



**Josh Byerly**  
NASA Public Affairs

**Dr. Liz Warren**  
Space Station Program Office

1  
00:00:04,230 --> 00:00:02,389  
hi everybody josh byerly here inside

2  
00:00:05,749 --> 00:00:04,240  
mission control houston i'm joined by my

3  
00:00:07,190 --> 00:00:05,759  
friend liz warren who is part of the

4  
00:00:08,950 --> 00:00:07,200  
international space station program

5  
00:00:10,790 --> 00:00:08,960  
science office liz

6  
00:00:11,910 --> 00:00:10,800  
uh is here because all this week and

7  
00:00:13,190 --> 00:00:11,920  
really all this month again we've been

8  
00:00:15,110 --> 00:00:13,200  
talking about the anniversaries of

9  
00:00:17,269 --> 00:00:15,120  
valentina tereshkova which has been 50

10  
00:00:19,189 --> 00:00:17,279  
years since sally ride which has been uh

11  
00:00:22,710 --> 00:00:19,199  
30 years since those two

12  
00:00:23,670 --> 00:00:22,720  
landmark uh flights took place but liz

13  
00:00:24,870 --> 00:00:23,680

let's talk about science for a little

14

00:00:26,230 --> 00:00:24,880

bit first of all let's talk about your

15

00:00:27,589 --> 00:00:26,240

background i've got it

16

00:00:29,269 --> 00:00:27,599

i have to write it down over here so

17

00:00:31,029 --> 00:00:29,279

let's say you grew up in san francisco

18

00:00:32,709 --> 00:00:31,039

right yes i did you have a bs degree in

19

00:00:34,549 --> 00:00:32,719

molecular cellular and integrative

20

00:00:35,350 --> 00:00:34,559

physiology did i say that right you did

21

00:00:37,670 --> 00:00:35,360

and a

22

00:00:39,590 --> 00:00:37,680

doctoral degree in physiology all from

23

00:00:41,030 --> 00:00:39,600

uc davis you're a california girl so

24

00:00:42,389 --> 00:00:41,040

let's talk about

25

00:00:43,430 --> 00:00:42,399

whenever you're going to school junior

26  
00:00:45,190 --> 00:00:43,440  
high school like when did you get

27  
00:00:47,270 --> 00:00:45,200  
involved in science when did you sort of

28  
00:00:50,389 --> 00:00:47,280  
kind of get the bug and have that happen

29  
00:00:52,389 --> 00:00:50,399  
i think i was born with an insatiable

30  
00:00:54,709 --> 00:00:52,399  
curiosity i think i always knew i was

31  
00:00:57,350 --> 00:00:54,719  
going to be a scientist because of that

32  
00:01:00,150 --> 00:00:57,360  
my parents and my family

33  
00:01:01,750 --> 00:01:00,160  
encouraged me and fostered my interests

34  
00:01:04,710 --> 00:01:01,760  
and i had some pretty great science

35  
00:01:07,109 --> 00:01:04,720  
teachers as well in seventh grade

36  
00:01:10,070 --> 00:01:07,119  
in california growing up i had a great

37  
00:01:12,230 --> 00:01:10,080  
science teacher at mrs pc and then in

38  
00:01:14,710 --> 00:01:12,240

high school miss miss brumbaugh at tim

39

00:01:16,789 --> 00:01:14,720

lopez high school and then at uc davis i

40

00:01:18,310 --> 00:01:16,799

had a really wonderful science teacher

41

00:01:20,950 --> 00:01:18,320

that really challenged me and taught me

42

00:01:23,030 --> 00:01:20,960

how fun science can be uh barbara

43

00:01:24,469 --> 00:01:23,040

horowitz at uc davis

44

00:01:27,109 --> 00:01:24,479

so did you spend your entire time in

45

00:01:30,069 --> 00:01:27,119

california i did and i arrived in

46

00:01:31,510 --> 00:01:30,079

houston after getting my phd

47

00:01:32,630 --> 00:01:31,520

about nine years ago

48

00:01:33,990 --> 00:01:32,640

okay so first of all let's talk about

49

00:01:35,109 --> 00:01:34,000

this about this photo that we're looking

50

00:01:37,350 --> 00:01:35,119

at right now you have a space shuttle on

51  
00:01:38,950 --> 00:01:37,360  
the back of your graduation gown did how

52  
00:01:41,030 --> 00:01:38,960  
did that happen

53  
00:01:42,789 --> 00:01:41,040  
well uh i knew where i was going there

54  
00:01:43,749 --> 00:01:42,799  
was no doubt in my mind that i was going

55  
00:01:47,030 --> 00:01:43,759  
to be

56  
00:01:48,950 --> 00:01:47,040  
working at nasa one day and i think it's

57  
00:01:51,429 --> 00:01:48,960  
in part because of the achievements of

58  
00:01:53,429 --> 00:01:51,439  
sally ride and valentina tereshkova

59  
00:01:54,950 --> 00:01:53,439  
really blazing the trail there was no

60  
00:01:56,709 --> 00:01:54,960  
doubt in my mind just because i was a

61  
00:01:58,870 --> 00:01:56,719  
woman that i'd be able to achieve my

62  
00:02:00,389 --> 00:01:58,880  
dreams as well so they sort of inspired

63  
00:02:01,830 --> 00:02:00,399

you to kind of go into it whatever you

64

00:02:03,350 --> 00:02:01,840

absolutely you know i'm sure you talked

65

00:02:05,510 --> 00:02:03,360

a lot of high school and junior high

66

00:02:06,789 --> 00:02:05,520

kids whenever you're out there and and

67

00:02:08,150 --> 00:02:06,799

you know the ones that are interested in

68

00:02:09,270 --> 00:02:08,160

science how do you tell them what to

69

00:02:10,469 --> 00:02:09,280

figure out what they want to do we

70

00:02:11,589 --> 00:02:10,479

talked to camille elaine yesterday about

71

00:02:13,750 --> 00:02:11,599

the same sort of thing like how do they

72

00:02:14,710 --> 00:02:13,760

even know what they want to go into

73

00:02:16,790 --> 00:02:14,720

well

74

00:02:18,229 --> 00:02:16,800

careers in stem and particularly in

75

00:02:20,630 --> 00:02:18,239

science

76

00:02:22,309 --> 00:02:20,640

are extremely rewarding

77

00:02:23,510 --> 00:02:22,319

primarily because you're always learning

78

00:02:26,150 --> 00:02:23,520

something new

79

00:02:27,510 --> 00:02:26,160

and that makes for an exciting career

80

00:02:28,390 --> 00:02:27,520

always changing

81

00:02:30,630 --> 00:02:28,400

and

82

00:02:32,229 --> 00:02:30,640

so to students i say

83

00:02:33,910 --> 00:02:32,239

stick with it sometimes careers or

84

00:02:35,670 --> 00:02:33,920

sometimes education can be a little bit

85

00:02:37,750 --> 00:02:35,680

challenging

86

00:02:39,990 --> 00:02:37,760

but that just makes it more fun yeah and

87

00:02:42,790 --> 00:02:40,000

the number of doors that are open to you

88

00:02:44,949 --> 00:02:42,800

when you have uh skills in science

89

00:02:46,630 --> 00:02:44,959

technology engineering and math are

90

00:02:48,229 --> 00:02:46,640

really limitless

91

00:02:50,470 --> 00:02:48,239

so you've done a lot of work here at

92

00:02:53,190 --> 00:02:50,480

nasa in terms of sort of how the human

93

00:02:54,710 --> 00:02:53,200

body reacts to being in space talk a

94

00:02:58,470 --> 00:02:54,720

little bit about that

95

00:03:00,470 --> 00:02:58,480

well uh when we watch uh people in zero

96

00:03:01,750 --> 00:03:00,480

gravity uh it sure looks like a lot of

97

00:03:03,190 --> 00:03:01,760

fun but um

98

00:03:07,110 --> 00:03:03,200

running on the treadmill right it is

99

00:03:09,190 --> 00:03:07,120

that's me running on nasa's c9 aircraft

100

00:03:11,670 --> 00:03:09,200

which allows 20 to 30 seconds of

101

00:03:12,790 --> 00:03:11,680

microgravity at a time it flies

102

00:03:16,949 --> 00:03:12,800

well yes

103

00:03:19,190 --> 00:03:16,959

also known as the vomit comet and

104

00:03:20,470 --> 00:03:19,200

well i tell students that

105

00:03:22,309 --> 00:03:20,480

um

106

00:03:24,470 --> 00:03:22,319

these careers are really exciting and

107

00:03:27,270 --> 00:03:24,480

really fun and my interest in

108

00:03:29,830 --> 00:03:27,280

microgravity um really stems from the

109

00:03:31,030 --> 00:03:29,840

fact that the human body is fascinating

110

00:03:33,190 --> 00:03:31,040

on its own but when we go to

111

00:03:35,589 --> 00:03:33,200

microgravity a lot of the changes that

112

00:03:37,430 --> 00:03:35,599

occur are really not so good for us our

113

00:03:39,350 --> 00:03:37,440

bodies decondition pretty rapidly

114

00:03:41,910 --> 00:03:39,360

without gravity

115

00:03:43,910 --> 00:03:41,920

and one of my favorite experiments on

116

00:03:45,750 --> 00:03:43,920

the international space station is

117

00:03:48,949 --> 00:03:45,760

actually an experiment called integrated

118

00:03:50,869 --> 00:03:48,959

cardiovascular and in essence it studies

119

00:03:53,110 --> 00:03:50,879

the way that the heart deconditions

120

00:03:53,910 --> 00:03:53,120

during long duration space flight

121

00:03:55,750 --> 00:03:53,920

and

122

00:03:57,110 --> 00:03:55,760

i helped implement that experiment

123

00:03:59,030 --> 00:03:57,120

actually just down the hall here in

124

00:04:00,869 --> 00:03:59,040

mission control working with working

125

00:04:02,630 --> 00:04:00,879

with the folks in the payload operations

126

00:04:05,190 --> 00:04:02,640

integration center

127

00:04:06,710 --> 00:04:05,200

as a scientist here at nasa

128

00:04:08,470 --> 00:04:06,720

and one of my favorite parts of that

129

00:04:10,470 --> 00:04:08,480

experiment was

130

00:04:12,149 --> 00:04:10,480

operating an ultrasound device which the

131

00:04:13,670 --> 00:04:12,159

astronauts used on orbit to take

132

00:04:15,190 --> 00:04:13,680

pictures of their heart so we could

133

00:04:17,189 --> 00:04:15,200

actually see the changes that were

134

00:04:18,229 --> 00:04:17,199

occurring that's interesting you know we

135

00:04:19,830 --> 00:04:18,239

talk about ultrasound a little bit

136

00:04:20,949 --> 00:04:19,840

because it's uh

137

00:04:23,270 --> 00:04:20,959

you know one thing i learned whenever i

138

00:04:25,189 --> 00:04:23,280

came here was that you know size

139

00:04:26,550 --> 00:04:25,199

and weight hugely matter whenever you

140

00:04:28,310 --> 00:04:26,560

take things up and one thing the space

141

00:04:29,590 --> 00:04:28,320

station is doing is helping to sort of

142

00:04:31,749 --> 00:04:29,600

miniaturize

143

00:04:33,430 --> 00:04:31,759

you know the size of mris and and

144

00:04:35,030 --> 00:04:33,440

ultrasounds and things such as that like

145

00:04:36,469 --> 00:04:35,040

talk a little bit about that

146

00:04:38,469 --> 00:04:36,479

so the ultrasound device that is

147

00:04:40,790 --> 00:04:38,479

currently on orbit is actually a

148

00:04:42,870 --> 00:04:40,800

commercial off the shelf item that is

149

00:04:43,990 --> 00:04:42,880

very small pretty much no larger than a

150

00:04:45,189 --> 00:04:44,000

laptop

151  
00:04:47,430 --> 00:04:45,199  
and

152  
00:04:49,670 --> 00:04:47,440  
we took that up on orbit with some

153  
00:04:52,950 --> 00:04:49,680  
slight modifications to make it uh make

154  
00:04:55,030 --> 00:04:52,960  
it usable on space but uh technologies

155  
00:04:58,469 --> 00:04:55,040  
have been miniaturized largely because

156  
00:05:02,070 --> 00:04:58,479  
of uh nasa technology and and the need

157  
00:05:04,950 --> 00:05:02,080  
to have smaller uh technologies and and

158  
00:05:06,870 --> 00:05:04,960  
machinery um thanks to nasa spinoffs

159  
00:05:08,070 --> 00:05:06,880  
essentially so final question whenever

160  
00:05:10,230 --> 00:05:08,080  
you take a look at these anniversaries

161  
00:05:11,909 --> 00:05:10,240  
of taraskova and ride and you know you

162  
00:05:13,430 --> 00:05:11,919  
look around at

163  
00:05:14,629 --> 00:05:13,440

you know the space station science team

164

00:05:15,909 --> 00:05:14,639

itself you take a look at all these

165

00:05:17,670 --> 00:05:15,919

flight controllers in this room i mean

166

00:05:19,430 --> 00:05:17,680

it's a very diverse

167

00:05:21,749 --> 00:05:19,440

uh you know people from all walks of

168

00:05:24,230 --> 00:05:21,759

life all over the world and all kinds of

169

00:05:26,150 --> 00:05:24,240

education background you know is that

170

00:05:27,990 --> 00:05:26,160

does that excite you or is it just sort

171

00:05:29,430 --> 00:05:28,000

of normal now

172

00:05:31,029 --> 00:05:29,440

you know i think it's actually pretty

173

00:05:33,350 --> 00:05:31,039

normal now

174

00:05:34,950 --> 00:05:33,360

we do have a very diverse team here at

175

00:05:36,950 --> 00:05:34,960

nasa in particular

176  
00:05:39,189 --> 00:05:36,960  
there are women astronauts women flight

177  
00:05:41,189 --> 00:05:39,199  
controllers women flight directors our

178  
00:05:42,870 --> 00:05:41,199  
center director is a woman

179  
00:05:45,350 --> 00:05:42,880  
we have a woman up on the international

180  
00:05:47,029 --> 00:05:45,360  
space station right now and these things

181  
00:05:50,230 --> 00:05:47,039  
don't make headlines i think it's just

182  
00:05:52,950 --> 00:05:50,240  
expected now the new astronaut class of

183  
00:05:54,310 --> 00:05:52,960  
2013 is half women and while that did

184  
00:05:56,070 --> 00:05:54,320  
make some headlines because it was the

185  
00:05:58,469 --> 00:05:56,080  
first time that it happened it really

186  
00:06:00,309 --> 00:05:58,479  
was wasn't that surprising that is more

187  
00:06:01,990 --> 00:06:00,319  
indicative of the number of applicants

188  
00:06:03,670 --> 00:06:02,000

that are women and and the most

189

00:06:04,870 --> 00:06:03,680

qualified people are picked so i think

190

00:06:05,909 --> 00:06:04,880

it says a lot

191

00:06:07,110 --> 00:06:05,919

well it's always good to talk to

192

00:06:08,790 --> 00:06:07,120

appreciate you coming over here and

193

00:06:10,230 --> 00:06:08,800

spending some time here on the air with

194

00:06:11,590 --> 00:06:10,240

us thank you of course if you'd like to

195

00:06:12,629 --> 00:06:11,600

learn more about the space station all

196

00:06:14,309 --> 00:06:12,639

the different science experiments that

197

00:06:16,230 --> 00:06:14,319

the crew is currently working on you can

198

00:06:17,670 --> 00:06:16,240

take a look at it by expedition or by

199

00:06:21,350 --> 00:06:17,680

discipline just log on to the nasa

200

00:06:23,749 --> 00:06:22,550

station just look on the left-hand side

201

00:06:25,990 --> 00:06:23,759

of the page you'll see research and

202

00:06:27,510 --> 00:06:26,000

technology there and see all kinds of

203

00:06:29,029 --> 00:06:27,520

information there about what uh what the