1
00:00:00,000 --> 00:00:11,720
ah

2
00:00:11,730 --> 00:00:21,990
Oh

3
00:00:29,320 --> 00:00:25,120
well it is good to see you

4
00:00:32,220 --> 00:00:29,330
all of it good evening I want to welcome

5
00:00:34,720 --> 00:00:32,230
all the students and teachers and

6
00:00:37,990 --> 00:00:34,730
amateur astronomers to the White House

7
00:00:39,910 --> 00:00:38,000
tonight I won't speak long because we've

8
00:00:42,430 --> 00:00:39,920
got a bunch of telescopes and great

9
00:00:43,900 --> 00:00:42,440
exhibits to get our hands on but before

10
00:00:47,830 --> 00:00:43,910
I begin let me first acknowledge a few

11
00:00:51,759 --> 00:00:47,840
other stars who are out tonight first of

12
00:00:54,370 --> 00:00:51,769
all John Holdren my science advisor an

13
00:00:56,770 --> 00:00:54,380

actual physicist is here and eager to

14
00:00:59,860 --> 00:00:56,780
look through one of these telescopes our

15
00:01:01,450 --> 00:00:59,870
NASA Administrator Charles Bolden who

16
00:01:04,719 --> 00:01:01,460
spent some time orbiting the Earth

17
00:01:06,999 --> 00:01:04,729
himself and his deputy lori Garver are

18
00:01:08,350 --> 00:01:07,009
here where's Charles and Lori they're in

19
00:01:14,410 --> 00:01:08,360
the back there give them a round of

20
00:01:17,859 --> 00:01:14,420
applause we've got some specialists from

21
00:01:19,870 --> 00:01:17,869
NASA the Smithsonian and the American

22
00:01:23,109 --> 00:01:19,880
Museum of Natural History in New York

23
00:01:25,180 --> 00:01:23,119
here with us as well and we've got some

24
00:01:27,130 --> 00:01:25,190
of the heroes who have flown closer to

25
00:01:29,440 --> 00:01:27,140
the stars than anybody else Buzz Aldrin

26
00:01:38,520 --> 00:01:29,450
a man who actually walked on the moon

27
00:01:41,320 --> 00:01:38,530
where's Buzz right there Sally Ride

28
00:01:47,800 --> 00:01:41,330
Sally Ride the first American woman in

29
00:01:56,560 --> 00:01:51,590
may Jameson the first african-american

30
00:02:03,289 --> 00:02:01,310
and John John Grunsfeld is here the man

31
00:02:06,010 --> 00:02:03,299
they called the Hubble repair man not to

32
00:02:08,749 --> 00:02:06,020
be a segment with the Maytag repairman

33
00:02:10,460 --> 00:02:08,759
for all the upgrades that he's made up

34
00:02:12,650 --> 00:02:10,470
there to the telescope that allows us to

35
00:02:17,949 --> 00:02:12,660
see farther than anyone ever imagined so

36
00:02:20,330 --> 00:02:17,959
get John a figure out on the fly Wow

37
00:02:24,430 --> 00:02:20,340
NASA's equipment is some pretty powerful

38
00:02:27,350 --> 00:02:24,440

stuff but astronomy also depends on the

39
00:02:29,660 --> 00:02:27,360
curiosity and the contributions of

40
00:02:32,479 --> 00:02:29,670
amateur astronomers and there are two

41
00:02:36,110 --> 00:02:32,489
students here tonight who've made some

42
00:02:39,559 --> 00:02:36,120
pretty amazing discoveries of their own

43
00:02:45,140 --> 00:02:39,569
first of all Caroline Moore and her dad

44
00:02:48,620 --> 00:02:45,150
Robert Fraser Ian where's dad there's

45
00:02:49,339 --> 00:02:48,630
Robert they look at the stars together

46
00:02:52,280 --> 00:02:49,349
in New York

47
00:02:55,849 --> 00:02:52,290
and last year think about this when she

48
00:02:58,420 --> 00:02:55,859
was only 14 years old she became the

49
00:03:02,240 --> 00:02:58,430
youngest person ever to discover a

50
00:03:04,759 --> 00:03:02,250
supernova and not just any supernova but

51
00:03:05,150 --> 00:03:04,769
a kind that we may have never seen

52
00:03:10,580 --> 00:03:05,160
before

53
00:03:11,750 --> 00:03:10,590
and earlier this year Lucas Bowyer Lucas

54
00:03:13,520 --> 00:03:11,760
raise your hand where are your folks

55
00:03:14,780 --> 00:03:13,530
Lucas but wherever's looks as folks

56
00:03:18,949 --> 00:03:14,790
raise your hands I know you guys are

57
00:03:21,229 --> 00:03:18,959
proud a high school sophomore from West

58
00:03:23,449 --> 00:03:21,239
Virginia discovered some unusual data

59
00:03:26,270 --> 00:03:23,459
that turned out to be an extremely rare

60
00:03:29,270 --> 00:03:26,280
kind of star called a pulsar and Lucas

61
00:03:31,699 --> 00:03:29,280
was explaining to me just what a pulsar

62
00:03:37,099 --> 00:03:31,709
was so that I wasn't embarrassed when I

63
00:03:41,360 --> 00:03:37,109

came out here now if they can discover

64
00:03:43,879 --> 00:03:41,370
something great so can any of you other

65
00:03:46,539 --> 00:03:43,889
students who are here tonight all you

66
00:03:49,490 --> 00:03:46,549
need is a passion for science

67
00:03:51,500 --> 00:03:49,500
from the moment humans first walked on

68
00:03:55,009 --> 00:03:51,510
this earth we've been endlessly

69
00:03:56,420 --> 00:03:55,019
fascinated by the stars as long as we've

70
00:03:58,250 --> 00:03:56,430
been around we've been trying to unlock

71
00:03:58,890 --> 00:03:58,260
the mysteries of the universe and figure

72
00:04:00,899 --> 00:03:58,900
out

73
00:04:04,289 --> 00:04:00,909
our proper place in the cosmos and

74
00:04:07,170 --> 00:04:04,299
somehow make sense of it all it was 400

75
00:04:08,970 --> 00:04:07,180
years ago this year that Galileo built

76
00:04:11,940 --> 00:04:08,980
his first telescope

77
00:04:14,369 --> 00:04:11,950
it was just three times more powerful

78
00:04:16,379 --> 00:04:14,379
than the naked eye but he kept on

79
00:04:20,039 --> 00:04:16,389
working on it and improving on it until

80
00:04:21,779 --> 00:04:20,049
he built 133 times as powerful and then

81
00:04:23,370 --> 00:04:21,789
he turned it towards the sky and he

82
00:04:26,370 --> 00:04:23,380
discovered that our moon wasn't smooth

83
00:04:29,460 --> 00:04:26,380
that Venus had phases that Jupiter had

84
00:04:32,460 --> 00:04:29,470
moons and that Copernicus was right that

85
00:04:34,710 --> 00:04:32,470
we do revolve around the Sun and we've

86
00:04:37,409 --> 00:04:34,720
come a long way since then while

87
00:04:40,290 --> 00:04:37,419
Galileo's first telescope had lenses an

88
00:04:42,090 --> 00:04:40,300

inch wide the Hubble Space Telescope has

89
00:04:45,480 --> 00:04:42,100
mirrors about seven and a half feet wide

90
00:04:47,939 --> 00:04:45,490
a few years ago the Hubble showed us the

91
00:04:50,629 --> 00:04:47,949
deepest image of the universe ever taken

92
00:04:53,370 --> 00:04:50,639
and in that image we can see about

93
00:04:56,310 --> 00:04:53,380
10,000 galaxies and each of those

94
00:04:58,939 --> 00:04:56,320
galaxies can hold billions of stars now

95
00:05:03,540 --> 00:04:58,949
that's a lot but get this it would take

96
00:05:08,219 --> 00:05:03,550
13 million of those images to map the

97
00:05:10,439 --> 00:05:08,229
entire sky that's how immense it is so

98
00:05:12,360 --> 00:05:10,449
there are a lot of mysteries left and

99
00:05:15,060 --> 00:05:12,370
there are a lot of problems for you

100
00:05:16,710 --> 00:05:15,070
students to solve and I want to be a

101
00:05:18,750 --> 00:05:16,720
president who makes sure you have the

102
00:05:20,730 --> 00:05:18,760
teachers and the tools that you need to

103
00:05:22,710 --> 00:05:20,740
solve them and that's why we're working

104
00:05:24,899 --> 00:05:22,720
to reinvigorate math and science and

105
00:05:26,939 --> 00:05:24,909
your schools and attract new and

106
00:05:30,089 --> 00:05:26,949
qualified math and science teachers into

107
00:05:32,460 --> 00:05:30,099
your classrooms some with lifetime's of

108
00:05:35,100 --> 00:05:32,470
experience that's why we've launched a

109
00:05:36,839 --> 00:05:35,110
race to the top to raise standards and

110
00:05:38,070 --> 00:05:36,849
upgrade your curricula and improve

111
00:05:40,020 --> 00:05:38,080
teaching and learning in math and

112
00:05:41,879 --> 00:05:40,030
science that's why we're making a

113
00:05:43,950 --> 00:05:41,889

college education more affordable so

114
00:05:46,469 --> 00:05:43,960
that by the time many of you graduate in

115
00:05:48,029 --> 00:05:46,479
2020 America will once again have the

116
00:05:50,790 --> 00:05:48,039
highest proportion of college graduates

117
00:05:52,589 --> 00:05:50,800
in the world and that's how we'll move

118
00:05:54,719 --> 00:05:52,599
American students to the top of the pack

119
00:05:56,939 --> 00:05:54,729
in math and in science over the next

120
00:05:59,610 --> 00:05:56,949
decade and guarantee that America will

121
00:06:03,480 --> 00:05:59,620
lead the world in discovery in this new

122
00:06:06,149 --> 00:06:03,490
century but that's going to take more

123
00:06:07,950 --> 00:06:06,159
than just what I as president or anybody

124
00:06:09,990 --> 00:06:07,960
in government can do it's going to take

125
00:06:11,119 --> 00:06:10,000
each and every one of you students it'll

126
00:06:13,609 --> 00:06:11,129
take

127
00:06:15,829 --> 00:06:13,619
your sense of wonder your passion your

128
00:06:17,409 --> 00:06:15,839
persistence your willingness to dedicate

129
00:06:19,689 --> 00:06:17,419
your lives to the pursuit of discovery

130
00:06:22,999 --> 00:06:19,699
and it's gonna take some hard work

131
00:06:25,129 --> 00:06:23,009
Caroline and Lucas didn't just get lucky

132
00:06:26,139 --> 00:06:25,139
they poured over data before they knew

133
00:06:29,359 --> 00:06:26,149
what they had found

134
00:06:32,209 --> 00:06:29,369
Galileo worked for years to prove his

135
00:06:35,269 --> 00:06:32,219
theories the Hubble's journey from paper

136
00:06:38,959 --> 00:06:35,279
to space took decades because that's how

137
00:06:41,449 --> 00:06:38,969
success is one might test by test and

138
00:06:43,279 --> 00:06:41,459

trial by trial now this morning I

139
00:06:44,809 --> 00:06:43,289
awarded the National medals of science

140
00:06:46,699 --> 00:06:44,819
and technology to individuals who've

141
00:06:48,579 --> 00:06:46,709
made extraordinary contributions to the

142
00:06:51,459 --> 00:06:48,589
advancement of human knowledge and

143
00:06:54,199 --> 00:06:51,469
here's my question which one of you are

144
00:06:59,600 --> 00:06:54,209
going to come back here to claim your

145
00:07:02,600 --> 00:06:59,610
prize I like that are you gonna find a

146
00:07:05,149 --> 00:07:02,610
new star or a cure for a disease will

147
00:07:06,949 --> 00:07:05,159
you invent the next iPhone or a brand

148
00:07:09,679 --> 00:07:06,959
new industry that no one's that even

149
00:07:12,679 --> 00:07:09,689
dreamed of yet what will your great

150
00:07:14,600 --> 00:07:12,689
discovery be now Galileo changed the

151
00:07:17,600 --> 00:07:14,610
world when he pointed his telescope to

152
00:07:20,659 --> 00:07:17,610
the sky and now it's your turn we need

153
00:07:22,939 --> 00:07:20,669
you to study do well in school explore

154
00:07:25,759 --> 00:07:22,949
everything from the infinite reaches of

155
00:07:28,159 --> 00:07:25,769
space to the microscopic spaulos of the

156
00:07:30,739 --> 00:07:28,169
atom we need you to think bigger and to

157
00:07:33,259 --> 00:07:30,749
dig deeper and to reach higher and we

158
00:07:35,719 --> 00:07:33,269
need your Restless curiosity and your

159
00:07:38,209 --> 00:07:35,729
boundless hope and imagination our

160
00:07:40,489 --> 00:07:38,219
future depends on it so don't let

161
00:07:42,559 --> 00:07:40,499
anybody tell you that there isn't more

162
00:07:43,730 --> 00:07:42,569
to discover don't let anybody tell you

163
00:07:45,889 --> 00:07:43,740

that there's knowledge that's beyond

164
00:07:47,779 --> 00:07:45,899
your reach there's something out there

165
00:07:50,059 --> 00:07:47,789
for each and every one of you for to

166
00:07:51,290 --> 00:07:50,069
discover and seeing how it's a beautiful

167
00:07:53,359 --> 00:07:51,300
night and we've got a bunch of

168
00:07:56,769 --> 00:07:53,369
telescopes out in the lawn let's get

169
00:07:59,209 --> 00:07:56,779
started together and if I all right so

170
00:08:01,309 --> 00:07:59,219
thank you very much everybody I'm glad

171
00:08:03,619 --> 00:08:01,319
you guys are here let's go have some fun

172
00:08:05,029 --> 00:08:03,629
I think I'm gonna get the first dibs and

173
00:08:06,889 --> 00:08:05,039
looking through one of these telescopes

174
00:08:08,480 --> 00:08:06,899
is that right all right now why don't

175
00:08:10,639 --> 00:08:08,490
you explain to us what exactly this

176
00:08:13,009 --> 00:08:10,649
telescope is here where we go well the

177
00:08:15,199 --> 00:08:13,019
first thing talking the mic I'm sorry

178
00:08:17,269 --> 00:08:15,209
the first thing to notice is that there

179
00:08:20,059 --> 00:08:17,279
are two eyepieces you could look through

180
00:08:23,519 --> 00:08:20,069
the one that is aligned with the barrel

181
00:08:25,019 --> 00:08:23,529
of the telescope is just the

182
00:08:27,179 --> 00:08:25,029
aimer that points it in the right

183
00:08:29,069 --> 00:08:27,189
direction the eyepiece you want to look

184
00:08:31,439 --> 00:08:29,079
in mr. president is the angled one at

185
00:08:33,329 --> 00:08:31,449
the bottom and if you look in there

186
00:08:36,420 --> 00:08:33,339
that's the one if you look in there you

187
00:08:39,119 --> 00:08:36,430
will see a double double star in the

188
00:08:42,089 --> 00:08:39,129

constellation Lyra a hundred and sixty

189
00:08:44,009 --> 00:08:42,099
light-years away 162 light-years but

190
00:08:46,230 --> 00:08:44,019
that's far away that means it takes the

191
00:08:48,600 --> 00:08:46,240
light from those stars a hundred and

192
00:08:50,129 --> 00:08:48,610
sixty years to get here so what you are

193
00:09:43,110 --> 00:08:50,139
seeing mr. president

194
00:09:47,410 --> 00:09:46,000
outstanding well let's go take a look at