
ARMY
To FGB
DECK

1
00:00:05,990 --> 00:00:02,629
station this is houston are you ready

2
00:00:06,000 --> 00:00:14,470
houston we're ready for the event

3
00:00:24,710 --> 00:00:16,390
abc news this is mission control houston

4
00:00:29,349 --> 00:00:27,029
station this is abc news chief health

5
00:00:33,430 --> 00:00:29,359
and medical editor dr rich besser

6
00:00:43,590 --> 00:00:35,270
dr besser we have you very loud and

7
00:00:47,430 --> 00:00:45,670
oh great talking to you well i want to

8
00:00:50,389 --> 00:00:47,440
welcome our audience to this very

9
00:00:56,549 --> 00:00:50,399
special abc news live stream uh

10
00:01:00,229 --> 00:00:58,389
okay we're not live yet i'm gonna i'll

11
00:01:01,670 --> 00:01:00,239
do that again in in a second thank you

12
00:01:05,990 --> 00:01:01,680
both for for being here i really

13
00:01:06,000 --> 00:01:33,990

you bet our pleasure

14
00:01:38,469 --> 00:01:36,630
welcome to a very special abc news live

15
00:01:40,469 --> 00:01:38,479
streaming event i'm going to be talking

16
00:01:43,429 --> 00:01:40,479
with two american astronauts

17
00:01:45,510 --> 00:01:43,439
uh flight commander jeff williams and dr

18
00:01:47,109 --> 00:01:45,520
kate rubins live from the international

19
00:01:49,670 --> 00:01:47,119
space station this is live streaming on

20
00:01:51,910 --> 00:01:49,680
all of abc's digital platforms as well

21
00:01:54,550 --> 00:01:51,920
as as facebook uh

22
00:01:56,630 --> 00:01:54,560
facebook live uh

23
00:01:58,709 --> 00:01:56,640
i want to welcome our two astronauts

24
00:02:01,270 --> 00:01:58,719
flight commander jeff williams is about

25
00:02:03,109 --> 00:02:01,280
to set a record for the most cumulative

26
00:02:05,990 --> 00:02:03,119
days in space

27
00:02:09,190 --> 00:02:06,000
it will be a total of 534 and dr kate

28
00:02:10,309 --> 00:02:09,200
rubins is is on her her first uh space

29
00:02:12,470 --> 00:02:10,319
flight

30
00:02:14,470 --> 00:02:12,480
kate i want to i want to start by asking

31
00:02:16,630 --> 00:02:14,480
you a question i i understand that both

32
00:02:19,670 --> 00:02:16,640
of you went on a spacewalk at the end of

33
00:02:21,110 --> 00:02:19,680
last week it was your first spacewalk so

34
00:02:22,630 --> 00:02:21,120
i want to get a sense

35
00:02:24,630 --> 00:02:22,640
what did that feel like what were you

36
00:02:26,949 --> 00:02:24,640
trying to do what does it feel like just

37
00:02:31,589 --> 00:02:26,959
being out there in space outside of the

38
00:02:36,070 --> 00:02:33,670

yeah well we train we prepare for these

39
00:02:37,910 --> 00:02:36,080
spacewalks it's been about seven years

40
00:02:40,390 --> 00:02:37,920
actually since i've been at nasa and we

41
00:02:42,710 --> 00:02:40,400
start our spacewalk training

42
00:02:45,589 --> 00:02:42,720
very early on so it's been a number of

43
00:02:47,750 --> 00:02:45,599
years and you get a really good sense of

44
00:02:49,030 --> 00:02:47,760
what to expect in terms of the tasks

45
00:02:50,710 --> 00:02:49,040
that you're doing

46
00:02:52,470 --> 00:02:50,720
we got a chance to bolt the

47
00:02:54,630 --> 00:02:52,480
international docking adapter to the

48
00:02:56,470 --> 00:02:54,640
front of space station but nothing quite

49
00:02:58,470 --> 00:02:56,480
prepares you for that first glimpse when

50
00:02:59,830 --> 00:02:58,480
you open the hatch and see the entire

51
00:03:01,589 --> 00:02:59,840
planet below

52
00:03:03,910 --> 00:03:01,599
i'm not even sure what i said i think it

53
00:03:12,869 --> 00:03:03,920
was something like wow or phenomenal

54
00:03:20,390 --> 00:03:16,390
and one of one of your big projects is

55
00:03:23,350 --> 00:03:20,400
focused on sequencing dna and i was

56
00:03:24,869 --> 00:03:23,360
wondering can you explain um why you're

57
00:03:27,270 --> 00:03:24,879
trying to do this in space what

58
00:03:32,630 --> 00:03:27,280
capability will will that that give you

59
00:03:37,350 --> 00:03:34,789
yeah so it's both a technology

60
00:03:40,309 --> 00:03:37,360
demonstration as well as an actual

61
00:03:42,309 --> 00:03:40,319
platform for future sequencing in space

62
00:03:44,390 --> 00:03:42,319
the tech demo part of it is that we're

63
00:03:48,149 --> 00:03:44,400

trying to understand can we even use

64
00:03:51,110 --> 00:03:48,159
this technology off-world as it is

65
00:03:54,309 --> 00:03:51,120
because uh it's very dependent on fluids

66
00:03:56,710 --> 00:03:54,319
and surface tension and and bubbles and

67
00:03:59,190 --> 00:03:56,720
so we're doing a lot of just the the

68
00:04:01,750 --> 00:03:59,200
tech dev side of things to see what we

69
00:04:03,910 --> 00:04:01,760
can do off the planet in terms of modern

70
00:04:06,070 --> 00:04:03,920
molecular biology in terms of a

71
00:04:07,830 --> 00:04:06,080
capability for the space station this

72
00:04:10,550 --> 00:04:07,840
just opens up the entire world of

73
00:04:12,149 --> 00:04:10,560
genomics so anytime you would have

74
00:04:14,949 --> 00:04:12,159
something for

75
00:04:17,349 --> 00:04:14,959
diagnosing a disease our bone and muscle

76
00:04:19,670 --> 00:04:17,359
degeneration up here you can actually

77
00:04:21,270 --> 00:04:19,680
look at this the sequencing data to

78
00:04:23,749 --> 00:04:21,280
understand that we can understand the

79
00:04:26,070 --> 00:04:23,759
microbial world up here we can try to

80
00:04:27,030 --> 00:04:26,080
understand uh all of the different kinds

81
00:04:28,870 --> 00:04:27,040
of

82
00:04:30,710 --> 00:04:28,880
eclipse systems the environmental life

83
00:04:32,550 --> 00:04:30,720
support systems that we have up here

84
00:04:34,390 --> 00:04:32,560
that constantly recycle our air and our

85
00:04:42,150 --> 00:04:34,400
water we can use sequencing to start

86
00:04:48,310 --> 00:04:45,430
that's that's fantastic uh jeff you're

87
00:04:50,710 --> 00:04:48,320
you're about to set a record for for the

88
00:04:53,670 --> 00:04:50,720

most days in in space

89
00:04:56,070 --> 00:04:53,680
um when when scott kelly came back there

90
00:04:59,110 --> 00:04:56,080
was a lot that was learned about the

91
00:05:01,270 --> 00:04:59,120
effects on on his body and you know as a

92
00:05:02,310 --> 00:05:01,280
as a physician i'm very very intrigued

93
00:05:05,029 --> 00:05:02,320
by

94
00:05:07,430 --> 00:05:05,039
what some of the the big effects of

95
00:05:08,710 --> 00:05:07,440
space on on the body and whether there's

96
00:05:10,070 --> 00:05:08,720
anything that was learned from his

97
00:05:12,469 --> 00:05:10,080
mission that you're trying to do

98
00:05:16,390 --> 00:05:12,479
differently to lessen the impact on on

99
00:05:20,150 --> 00:05:17,990
well i think we're all doing basically

100
00:05:21,909 --> 00:05:20,160
the same things it's just that his

101
00:05:24,469 --> 00:05:21,919
duration was much longer than the

102
00:05:26,469 --> 00:05:24,479
typical duration up here uh but yeah

103
00:05:28,230 --> 00:05:26,479
there are effects we know we have known

104
00:05:30,550 --> 00:05:28,240
effects on uh

105
00:05:32,070 --> 00:05:30,560
not on everybody but on some people on

106
00:05:34,390 --> 00:05:32,080
vision and of course that's a very

107
00:05:36,230 --> 00:05:34,400
significant thing and uh so we're trying

108
00:05:38,469 --> 00:05:36,240
to study that to understand understand

109
00:05:40,469 --> 00:05:38,479
the root cause the mechanism so that we

110
00:05:41,590 --> 00:05:40,479
can hopefully develop counter measures

111
00:05:43,590 --> 00:05:41,600
for it

112
00:05:45,830 --> 00:05:43,600
we the air we breathe here has a little

113
00:05:48,310 --> 00:05:45,840

bit higher level of co2 than we breathe

114
00:05:51,189 --> 00:05:48,320
on the ground and that has some impacts

115
00:05:54,790 --> 00:05:51,199
on the body not all of which we we fully

116
00:05:56,790 --> 00:05:54,800
understand so that's another area of

117
00:05:58,309 --> 00:05:56,800
investigation of course we know in a

118
00:06:00,550 --> 00:05:58,319
weightless environment your muscles and

119
00:06:01,749 --> 00:06:00,560
your bones atrophy we understand that

120
00:06:03,350 --> 00:06:01,759
pretty well we've developed

121
00:06:05,590 --> 00:06:03,360
countermeasures to keep our bone

122
00:06:07,029 --> 00:06:05,600
strength up over the years and the space

123
00:06:09,670 --> 00:06:07,039
station that's been one of the great

124
00:06:12,309 --> 00:06:09,680
advances accomplished uh during the time

125
00:06:14,710 --> 00:06:12,319
of the space station uh to maintain uh

126
00:06:16,870 --> 00:06:14,720
bones and and muscle strength so but uh

127
00:06:19,350 --> 00:06:16,880
very important and of course there are

128
00:06:21,350 --> 00:06:19,360
other maybe less visible or less

129
00:06:24,230 --> 00:06:21,360
significant items that we're studying on

130
00:06:27,270 --> 00:06:24,240
the human body too but that's one of the

131
00:06:28,629 --> 00:06:27,280
the main areas of study on board the

132
00:06:31,029 --> 00:06:28,639
international space station of course

133
00:06:38,950 --> 00:06:31,039
that's going to help enable future space

134
00:06:44,790 --> 00:06:41,909
so you know i i'm an infectious disease

135
00:06:47,830 --> 00:06:44,800
guy and i'm intrigued by

136
00:06:49,589 --> 00:06:47,840
by risks of getting infections when when

137
00:06:52,710 --> 00:06:49,599
you're in space so

138
00:06:56,390 --> 00:06:52,720

a question a question i have is can you

139
00:06:58,309 --> 00:06:56,400
catch a cold in space and if so

140
00:07:00,790 --> 00:06:58,319
where do where do those viruses come

141
00:07:03,670 --> 00:07:00,800
from and the big question that a number

142
00:07:04,870 --> 00:07:03,680
of us had here is if you sneeze right

143
00:07:06,550 --> 00:07:04,880
where you are

144
00:07:09,749 --> 00:07:06,560
does that sneeze

145
00:07:11,749 --> 00:07:09,759
stay in the air in your in your capsule

146
00:07:16,230 --> 00:07:11,759
for all time because of the microgravity

147
00:07:21,430 --> 00:07:17,909
those are some great questions i'm also

148
00:07:23,350 --> 00:07:21,440
an infectious disease researcher so i i

149
00:07:25,909 --> 00:07:23,360
really appreciate that line of thinking

150
00:07:28,070 --> 00:07:25,919
um so we actually it's pretty nice up

151
00:07:30,550 --> 00:07:28,080
here uh everybody that comes up to the

152
00:07:33,110 --> 00:07:30,560
space station goes into quarantine and

153
00:07:36,070 --> 00:07:33,120
so we actually are very protected from

154
00:07:38,070 --> 00:07:36,080
viruses up here because we don't have

155
00:07:40,230 --> 00:07:38,080
a lot of other humans around to pass

156
00:07:43,510 --> 00:07:40,240
those viruses on to us so you really

157
00:07:45,029 --> 00:07:43,520
can't catch a cold up on space station

158
00:07:47,029 --> 00:07:45,039
but we that's not to say we don't have

159
00:07:48,950 --> 00:07:47,039
microbial life up here there's microbes

160
00:07:50,869 --> 00:07:48,960
everywhere they're uh they're on our

161
00:07:52,710 --> 00:07:50,879
skin they're in our digestive system

162
00:07:54,710 --> 00:07:52,720
they're they're all over on the

163
00:07:56,550 --> 00:07:54,720

equipment on space station

164
00:07:58,309 --> 00:07:56,560
and it's it's not a sterile environment

165
00:07:59,909 --> 00:07:58,319
it's probably not a good idea to have it

166
00:08:02,469 --> 00:07:59,919
be a sterile environment because you

167
00:08:04,550 --> 00:08:02,479
don't want a bad microbial population to

168
00:08:06,950 --> 00:08:04,560
take over a fair amount of good

169
00:08:08,150 --> 00:08:06,960
microorganisms is a good thing and and

170
00:08:09,670 --> 00:08:08,160
that is one of the things that we're

171
00:08:11,990 --> 00:08:09,680
very interested in

172
00:08:14,309 --> 00:08:12,000
with things like there's a new real-time

173
00:08:16,710 --> 00:08:14,319
pcr machine a sequencer

174
00:08:19,510 --> 00:08:16,720
a glove box the ability to do cell

175
00:08:21,749 --> 00:08:19,520
culture these are all the cutting edge

176
00:08:24,790 --> 00:08:21,759
molecular biology tools we need to

177
00:08:27,430 --> 00:08:24,800
understand microorganisms onboard space

178
00:08:29,670 --> 00:08:27,440
station and how that complex microbial

179
00:08:30,950 --> 00:08:29,680
life is interacting

180
00:08:32,230 --> 00:08:30,960
in this space environment it's a

181
00:08:33,589 --> 00:08:32,240
completely different environment than

182
00:08:40,949 --> 00:08:33,599
we've ever been able to study

183
00:08:45,509 --> 00:08:43,190
so those of you who are watching on

184
00:08:47,670 --> 00:08:45,519
facebook feel free to to add your

185
00:08:49,509 --> 00:08:47,680
questions we have some comment coming in

186
00:08:51,750 --> 00:08:49,519
um i want to just follow up on that

187
00:08:54,550 --> 00:08:51,760
because i i'm absolutely fascinated by

188
00:08:57,190 --> 00:08:54,560

the whole microbial thing did they study

189
00:08:59,190 --> 00:08:57,200
your microbiome the the bacteria and

190
00:09:00,630 --> 00:08:59,200
organisms that are in and on your body

191
00:09:02,710 --> 00:09:00,640
and um

192
00:09:05,030 --> 00:09:02,720
how does it play in that you're on a

193
00:09:06,550 --> 00:09:05,040
space station with astronauts from all

194
00:09:12,630 --> 00:09:06,560
over the world who who may have

195
00:09:17,190 --> 00:09:14,790
yeah that's a great question and we are

196
00:09:19,509 --> 00:09:17,200
studying the microbiomes uh of all

197
00:09:21,910 --> 00:09:19,519
astronauts we've got uh quite a few

198
00:09:24,310 --> 00:09:21,920
studies going on we're looking at both

199
00:09:26,550 --> 00:09:24,320
the microbiomes pre and post flight as

200
00:09:27,990 --> 00:09:26,560
well as on board what happens to your

201
00:09:29,990 --> 00:09:28,000
microbiome

202
00:09:31,910 --> 00:09:30,000
when you're in space

203
00:09:33,910 --> 00:09:31,920
we do actually travel quite a bit

204
00:09:36,150 --> 00:09:33,920
internationally so

205
00:09:37,670 --> 00:09:36,160
we are all over the globe before we

206
00:09:39,829 --> 00:09:37,680
launch because we train with our

207
00:09:42,470 --> 00:09:39,839
international partners in russia in

208
00:09:44,630 --> 00:09:42,480
europe in canada and japan

209
00:09:46,790 --> 00:09:44,640
but then we do have we do have folks all

210
00:09:49,110 --> 00:09:46,800
launching up here and so the question is

211
00:09:50,550 --> 00:09:49,120
how do microbiomes change up here is

212
00:09:52,710 --> 00:09:50,560
there an influence

213
00:09:55,590 --> 00:09:52,720

because of microgravity it's hugely

214
00:09:57,269 --> 00:09:55,600
influential in our human physiology so

215
00:10:00,150 --> 00:09:57,279
how does that influence microbial

216
00:10:02,150 --> 00:10:00,160
physiology and then also is there an

217
00:10:03,590 --> 00:10:02,160
effect due to the radiation environment

218
00:10:05,750 --> 00:10:03,600
we've got a completely different

219
00:10:08,470 --> 00:10:05,760
environment up here where the microbes

220
00:10:11,110 --> 00:10:08,480
are subject to some radiation so

221
00:10:13,269 --> 00:10:11,120
over the course of 16 years we've had

222
00:10:15,030 --> 00:10:13,279
the space station up here and the

223
00:10:18,069 --> 00:10:15,040
microbial communities have been under

224
00:10:19,670 --> 00:10:18,079
this constant effect of radiation uh so

225
00:10:21,670 --> 00:10:19,680
all of those are great questions we're

226
00:10:23,430 --> 00:10:21,680
answering that with the research on

227
00:10:25,030 --> 00:10:23,440
space station right now and we think

228
00:10:26,949 --> 00:10:25,040
that it's going to have some pretty big

229
00:10:35,430 --> 00:10:26,959
impacts for our understanding of

230
00:10:40,470 --> 00:10:37,670
uh we have some some questions coming in

231
00:10:42,389 --> 00:10:40,480
on facebook and uh a number of questions

232
00:10:43,350 --> 00:10:42,399
that are dealing with the issue of of

233
00:10:44,310 --> 00:10:43,360
sleep

234
00:10:45,829 --> 00:10:44,320
um

235
00:10:49,350 --> 00:10:45,839
and i wonder if you could talk a little

236
00:10:51,829 --> 00:10:49,360
bit about what it's like to to sleep uh

237
00:10:55,269 --> 00:10:51,839
in the space station um do you sleep

238
00:10:57,030 --> 00:10:55,279

floating um do you lose your circadian

239
00:10:59,910 --> 00:10:57,040
rhythm that kind of natural rhythm that

240
00:11:05,030 --> 00:10:59,920
the body has and does that make you a

241
00:11:09,750 --> 00:11:07,509
well the last is uh easy to answer no

242
00:11:12,710 --> 00:11:09,760
we're not typically crabby up here we're

243
00:11:15,030 --> 00:11:12,720
we're tired uh i think you you do get to

244
00:11:17,350 --> 00:11:15,040
a level of fatigue that you can sustain

245
00:11:18,949 --> 00:11:17,360
for a long period of time

246
00:11:20,870 --> 00:11:18,959
and everybody varies of course just like

247
00:11:22,630 --> 00:11:20,880
on on the planet

248
00:11:24,550 --> 00:11:22,640
everybody's individual characteristics

249
00:11:25,670 --> 00:11:24,560
vary in terms of sleep

250
00:11:27,509 --> 00:11:25,680
ability

251
00:11:29,829 --> 00:11:27,519
but yeah you touch on some some real

252
00:11:32,470 --> 00:11:29,839
issues up here we do float everything

253
00:11:34,150 --> 00:11:32,480
floats up here uh so each of us have a

254
00:11:36,870 --> 00:11:34,160
private crew quarters it's about the

255
00:11:39,350 --> 00:11:36,880
size of a of a phone booth for those

256
00:11:41,910 --> 00:11:39,360
that remember phone booths out there so

257
00:11:43,990 --> 00:11:41,920
but it's enough room to uh to have some

258
00:11:44,710 --> 00:11:44,000
private space you can close it up and

259
00:11:47,750 --> 00:11:44,720
and

260
00:11:49,829 --> 00:11:47,760
quieter

261
00:11:52,069 --> 00:11:49,839
uh we have a sl each have a sleeping bag

262
00:11:53,110 --> 00:11:52,079
that we tied to the wall of that crew

263
00:11:54,710 --> 00:11:53,120

quarters

264
00:11:55,829 --> 00:11:54,720
and that keeps us from floating around

265
00:11:57,509 --> 00:11:55,839
at night

266
00:11:59,509 --> 00:11:57,519
and banging into things it also keeps

267
00:12:01,910 --> 00:11:59,519
you warm obviously

268
00:12:03,670 --> 00:12:01,920
and sleeping up here is

269
00:12:06,310 --> 00:12:03,680
pretty good

270
00:12:09,509 --> 00:12:06,320
i have to personally i don't sleep a

271
00:12:11,990 --> 00:12:09,519
sound up here as i do sometimes on earth

272
00:12:13,910 --> 00:12:12,000
part of it is the environment i suppose

273
00:12:16,550 --> 00:12:13,920
of weightlessness but part of it also is

274
00:12:18,949 --> 00:12:16,560
that you need to be ready to wake up and

275
00:12:21,350 --> 00:12:18,959
deal with some kind of a system failure

276
00:12:23,590 --> 00:12:21,360
or emergency at any time so that's on

277
00:12:25,590 --> 00:12:23,600
your mind in terms of circadian rhythm

278
00:12:27,910 --> 00:12:25,600
most of us have a natural circadian

279
00:12:29,430 --> 00:12:27,920
rhythm that's about 24 hours but some

280
00:12:31,750 --> 00:12:29,440
are a little plus and some are a little

281
00:12:33,990 --> 00:12:31,760
minus 24 hours

282
00:12:36,870 --> 00:12:34,000
we go around the earth every 90 minutes

283
00:12:39,030 --> 00:12:36,880
16 times a day so sunrises and sunsets

284
00:12:41,670 --> 00:12:39,040
don't give us the cues that you have

285
00:12:44,870 --> 00:12:41,680
typically on the planet so you we work

286
00:12:46,710 --> 00:12:44,880
off time we work off the schedule and uh

287
00:12:48,150 --> 00:12:46,720
the schedule tells us when the day's

288
00:12:49,990 --> 00:12:48,160

over the work day is over it tells us

289
00:12:51,990 --> 00:12:50,000
when it's time to go to bed and we're

290
00:12:54,069 --> 00:12:52,000
pretty disciplined about getting lights

291
00:12:57,110 --> 00:12:54,079
out about bedtime and getting the sleep

292
00:12:59,269 --> 00:12:57,120
we need we work a 24-hour day and

293
00:13:01,269 --> 00:12:59,279
we typically work on greenwich meantime

294
00:13:09,430 --> 00:13:01,279
getting up at six in the morning and in

295
00:13:15,269 --> 00:13:11,910
uh another another question here from

296
00:13:17,509 --> 00:13:15,279
from facebook um has to do with aging um

297
00:13:21,269 --> 00:13:17,519
have have there been any studies to look

298
00:13:26,870 --> 00:13:21,279
at whether the body ages faster or

299
00:13:31,829 --> 00:13:28,710
that's a great question about aging and

300
00:13:34,790 --> 00:13:31,839
aging is a really complex process so we

301
00:13:36,790 --> 00:13:34,800
see that in humans as as we get older

302
00:13:37,990 --> 00:13:36,800
but there's a number of factors involved

303
00:13:39,509 --> 00:13:38,000
in aging

304
00:13:41,350 --> 00:13:39,519
and there's a whole lot of research

305
00:13:44,069 --> 00:13:41,360
that's been going on recently

306
00:13:46,870 --> 00:13:44,079
things to look at telomere length so the

307
00:13:50,069 --> 00:13:46,880
very bits of ends of your dna it's kind

308
00:13:52,310 --> 00:13:50,079
of a cap on the dna in your cells uh it

309
00:13:55,189 --> 00:13:52,320
keeps it from fraying at the ends maybe

310
00:13:57,110 --> 00:13:55,199
if you uh if you burn the end of a rope

311
00:13:58,150 --> 00:13:57,120
a little bit when you've tied a knot

312
00:14:00,310 --> 00:13:58,160
those can

313
00:14:02,949 --> 00:14:00,320

actually degrade over time and that's

314
00:14:05,910 --> 00:14:02,959
one of the symbols of aging we're

315
00:14:07,829 --> 00:14:05,920
looking at potential skin aging on board

316
00:14:09,829 --> 00:14:07,839
there's a european experiment to look at

317
00:14:12,310 --> 00:14:09,839
that we're looking at immune function

318
00:14:14,310 --> 00:14:12,320
immune response is very important in

319
00:14:16,389 --> 00:14:14,320
aging that's why you see things like flu

320
00:14:19,110 --> 00:14:16,399
and elderly people the immune system is

321
00:14:21,030 --> 00:14:19,120
just not strong enough we also see

322
00:14:22,629 --> 00:14:21,040
weakened immune systems on board the

323
00:14:24,310 --> 00:14:22,639
space station and so there's been a lot

324
00:14:26,389 --> 00:14:24,320
of research over the years and there's

325
00:14:28,870 --> 00:14:26,399
several continuing studies to look at

326
00:14:31,269 --> 00:14:28,880
how our immune systems change in

327
00:14:40,069 --> 00:14:31,279
normally really healthy people once we

328
00:14:44,629 --> 00:14:42,069
thanks thanks very much now

329
00:14:46,710 --> 00:14:44,639
we're seeing some incredible images of

330
00:14:49,189 --> 00:14:46,720
of you there on the on the space station

331
00:14:51,829 --> 00:14:49,199
and that's raised some questions um jeff

332
00:14:54,069 --> 00:14:51,839
uh question as to why you're wearing two

333
00:14:55,509 --> 00:14:54,079
watches and then if you could show us

334
00:14:57,110 --> 00:14:55,519
around a little bit right where you are

335
00:14:58,550 --> 00:14:57,120
there's a banner behind you what's

336
00:15:02,069 --> 00:14:58,560
what's that banner and what are some of

337
00:15:05,990 --> 00:15:04,150
okay well i'm actually wearing one watch

338
00:15:09,269 --> 00:15:06,000

and then the other one is uh

339
00:15:11,829 --> 00:15:09,279
it's measuring uh the light environment

340
00:15:13,430 --> 00:15:11,839
around me as well as my motion and this

341
00:15:16,069 --> 00:15:13,440
is i'm actually wearing this for just a

342
00:15:19,590 --> 00:15:16,079
few days it's part of an experiment uh

343
00:15:21,750 --> 00:15:19,600
to study uh sleep and circadian rhythm

344
00:15:23,430 --> 00:15:21,760
uh so that's why i have two things on my

345
00:15:25,269 --> 00:15:23,440
arm but though only one of them is a

346
00:15:27,990 --> 00:15:25,279
watch let's see some of the things you

347
00:15:31,030 --> 00:15:28,000
see the banner in the back that's mine

348
00:15:33,189 --> 00:15:31,040
i'm a west point graduate 1980 and uh i

349
00:15:35,670 --> 00:15:33,199
like to wave the flag if you will and

350
00:15:37,910 --> 00:15:35,680
show the army presence and actually kate

351
00:15:39,269 --> 00:15:37,920
i consider an honorary army person

352
00:15:42,230 --> 00:15:39,279
because she worked with the army in

353
00:15:45,590 --> 00:15:42,240
africa on a medical program over there

354
00:15:47,110 --> 00:15:45,600
so so the the army has uh control and

355
00:15:48,870 --> 00:15:47,120
command of the international space

356
00:15:51,110 --> 00:15:48,880
station at this time and i want to make

357
00:15:54,230 --> 00:15:51,120
that obvious to everybody

358
00:15:57,590 --> 00:15:54,240
you also see uh behind kate here uh a

359
00:16:00,230 --> 00:15:57,600
robotic uh system that's uh one of the

360
00:16:02,310 --> 00:16:00,240
the workstations uh that we use to

361
00:16:05,189 --> 00:16:02,320
operate the robotic arm outside and we

362
00:16:07,670 --> 00:16:05,199
use camera views to uh to keep uh

363
00:16:09,910 --> 00:16:07,680

our uh our situational awareness up as

364
00:16:12,470 --> 00:16:09,920
we as we operate that

365
00:16:14,550 --> 00:16:12,480
uh a lot of our activity has to do with

366
00:16:16,870 --> 00:16:14,560
taking photography of the earth and

367
00:16:19,509 --> 00:16:16,880
here's an example of of a camera and a

368
00:16:21,829 --> 00:16:19,519
big lens this one is 400 millimeter uh

369
00:16:23,990 --> 00:16:21,839
we have all kinds of lenses and they're

370
00:16:26,310 --> 00:16:24,000
the professional-grade cameras

371
00:16:28,790 --> 00:16:26,320
that we use to uh to try to capture the

372
00:16:30,870 --> 00:16:28,800
view out the window uh to vicariously

373
00:16:33,829 --> 00:16:30,880
bring that perspective to the folks on

374
00:16:35,590 --> 00:16:33,839
on earth and then this we're in the u.s

375
00:16:37,829 --> 00:16:35,600
laboratory which is the center of the

376
00:16:39,990 --> 00:16:37,839
space station it's really the heart and

377
00:16:41,910 --> 00:16:40,000
the brains and the lungs

378
00:16:43,670 --> 00:16:41,920
of the space station it has all the main

379
00:16:45,670 --> 00:16:43,680
computers that operate all the systems

380
00:16:46,949 --> 00:16:45,680
throughout the space station it cleans

381
00:16:48,710 --> 00:16:46,959
the air

382
00:16:51,030 --> 00:16:48,720
it distributes the power throughout the

383
00:16:52,710 --> 00:16:51,040
space station and it also has quite a

384
00:16:53,910 --> 00:16:52,720
few different kinds of experimental

385
00:16:56,150 --> 00:16:53,920
facilities

386
00:16:58,389 --> 00:16:56,160
covering the spectrum of sciences so

387
00:17:05,029 --> 00:16:58,399
just a just a brief description of what

388
00:17:10,630 --> 00:17:07,590

well um yeah i have to say that in my

389
00:17:11,429 --> 00:17:10,640
job at abc news i get to interview a lot

390
00:17:15,029 --> 00:17:11,439
of

391
00:17:17,189 --> 00:17:15,039
things but watching youtube floating

392
00:17:19,590 --> 00:17:17,199
around there uh is is absolutely

393
00:17:22,069 --> 00:17:19,600
incredible but kate this is your first

394
00:17:24,470 --> 00:17:22,079
mission you trained for so many years

395
00:17:27,270 --> 00:17:24,480
is there anything about this

396
00:17:29,750 --> 00:17:27,280
being in space that surprised you um

397
00:17:34,630 --> 00:17:29,760
what's what's been the the coolest part

398
00:17:38,950 --> 00:17:36,950
so i actually uh have been remarking a

399
00:17:40,789 --> 00:17:38,960
lot to jeff i get surprised on just

400
00:17:42,870 --> 00:17:40,799
about a daily basis

401
00:17:44,710 --> 00:17:42,880
and i've been here for

402
00:17:46,710 --> 00:17:44,720
almost a month and a half now there's

403
00:17:48,630 --> 00:17:46,720
always something new

404
00:17:50,150 --> 00:17:48,640
the there's a there's a couple things

405
00:17:51,590 --> 00:17:50,160
that really stand out and one is the

406
00:17:53,830 --> 00:17:51,600
view of the earth

407
00:17:56,150 --> 00:17:53,840
so we have some incredible photography

408
00:17:58,070 --> 00:17:56,160
from astronauts we have video

409
00:18:00,390 --> 00:17:58,080
but nothing had really prepared me for

410
00:18:03,190 --> 00:18:00,400
the actual sight of our planet as we're

411
00:18:05,830 --> 00:18:03,200
orbiting and the way our our orbital

412
00:18:08,310 --> 00:18:05,840
inclination hits we can actually see

413
00:18:10,230 --> 00:18:08,320

most of the globe so i feel like i might

414
00:18:12,710 --> 00:18:10,240
finally be able to pass my 4th grade

415
00:18:14,470 --> 00:18:12,720
geography quiz at this point

416
00:18:16,789 --> 00:18:14,480
you really end up getting to know

417
00:18:19,510 --> 00:18:16,799
continents you know land masses you know

418
00:18:21,430 --> 00:18:19,520
landmarks and it's beautiful it's just

419
00:18:22,310 --> 00:18:21,440
stunningly beautiful every time you look

420
00:18:23,510 --> 00:18:22,320
at it

421
00:18:26,470 --> 00:18:23,520
every time i look out the window there's

422
00:18:29,510 --> 00:18:26,480
an aurora or a meteor burning through

423
00:18:31,750 --> 00:18:29,520
the atmosphere or you can see the moon

424
00:18:33,909 --> 00:18:31,760
rising and setting

425
00:18:36,710 --> 00:18:33,919
you can see that it will happen in 20

426
00:18:38,470 --> 00:18:36,720
seconds a moon rise at the right beta

427
00:18:40,310 --> 00:18:38,480
angle on earth so

428
00:18:41,510 --> 00:18:40,320
you can train for a very long time

429
00:18:43,430 --> 00:18:41,520
there's still

430
00:18:50,150 --> 00:18:43,440
pretty much wonder around every corner

431
00:18:53,830 --> 00:18:51,029
well

432
00:18:55,590 --> 00:18:53,840
commander jeff williams dr kate rubins i

433
00:18:57,110 --> 00:18:55,600
i want to thank you for what you do and

434
00:18:59,430 --> 00:18:57,120
i want to thank you for giving us a

435
00:19:01,990 --> 00:18:59,440
little bit of your time to share that

436
00:19:03,270 --> 00:19:02,000
experience with us for abc news i'm dr

437
00:19:16,789 --> 00:19:03,280
richard besser