
NASA
SPACESTATION
LIVE

1
00:00:10,150 --> 00:00:07,990
what's your assessment so far as far as

2
00:00:11,830 --> 00:00:10,160
aquarius being an analog to space flight

3
00:00:14,310 --> 00:00:11,840
is it is it giving you a fairly

4
00:00:16,550 --> 00:00:14,320
realistic feel or your crewmates who

5
00:00:20,230 --> 00:00:16,560
haven't been to space before actually we

6
00:00:22,870 --> 00:00:20,240
have talked about this among us and

7
00:00:25,269 --> 00:00:22,880
in my personal opinion

8
00:00:27,990 --> 00:00:25,279
this is the most accurate analog i've

9
00:00:29,750 --> 00:00:28,000
ever been into i've i've done

10
00:00:31,669 --> 00:00:29,760
other analogs

11
00:00:34,630 --> 00:00:31,679
one underground for example which is

12
00:00:36,870 --> 00:00:34,640
more about exploration

13
00:00:39,030 --> 00:00:36,880

but this one just because of the

14
00:00:42,150 --> 00:00:39,040
conditions and because of the the

15
00:00:44,229 --> 00:00:42,160
habitat itself it is incredibly accurate

16
00:00:45,910 --> 00:00:44,239
it really feels like you're you are on a

17
00:00:48,310 --> 00:00:45,920
different planet

18
00:00:50,470 --> 00:00:48,320
give me the the thumbnail version of

19
00:00:52,709 --> 00:00:50,480
what nemo 20 is about what are you guys

20
00:00:55,670 --> 00:00:52,719
there to do

21
00:00:58,630 --> 00:00:55,680
wow nemo 20 is about a lot of different

22
00:01:02,310 --> 00:00:58,640
things the main the main thing is

23
00:01:03,670 --> 00:01:02,320
um evaluation of procedure techniques

24
00:01:06,390 --> 00:01:03,680
and tools

25
00:01:08,710 --> 00:01:06,400
for future exploration on extra

26
00:01:10,469 --> 00:01:08,720
planetary objects

27
00:01:13,109 --> 00:01:10,479
we had

28
00:01:17,429 --> 00:01:13,119
we have been testing and evaluating

29
00:01:20,310 --> 00:01:17,439
um flight specific tools designed to

30
00:01:23,830 --> 00:01:20,320
explore to retrieve samples and to do

31
00:01:26,870 --> 00:01:23,840
science on small asteroids or bigger

32
00:01:28,630 --> 00:01:26,880
moons or even even mars

33
00:01:30,950 --> 00:01:28,640
and the reason why we can only do it

34
00:01:33,190 --> 00:01:30,960
here or or the reason why

35
00:01:35,190 --> 00:01:33,200
nemo is such a unique place to do it is

36
00:01:37,830 --> 00:01:35,200
because thanks to the to the water and

37
00:01:39,910 --> 00:01:37,840
to the buoyancy we can simulate

38
00:01:42,870 --> 00:01:39,920

different levels of gravity from

39
00:01:45,030 --> 00:01:42,880
microgravity so completely floating to

40
00:01:47,270 --> 00:01:45,040
partial gravity like we would experiment

41
00:01:49,670 --> 00:01:47,280
on the moon or on mars

42
00:01:52,230 --> 00:01:49,680
has your own experience and specifically

43
00:01:54,389 --> 00:01:52,240
your space walking experience

44
00:01:57,190 --> 00:01:54,399
has that really helped you in in that

45
00:02:01,429 --> 00:01:59,510
i think it does in in many different

46
00:02:03,749 --> 00:02:01,439
ways there there are

47
00:02:06,310 --> 00:02:03,759
there are two two ways to see this uh

48
00:02:08,710 --> 00:02:06,320
you can have an experienced space walker

49
00:02:11,670 --> 00:02:08,720
uh come in and use that experience to

50
00:02:13,670 --> 00:02:11,680
evaluate a tool to evaluate a technique

51
00:02:15,589 --> 00:02:13,680
to evaluate a procedure

52
00:02:17,510 --> 00:02:15,599
on the other hand you can have people

53
00:02:19,830 --> 00:02:17,520
that have been trained

54
00:02:21,030 --> 00:02:19,840
but i never experienced it and they can

55
00:02:23,830 --> 00:02:21,040
give their

56
00:02:25,910 --> 00:02:23,840
their best evaluation and it will be

57
00:02:28,390 --> 00:02:25,920
just as important because we may have

58
00:02:30,630 --> 00:02:28,400
people that have never done an mba on

59
00:02:32,710 --> 00:02:30,640
mars and they will have to use the same

60
00:02:33,750 --> 00:02:32,720
tools the same technique and procedures

61
00:02:35,910 --> 00:02:33,760
and so

62
00:02:37,670 --> 00:02:35,920
we can learn a lot from combining those

63
00:02:39,350 --> 00:02:37,680

experiences together

64
00:02:40,949 --> 00:02:39,360
another thing that you're doing there

65
00:02:43,509 --> 00:02:40,959
you're working with some

66
00:02:44,869 --> 00:02:43,519
european space agency sponsored hardware

67
00:02:46,390 --> 00:02:44,879
that is

68
00:02:48,790 --> 00:02:46,400
designed to let an astronaut keep his

69
00:02:52,550 --> 00:02:48,800
eye on the job instead of looking away

70
00:02:54,470 --> 00:02:52,560
to the instructions how's that going

71
00:02:56,630 --> 00:02:54,480
so that part of the experiment is

72
00:02:58,869 --> 00:02:56,640
completed and we did it in the very

73
00:02:59,990 --> 00:02:58,879
first part of our mission

74
00:03:01,670 --> 00:03:00,000
that

75
00:03:04,790 --> 00:03:01,680
the hardware developed by the european

76
00:03:06,949 --> 00:03:04,800
space agency is called the mobipb and it

77
00:03:09,670 --> 00:03:06,959
will be used in the upcoming mission

78
00:03:12,070 --> 00:03:09,680
iris with my classmate and colleague

79
00:03:13,589 --> 00:03:12,080
andres morgensen

80
00:03:15,990 --> 00:03:13,599
when he when he goes up on the space

81
00:03:18,869 --> 00:03:16,000
station this september he will be using

82
00:03:21,509 --> 00:03:18,879
this special device that he can wear on

83
00:03:23,990 --> 00:03:21,519
his wrist and from there through his

84
00:03:25,990 --> 00:03:24,000
voice he can command a procedure to just

85
00:03:28,229 --> 00:03:26,000
scroll down which is something that can

86
00:03:30,229 --> 00:03:28,239
be very useful if you are using your

87
00:03:33,750 --> 00:03:30,239
feet to stabilize yourself and you need

88
00:03:36,229 --> 00:03:33,760

both hands to um to perform the task so

89
00:03:38,229 --> 00:03:36,239
thanks to this device

90
00:03:41,830 --> 00:03:38,239
hopefully we will have an improvement on

91
00:03:43,589 --> 00:03:41,840
that and the experiment went really well

92
00:03:45,509 --> 00:03:43,599
i think that andy is going to have a

93
00:03:46,550 --> 00:03:45,519
very good tool available for him in his

94
00:03:47,750 --> 00:03:46,560
mission

95
00:03:49,589 --> 00:03:47,760
you've got another

96
00:03:51,350 --> 00:03:49,599
high-tech looking piece of hardware

97
00:03:54,390 --> 00:03:51,360
there on the table right in front of you

98
00:03:56,630 --> 00:03:54,400
tell me tell me what that's about

99
00:03:58,630 --> 00:03:56,640
so while we were here we also evaluated

100
00:04:01,990 --> 00:03:58,640
two different sets

101
00:04:03,030 --> 00:04:02,000
of augmenting reality uh devices this

102
00:04:06,149 --> 00:04:03,040
one

103
00:04:07,750 --> 00:04:06,159
was is a a prototype of the so called

104
00:04:09,670 --> 00:04:07,760
hololens

105
00:04:12,070 --> 00:04:09,680
you wear them just like glasses you put

106
00:04:14,789 --> 00:04:12,080
them on on your head and then through

107
00:04:18,390 --> 00:04:14,799
these visors you have

108
00:04:21,349 --> 00:04:18,400
holographic images that are superimposed

109
00:04:23,189 --> 00:04:21,359
on on on reality so instead of talking

110
00:04:25,990 --> 00:04:23,199
about virtual reality we talk about

111
00:04:28,629 --> 00:04:26,000
augmented reality and we use them for

112
00:04:29,670 --> 00:04:28,639
two different uh

113
00:04:32,230 --> 00:04:29,680

kind of

114
00:04:34,310 --> 00:04:32,240
of procedures um that are bought both

115
00:04:37,110 --> 00:04:34,320
called just in time training

116
00:04:39,590 --> 00:04:37,120
so we have a tele operator telling us

117
00:04:41,270 --> 00:04:39,600
how to run a procedure and today we

118
00:04:42,710 --> 00:04:41,280
actually performed

119
00:04:48,790 --> 00:04:42,720
a medical

120
00:04:51,510 --> 00:04:48,800
diagnosis using an operator outside that

121
00:04:54,310 --> 00:04:51,520
talks to me and guides me by seeing what

122
00:04:57,430 --> 00:04:54,320
i see and by telling me what to do

123
00:04:59,189 --> 00:04:57,440
the other one was is called the odg

124
00:05:01,990 --> 00:04:59,199
slightly different the procedure is

125
00:05:04,150 --> 00:05:02,000
already memorizing the glasses and you

126
00:05:06,629 --> 00:05:04,160
just have to position yourself in front

127
00:05:08,950 --> 00:05:06,639
of that of the object that you need to

128
00:05:11,749 --> 00:05:08,960
interface with and then the glasses will

129
00:05:13,430 --> 00:05:11,759
tell you what to do once you are there

130
00:05:16,230 --> 00:05:13,440
another thing that you folks have been

131
00:05:18,230 --> 00:05:16,240
working on is uh working out figuring

132
00:05:20,390 --> 00:05:18,240
out how to have conversations when there

133
00:05:21,909 --> 00:05:20,400
are long delays as there will be on on

134
00:05:24,710 --> 00:05:21,919
future missions much longer than the

135
00:05:26,950 --> 00:05:24,720
delays that you and i have right now how

136
00:05:29,110 --> 00:05:26,960
is that going

137
00:05:30,950 --> 00:05:29,120
so that has been probably one of the

138
00:05:34,870 --> 00:05:30,960

most interesting parts of this

139
00:05:35,830 --> 00:05:34,880
experiment we simulated a zero delay uh

140
00:05:38,070 --> 00:05:35,840
time

141
00:05:41,749 --> 00:05:38,080
uh five minutes and 10 minutes

142
00:05:43,830 --> 00:05:41,759
simulating to be in in a lunar orbit or

143
00:05:46,469 --> 00:05:43,840
uh in orbit around

144
00:05:48,310 --> 00:05:46,479
on phobos orbiting around mars when the

145
00:05:50,710 --> 00:05:48,320
communication is when the distance is

146
00:05:53,350 --> 00:05:50,720
close enough or being at the further

147
00:05:55,590 --> 00:05:53,360
away area of the orbits on the surface

148
00:05:57,670 --> 00:05:55,600
on mars

149
00:06:00,230 --> 00:05:57,680
it turns out that

150
00:06:01,909 --> 00:06:00,240
voice communication is very ineffective

151
00:06:04,710 --> 00:06:01,919
at that point

152
00:06:07,270 --> 00:06:04,720
it's just hard to to send a good clear

153
00:06:09,430 --> 00:06:07,280
message good uh um

154
00:06:11,430 --> 00:06:09,440
understand the communication by voice

155
00:06:13,749 --> 00:06:11,440
and so we've been using a different tool

156
00:06:15,749 --> 00:06:13,759
called playbook which is also a

157
00:06:18,070 --> 00:06:15,759
prototype development for this kind of

158
00:06:22,230 --> 00:06:18,080
exploration and instead we've been using

159
00:06:23,590 --> 00:06:22,240
text messages with attached files videos

160
00:06:26,870 --> 00:06:23,600
photos

161
00:06:28,790 --> 00:06:26,880
to try to make the experience

162
00:06:30,309 --> 00:06:28,800
the clearest possible

163
00:06:32,230 --> 00:06:30,319

and

164
00:06:34,390 --> 00:06:32,240
we found out that

165
00:06:37,430 --> 00:06:34,400
when we have a lot of delay the

166
00:06:39,189 --> 00:06:37,440
astronauts need a lot of independence in

167
00:06:41,430 --> 00:06:39,199
in coming up with a plan in case

168
00:06:42,870 --> 00:06:41,440
something goes not as planned

169
00:06:45,029 --> 00:06:42,880
and they need to have a very good

170
00:06:47,029 --> 00:06:45,039
understanding of

171
00:06:50,070 --> 00:06:47,039
the requirements on the mission in order

172
00:06:51,990 --> 00:06:50,080
to come up with the best possible plan

173
00:06:53,589 --> 00:06:52,000
luca thanks for bringing us up to date

174
00:06:55,990 --> 00:06:53,599
uh and good luck with the rest of the

175
00:06:57,670 --> 00:06:56,000
your nemo mission

176
00:07:00,230 --> 00:06:57,680
thank you very much nemo it's been a

177
00:07:01,749 --> 00:07:00,240
fantastic experience so far and we can

178
00:07:02,629 --> 00:07:01,759
only think that it's gonna get even

179
00:07:04,629 --> 00:07:02,639
better

180
00:07:07,029 --> 00:07:04,639
it's european space agency astronaut

181
00:07:09,909 --> 00:07:07,039
luca parmitano who is the commander of