
Windows
34

1
00:00:09,830 --> 00:00:07,990
so the space station ready for the event

2
00:00:11,830 --> 00:00:09,840
eastern kentucky university this is

3
00:00:22,230 --> 00:00:11,840
mission control houston please call

4
00:00:27,990 --> 00:00:24,550
this is the international space station

5
00:00:36,470 --> 00:00:30,790
station this is at eastern kentucky

6
00:00:43,430 --> 00:00:38,630
read you loud and clear how do you read

7
00:00:43,440 --> 00:00:52,709
yes we hear you

8
00:01:01,349 --> 00:00:55,270
stationed this is jonathan at eastern

9
00:01:06,950 --> 00:01:03,270
read you loud and clear how do you read

10
00:01:11,030 --> 00:01:08,710
good afternoon

11
00:01:16,870 --> 00:01:11,040
welcome to eku we have the first

12
00:01:21,109 --> 00:01:18,870
what is it like to work with astronauts

13
00:01:23,030 --> 00:01:21,119

and cosmonauts from other countries on

14
00:01:28,310 --> 00:01:23,040
research and development of projects on

15
00:01:31,749 --> 00:01:30,230
i would say that is the best part of

16
00:01:32,710 --> 00:01:31,759
space flight or the people we get to

17
00:01:34,469 --> 00:01:32,720
work with

18
00:01:37,429 --> 00:01:34,479
we've uh in training we travel all

19
00:01:40,069 --> 00:01:37,439
around the world japan canada uh over to

20
00:01:42,310 --> 00:01:40,079
germany other places in europe russia

21
00:01:43,990 --> 00:01:42,320
and it is absolutely wonderful it really

22
00:01:52,149 --> 00:01:44,000
draws everyone together it's a true

23
00:01:55,350 --> 00:01:53,670
i know that astronauts have to go

24
00:01:57,109 --> 00:01:55,360
through so much training before going

25
00:01:58,469 --> 00:01:57,119
into space so was there anything that

26
00:02:04,709 --> 00:01:58,479
happened that you weren't prepared for

27
00:02:07,510 --> 00:02:06,469
and i think you said is there anything

28
00:02:09,830 --> 00:02:07,520
we look

29
00:02:17,589 --> 00:02:09,840
anything special about our our training

30
00:02:17,599 --> 00:02:23,830
yes

31
00:02:28,309 --> 00:02:26,070
the uh training to fly into space you're

32
00:02:29,990 --> 00:02:28,319
right it took two and a half years of

33
00:02:31,830 --> 00:02:30,000
training to get here to the space

34
00:02:33,110 --> 00:02:31,840
station besides riding on a rocket

35
00:02:35,030 --> 00:02:33,120
learning how to do that learning how to

36
00:02:37,830 --> 00:02:35,040
do the science we had to learn how to

37
00:02:39,990 --> 00:02:37,840
speak russian and all of that has been

38
00:02:42,710 --> 00:02:40,000

useful up here but i'll tell you once

39
00:02:44,309 --> 00:02:42,720
you're here you're in an isolated place

40
00:02:46,630 --> 00:02:44,319
and you have to use your wits quite a

41
00:02:48,390 --> 00:02:46,640
bit there's a fair amount of things we

42
00:02:50,470 --> 00:02:48,400
have to do here that we can never

43
00:02:53,589 --> 00:02:50,480
anticipate that no one can anticipate

44
00:02:55,990 --> 00:02:53,599
in training and so we have to just go by

45
00:03:02,869 --> 00:02:56,000
our wits i'd say you know 30 sometimes

46
00:03:06,149 --> 00:03:04,630
how do the astronauts communicate with

47
00:03:11,270 --> 00:03:06,159
each other aboard the international

48
00:03:15,910 --> 00:03:14,309
well we have a a com system here on

49
00:03:17,350 --> 00:03:15,920
board the space station usually we're

50
00:03:20,229 --> 00:03:17,360
just talking to each other like you and

51
00:03:21,910 --> 00:03:20,239
i are if some astronaut is around the

52
00:03:23,509 --> 00:03:21,920
corner a little bit farther away there's

53
00:03:25,110 --> 00:03:23,519
fan noise here so it's a little bit hard

54
00:03:26,949 --> 00:03:25,120
to hear each other so we have an

55
00:03:29,270 --> 00:03:26,959
intercom system we can talk to each

56
00:03:31,270 --> 00:03:29,280
other on as well but it's always nice to

57
00:03:33,110 --> 00:03:31,280
float over to one side of the

58
00:03:39,990 --> 00:03:33,120
station or the other and talk to our

59
00:03:49,190 --> 00:03:43,190
can 55 put robotic arm on the iss with

60
00:03:59,429 --> 00:03:50,630
and i'm sorry i didn't understand the

61
00:04:04,710 --> 00:04:02,550
came the 55 foot long robotic arm on the

62
00:04:10,229 --> 00:04:04,720
iss with more light and space than on

63
00:04:12,470 --> 00:04:11,030

the

64
00:04:15,429 --> 00:04:12,480
i believe you said

65
00:04:18,710 --> 00:04:15,439
do things look different uh from space

66
00:04:19,990 --> 00:04:18,720
uh than uh from satellites

67
00:04:22,710 --> 00:04:20,000
and uh

68
00:04:24,950 --> 00:04:22,720
the earth is actually uh quite a amazing

69
00:04:26,790 --> 00:04:24,960
place to look at the brilliant blue of

70
00:04:29,990 --> 00:04:26,800
the ocean usually we look down and we

71
00:04:31,670 --> 00:04:30,000
see the ocean usually uh we see clouds

72
00:04:34,070 --> 00:04:31,680
and every now and then we get to cross

73
00:04:35,830 --> 00:04:34,080
over the earth and see uh

74
00:04:37,110 --> 00:04:35,840
we're always looking for cities looking

75
00:04:38,390 --> 00:04:37,120
for places where humans are because we

76
00:04:40,390 --> 00:04:38,400
love to see that

77
00:04:43,590 --> 00:04:40,400
looking for volcanoes that sort of thing

78
00:04:48,710 --> 00:04:43,600
but um it's always breathtaking every

79
00:04:52,550 --> 00:04:50,469
if you had a choice to feel like you

80
00:04:54,550 --> 00:04:52,560
were always in microgravity whether you

81
00:04:59,350 --> 00:04:54,560
were on earth or not would you choose

82
00:05:03,510 --> 00:05:01,110
that is a great question i've thought

83
00:05:05,510 --> 00:05:03,520
about that a lot and you know what i

84
00:05:07,670 --> 00:05:05,520
think i would pick

85
00:05:09,749 --> 00:05:07,680
gravity hard as it is to believe because

86
00:05:11,270 --> 00:05:09,759
it is a delightful is a lot of fun to

87
00:05:13,590 --> 00:05:11,280
have things floating right in front of

88
00:05:15,510 --> 00:05:13,600

you to be able to fly from module to

89
00:05:17,510 --> 00:05:15,520
module but there's something about us

90
00:05:20,150 --> 00:05:17,520
that likes to just be able to set

91
00:05:22,710 --> 00:05:20,160
something down and have it stay there

92
00:05:24,950 --> 00:05:22,720
like a coffee in a in a cup would be

93
00:05:27,189 --> 00:05:24,960
nice to put on a table but for right now

94
00:05:33,350 --> 00:05:27,199
i'm enjoying microgravity as much as i

95
00:05:40,870 --> 00:05:35,590
what do astronauts do if they get sick

96
00:05:44,550 --> 00:05:43,189
so well i'm a medical doctor

97
00:05:45,990 --> 00:05:44,560
and

98
00:05:48,469 --> 00:05:46,000
we'd like to have a medical doctor up

99
00:05:49,830 --> 00:05:48,479
here sometimes that is one way to become

100
00:05:50,710 --> 00:05:49,840
an astronaut

101
00:05:52,710 --> 00:05:50,720
but

102
00:05:54,710 --> 00:05:52,720
we have medical kits here we can take

103
00:05:56,710 --> 00:05:54,720
care of most minor injuries first aid

104
00:05:59,110 --> 00:05:56,720
and i would probably be the one to do to

105
00:06:01,110 --> 00:05:59,120
do that however uh if i'm the one that

106
00:06:02,390 --> 00:06:01,120
gets sick there is always at least one

107
00:06:04,550 --> 00:06:02,400
other person trained to be a crew

108
00:06:06,950 --> 00:06:04,560
medical officer and we don't always have

109
00:06:08,150 --> 00:06:06,960
a doctor on board we have specialists on

110
00:06:10,070 --> 00:06:08,160
the ground we could talk to we have an

111
00:06:12,390 --> 00:06:10,080
ultrasound machine so we could do some

112
00:06:14,629 --> 00:06:12,400
diagnostic imaging take a look inside

113
00:06:16,629 --> 00:06:14,639

the body with ultrasound if we needed to

114
00:06:18,150 --> 00:06:16,639
and a lot of experts to help us out and

115
00:06:19,909 --> 00:06:18,160
if it got really really bad we always

116
00:06:26,309 --> 00:06:19,919
have our soyuz to get home with it's

117
00:06:30,710 --> 00:06:28,469
what experiments are you working on

118
00:06:37,270 --> 00:06:30,720
currently that you think will have the

119
00:06:41,590 --> 00:06:38,790
you know that's the great thing about

120
00:06:44,629 --> 00:06:41,600
science is that you never really know we

121
00:06:46,550 --> 00:06:44,639
are doing some basic science up here uh

122
00:06:48,550 --> 00:06:46,560
it's impossible to say how that's going

123
00:06:51,029 --> 00:06:48,560
to help us in the future we might be

124
00:06:53,430 --> 00:06:51,039
able to cure osteoporosis we might be

125
00:06:55,589 --> 00:06:53,440
able to cure heart disease from some of

126
00:06:57,749 --> 00:06:55,599
the experiments we're doing here

127
00:06:59,830 --> 00:06:57,759
some of the more

128
00:07:01,990 --> 00:06:59,840
direct impact is going to be the way we

129
00:07:04,469 --> 00:07:02,000
do things we solve very hard problems to

130
00:07:06,390 --> 00:07:04,479
solve to fly in space that's what space

131
00:07:08,309 --> 00:07:06,400
flight's all about doing things that are

132
00:07:09,830 --> 00:07:08,319
very hard to do and when you bring

133
00:07:12,070 --> 00:07:09,840
medical care to astronauts it allows you

134
00:07:13,270 --> 00:07:12,080
to bring medical care to people all

135
00:07:14,830 --> 00:07:13,280
around the world that normally don't

136
00:07:17,270 --> 00:07:14,840
have access to nice

137
00:07:23,670 --> 00:07:17,280
hospitals and that's at the top of my

138
00:07:27,909 --> 00:07:25,670

what can you tell us about the medical

139
00:07:30,150 --> 00:07:27,919
fish experiment that is growing on the

140
00:07:32,270 --> 00:07:30,160
space station and is it providing any

141
00:07:37,670 --> 00:07:32,280
helpful helpful information for the

142
00:07:40,550 --> 00:07:39,670
the madoka fish experiment was one of

143
00:07:42,469 --> 00:07:40,560
the

144
00:07:44,710 --> 00:07:42,479
basic science experiments that were

145
00:07:46,790 --> 00:07:44,720
going on here it was just finishing up

146
00:07:49,110 --> 00:07:46,800
just finishing up when i arrived

147
00:07:50,390 --> 00:07:49,120
so it certainly could lead to

148
00:07:52,070 --> 00:07:50,400
breakthroughs you know they're looking

149
00:07:54,070 --> 00:07:52,080
at individual cells and that's why

150
00:07:56,070 --> 00:07:54,080
they're using the madoka fish so they

151
00:07:57,830 --> 00:07:56,080
could actually look at the cells that

152
00:07:59,589 --> 00:07:57,840
break down bone and that build it back

153
00:08:01,110 --> 00:07:59,599
up again so

154
00:08:03,189 --> 00:08:01,120
who knows when you're actually able to

155
00:08:05,189 --> 00:08:03,199
study this on the cellular cellular

156
00:08:07,110 --> 00:08:05,199
level rather than just measuring bone

157
00:08:13,270 --> 00:08:07,120
density in humans who knows what we'll

158
00:08:16,790 --> 00:08:15,430
do large-scale weather systems look

159
00:08:24,469 --> 00:08:16,800
different from the international space

160
00:08:27,909 --> 00:08:26,390
the view from the space station

161
00:08:29,189 --> 00:08:27,919
uh

162
00:08:30,950 --> 00:08:29,199
it is quite a bit different from

163
00:08:33,110 --> 00:08:30,960

satellites and the reason why i say that

164
00:08:35,589 --> 00:08:33,120
satellites are a great capability but

165
00:08:37,430 --> 00:08:35,599
what humans can do is look down and

166
00:08:39,190 --> 00:08:37,440
evaluate immediately the view that

167
00:08:40,790 --> 00:08:39,200
they're getting they can look off to all

168
00:08:42,149 --> 00:08:40,800
sides if they see something interesting

169
00:08:44,550 --> 00:08:42,159
in one place they can look somewhere

170
00:08:46,070 --> 00:08:44,560
else we've been able to study uh say

171
00:08:47,590 --> 00:08:46,080
lightning patterns for instance there's

172
00:08:48,389 --> 00:08:47,600
no way you could have

173
00:09:21,269 --> 00:08:48,399
a

174
00:09:23,110 --> 00:09:21,279
icebergs

175
00:09:24,710 --> 00:09:23,120
but we can't take any measurements up

176
00:09:27,430 --> 00:09:24,720
here uh per se

177
00:09:29,269 --> 00:09:27,440
now i did fly three years ago and i

178
00:09:31,190 --> 00:09:29,279
on the space shuttle i can't say that i

179
00:09:32,230 --> 00:09:31,200
remember seeing any differences that i

180
00:09:34,630 --> 00:09:32,240
could say

181
00:09:41,269 --> 00:09:34,640
were due to any long-term changes in

182
00:09:46,310 --> 00:09:43,509
given the current state of the economies

183
00:09:48,870 --> 00:09:46,320
of both the united states and russia

184
00:09:50,550 --> 00:09:48,880
which fight

185
00:09:53,430 --> 00:09:50,560
given the current state of the economy

186
00:09:55,590 --> 00:09:53,440
to both the united states and russia

187
00:09:57,269 --> 00:09:55,600
what benefits could be expected from the

188
00:09:58,710 --> 00:09:57,279

findings from the space station that

189
00:10:04,310 --> 00:09:58,720
would make money spent on the space

190
00:10:07,990 --> 00:10:06,069
at every level

191
00:10:09,910 --> 00:10:08,000
i believe that it's worth it

192
00:10:11,590 --> 00:10:09,920
just to be a space faring nation like i

193
00:10:13,910 --> 00:10:11,600
mentioned to solve incredibly hard

194
00:10:15,990 --> 00:10:13,920
problems to get people in space

195
00:10:17,670 --> 00:10:16,000
the technology is required to do this

196
00:10:19,509 --> 00:10:17,680
and to do it safely

197
00:10:21,509 --> 00:10:19,519
makes everybody better makes the

198
00:10:24,310 --> 00:10:21,519
industrial base better because the

199
00:10:25,910 --> 00:10:24,320
precision has to be so much higher

200
00:10:27,990 --> 00:10:25,920
and the great thing about space flight

201
00:10:30,150 --> 00:10:28,000
is inspires people

202
00:10:31,829 --> 00:10:30,160
i when i became an astronaut i probably

203
00:10:33,190 --> 00:10:31,839
knew a thousand people in my life that

204
00:10:35,269 --> 00:10:33,200
wanted to be an astronaut and wanted to

205
00:10:37,190 --> 00:10:35,279
work for nasa that went into some of the

206
00:10:37,990 --> 00:10:37,200
stem fields such as you might be going

207
00:10:39,670 --> 00:10:38,000
into

208
00:10:41,910 --> 00:10:39,680
they may not have become astronauts most

209
00:10:42,870 --> 00:10:41,920
of them did not however they went on to

210
00:10:46,389 --> 00:10:42,880
doing

211
00:10:49,590 --> 00:10:46,399
their technical field that they fell in

212
00:10:51,750 --> 00:10:49,600
love with so i believe that that

213
00:10:53,430 --> 00:10:51,760

besides all of the research findings and

214
00:10:54,630 --> 00:10:53,440
all the technology development findings

215
00:11:01,030 --> 00:10:54,640
i believe that's one of the greatest

216
00:11:06,150 --> 00:11:03,509
do you believe that technology developed

217
00:11:08,069 --> 00:11:06,160
on the iss for life support could be

218
00:11:13,350 --> 00:11:08,079
applied to the environmental problems

219
00:11:17,590 --> 00:11:14,790
that's a great question because you know

220
00:11:19,509 --> 00:11:17,600
what we have a water system up here that

221
00:11:22,069 --> 00:11:19,519
is completely enclosed

222
00:11:23,990 --> 00:11:22,079
we can generate and our atmosphere we

223
00:11:25,990 --> 00:11:24,000
can generate our own oxygen we can

224
00:11:27,590 --> 00:11:26,000
generate our own water we take what we

225
00:11:30,630 --> 00:11:27,600
put out and turn it back back into

226
00:11:32,870 --> 00:11:30,640
something we can take in safely and yes

227
00:11:34,790 --> 00:11:32,880
it's a very difficult thing to do but

228
00:11:37,430 --> 00:11:34,800
already that technology is being used in

229
00:11:40,230 --> 00:11:37,440
some drought threatened areas around the

230
00:11:42,870 --> 00:11:40,240
world and i believe the technology will

231
00:11:43,990 --> 00:11:42,880
will be able to be used quite a bit more

232
00:11:45,590 --> 00:11:44,000
and

233
00:11:53,110 --> 00:11:45,600
to make areas of the earth habitable

234
00:11:57,190 --> 00:11:55,110
when you are working on new experimental

235
00:11:59,030 --> 00:11:57,200
ideas how often is the result something

236
00:12:04,150 --> 00:11:59,040
new and useful that wasn't part of the

237
00:12:08,150 --> 00:12:05,990
that's the wonderful thing about science

238
00:12:10,550 --> 00:12:08,160

it happens about a hundred percent of

239
00:12:12,470 --> 00:12:10,560
the time especially in space flight we

240
00:12:13,750 --> 00:12:12,480
cannot create this environment for any

241
00:12:16,790 --> 00:12:13,760
length of time

242
00:12:18,870 --> 00:12:16,800
uh for more than about 30 40 seconds

243
00:12:20,230 --> 00:12:18,880
anywhere else other than on the space

244
00:12:23,030 --> 00:12:20,240
station so

245
00:12:24,870 --> 00:12:23,040
every day is exploration every day is

246
00:12:26,310 --> 00:12:24,880
discoveries and i would say every single

247
00:12:32,550 --> 00:12:26,320
time we do something something

248
00:12:36,710 --> 00:12:34,550
out of all the skills you have obtained

249
00:12:39,030 --> 00:12:36,720
in training which has assisted you the

250
00:12:45,590 --> 00:12:39,040
most in your adventures and how do you

251
00:12:49,350 --> 00:12:46,870
you know the

252
00:12:52,230 --> 00:12:49,360
i would say training for working in

253
00:12:53,750 --> 00:12:52,240
space starts at your age or even before

254
00:12:55,190 --> 00:12:53,760
learning how to learn

255
00:12:56,949 --> 00:12:55,200
and uh

256
00:12:58,629 --> 00:12:56,959
it's not so much exactly what you're

257
00:13:00,790 --> 00:12:58,639
studying right now but if you're really

258
00:13:02,870 --> 00:13:00,800
good at what you do and try to do the

259
00:13:04,790 --> 00:13:02,880
best as you can then

260
00:13:06,790 --> 00:13:04,800
you've you're learning how to get good

261
00:13:08,230 --> 00:13:06,800
at something and so whenever you're

262
00:13:09,750 --> 00:13:08,240
faced with something new on the space

263
00:13:11,030 --> 00:13:09,760

station which happens you know many

264
00:13:12,629 --> 00:13:11,040
times a day

265
00:13:14,150 --> 00:13:12,639
you can learn from it you can even get

266
00:13:15,829 --> 00:13:14,160
better and that is one of the skills i

267
00:13:17,829 --> 00:13:15,839
think that's very important to develop

268
00:13:21,910 --> 00:13:17,839
early and certainly the most useful one

269
00:13:25,430 --> 00:13:23,509
after the next question

270
00:13:27,110 --> 00:13:25,440
on the nasa website said that nasa is

271
00:13:28,710 --> 00:13:27,120
planning on sending humans deeper into

272
00:13:30,150 --> 00:13:28,720
space than ever before

273
00:13:31,910 --> 00:13:30,160
would you be willing to become one of

274
00:13:33,430 --> 00:13:31,920
the first humans to travel that far into

275
00:13:35,030 --> 00:13:33,440
space with all the health problems

276
00:13:39,590 --> 00:13:35,040
associated with long-duration space

277
00:13:45,030 --> 00:13:41,990
well you know space flight is risky but

278
00:13:47,269 --> 00:13:45,040
we it's a calculated risk as we call it

279
00:13:48,870 --> 00:13:47,279
and that means we understand that it is

280
00:13:50,949 --> 00:13:48,880
dangerous we understand the limits of

281
00:13:52,629 --> 00:13:50,959
what a human can handle and we're

282
00:13:53,509 --> 00:13:52,639
experienced enough as a space faring

283
00:13:56,629 --> 00:13:53,519
nation

284
00:13:58,310 --> 00:13:56,639
now to be able to have some protection

285
00:13:59,910 --> 00:13:58,320
for humans out there so the answer is

286
00:14:02,150 --> 00:13:59,920
yes i would be willing to and i think a

287
00:14:04,389 --> 00:14:02,160
lot of people would what we can discover

288
00:14:06,949 --> 00:14:04,399

the experience of flying in space far

289
00:14:08,389 --> 00:14:06,959
outweigh for me personally the risk

290
00:14:11,350 --> 00:14:08,399
that's a decision every astronaut would

291
00:14:18,550 --> 00:14:11,360
have to make but yes i would love to fly

292
00:14:26,069 --> 00:14:20,949
thank you dr marshburn and good luck

293
00:14:29,750 --> 00:14:27,829
thank you so much it's great to talk to

294
00:14:31,750 --> 00:14:29,760
you hello to everyone down there it's an

295
00:14:33,509 --> 00:14:31,760
incredible gathering you've got there

296
00:14:35,509 --> 00:14:33,519
and you know i feel like i'm talking to

297
00:14:37,910 --> 00:14:35,519
the future flight controllers and flight

298
00:14:39,509 --> 00:14:37,920
directors and astronauts and engineers

299
00:14:41,030 --> 00:14:39,519
that's going to make life better for all

300
00:14:54,069 --> 00:14:41,040
of us so thank you very much for having

301
00:14:54,079 --> 00:15:03,590
oh