,599

202 WATTS OF ELECTRICITY.  
202 WATTS ISN'T A LOT OF POWER.

143

00:08:31,599 --> 00:08:36,539

IT'S JUST ENOUGH TO PRODUCE FOR  
ABOUT TWO LIGHTBULBS OR A VIDEO

144

00:08:36,539 --> 00:08:40,540

GAME CONSOLE, BUT IT'S MORE THAN  
ENOUGH TO SUPPLY EVERYTHING FOR

145

00:08:40,540 --> 00:08:42,760

THE NEW HORIZONS SPACECRAFT.

146

00:08:42,760 --> 00:08:43,969

>> AND THAT'S THROUGH PLUTO,  
TOO.

147

00:08:43,969 --> 00:08:47,550

HOW LONG WOULD THE SPACECRAFT  
LAST WITH A POWER SOURCE?

148

00:08:47,550 --> 00:08:51,320

>> WE FULLY EXPECT THE RTG TO  
PRODUCE ENOUGH POWER FOR THE

149

00:08:51,320 --> 00:08:55,850  
SPACECRAFT AND FOR ITS  
INSTRUMENTS THROUGH THE EARLY

150  
00:08:55,850 --> 00:08:56,850  
2030s.

151  
00:08:56,850 --> 00:09:00,710  
BUT THAT'S MORE THAN ENOUGH TIME  
TO POWER THE ENCOUNTER NEXT

152  
00:09:00,710 --> 00:09:05,520  
WEEK, SEND ALL THAT INFORMATION  
BACK AND EXPLORE ANOTHER OBJECT.

153  
00:09:05,520 --> 00:09:08,730  
>> SO, MUCH MORE AHEAD.

154  
00:09:08,730 --> 00:09:10,170  
THANKS FOR JOINING US.

155  
00:09:10,170 --> 00:09:14,440  
NOW, THE SUN MIGHT NOT BE STRONG  
ENOUGH TO POWER THE SPACECRAFT,

156  
00:09:14,440 --> 00:09:18,070  
BUT IT IS BLIGHTER ON PLUTO THAN  
YOU MIGHT EXPECT.

157  
00:09:18,070 --> 00:09:23,110  
THE NASA WEBSITE WHERE YOU CAN  
FIND THE MOMENT BETWEEN DAWN AND

158  
00:09:23,110 --> 00:09:25,770  
DUSK EACH DAY FOR THE  
ILLUMINATION ON EARTH MATCHES

159  
00:09:25,770 --> 00:09:40,060  
THAT ON PLUTO.

160

00:09:40,060 --> 00:10:01,960

\MM

FOR A SCIENCE UPDATE, WE WELCOME

161

00:10:01,960 --> 00:10:03,060

FRAN.

162

00:10:03,060 --> 00:10:05,650

A NEW HORIZONS INVESTIGATOR FROM  
THE UNIVERSITY OF COLORADO

163

00:10:05,650 --> 00:10:06,880

BOWLER.

164

00:10:06,880 --> 00:10:09,120

THANKS FOR JOINING US.

165

00:10:09,120 --> 00:10:11,780

WITH PLUTO TIME, IT'S DESIGNED  
TO GIVE AN IDEA OF HOW BRIGHT IT

166

00:10:11,780 --> 00:10:13,650

IS.

167

00:10:13,650 --> 00:10:16,900

IF I WAS STANDING ON PLUTO, WHAT  
WOULD I SEE?

168

00:10:16,900 --> 00:10:19,400

>> MOST EXCITING WOULD BE THE  
BIG MOON SHOWER.

169

00:10:19,400 --> 00:10:24,090

IF YOU THINK OF OUR MOON, FULL  
MOON, IT'S ABOUT THE SIZE OF A

170

00:10:24,090 --> 00:10:29,050

LITTLE THING OF†-- IF WE WERE ON  
PLUTO, LOOKED UP, WE WOULD SEE A

171

00:10:29,050 --> 00:10:33,480

MOON THAT'S THREE FAT FINGERS  
ACROSS UP IN THE SKY, SO, BIG,

172

00:10:33,480 --> 00:10:35,380

BUT IT STAYS THERE.

173

00:10:35,380 --> 00:10:36,910

IF YOU'RE ON ONE SIDE.

174

00:10:36,910 --> 00:10:40,650

NOW, IF YOU'RE ON THE OTHER  
SIDE, NEVER SEE IT.

175

00:10:40,650 --> 00:10:43,390

NEVER, EVER, EVER WOULD YOU SEE  
SHOWER IN THE SKY.

176

00:10:43,390 --> 00:10:50,440

YOU'D SEE THE OTHER MOONS GO BY,  
BUT BECAUSE THEY'RE IN THAT

177

00:10:50,440 --> 00:10:54,160

ORBIT.

178

00:10:54,160 --> 00:10:57,000

>> WE'RE GETTING BETTER AND  
BETTER LOOKS AT PLUTO.

179

00:10:57,000 --> 00:11:01,380

EVEN TO THE POINT WHERE SOME OF  
THE FEATURES, WHAT ARE WE SEE

180

00:11:01,380 --> 00:11:04,610

ING IN SOME TO HAVE LATEST  
PICTURES THAT HAVE COME DOWN?

181

00:11:04,610 --> 00:11:06,640

>> THEY'RE A LITTLE LESS FUZZY.

182

00:11:06,640 --> 00:11:08,630

WE'RE GOING TO SEE FEATURES.

183

00:11:08,630 --> 00:11:10,810

DARK REGIONS, LIGHT REGIONS.

184

00:11:10,810 --> 00:11:14,100

SORT OF SHAPES A LITTLE BIT.

185

00:11:14,100 --> 00:11:18,490

IN FACT, THEY'RE CALLING THIS  
THING BIG BLACK THING THE WHALE.

186

00:11:18,490 --> 00:11:21,570

LITTLE ROUND THING LOOKS LIKE A  
DONUT AND YOU KNOW, THEY'RE

187

00:11:21,570 --> 00:11:22,570

STILL FUZZY.

188

00:11:22,570 --> 00:11:26,090

WE CAN'T REALLY SAY, BUT WE'RE  
GETTING THERE.

189

00:11:26,090 --> 00:11:27,740

WE'RE GETTING CLOSE.

190

00:11:27,740 --> 00:11:31,810

>> THE PICTURES ARE CAPTIVATING  
US, BUT NEW HORIZONS IS IS MORE

191

00:11:31,810 --> 00:11:33,390

IN THE PICTURES.

192

00:11:33,390 --> 00:11:36,210

YOU LEAD THE MISSIONS PARTICLE  
OF PLASMA TEAM.

193

00:11:36,210 --> 00:11:38,910

IN PARTICULAR, WHAT ARE YOU  
LOOKING FOR?

194

00:11:38,910 --> 00:11:41,570

>> THE MOST INTERESTING THING TO  
ME IS THE FACT WE'VE GOT THESE

195

00:11:41,570 --> 00:11:42,830

ICE ON THE SURFACE.

196

00:11:42,830 --> 00:11:45,440

THE ICES EVAPORATE, THEY MOVE  
OUT.

197

00:11:45,440 --> 00:11:48,970

SO, IT HAS AN ATMOSPHERE OF  
NITROGEN MUCH LIKE THE

198

00:11:48,970 --> 00:11:53,820

ATMOSPHERE HERE IN THIS ROOM,  
BUT THAT MAKES IT AN ESCAPING

199

00:11:53,820 --> 00:11:57,570

ATMOSPHERE BECAUSE THE GROUND IS  
A LITTLE WEAKER AND IT MOVES OUT

200

00:11:57,570 --> 00:12:02,870

AND ESCAPES AND OUT INTO SPACE  
AND MAKES A BIG REGION THAT IS

201

00:12:02,870 --> 00:12:05,350

COMPARABLE IN SIZE TO THAT OF  
THE EARTH IS ESPECIALLY

202

00:12:05,350 --> 00:12:09,590

CAPING ATMOSPHERE REGION AND THE  
PARTICLES MOVE AWAY AND WHAT

203

00:12:09,590 --> 00:12:13,310

HAPPENS THEN IS AS THESE  
PARTICLES MOVE AWAY IS THE

204

00:12:13,310 --> 00:12:16,280

MATERIAL FROM THE SUN COMES IN  
AND INTERACTS WITH THAT

205

00:12:16,280 --> 00:12:19,730

ATMOSPHERE, SO FROM THE SUN WE  
HAVE PROTONS AND ELECTRONS THAT

206

00:12:19,730 --> 00:12:26,250

COME AWAY AND RAM INTO IS THIS  
REGION AND THAT MATERIAL IS

207

00:12:26,250 --> 00:12:31,080

IONIZED, THE MATERIAL FROM PLUTO  
AND WHEN IT BECOMES IONIZED, IT

208

00:12:31,080 --> 00:12:35,050

GETS PICKS UP AND CARRIED AWAY.

209

00:12:35,050 --> 00:12:39,860

WE DON'T REALLY KNOW THE SIZE,  
BUT WE'RE GOING TO FLY THROUGHEN

210

00:12:39,860 --> 00:12:45,780

IT AND THE PARTICLES AND PLASMA  
INSTRUMENTS, SWAP AND†-- WILL

211

00:12:45,780 --> 00:12:48,130

MEASURE THOSE PARTICLES.

212

00:12:48,130 --> 00:12:52,460

>> NOW, THERE'S A LOT OF THINGS  
THAT WILL HELP THE TEAM COMPLETE

213

00:12:52,460 --> 00:12:54,160

THE PICTURE OF THE PLUTO SYSTEM.

214

00:12:54,160 --> 00:12:57,180

THERE'S THE JOL JI, WE SEE A LOT  
OF THE PICTURES.

215

00:12:57,180 --> 00:12:59,030

YOU MENTION WHAT'S GOING ON WITH  
PARTICLES AND PLASMA.

216

00:12:59,030 --> 00:13:04,060

THERE ARE OTHER ELEMENTS, TOO.

217

00:13:04,060 --> 00:13:06,320

SEEMS LIKE THAT'S THE COME  
TOGETHER TO GET THAT COMPLETE

218

00:13:06,320 --> 00:13:08,320

PICTURE OF WHAT'S HAPPENING IN  
PLUTO.

219

00:13:08,320 --> 00:13:12,150

>> SO, WE HAVE A REALLY EXCITING  
SITUATION WITH PLUTO BECAUSE WE

220

00:13:12,150 --> 00:13:13,150

HAVE AN ATMOSPHERE.

221

00:13:13,150 --> 00:13:14,150

WE HAVE A SURFACE.

222

00:13:14,150 --> 00:13:17,650

THIS ICE IS EVAPORATING.

223

00:13:17,650 --> 00:13:20,360

WHAT'S INTERESTING IS THAT THEY  
ALL COME TOGETHER.

224

00:13:20,360 --> 00:13:24,290

RIG RIGHT NOW, THE ATMOSPHERE IS  
IS IS ESCAPING.

225

00:13:24,290 --> 00:13:29,710

WHAT HAPPENS IS IT FREEZES DOWN  
AND THE SOLO HITS THE SURFACE

226

00:13:29,710 --> 00:13:35,310

AND INTERACTS, RADIATES AND SO,  
THE METHANE AND NITROGEN AND SO

227

00:13:35,310 --> 00:13:39,470

ON, CHEMICAL REACTIONS OCCUR  
THIS MAKE THAT BROWNIE, GUNKY,

228

00:13:39,470 --> 00:13:43,220

OIL WILL I, HYDRO CASHIN  
MATERIAL.

229

00:13:43,220 --> 00:13:47,700

THE BROWN GUNK, WE LIKE TO CALL  
IT, ON THE SURFACE AND MAKES IT

230

00:13:47,700 --> 00:13:52,180

THAT REDDISH BROWNISH, DARKISH  
COLOR.

231

00:13:52,180 --> 00:13:55,630

>> EVEN STARTING SINCE WE'RE  
GETTING CLOSER, YOU WERE ON THE

232

00:13:55,630 --> 00:14:01,310

VOYAGER TEAM WHEN IT FLEW PAST  
NEPTUNE IN 1989 TO GIVE US OUR

233

00:14:01,310 --> 00:14:05,830

LAST FIRST LOOK AT A NEW PLANET  
UNTIL NOW.

234

00:14:05,830 --> 00:14:09,201

I'M WONDERING, STARTING TO FEEL  
THE SAME WORKING ON NEW HORIZONS

235

00:14:09,201 --> 00:14:11,140  
AS YOU DID THEN?

236

00:14:11,140 --> 00:14:16,140  
>> AFTER WE WERE ALL LIKE IT'S A  
LIFE AFTER TRITON.

237

00:14:16,140 --> 00:14:17,140  
WHAT DO WE DO?

238

00:14:17,140 --> 00:14:18,140  
WHERE DO WE GO?

239

00:14:18,140 --> 00:14:26,700  
OF COURSE NOW, WE KNOW IT'S  
PLUTO AND IT'S THE SAME THING.

240

00:14:26,700 --> 00:14:27,810  
IT'S JUST BRILLIANT.

241

00:14:27,810 --> 00:14:29,890  
>> THE EXCITEMENT I KNOW GETTING  
THERE DAYS IN AND SEEING WHAT'S

242

00:14:29,890 --> 00:14:31,040  
COMING UP EVERY DAY.

243

00:14:31,040 --> 00:14:32,980  
>> EACH DAY'S DIFFERENT.

244

00:14:32,980 --> 00:14:34,150  
>> THANKS.

245

00:14:34,150 --> 00:14:37,260  
JOIN THE CONVERSATION VIA  
TWITTER, FACEBOOK AND OTHER

246

00:14:37,260 --> 00:14:40,540

PLATFORMS TALKING ABOUT THE JULY  
14th FLY BY.

247

00:14:40,540 --> 00:14:44,710

SEND QUESTIONS, MISSION  
INFORMATION ALONG WITH NEW

248

00:14:44,710 --> 00:14:54,850

INFORMATIONS ARE AVAILABLE ON  
LINE AT [NASA.GOV/NEW HORIZONS](https://www.nasa.gov/newhorizons).

249

00:14:54,850 --> 00:14:56,460

WE ARE FIVE DAYS AWAY.