
PAO

1
00:00:10,230 --> 00:00:08,150
expedition 43 now underway is of course

2
00:00:12,870 --> 00:00:10,240
the start of the one-year mission for

3
00:00:15,030 --> 00:00:12,880
scott kelly and mikhail kornienko and

4
00:00:16,950 --> 00:00:15,040
it's devoted to expanding our knowledge

5
00:00:19,189 --> 00:00:16,960
of what it'll take to support human

6
00:00:20,630 --> 00:00:19,199
explorers on deep space missions in the

7
00:00:22,470 --> 00:00:20,640
years to come

8
00:00:24,550 --> 00:00:22,480
some experiments are designed to learn

9
00:00:26,630 --> 00:00:24,560
how the space environment impacts the

10
00:00:28,870 --> 00:00:26,640
human bodies but there's also a new

11
00:00:31,669 --> 00:00:28,880
experiment dedicated to learning how the

12
00:00:34,229 --> 00:00:31,679
man-made environment impacts the comfort

13
00:00:36,310 --> 00:00:34,239

and efficiency of the crew members that

14
00:00:38,389 --> 00:00:36,320
experiment is called the habitability

15
00:00:40,310 --> 00:00:38,399
assessment of the international space

16
00:00:42,630 --> 00:00:40,320
station and the principal investigator

17
00:00:44,389 --> 00:00:42,640
is dr sherry thaxton of the human

18
00:00:46,229 --> 00:00:44,399
systems engineering and development

19
00:00:48,229 --> 00:00:46,239
division at nasa's johnson space center

20
00:00:50,069 --> 00:00:48,239
good morning good morning um let me

21
00:00:51,670 --> 00:00:50,079
start by asking you for the summary

22
00:00:54,950 --> 00:00:51,680
description what is it that you're

23
00:00:56,630 --> 00:00:54,960
studying in habitability okay so it's a

24
00:00:58,069 --> 00:00:56,640
habitability and human factor study

25
00:00:59,750 --> 00:00:58,079
which basically means we're looking at

26
00:01:01,590 --> 00:00:59,760
how the humans interact with their

27
00:01:03,430 --> 00:01:01,600
living and working environment we want

28
00:01:05,830 --> 00:01:03,440
to make sure that we design vehicles and

29
00:01:07,429 --> 00:01:05,840
habitats so that it accommodates for the

30
00:01:10,469 --> 00:01:07,439
person instead of the person having to

31
00:01:12,390 --> 00:01:10,479
adjust to what we throw up for them

32
00:01:13,670 --> 00:01:12,400
as we look at longer duration missions

33
00:01:16,390 --> 00:01:13,680
like we're going to have for near earth

34
00:01:18,230 --> 00:01:16,400
asteroid or mars missions the

35
00:01:20,550 --> 00:01:18,240
longer you're in the vehicle the more

36
00:01:22,070 --> 00:01:20,560
critical those concerns become just

37
00:01:24,230 --> 00:01:22,080
because you have to deal with it longer

38
00:01:25,749 --> 00:01:24,240

and longer um one of the top concerns we

39
00:01:27,749 --> 00:01:25,759
have as far as habitability goes is how

40
00:01:29,429 --> 00:01:27,759
much volume you have in your spacecraft

41
00:01:31,830 --> 00:01:29,439
so how much space do i have do i have

42
00:01:34,069 --> 00:01:31,840
enough room to get my job done iss is

43
00:01:36,230 --> 00:01:34,079
kind of luxury as far as volume goes

44
00:01:38,230 --> 00:01:36,240
they have a lot of space up there but we

45
00:01:40,310 --> 00:01:38,240
might not have that same luxury in

46
00:01:42,149 --> 00:01:40,320
future spacecraft so we want to learn

47
00:01:43,270 --> 00:01:42,159
what we can from them now about the

48
00:01:44,870 --> 00:01:43,280
tasks that they're doing and how they

49
00:01:46,469 --> 00:01:44,880
perform them so that we can feed that

50
00:01:48,550 --> 00:01:46,479
into future designs so what we're asking

51
00:01:50,789 --> 00:01:48,560
them to do as part of this mission is to

52
00:01:52,710 --> 00:01:50,799
give us feedback about habitable and

53
00:01:53,990 --> 00:01:52,720
human factors observations and then

54
00:01:55,910 --> 00:01:54,000
we're also going to try to assess

55
00:01:58,149 --> 00:01:55,920
details about layout and volume that we

56
00:02:01,270 --> 00:01:58,159
can feed into future design so you're

57
00:02:04,389 --> 00:02:01,280
interested in how they make use of the

58
00:02:06,389 --> 00:02:04,399
available space right what kinds of

59
00:02:07,670 --> 00:02:06,399
are there like a list of activities that

60
00:02:09,109 --> 00:02:07,680
you're particularly interested we do we

61
00:02:10,630 --> 00:02:09,119
actually have a list of 14 tasks that

62
00:02:12,630 --> 00:02:10,640
we're really interested in and so we're

63
00:02:14,550 --> 00:02:12,640

targeting those throughout this mission

64
00:02:16,150 --> 00:02:14,560
um we also just want their feedback on

65
00:02:17,670 --> 00:02:16,160
whatever they come up with day-to-day

66
00:02:19,589 --> 00:02:17,680
but we're particularly interested in

67
00:02:21,350 --> 00:02:19,599
things like how they perform their

68
00:02:23,270 --> 00:02:21,360
hygiene activities do they have enough

69
00:02:25,670 --> 00:02:23,280
space in their sleep quarters to perform

70
00:02:27,270 --> 00:02:25,680
their personal activities um how much

71
00:02:28,949 --> 00:02:27,280
room does it take if they all want to

72
00:02:30,550 --> 00:02:28,959
get together for a meal that they share

73
00:02:32,390 --> 00:02:30,560
together how much room do they need for

74
00:02:34,390 --> 00:02:32,400
for recreation all of those kinds of

75
00:02:36,470 --> 00:02:34,400
tasks are things that they will be doing

76
00:02:37,910 --> 00:02:36,480
on long duration missions in the future

77
00:02:39,030 --> 00:02:37,920
and we want to make sure that we have a

78
00:02:41,030 --> 00:02:39,040
good understanding of how they're

79
00:02:42,790 --> 00:02:41,040
performed now so that we can help

80
00:02:44,869 --> 00:02:42,800
provide tools to designers to give them

81
00:02:46,470 --> 00:02:44,879
what they need in the future

82
00:02:48,470 --> 00:02:46,480
you're trying to find out if what they

83
00:02:50,150 --> 00:02:48,480
have works or

84
00:02:52,070 --> 00:02:50,160
does what they have now work and if not

85
00:02:53,990 --> 00:02:52,080
what would you do differently or we know

86
00:02:55,750 --> 00:02:54,000
what we have now works so make sure we

87
00:02:57,589 --> 00:02:55,760
carry that forward with us so we don't

88
00:02:59,990 --> 00:02:57,599

lose something yes that's good is it

89
00:03:01,110 --> 00:03:00,000
just a matter of comfort physical

90
00:03:02,309 --> 00:03:01,120
comfort or

91
00:03:04,390 --> 00:03:02,319
does that

92
00:03:06,470 --> 00:03:04,400
ability to use that space

93
00:03:08,390 --> 00:03:06,480
really make a difference well in their

94
00:03:10,070 --> 00:03:08,400
job or yours or mine oh yeah definitely

95
00:03:12,149 --> 00:03:10,080
it goes beyond physical comfort we're

96
00:03:13,670 --> 00:03:12,159
looking at efficiency and effectiveness

97
00:03:15,670 --> 00:03:13,680
and satisfaction are some of the top

98
00:03:17,830 --> 00:03:15,680
three things we look at in this field so

99
00:03:20,470 --> 00:03:17,840
the efficiency is really important for

100
00:03:22,309 --> 00:03:20,480
space because time is very expensive for

101
00:03:23,910 --> 00:03:22,319
astronauts and so if we can lay things

102
00:03:25,430 --> 00:03:23,920
out better if we can provide them better

103
00:03:26,949 --> 00:03:25,440
tools to get their job done more

104
00:03:29,430 --> 00:03:26,959
efficiently

105
00:03:31,030 --> 00:03:29,440
we save money we provide more time for

106
00:03:32,390 --> 00:03:31,040
them to get more science done all the

107
00:03:33,509 --> 00:03:32,400
important things that they're doing on

108
00:03:35,750 --> 00:03:33,519
orbit

109
00:03:37,750 --> 00:03:35,760
the effectiveness if we don't give them

110
00:03:39,190 --> 00:03:37,760
the right space the right design then

111
00:03:40,949 --> 00:03:39,200
they might not actually even be able to

112
00:03:43,030 --> 00:03:40,959
get the tasks done like i said iss is

113
00:03:45,589 --> 00:03:43,040

kind of luxurious we want to make sure

114
00:03:47,110 --> 00:03:45,599
as we try to cramp down into a smaller

115
00:03:49,110 --> 00:03:47,120
volume that's easier to launch for a

116
00:03:49,910 --> 00:03:49,120
longer duration mission

117
00:03:52,149 --> 00:03:49,920
we want to make sure that they're

118
00:03:54,070 --> 00:03:52,159
actually able to get those jobs done

119
00:03:55,990 --> 00:03:54,080
and then the satisfaction is beyond just

120
00:03:57,750 --> 00:03:56,000
is it comfy it's

121
00:03:59,670 --> 00:03:57,760
when you're there for that long if

122
00:04:01,750 --> 00:03:59,680
there's little things that are adding up

123
00:04:03,270 --> 00:04:01,760
and causing you frustration it's going

124
00:04:04,949 --> 00:04:03,280
to start to impact your performance we

125
00:04:07,110 --> 00:04:04,959
work closely with the behavioral health

126
00:04:09,110 --> 00:04:07,120
and performance element here at nasa

127
00:04:10,869 --> 00:04:09,120
they look into research about

128
00:04:12,710 --> 00:04:10,879
how these things impact their behavioral

129
00:04:13,750 --> 00:04:12,720
health and performance and it's so we

130
00:04:14,869 --> 00:04:13,760
kind of look at the physical side and

131
00:04:16,150 --> 00:04:14,879
then we team up with them to look at the

132
00:04:17,749 --> 00:04:16,160
psychological side and make sure we're

133
00:04:19,110 --> 00:04:17,759
covering all aspects of the impacts of

134
00:04:21,430 --> 00:04:19,120
the human

135
00:04:23,030 --> 00:04:21,440
how are you getting data from the crew

136
00:04:25,030 --> 00:04:23,040
members on this are you just watching

137
00:04:27,350 --> 00:04:25,040
them on the downlink video or well there

138
00:04:29,270 --> 00:04:27,360

is some of that but we also developed an

139
00:04:31,510 --> 00:04:29,280
app that they have on their ipads and so

140
00:04:32,230 --> 00:04:31,520
it provides them an easy platform to go

141
00:04:34,710 --> 00:04:32,240
to

142
00:04:37,510 --> 00:04:34,720
they can give us text they can take

143
00:04:39,030 --> 00:04:37,520
photos videos do audio recordings and

144
00:04:41,189 --> 00:04:39,040
then it's all in one place and they can

145
00:04:43,430 --> 00:04:41,199
hit a button and it comes to us and it's

146
00:04:45,670 --> 00:04:43,440
low overhead for the crew

147
00:04:47,830 --> 00:04:45,680
they also can take questionnaires within

148
00:04:49,749 --> 00:04:47,840
the app so we can adjust what questions

149
00:04:51,590 --> 00:04:49,759
we ask them throughout the mission based

150
00:04:53,270 --> 00:04:51,600
on things we've been seeing

151
00:04:55,430 --> 00:04:53,280
in addition to using that app to give us

152
00:04:57,430 --> 00:04:55,440
data we're going to have some real-time

153
00:04:59,110 --> 00:04:57,440
debriefs with the people that do the

154
00:05:00,550 --> 00:04:59,120
post-mission human factors debriefs

155
00:05:01,749 --> 00:05:00,560
which is usually months after they get

156
00:05:03,909 --> 00:05:01,759
back and so there's probably some

157
00:05:05,270 --> 00:05:03,919
detailed loss in the time in between

158
00:05:07,189 --> 00:05:05,280
they're part of our research team and

159
00:05:08,469 --> 00:05:07,199
they're going to come in and ask some

160
00:05:10,469 --> 00:05:08,479
questions based on what we've been

161
00:05:11,909 --> 00:05:10,479
seeing through this application

162
00:05:13,350 --> 00:05:11,919
and through the questionnaires that

163
00:05:15,590 --> 00:05:13,360

we've received

164
00:05:18,390 --> 00:05:15,600
give me a sense of how that data gets

165
00:05:19,189 --> 00:05:18,400
applied to the future spacecraft how how

166
00:05:20,710 --> 00:05:19,199
do

167
00:05:22,830 --> 00:05:20,720
those designers look at what you're

168
00:05:25,270 --> 00:05:22,840
gathering now and and put it into

169
00:05:27,350 --> 00:05:25,280
practice so this is one of many

170
00:05:29,110 --> 00:05:27,360
experiments and studies that we have

171
00:05:31,830 --> 00:05:29,120
going on as part of our habitability

172
00:05:34,150 --> 00:05:31,840
research portfolio and our goal as

173
00:05:36,390 --> 00:05:34,160
researchers is to try to

174
00:05:38,310 --> 00:05:36,400
to get it into a form that will be

175
00:05:40,550 --> 00:05:38,320
standards and guidelines for designers

176
00:05:42,629 --> 00:05:40,560
in the future everyone will look to

177
00:05:43,749 --> 00:05:42,639
a book that will tell them

178
00:05:45,510 --> 00:05:43,759
these are the rules that you need to

179
00:05:46,710 --> 00:05:45,520
follow as you build it in addition to

180
00:05:48,070 --> 00:05:46,720
that beyond that some of these things

181
00:05:49,430 --> 00:05:48,080
are kind of tricky to apply because it's

182
00:05:50,870 --> 00:05:49,440
easy to say

183
00:05:52,150 --> 00:05:50,880
you know don't put things that make a

184
00:05:53,350 --> 00:05:52,160
mess next to things that need to be

185
00:05:55,189 --> 00:05:53,360
cleaned but then when you're actually

186
00:05:57,110 --> 00:05:55,199
laying it out it's more complicated than

187
00:05:58,629 --> 00:05:57,120
that so we're also working on developing

188
00:06:00,790 --> 00:05:58,639

models and tools and so this would be

189
00:06:02,629 --> 00:06:00,800
important inputs into those models if we

190
00:06:04,469 --> 00:06:02,639
can see how they perform the tasks now

191
00:06:06,070 --> 00:06:04,479
then it can it can give us information

192
00:06:08,550 --> 00:06:06,080
into how it works and we can feed that

193
00:06:10,230 --> 00:06:08,560
into models and give a nice tool to

194
00:06:11,990 --> 00:06:10,240
designers that they can use and play

195
00:06:13,350 --> 00:06:12,000
with the layout and and see if they're

196
00:06:14,550 --> 00:06:13,360
meeting all of our requirements and

197
00:06:16,150 --> 00:06:14,560
desires

198
00:06:17,990 --> 00:06:16,160
is what you're gathering here so

199
00:06:20,390 --> 00:06:18,000
specific that it's really only

200
00:06:23,430 --> 00:06:20,400
applicable to a space vehicle or could

201
00:06:24,629 --> 00:06:23,440
it have application terrestrially

202
00:06:26,469 --> 00:06:24,639
there are definitely terrestrial

203
00:06:28,790 --> 00:06:26,479
applications we've worked in the past

204
00:06:30,710 --> 00:06:28,800
when we're working on developing this

205
00:06:31,749 --> 00:06:30,720
experiment and looking at what tasks are

206
00:06:33,350 --> 00:06:31,759
important

207
00:06:34,550 --> 00:06:33,360
with folks from the oil and gas industry

208
00:06:35,510 --> 00:06:34,560
being in houston that's convenient we

209
00:06:37,909 --> 00:06:35,520
can meet with them they're very

210
00:06:40,309 --> 00:06:37,919
interested in it in the context of rigs

211
00:06:41,510 --> 00:06:40,319
that people would live on long term out

212
00:06:43,270 --> 00:06:41,520
on the ocean

213
00:06:45,430 --> 00:06:43,280

we also work with

214
00:06:47,430 --> 00:06:45,440
folks who design ships for the navy with

215
00:06:50,469 --> 00:06:47,440
people who design habitats for antarctic

216
00:06:52,950 --> 00:06:50,479
research stations with other

217
00:06:54,870 --> 00:06:52,960
submarines and commercial shipping

218
00:06:57,110 --> 00:06:54,880
industry we've we've got kind of a

219
00:06:58,150 --> 00:06:57,120
network of people that we reach out to

220
00:06:59,350 --> 00:06:58,160
that they're interested in what we're

221
00:07:00,870 --> 00:06:59,360
doing and we're interested in what

222
00:07:04,230 --> 00:07:00,880
they're doing so they may not have

223
00:07:06,150 --> 00:07:04,240
somebody doing um you know a treadmill

224
00:07:07,830 --> 00:07:06,160
in microgravity in their environment but

225
00:07:09,830 --> 00:07:07,840
they're still interested in the process

226
00:07:12,469 --> 00:07:09,840
of how do we come up with these answers

227
00:07:14,150 --> 00:07:12,479
how do we how do we approach the problem

228
00:07:15,270 --> 00:07:14,160
and and they're they're interested in

229
00:07:17,510 --> 00:07:15,280
the same type of things anybody that's

230
00:07:19,350 --> 00:07:17,520
looking at people and can find spaces in

231
00:07:20,469 --> 00:07:19,360
extreme environments for long periods of

232
00:07:22,230 --> 00:07:20,479
time

233
00:07:23,830 --> 00:07:22,240
very interesting to see how that works

234
00:07:25,350 --> 00:07:23,840
out thank you for uh for telling us

235
00:07:27,909 --> 00:07:25,360
about it you're welcome dr sherry

236
00:07:29,670 --> 00:07:27,919
thaxton is the principal investigator of