
GOLD
AWARD
JAXA

1
00:00:05,349 --> 00:00:03,350
joining me right now is daniel burbank

2
00:00:07,349 --> 00:00:05,359
who's the commander of expedition 30

3
00:00:08,710 --> 00:00:07,359
aboard the international space station

4
00:00:10,549 --> 00:00:08,720
and commander thank you so much for

5
00:00:15,270 --> 00:00:10,559
joining us today what's the weather like

6
00:00:19,189 --> 00:00:16,630
actually the weather's beautiful it's

7
00:00:21,109 --> 00:00:19,199
always clear temperature's just great no

8
00:00:22,630 --> 00:00:21,119
humidity hardly ever any rain or any

9
00:00:24,470 --> 00:00:22,640
snow or anything like that it's actually

10
00:00:25,269 --> 00:00:24,480
wonderful and it's great to look at the

11
00:00:28,870 --> 00:00:25,279
earth

12
00:00:31,990 --> 00:00:30,390
now dan you've had the advantage of

13
00:00:33,910 --> 00:00:32,000

having gone up in the space shuttle a

14
00:00:35,670 --> 00:00:33,920
couple of times this last time you came

15
00:00:37,270 --> 00:00:35,680
up in the soyuz what's the difference

16
00:00:43,350 --> 00:00:37,280
between the two in terms of the way that

17
00:00:47,270 --> 00:00:45,510
well as far as the the sensations that

18
00:00:49,670 --> 00:00:47,280
you have the acceleration you feel the

19
00:00:51,510 --> 00:00:49,680
vibrations of the vehicle um it's very

20
00:00:53,430 --> 00:00:51,520
similar uh it takes about the same

21
00:00:55,430 --> 00:00:53,440
amount of time to go from zero miles an

22
00:00:57,189 --> 00:00:55,440
hour to seventeen thousand a space

23
00:00:59,349 --> 00:00:57,199
shuttle as it does in the soyuz the

24
00:01:02,069 --> 00:00:59,359
soyuz is quite a bit smaller so from the

25
00:01:04,469 --> 00:01:02,079
crew perspective inside it's um

26
00:01:06,550 --> 00:01:04,479
it's uh it's a little bit smaller it's a

27
00:01:07,830 --> 00:01:06,560
little bit it's a little bit cramped i

28
00:01:09,670 --> 00:01:07,840
guess you could say at least in the

29
00:01:12,149 --> 00:01:09,680
descent module the part of the the

30
00:01:14,710 --> 00:01:12,159
capsule that we ride in the way uphill

31
00:01:16,070 --> 00:01:14,720
after we get on orbit for an hour or two

32
00:01:17,830 --> 00:01:16,080
and we've had some time to check out the

33
00:01:20,550 --> 00:01:17,840
systems we can kind of stretch our legs

34
00:01:23,270 --> 00:01:20,560
a little bit in the the on orbit module

35
00:01:25,510 --> 00:01:23,280
the the round part of the soyuz vehicle

36
00:01:27,350 --> 00:01:25,520
that you've probably seen in in diagrams

37
00:01:29,590 --> 00:01:27,360
and pictures on board space station but

38
00:01:31,350 --> 00:01:29,600

on the way uphill you're snug you're

39
00:01:35,350 --> 00:01:31,360
very you're strapped in as tight as can

40
00:01:38,310 --> 00:01:35,360
be and uh and for a guy my size

41
00:01:39,910 --> 00:01:38,320
it's about as small as i could handle i

42
00:01:43,429 --> 00:01:39,920
think much smaller than that it would be

43
00:01:47,830 --> 00:01:45,590
wow okay let's talk about the projects

44
00:01:49,749 --> 00:01:47,840
you're working on right now obviously

45
00:01:51,510 --> 00:01:49,759
our sites are now set beyond the

46
00:01:53,990 --> 00:01:51,520
international space station potentially

47
00:01:55,670 --> 00:01:54,000
to the moon and then to mars and beyond

48
00:01:57,030 --> 00:01:55,680
what kind of projects are you working on

49
00:02:01,190 --> 00:01:57,040
right now that will help us in our

50
00:02:04,230 --> 00:02:02,389
yeah i think one of the most important

51
00:02:05,749 --> 00:02:04,240
things at least in the in the american

52
00:02:08,229 --> 00:02:05,759
science the u.s sponsored science on

53
00:02:10,469 --> 00:02:08,239
board space station is to to answer the

54
00:02:12,790 --> 00:02:10,479
questions that we need to answer to be

55
00:02:14,949 --> 00:02:12,800
able to safely send a crew to mars and

56
00:02:16,949 --> 00:02:14,959
it's how to keep humans healthy safe

57
00:02:18,790 --> 00:02:16,959
productive in space there's a lot of

58
00:02:20,229 --> 00:02:18,800
things that are an awful lot of fun

59
00:02:21,589 --> 00:02:20,239
about being in weightlessness but they

60
00:02:23,910 --> 00:02:21,599
also have some

61
00:02:26,150 --> 00:02:23,920
some physiological hazards to us we

62
00:02:27,589 --> 00:02:26,160
quickly adapt to the environments we're

63
00:02:29,190 --> 00:02:27,599

in and we quickly

64
00:02:30,710 --> 00:02:29,200
adapt to weightlessness and that means

65
00:02:32,070 --> 00:02:30,720
we don't our hearts don't have to be as

66
00:02:33,910 --> 00:02:32,080
strong our bones don't have to be as

67
00:02:35,670 --> 00:02:33,920
strong muscles all the rest and there's

68
00:02:37,589 --> 00:02:35,680
other changes as well

69
00:02:38,790 --> 00:02:37,599
those would all be fine if we were going

70
00:02:40,150 --> 00:02:38,800
to live in space forever in

71
00:02:41,750 --> 00:02:40,160
weightlessness but if we're going to go

72
00:02:42,869 --> 00:02:41,760
to mars we want to land and be

73
00:02:45,509 --> 00:02:42,879
functional if we're going to come back

74
00:02:47,509 --> 00:02:45,519
to earth as i hope i will shortly then

75
00:02:49,589 --> 00:02:47,519
i'd also like to be able to retain as

76
00:02:50,869 --> 00:02:49,599
much of the muscle mass and bone mass as

77
00:02:52,150 --> 00:02:50,879
possible so

78
00:02:55,110 --> 00:02:52,160
a lot of the experiments we're doing

79
00:02:56,869 --> 00:02:55,120
including one that i'm wearing right now

80
00:02:58,229 --> 00:02:56,879
are aimed to figure out all the

81
00:03:01,589 --> 00:02:58,239
different things that happen to for

82
00:03:03,509 --> 00:03:01,599
example the heart so from a from

83
00:03:05,190 --> 00:03:03,519
the electric signal standpoint from the

84
00:03:07,990 --> 00:03:05,200
muscle strength standpoint from the

85
00:03:10,390 --> 00:03:08,000
volume the cardiac the cardiovascular

86
00:03:11,830 --> 00:03:10,400
output the stroke volume that the heart

87
00:03:13,830 --> 00:03:11,840
pumps out all those kinds of things

88
00:03:15,190 --> 00:03:13,840

we're doing studies to to analyze that

89
00:03:16,149 --> 00:03:15,200
and we do it for a whole host of other

90
00:03:17,190 --> 00:03:16,159
things

91
00:03:18,869 --> 00:03:17,200
and

92
00:03:21,350 --> 00:03:18,879
hopefully we'll be able to apply those

93
00:03:23,750 --> 00:03:21,360
here and before too many more years and

94
00:03:25,110 --> 00:03:23,760
actually leave low earth orbit and go to

95
00:03:28,149 --> 00:03:25,120
some of these great destinations like

96
00:03:31,670 --> 00:03:30,070
now tell me how the space program has

97
00:03:32,949 --> 00:03:31,680
changed for you without the shuttle

98
00:03:34,710 --> 00:03:32,959
because i'm thinking from one

99
00:03:36,789 --> 00:03:34,720
perspective because i've covered so many

100
00:03:38,550 --> 00:03:36,799
of the space shuttle flights it's not in

101
00:03:40,550 --> 00:03:38,560
the news and unfortunately it's that out

102
00:03:42,710 --> 00:03:40,560
of sight out of mind and but we still

103
00:03:44,070 --> 00:03:42,720
have a lot of projects going on but i

104
00:03:45,589 --> 00:03:44,080
think a lot of people have kind of i

105
00:03:47,270 --> 00:03:45,599
don't want to say they backed off but

106
00:03:52,630 --> 00:03:47,280
but maybe they've lost a little their

107
00:03:56,630 --> 00:03:54,550
well launches i mean well for i would

108
00:03:58,229 --> 00:03:56,640
say one thing i think it's in the best

109
00:03:59,830 --> 00:03:58,239
interest of all of us as people that

110
00:04:01,990 --> 00:03:59,840
want to explore space to have as many

111
00:04:04,470 --> 00:04:02,000
ways to get to and from planet earth

112
00:04:06,710 --> 00:04:04,480
into space as possible it's just it's

113
00:04:08,390 --> 00:04:06,720

just smart from a redundancy standpoint

114
00:04:11,110 --> 00:04:08,400
the people afforded us the opportunity

115
00:04:13,270 --> 00:04:11,120
to to carry you know massive pieces of

116
00:04:15,750 --> 00:04:13,280
cargo up to space to be able to stage

117
00:04:17,909 --> 00:04:15,760
evas and do extensive and complicated

118
00:04:19,909 --> 00:04:17,919
robotics work from it the shuttle just

119
00:04:21,430 --> 00:04:19,919
finished up doing the most important job

120
00:04:23,350 --> 00:04:21,440
the thing that it was designed to do all

121
00:04:25,670 --> 00:04:23,360
along and that was to build this

122
00:04:28,230 --> 00:04:25,680
unbelievable laboratory in space million

123
00:04:30,550 --> 00:04:28,240
pounds of space station and the shuttle

124
00:04:32,390 --> 00:04:30,560
was uniquely suited to do that

125
00:04:33,590 --> 00:04:32,400
as we look at going beyond low earth

126
00:04:34,790 --> 00:04:33,600
orbit

127
00:04:36,150 --> 00:04:34,800
the shuttle is not the right kind of

128
00:04:38,469 --> 00:04:36,160
vehicle to do that you don't want a

129
00:04:41,350 --> 00:04:38,479
vehicle with wings that's a waste of of

130
00:04:42,790 --> 00:04:41,360
up mass it's a waste of energy and what

131
00:04:44,710 --> 00:04:42,800
you want to do is have a vehicle that's

132
00:04:46,390 --> 00:04:44,720
designed to take for us for example the

133
00:04:48,710 --> 00:04:46,400
next step beyond low earth orbit onto

134
00:04:50,150 --> 00:04:48,720
the moon and mars for the time being

135
00:04:51,749 --> 00:04:50,160
though between now and when we have

136
00:04:53,430 --> 00:04:51,759
those vehicles in hand the things we

137
00:04:55,590 --> 00:04:53,440
need to do on space station is to work

138
00:04:58,390 --> 00:04:55,600

hard to figure out to solve all the

139
00:05:00,790 --> 00:04:58,400
problems that that uh potentially could

140
00:05:02,950 --> 00:05:00,800
be major hazards for us down the road

141
00:05:05,350 --> 00:05:02,960
and the shuttle for all its elegance and

142
00:05:06,150 --> 00:05:05,360
capability isn't the vehicle for that

143
00:05:07,350 --> 00:05:06,160
now

144
00:05:08,790 --> 00:05:07,360
i've been there and i've watched

145
00:05:11,029 --> 00:05:08,800
launches and i've experienced a couple

146
00:05:12,870 --> 00:05:11,039
of them myself and it's a very moving

147
00:05:14,629 --> 00:05:12,880
thing and it's a very powerful thing and

148
00:05:16,629 --> 00:05:14,639
and the state of florida has contributed

149
00:05:18,390 --> 00:05:16,639
an awful lot in the and the workers at

150
00:05:19,909 --> 00:05:18,400
kennedy space center for example to make

151
00:05:21,749 --> 00:05:19,919
that possible

152
00:05:23,670 --> 00:05:21,759
i hope sooner than later that we're

153
00:05:25,430 --> 00:05:23,680
going to have a suite of other vehicles

154
00:05:26,870 --> 00:05:25,440
and many of them launched out of florida

155
00:05:31,749 --> 00:05:26,880
to continue

156
00:05:34,550 --> 00:05:31,759
american access to low earth orbit so

157
00:05:35,830 --> 00:05:34,560
i look at this as the next logical thing

158
00:05:37,029 --> 00:05:35,840
we only have a certain amount of money

159
00:05:38,469 --> 00:05:37,039
we're spending that right now in the

160
00:05:40,310 --> 00:05:38,479
things we need to do in the research

161
00:05:42,070 --> 00:05:40,320
onboard space station but we're also

162
00:05:44,629 --> 00:05:42,080
investing in new vehicles down the road

163
00:05:48,790 --> 00:05:46,070

right we're talking about the dragon

164
00:05:50,390 --> 00:05:48,800
capsule the falcon rockets the orion and

165
00:05:52,469 --> 00:05:50,400
some of the other projects now tell me

166
00:05:53,909 --> 00:05:52,479
about this automated transfer vehicle

167
00:05:56,309 --> 00:05:53,919
because i think a lot of people don't

168
00:05:57,990 --> 00:05:56,319
understand is if you don't occasionally

169
00:06:00,309 --> 00:05:58,000
boost the international space station to

170
00:06:01,749 --> 00:06:00,319
a higher orbit earth is constantly

171
00:06:06,550 --> 00:06:01,759
pulling it down and would love to drag

172
00:06:09,510 --> 00:06:07,909
yeah that's right in fact the space

173
00:06:11,270 --> 00:06:09,520
station is kind of in a sweet spot

174
00:06:12,870 --> 00:06:11,280
altitude wise right now it's at a place

175
00:06:14,390 --> 00:06:12,880
where we don't have to expend a lot of

176
00:06:15,990 --> 00:06:14,400
propellant to get to it don't have to

177
00:06:18,390 --> 00:06:16,000
expend a lot of propellant to get back

178
00:06:20,870 --> 00:06:18,400
down but it's also in a place although

179
00:06:23,029 --> 00:06:20,880
it's nearly a vacuum outside

180
00:06:26,150 --> 00:06:23,039
behind me here for example there's just

181
00:06:28,710 --> 00:06:26,160
enough air with the uh with the wide

182
00:06:30,710 --> 00:06:28,720
expanse of solar rays and the and just

183
00:06:32,790 --> 00:06:30,720
the the uh the surface area the space

184
00:06:35,189 --> 00:06:32,800
station to gradually slow it down and

185
00:06:37,590 --> 00:06:35,199
bring it down so the space station left

186
00:06:39,670 --> 00:06:37,600
to its own after a course of you know

187
00:06:41,590 --> 00:06:39,680
many months would re-enter the the

188
00:06:43,590 --> 00:06:41,600

earth's atmosphere but we periodically

189
00:06:45,510 --> 00:06:43,600
reduced it and we do that with

190
00:06:47,110 --> 00:06:45,520
visiting vehicles it could be the the

191
00:06:48,870 --> 00:06:47,120
automated transfer vehicle which is a

192
00:06:50,469 --> 00:06:48,880
european vehicle we have russian

193
00:06:52,070 --> 00:06:50,479
progress vehicles

194
00:06:53,589 --> 00:06:52,080
we had the shuttle doing those kinds of

195
00:06:55,270 --> 00:06:53,599
things as well we also have plenty of

196
00:06:57,189 --> 00:06:55,280
propellant onboard space station to do

197
00:06:58,230 --> 00:06:57,199
that we don't want to take it up really

198
00:06:59,510 --> 00:06:58,240
high where it would stay there for a

199
00:07:00,870 --> 00:06:59,520
long period of time because again it

200
00:07:03,430 --> 00:07:00,880
would take us an awful lot of propellant

201
00:07:05,430 --> 00:07:03,440
to get to it so it's it's in a good

202
00:07:06,870 --> 00:07:05,440
place but we do need to

203
00:07:10,629 --> 00:07:06,880
periodically

204
00:07:14,550 --> 00:07:12,790
yeah always trade-offs with weight when

205
00:07:15,909 --> 00:07:14,560
it comes to space daniel thank you so

206
00:07:17,270 --> 00:07:15,919
much for joining us and good luck to you

207
00:07:22,230 --> 00:07:17,280
folks up there and may you have a safe

208
00:07:25,749 --> 00:07:23,510
alex been a pleasure to be with you

209
00:07:28,070 --> 00:07:25,759
thanks for all your years of supporting

210
00:07:29,670 --> 00:07:28,080
us and supporting space flight and wish