1
00:00:03,669 --> 00:00:01,829
you've been training for a long time for

2
00:00:05,510 --> 00:00:03,679
this mission about two years now and

3
00:00:07,430 --> 00:00:05,520
you've passed your final exams and it's

4
00:00:09,030 --> 00:00:07,440
just about time to go so

5
00:00:10,549 --> 00:00:09,040
do you feel like it was what you

6
00:00:13,430 --> 00:00:10,559
expected do you feel like you're ready

7
00:00:15,430 --> 00:00:13,440
for the trip and ready for the mission

8
00:00:17,269 --> 00:00:15,440
yeah i think we actually get a great

9
00:00:19,750 --> 00:00:17,279
sense of the training program and how

10
00:00:22,870 --> 00:00:19,760
the training flow is going to proceed

11
00:00:25,029 --> 00:00:22,880
when we start and it's really been

12
00:00:27,750 --> 00:00:25,039
exciting for me to see in these final

13
00:00:28,870 --> 00:00:27,760

phases of flight how the crew has come

14
00:00:32,630 --> 00:00:28,880
together

15
00:00:33,910 --> 00:00:32,640
ground and

16
00:00:35,430 --> 00:00:33,920
that the fact that folks are really

17
00:00:37,190 --> 00:00:35,440
ready for the flight and everything's

18
00:00:39,190 --> 00:00:37,200
getting integrated and put together

19
00:00:40,389 --> 00:00:39,200
really well that's been just a pleasure

20
00:00:42,470 --> 00:00:40,399
to see

21
00:00:43,990 --> 00:00:42,480
i know that with your background in

22
00:00:46,470 --> 00:00:44,000
science you're a scientist here on earth

23
00:00:47,750 --> 00:00:46,480
before you even became an astronaut

24
00:00:49,270 --> 00:00:47,760
you're really looking forward to getting

25
00:00:51,110 --> 00:00:49,280
your hands on the science equipment on

26
00:00:52,790 --> 00:00:51,120
board the space station can you tell us

27
00:00:54,229 --> 00:00:52,800
a little bit about what you are most

28
00:00:55,189 --> 00:00:54,239
excited about what experiments you're

29
00:00:57,110 --> 00:00:55,199
going to be performing and you're

30
00:00:59,510 --> 00:00:57,120
looking forward to

31
00:01:01,270 --> 00:00:59,520
yeah i'm incredibly excited about a lot

32
00:01:02,549 --> 00:01:01,280
of the biology experiments of course

33
00:01:04,869 --> 00:01:02,559
that we're going to be doing on space

34
00:01:06,550 --> 00:01:04,879
station so i think some of the most

35
00:01:08,310 --> 00:01:06,560
interesting pieces of equipment that

36
00:01:10,230 --> 00:01:08,320
we've got on board for research

37
00:01:11,190 --> 00:01:10,240
capabilities are some of the ones that

38
00:01:13,590 --> 00:01:11,200

we're going to be doing for the first

39
00:01:16,310 --> 00:01:13,600
time on on our mission which is trying

40
00:01:17,429 --> 00:01:16,320
to sequence dna in low earth orbit it's

41
00:01:18,550 --> 00:01:17,439
going to be very interesting and

42
00:01:20,950 --> 00:01:18,560
exciting

43
00:01:23,270 --> 00:01:20,960
it gives us a great capability for space

44
00:01:25,429 --> 00:01:23,280
station going forward both for studying

45
00:01:28,390 --> 00:01:25,439
diseases on the planet as well as our

46
00:01:29,510 --> 00:01:28,400
future exploration for mars beyond low

47
00:01:32,310 --> 00:01:29,520
earth orbit

48
00:01:34,550 --> 00:01:32,320
also there's a phenomenal research suite

49
00:01:36,950 --> 00:01:34,560
on board to actually study

50
00:01:38,390 --> 00:01:36,960
cellular material so we're going to be

51
00:01:40,230 --> 00:01:38,400
bringing up a couple of different kinds

52
00:01:43,030 --> 00:01:40,240
of cells we're going to be bringing up

53
00:01:45,590 --> 00:01:43,040
heart cells and looking at how heart

54
00:01:48,550 --> 00:01:45,600
tissue organizes itself and how that

55
00:01:49,910 --> 00:01:48,560
behaves without gravity as a presence

56
00:01:53,270 --> 00:01:49,920
and we're also going to be looking at

57
00:01:55,190 --> 00:01:53,280
bone cells so what happens to the kinds

58
00:01:58,069 --> 00:01:55,200
of bone cells that are responsible for

59
00:02:00,230 --> 00:01:58,079
bone regeneration when they no longer

60
00:02:02,069 --> 00:02:00,240
have that gravity stimulus

61
00:02:04,230 --> 00:02:02,079
and for those experiments and just in

62
00:02:06,950 --> 00:02:04,240
general what what would you say as a

63
00:02:09,830 --> 00:02:06,960

scientist is the value of the lab on the

64
00:02:11,830 --> 00:02:09,840
space station a lab in in microgravity

65
00:02:14,390 --> 00:02:11,840
that's a really good question because uh

66
00:02:16,630 --> 00:02:14,400
the space station is this enormous

67
00:02:18,790 --> 00:02:16,640
engineering achievement and we've seen

68
00:02:21,030 --> 00:02:18,800
the international partner agencies come

69
00:02:23,750 --> 00:02:21,040
together to build this incredible space

70
00:02:25,589 --> 00:02:23,760
station but one of the most exciting

71
00:02:27,990 --> 00:02:25,599
things to me is actually the science

72
00:02:30,630 --> 00:02:28,000
that we can do that we can utilize the

73
00:02:32,229 --> 00:02:30,640
space station for and the unique thing

74
00:02:34,630 --> 00:02:32,239
about the space station is that we are

75
00:02:37,670 --> 00:02:34,640
in this this low earth orbit environment

76
00:02:39,670 --> 00:02:37,680
so we don't have gravity we really have

77
00:02:41,910 --> 00:02:39,680
this presence of microgravity it's very

78
00:02:44,550 --> 00:02:41,920
very small amounts of gravity we're in

79
00:02:46,869 --> 00:02:44,560
free fall around the planet and so on

80
00:02:49,910 --> 00:02:46,879
earth any time you do an experiment you

81
00:02:51,990 --> 00:02:49,920
always have that gravitational force and

82
00:02:54,070 --> 00:02:52,000
that's never anything that you can vary

83
00:02:56,309 --> 00:02:54,080
in your experimental conditions what we

84
00:02:58,790 --> 00:02:56,319
have on the space station is the ability

85
00:03:01,110 --> 00:02:58,800
to vary how much gravitational force

86
00:03:03,430 --> 00:03:01,120
we're putting into the cells or the

87
00:03:05,110 --> 00:03:03,440
tissues or even sometimes the human body

88
00:03:06,550 --> 00:03:05,120

is the experiment

89
00:03:07,990 --> 00:03:06,560
so another thing that's really unique

90
00:03:10,309 --> 00:03:08,000
about the space station is the

91
00:03:13,350 --> 00:03:10,319
environment that it's in it's traveling

92
00:03:15,430 --> 00:03:13,360
at 17 500 miles an hour it's in a

93
00:03:17,430 --> 00:03:15,440
slightly different place in the magnetic

94
00:03:19,509 --> 00:03:17,440
field it's in a different place in the

95
00:03:21,990 --> 00:03:19,519
atmosphere than when we have an

96
00:03:24,229 --> 00:03:22,000
experimental station on the ground so we

97
00:03:26,229 --> 00:03:24,239
can see things like

98
00:03:28,630 --> 00:03:26,239
heavy particle radiation ionizing

99
00:03:30,470 --> 00:03:28,640
radiation in a slightly different way we

100
00:03:32,550 --> 00:03:30,480
can take a look at for example the

101
00:03:34,710 --> 00:03:32,560
search for dark matter in the universe

102
00:03:36,309 --> 00:03:34,720
with the alpha magnetic spectrometer in

103
00:03:38,710 --> 00:03:36,319
a slightly different way than we could

104
00:03:40,309 --> 00:03:38,720
using earth-based laboratories and you

105
00:03:42,070 --> 00:03:40,319
just mentioned that sometimes the human

106
00:03:44,869 --> 00:03:42,080
body is experiment and in this case

107
00:03:47,350 --> 00:03:44,879
that's you so has it been interesting or

108
00:03:49,030 --> 00:03:47,360
different to to kind of turn the tables

109
00:03:50,149 --> 00:03:49,040
and be the experiment yourself in some

110
00:03:51,830 --> 00:03:50,159
cases

111
00:03:54,390 --> 00:03:51,840
yeah just kind of funny sometimes to be

112
00:03:56,229 --> 00:03:54,400
the experiment and the experimenter

113
00:03:58,710 --> 00:03:56,239

so all of the research that we do of

114
00:04:00,710 --> 00:03:58,720
course is is subject to human studies

115
00:04:02,869 --> 00:04:00,720
regulation and done through informed

116
00:04:04,949 --> 00:04:02,879
consent but we do have the opportunity

117
00:04:06,789 --> 00:04:04,959
in a lot of cases to be the experiment

118
00:04:09,670 --> 00:04:06,799
so i think that's really fascinating for

119
00:04:11,990 --> 00:04:09,680
me actually is to see the response of

120
00:04:14,309 --> 00:04:12,000
the human body physiologically to

121
00:04:16,550 --> 00:04:14,319
microgravity so we know things like the

122
00:04:18,949 --> 00:04:16,560
immune system changes there's some

123
00:04:20,870 --> 00:04:18,959
dysregulation of the immune system when

124
00:04:23,510 --> 00:04:20,880
you're in microgravity you no longer

125
00:04:25,830 --> 00:04:23,520
have fluid drawn to your feet the whole

126
00:04:27,749 --> 00:04:25,840
time so there's changes in where the

127
00:04:29,749 --> 00:04:27,759
fluid shifts around in your body and

128
00:04:30,870 --> 00:04:29,759
fluid compartmentalization

129
00:04:33,510 --> 00:04:30,880
we certainly know that there's

130
00:04:35,110 --> 00:04:33,520
cardiovascular changes there's changes

131
00:04:37,350 --> 00:04:35,120
with your heart and the way you pump

132
00:04:39,909 --> 00:04:37,360
blood in your body we know that there

133
00:04:43,189 --> 00:04:39,919
are skin changes on board we do know

134
00:04:45,510 --> 00:04:43,199
that there's changes in the levels of

135
00:04:47,510 --> 00:04:45,520
dormant viruses that will reactivate as

136
00:04:49,670 --> 00:04:47,520
well as the microbial ecosystem that

137
00:04:51,510 --> 00:04:49,680
surrounds us so pretty much any system

138
00:04:53,909 --> 00:04:51,520

you can think of there's some really

139
00:04:55,510 --> 00:04:53,919
interesting observation that we can make

140
00:04:56,469 --> 00:04:55,520
in low earth orbit that we can't study

141
00:04:58,230 --> 00:04:56,479
on the ground

142
00:04:59,990 --> 00:04:58,240
okay clearly there's a lot to be excited

143
00:05:01,830 --> 00:05:00,000
about as a scientist but now shifting

144
00:05:03,510 --> 00:05:01,840
gears a little bit to as an astronaut

145
00:05:05,189 --> 00:05:03,520
what are you looking forward to

146
00:05:07,110 --> 00:05:05,199
the the ride on the rocket the

147
00:05:08,629 --> 00:05:07,120
possibility of a spacewalk and and just

148
00:05:10,150 --> 00:05:08,639
looking out the window

149
00:05:12,390 --> 00:05:10,160
yeah i think the moment that i'm most

150
00:05:14,150 --> 00:05:12,400
looking forward to uh is that first

151
00:05:16,230 --> 00:05:14,160
moment when we open the hatch on the

152
00:05:18,390 --> 00:05:16,240
space station and we get to float in and

153
00:05:20,469 --> 00:05:18,400
we get to to look out the cupola i think

154
00:05:22,629 --> 00:05:20,479
your first glimpse of the planet from

155
00:05:23,590 --> 00:05:22,639
the space station is a pretty incredible

156
00:05:25,270 --> 00:05:23,600
moment

157
00:05:26,790 --> 00:05:25,280
i think you know

158
00:05:28,310 --> 00:05:26,800
really all of the above the ride on the

159
00:05:30,950 --> 00:05:28,320
rocket's going to be

160
00:05:33,590 --> 00:05:30,960
amazing probably fairly indescribable

161
00:05:35,749 --> 00:05:33,600
and the the opportunities that we have

162
00:05:37,749 --> 00:05:35,759
to actually install some hardware in the

163
00:05:40,469 --> 00:05:37,759

space station are really interesting on

164
00:05:42,710 --> 00:05:40,479
our mission so we're hoping to install

165
00:05:44,710 --> 00:05:42,720
the international docking adapter to the

166
00:05:47,189 --> 00:05:44,720
front of space station this is going to

167
00:05:48,629 --> 00:05:47,199
allow us to do commercial crew flights

168
00:05:51,430 --> 00:05:48,639
to the station

169
00:05:53,909 --> 00:05:51,440
with our u.s base partners

170
00:05:56,390 --> 00:05:53,919
as well as the upgrading of space

171
00:05:58,390 --> 00:05:56,400
station to have lithium-ion battery

172
00:06:01,830 --> 00:05:58,400
capability this is really going to allow

173
00:06:04,390 --> 00:06:01,840
our energy storage to go well into

174
00:06:06,790 --> 00:06:04,400
2020 and beyond to maintain space

175
00:06:08,390 --> 00:06:06,800
station as this incredible laboratory

176
00:06:10,309 --> 00:06:08,400
well it sounds like there's a lot going

177
00:06:11,590 --> 00:06:10,319
on in your mission anything else in

178
00:06:13,110 --> 00:06:11,600
particular that you tell people to be

179
00:06:15,510 --> 00:06:13,120
watching out for

180
00:06:17,590 --> 00:06:15,520
yeah so i'm hoping to share some of

181
00:06:19,270 --> 00:06:17,600
these experiences through the nasa

182
00:06:21,430 --> 00:06:19,280
astronauts account

183
00:06:23,749 --> 00:06:21,440
we'll see if my photography skills are

184
00:06:25,510 --> 00:06:23,759
up to par with those of scott kelly and

185
00:06:27,990 --> 00:06:25,520
jeff williams they have set a pretty

186
00:06:30,230 --> 00:06:28,000
high bar so we'll do our best as

187
00:06:31,830 --> 00:06:30,240
expedition 48 crew to share a little bit

188
00:06:33,510 --> 00:06:31,840

of this journey with you both the

189
00:06:35,510 --> 00:06:33,520
research that we're doing as well as the

190
00:06:37,189 --> 00:06:35,520
views that we're seeing outside

191
00:06:38,309 --> 00:06:37,199
we can't wait to see them thanks so much

192
00:06:41,430 --> 00:06:38,319
have a great