1
00:00:04,870 --> 00:00:01,750
station this is houston are you ready

2
00:00:09,589 --> 00:00:07,749
we are ready for the event

3
00:00:11,350 --> 00:00:09,599
associated press this is mission control

4
00:00:12,310 --> 00:00:11,360
houston please call station for a voice

5
00:00:13,990 --> 00:00:12,320
check

6
00:00:19,029 --> 00:00:14,000
station this is marcia doane with the

7
00:00:22,550 --> 00:00:20,870
hello marcia we have you loud and clear

8
00:00:24,630 --> 00:00:22,560
good to talk to you today

9
00:00:25,589 --> 00:00:24,640
good morning from the kennedy space

10
00:00:27,589 --> 00:00:25,599
center

11
00:00:30,230 --> 00:00:27,599
i'd like to start off by welcoming kate

12
00:00:32,870 --> 00:00:30,240
to space and directing my first several

13
00:00:34,470 --> 00:00:32,880

questions to her if you don't mind

14
00:00:36,470 --> 00:00:34,480
tell me a bit about the write-up last

15
00:00:38,310 --> 00:00:36,480
week kate and your time so far at the

16
00:00:42,950 --> 00:00:38,320
space station is space how you thought

17
00:00:46,790 --> 00:00:44,709
great question we spend a lot of time

18
00:00:48,069 --> 00:00:46,800
preparing uh for launch obviously it's

19
00:00:50,150 --> 00:00:48,079
been about a two and a half year

20
00:00:51,830 --> 00:00:50,160
training flow and you hear a lot about

21
00:00:54,790 --> 00:00:51,840
launch but there's nothing really that

22
00:00:57,430 --> 00:00:54,800
can quite prepare you for uh the actual

23
00:00:59,670 --> 00:00:57,440
event of a ride on a rocket so

24
00:01:01,189 --> 00:00:59,680
it was a it was an amazing launch

25
00:01:02,630 --> 00:01:01,199
all the folks on the ground said that it

26
00:01:04,950 --> 00:01:02,640
was beautiful to see

27
00:01:06,469 --> 00:01:04,960
and for me one of the most amazing parts

28
00:01:07,830 --> 00:01:06,479
has been opening the hatch and getting

29
00:01:10,070 --> 00:01:07,840
to glimpse the space station for the

30
00:01:12,149 --> 00:01:10,080
first time

31
00:01:14,070 --> 00:01:12,159
well correct me if i'm wrong but i

32
00:01:16,789 --> 00:01:14,080
believe you are the first professional

33
00:01:19,030 --> 00:01:16,799
virus hunter to fly in space and there's

34
00:01:21,030 --> 00:01:19,040
a lot of interest down here in the dna

35
00:01:23,270 --> 00:01:21,040
sequencer launching next week on the

36
00:01:25,830 --> 00:01:23,280
spacex dragon can you tell me about the

37
00:01:32,230 --> 00:01:25,840
device and how and when you plan to use

38
00:01:36,870 --> 00:01:34,310

yeah it's an example of some of the

39
00:01:39,510 --> 00:01:36,880
really exciting technology development

40
00:01:42,069 --> 00:01:39,520
and also life sciences microbiological

41
00:01:43,910 --> 00:01:42,079
experiments that we're doing on station

42
00:01:46,630 --> 00:01:43,920
it's going to be launching on spacex

43
00:01:48,069 --> 00:01:46,640
coming up pretty soon and we're really

44
00:01:50,630 --> 00:01:48,079
interested in how this works in

45
00:01:52,310 --> 00:01:50,640
microgravity it's never been done before

46
00:01:54,870 --> 00:01:52,320
we're going to be trying to do the first

47
00:01:58,550 --> 00:01:54,880
dna sequencing in space and it'll be a

48
00:01:59,830 --> 00:01:58,560
combination of a bacteria a virus

49
00:02:01,670 --> 00:01:59,840
and a mouse genome that we'll be

50
00:02:02,469 --> 00:02:01,680
sequencing

51
00:02:04,389 --> 00:02:02,479
um

52
00:02:06,389 --> 00:02:04,399
certainly you've worked with a lot of

53
00:02:08,309 --> 00:02:06,399
dangerous viruses on earth and i'm

54
00:02:10,309 --> 00:02:08,319
assuming nothing is coming up to the

55
00:02:11,029 --> 00:02:10,319
space station that's going to equal that

56
00:02:12,869 --> 00:02:11,039
but

57
00:02:15,110 --> 00:02:12,879
what is the the deadliest most

58
00:02:17,110 --> 00:02:15,120
infectious um virus you've worked with

59
00:02:18,869 --> 00:02:17,120
on earth and and

60
00:02:20,869 --> 00:02:18,879
by comparison do you think your work up

61
00:02:26,949 --> 00:02:20,879
there is going to be much easier at

62
00:02:30,390 --> 00:02:28,470
yeah we've got a lot of safety folks on

63
00:02:32,070 --> 00:02:30,400

the ground making sure that nothing

64
00:02:33,990 --> 00:02:32,080
dangerous gets on board and we really

65
00:02:35,990 --> 00:02:34,000
appreciate the work that those guys do

66
00:02:37,990 --> 00:02:36,000
so everything that we send up is not

67
00:02:39,670 --> 00:02:38,000
pathogenic to humans and has been really

68
00:02:42,150 --> 00:02:39,680
carefully tested

69
00:02:44,309 --> 00:02:42,160
on the ground my previous work was

70
00:02:47,030 --> 00:02:44,319
definitely in more of the dangerous

71
00:02:50,229 --> 00:02:47,040
pathogen area we worked on ebola

72
00:02:52,150 --> 00:02:50,239
smallpox marburg and loss of virus and

73
00:02:53,910 --> 00:02:52,160
those are diseases that uh are

74
00:02:55,670 --> 00:02:53,920
definitely affecting human populations

75
00:02:57,670 --> 00:02:55,680
on earth and so

76
00:02:59,509 --> 00:02:57,680
doing the work on that was important

77
00:03:00,710 --> 00:02:59,519
it is stressful to work in a dangerous

78
00:03:03,190 --> 00:03:00,720
environment

79
00:03:05,670 --> 00:03:03,200
but we feel like the training really

80
00:03:07,990 --> 00:03:05,680
takes care of a lot of the

81
00:03:10,949 --> 00:03:08,000
uncertainty of the situation and our

82
00:03:12,390 --> 00:03:10,959
ability to respond to a dangerous

83
00:03:14,390 --> 00:03:12,400
environment whether it's in a biosafety

84
00:03:15,589 --> 00:03:14,400
level lab on the ground or on space

85
00:03:17,110 --> 00:03:15,599
station

86
00:03:18,949 --> 00:03:17,120
we've got a lot of good folks working to

87
00:03:20,630 --> 00:03:18,959
help us out and we do have quite a lot

88
00:03:21,910 --> 00:03:20,640

of training and preparation to get us

89
00:03:24,390 --> 00:03:21,920
here

90
00:03:26,149 --> 00:03:24,400
what about previous dna research done in

91
00:03:28,550 --> 00:03:26,159
space i mean

92
00:03:30,789 --> 00:03:28,560
tell me tell me what's been done so far

93
00:03:32,949 --> 00:03:30,799
in space and how is the sequencer going

94
00:03:36,949 --> 00:03:32,959
to expand the genetic envelope so to

95
00:03:42,470 --> 00:03:39,190
yeah so jeff actually did a couple of

96
00:03:44,070 --> 00:03:42,480
great experiments early on expedition 47

97
00:03:46,309 --> 00:03:44,080
one of them was an experiment called

98
00:03:49,430 --> 00:03:46,319
genes in space which was a high school

99
00:03:51,990 --> 00:03:49,440
competition and it was a pcr machine so

100
00:03:53,270 --> 00:03:52,000
it was designed to detect specific dna

101
00:03:54,710 --> 00:03:53,280
sequences

102
00:03:57,589 --> 00:03:54,720
there's also a great experiment called

103
00:04:00,229 --> 00:03:57,599
wet lab which is a different kind of pcr

104
00:04:02,949 --> 00:04:00,239
machine that allows you to see in real

105
00:04:04,630 --> 00:04:02,959
time what the genetic results are on

106
00:04:07,190 --> 00:04:04,640
board space station and those are

107
00:04:09,190 --> 00:04:07,200
looking for specific sequences

108
00:04:10,710 --> 00:04:09,200
the biomolecule sequencer that we're

109
00:04:12,869 --> 00:04:10,720
going to be taking a look at is actually

110
00:04:15,350 --> 00:04:12,879
going to look at everything in a sample

111
00:04:17,909 --> 00:04:15,360
so it's a way of looking globally at

112
00:04:20,229 --> 00:04:17,919
what's going on in a sample versus going

113
00:04:22,069 --> 00:04:20,239

in and looking at individual genes

114
00:04:24,310 --> 00:04:22,079
altogether it's an extremely exciting

115
00:04:25,590 --> 00:04:24,320
research package and a great capability

116
00:04:27,430 --> 00:04:25,600
on board station

117
00:04:29,350 --> 00:04:27,440
well you know there's so much talk about

118
00:04:33,590 --> 00:04:29,360
going to mars how might that benefit a

119
00:04:37,909 --> 00:04:35,590
well anything that we do on space

120
00:04:39,990 --> 00:04:37,919
station is helping us understand how

121
00:04:41,909 --> 00:04:40,000
human beings can live in space and so

122
00:04:43,670 --> 00:04:41,919
the kind of work that we'd be doing with

123
00:04:45,830 --> 00:04:43,680
the sequencer it's just going to

124
00:04:48,550 --> 00:04:45,840
understand the general process of things

125
00:04:50,950 --> 00:04:48,560
like bone loss and microbial changes on

126
00:04:53,030 --> 00:04:50,960
board space station but it also actually

127
00:04:55,189 --> 00:04:53,040
has a benefit for the earth-based

128
00:04:57,350 --> 00:04:55,199
research as well when we do things in a

129
00:04:59,430 --> 00:04:57,360
remote environment up here we can

130
00:05:01,430 --> 00:04:59,440
understand how these technologies might

131
00:05:04,230 --> 00:05:01,440
work in remote places on earth that

132
00:05:06,390 --> 00:05:04,240
don't have access to good medical care

133
00:05:08,629 --> 00:05:06,400
so it's got an exploration goal but it

134
00:05:10,469 --> 00:05:08,639
also definitely really i think has a

135
00:05:12,469 --> 00:05:10,479
earth research benefit as well

136
00:05:14,950 --> 00:05:12,479
and one last question to you along these

137
00:05:17,110 --> 00:05:14,960
lines before i talk to jeff um you know

138
00:05:18,790 --> 00:05:17,120

how jeremy is the space station you know

139
00:05:20,390 --> 00:05:18,800
i mean you're a professional here what's

140
00:05:22,150 --> 00:05:20,400
your take on it without getting out all

141
00:05:24,310 --> 00:05:22,160
the scientific equipment you know we've

142
00:05:30,390 --> 00:05:24,320
heard about the microbes up there is it

143
00:05:35,749 --> 00:05:32,790
no i think we've demonstrated that human

144
00:05:37,189 --> 00:05:35,759
beings can live in space for 15 years

145
00:05:39,350 --> 00:05:37,199
now we've had a continuous human

146
00:05:41,110 --> 00:05:39,360
presence on board the space station i

147
00:05:43,430 --> 00:05:41,120
think it's a really interesting question

148
00:05:45,510 --> 00:05:43,440
from a research perspective what's going

149
00:05:46,790 --> 00:05:45,520
on in the microbial world around us we

150
00:05:49,110 --> 00:05:46,800
know we have

151
00:05:51,749 --> 00:05:49,120
microbes inside and outside the human

152
00:05:53,830 --> 00:05:51,759
body that are living along with us and

153
00:05:55,749 --> 00:05:53,840
so the chance to see how those behave in

154
00:05:57,189 --> 00:05:55,759
microgravity is going to be a really

155
00:05:59,510 --> 00:05:57,199
interesting question on board space

156
00:06:01,430 --> 00:05:59,520
station in the coming years

157
00:06:03,189 --> 00:06:01,440
uh jeff you know the dragon of course is

158
00:06:04,870 --> 00:06:03,199
going to be flying up next week how

159
00:06:07,189 --> 00:06:04,880
important is it to get this stocking

160
00:06:08,710 --> 00:06:07,199
adapter up there safe and sound we all

161
00:06:13,510 --> 00:06:08,720
remember what happened to the first

162
00:06:17,990 --> 00:06:15,749
well of course it's very important we it

163
00:06:19,510 --> 00:06:18,000

is required in order to have the

164
00:06:21,670 --> 00:06:19,520
commercial crude vehicles that are

165
00:06:23,990 --> 00:06:21,680
currently in development be able to dock

166
00:06:26,629 --> 00:06:24,000
to the space station so it's a it's in

167
00:06:29,189 --> 00:06:26,639
the critical path to the future of the

168
00:06:31,830 --> 00:06:29,199
exploitation of the international space

169
00:06:36,550 --> 00:06:34,710
do you see two as being necessary before

170
00:06:38,790 --> 00:06:36,560
the first um

171
00:06:40,870 --> 00:06:38,800
crew flight by either dragon or the

172
00:06:42,390 --> 00:06:40,880
starliner i mean or do you think one

173
00:06:45,749 --> 00:06:42,400
would suffice at least for a short

174
00:06:49,990 --> 00:06:47,510
well you know that virtually everything

175
00:06:53,430 --> 00:06:50,000
we do has redundancy in it and having

176
00:06:54,550 --> 00:06:53,440
two on board gives us that redundancy

177
00:06:55,350 --> 00:06:54,560
so

178
00:06:57,510 --> 00:06:55,360
my

179
00:06:59,830 --> 00:06:57,520
uh i think what the current thinking is

180
00:07:02,150 --> 00:06:59,840
is is that we need to have two on board

181
00:07:05,189 --> 00:07:02,160
before that first launch

182
00:07:07,350 --> 00:07:05,199
for that obvious reason of redundancy

183
00:07:09,270 --> 00:07:07,360
um thanks for that answer and five years

184
00:07:11,749 --> 00:07:09,280
ago these days atlantis was making the

185
00:07:13,670 --> 00:07:11,759
final shuttle flight um what's your

186
00:07:16,070 --> 00:07:13,680
thoughts jeff on this fifth anniversary

187
00:07:17,990 --> 00:07:16,080
of the last shuttle voyage and do you

188
00:07:19,990 --> 00:07:18,000

feel a bit of melancholy still over the

189
00:07:21,830 --> 00:07:20,000
end of the shuttle program or are you

190
00:07:22,710 --> 00:07:21,840
looking more to the future at this point

191
00:07:29,350 --> 00:07:22,720
in

192
00:07:31,589 --> 00:07:29,360
if you look at it historically the

193
00:07:34,469 --> 00:07:31,599
shuttle was a shuttle-like vehicle was

194
00:07:36,790 --> 00:07:34,479
first envisioned as early as the the 50s

195
00:07:38,790 --> 00:07:36,800
the mid and late 50s and it was

196
00:07:40,390 --> 00:07:38,800
developed in the 70s and we

197
00:07:42,469 --> 00:07:40,400
we went through the 80s largely

198
00:07:44,710 --> 00:07:42,479
forgetting what it was developed for but

199
00:07:47,189 --> 00:07:44,720
the primary purpose was to put up a

200
00:07:49,270 --> 00:07:47,199
space station piece by piece in 1984 of

201
00:07:50,950 --> 00:07:49,280
course president reagan announced space

202
00:07:51,749 --> 00:07:50,960
station freedom

203
00:07:53,749 --> 00:07:51,759
which

204
00:07:55,909 --> 00:07:53,759
never really coalesced in terms of the

205
00:07:57,589 --> 00:07:55,919
political support to launch it but then

206
00:07:59,670 --> 00:07:57,599
we morphed into the international space

207
00:08:01,749 --> 00:07:59,680
station in the early 90s bringing the

208
00:08:03,430 --> 00:08:01,759
russians on board as a partner

209
00:08:05,909 --> 00:08:03,440
and then finally began launching

210
00:08:07,589 --> 00:08:05,919
elements in 1998

211
00:08:09,029 --> 00:08:07,599
and finished it out as you said five

212
00:08:10,710 --> 00:08:09,039
years ago with the flight of the shuttle

213
00:08:13,189 --> 00:08:10,720

now the early cancellation the shuttle

214
00:08:15,670 --> 00:08:13,199
of course was driven uh largely by

215
00:08:17,990 --> 00:08:15,680
circumstances surrounding the columbia

216
00:08:19,670 --> 00:08:18,000
accident and the in the the hard

217
00:08:21,589 --> 00:08:19,680
decisions that had to be made after the

218
00:08:23,350 --> 00:08:21,599
columbia accident

219
00:08:25,430 --> 00:08:23,360
as you know the shuttle was originally

220
00:08:28,469 --> 00:08:25,440
envisioned to continue to fly for the

221
00:08:30,790 --> 00:08:28,479
life of the space station to support it

222
00:08:33,430 --> 00:08:30,800
and that that decision was made to

223
00:08:35,589 --> 00:08:33,440
retire early it was it was tough for

224
00:08:37,509 --> 00:08:35,599
everybody to retire the shuttle it was

225
00:08:39,589 --> 00:08:37,519
it was a great vehicle

226
00:08:41,829 --> 00:08:39,599
and did its job but that's the point it

227
00:08:44,070 --> 00:08:41,839
did its primary job it fulfilled its

228
00:08:46,389 --> 00:08:44,080
primary purpose and the teams did a

229
00:08:48,630 --> 00:08:46,399
great job of adjusting

230
00:08:51,110 --> 00:08:48,640
so that we could continue

231
00:08:53,269 --> 00:08:51,120
to fly out the space station for an

232
00:08:55,190 --> 00:08:53,279
extended period of time without the

233
00:08:57,430 --> 00:08:55,200
shuttle using other vehicles and then

234
00:09:00,070 --> 00:08:57,440
also using it as an opportunity as a

235
00:09:01,269 --> 00:09:00,080
destination if you will

236
00:09:03,269 --> 00:09:01,279
for

237
00:09:07,030 --> 00:09:03,279
these new

238
00:09:09,750 --> 00:09:07,040

developed commercial crew vehicles

239
00:09:11,910 --> 00:09:09,760
yes uh jeff and congratulations in

240
00:09:13,910 --> 00:09:11,920
advance on your record that you'll be

241
00:09:16,389 --> 00:09:13,920
breaking with the accumulated of u.s

242
00:09:17,910 --> 00:09:16,399
time um does a year and a half in space

243
00:09:20,470 --> 00:09:17,920
even if it's cobbled together over

244
00:09:22,230 --> 00:09:20,480
several flights belong to you and

245
00:09:24,710 --> 00:09:22,240
i'm afraid i'm going to have to sign off

246
00:09:27,829 --> 00:09:24,720
after that question so god speak to you

247
00:09:33,990 --> 00:09:29,829
thank you very much marcia great to talk

248
00:09:38,710 --> 00:09:35,590
stationed this is houston acr that

249
00:09:42,230 --> 00:09:40,389
thank you associated press station