
Maria Bualat
Payload Developer - Ames Research Center

1
00:00:05,670 --> 00:00:03,669
flight controllers here in the payload

2
00:00:07,269 --> 00:00:05,680
operations integration center are busy

3
00:00:09,030 --> 00:00:07,279
at work this morning they've been

4
00:00:11,589 --> 00:00:09,040
working with karen nyberg from the kibo

5
00:00:13,669 --> 00:00:11,599
module discussing melfi operations

6
00:00:15,749 --> 00:00:13,679
that's the station's minus 80 degree

7
00:00:17,510 --> 00:00:15,759
freezer that's used to store biological

8
00:00:20,070 --> 00:00:17,520
samples among other things in the

9
00:00:22,630 --> 00:00:20,080
meantime chris cassidy has been having a

10
00:00:23,750 --> 00:00:22,640
little fun all in the name of science

11
00:00:25,589 --> 00:00:23,760
he's been working with a new

12
00:00:27,349 --> 00:00:25,599
investigation called surface tele

13
00:00:29,509 --> 00:00:27,359

robotics that's where he actually gets

14
00:00:31,509 --> 00:00:29,519
to control a robot on the ground from

15
00:00:34,630 --> 00:00:31,519
the space station i spoke with the

16
00:00:37,670 --> 00:00:34,640
payload developer about these operations

17
00:00:39,830 --> 00:00:37,680
what we're looking at is ways for

18
00:00:41,750 --> 00:00:39,840
humans to control robots

19
00:00:44,790 --> 00:00:41,760
in you know different situations

20
00:00:47,830 --> 00:00:44,800
primarily to to aid in exploration

21
00:00:50,150 --> 00:00:47,840
so the other projects within human

22
00:00:51,189 --> 00:00:50,160
exploration telerobotics are robonaut 2

23
00:00:52,229 --> 00:00:51,199
which i'm sure a lot of people have

24
00:00:54,869 --> 00:00:52,239
heard about

25
00:00:56,549 --> 00:00:54,879
and smartphone spheres which is we've

26
00:00:58,950 --> 00:00:56,559
taken a smartphone and put it on the

27
00:01:01,590 --> 00:00:58,960
side of the spheres facility which also

28
00:01:02,389 --> 00:01:01,600
very many people are familiar with

29
00:01:04,549 --> 00:01:02,399
to

30
00:01:06,070 --> 00:01:04,559
basically make it a robot a free-flying

31
00:01:08,230 --> 00:01:06,080
robot they give it a little more

32
00:01:10,070 --> 00:01:08,240
computational power and some additional

33
00:01:11,190 --> 00:01:10,080
sensors that aren't already on board the

34
00:01:14,390 --> 00:01:11,200
spheres

35
00:01:16,950 --> 00:01:14,400
surface tele robotics is a

36
00:01:20,070 --> 00:01:16,960
what we're trying to do is have crew

37
00:01:22,469 --> 00:01:20,080
onboard space station control a robot on

38
00:01:25,109 --> 00:01:22,479

the surface of earth and this is a

39
00:01:27,190 --> 00:01:25,119
simulation of different types of

40
00:01:30,390 --> 00:01:27,200
missions that you could run

41
00:01:32,069 --> 00:01:30,400
say in orbiting vehicle around mars

42
00:01:33,990 --> 00:01:32,079
controlling a robot on the surface of

43
00:01:37,510 --> 00:01:34,000
mars or a

44
00:01:39,030 --> 00:01:37,520
crew vehicle at the lunar earth lagrange

45
00:01:40,950 --> 00:01:39,040
point on the far side of the moon

46
00:01:42,950 --> 00:01:40,960
controlling a robot on the far side of

47
00:01:44,389 --> 00:01:42,960
the moon which we cannot communicate

48
00:01:46,389 --> 00:01:44,399
without orbital

49
00:01:47,910 --> 00:01:46,399
assets in place because we have no line

50
00:01:50,630 --> 00:01:47,920
of sight

51
00:01:53,510 --> 00:01:50,640
so what we're testing is you know what

52
00:01:54,789 --> 00:01:53,520
do we need technology wise in order to

53
00:01:56,630 --> 00:01:54,799
do this sort of mission because we've

54
00:01:59,190 --> 00:01:56,640
never done anything like it before and

55
00:02:01,749 --> 00:01:59,200
so we need to understand com issues

56
00:02:03,350 --> 00:02:01,759
usability issues

57
00:02:05,109 --> 00:02:03,360
situational awareness so we're looking

58
00:02:06,709 --> 00:02:05,119
at our user interfaces you know do they

59
00:02:08,710 --> 00:02:06,719
give the crew the information that they

60
00:02:10,790 --> 00:02:08,720
need in order to understand

61
00:02:12,309 --> 00:02:10,800
what the robot's doing what's what's its

62
00:02:14,470 --> 00:02:12,319
uh status

63
00:02:15,830 --> 00:02:14,480

and then can they control it

64
00:02:16,790 --> 00:02:15,840
so what kind of hardware are we talking

65
00:02:18,229 --> 00:02:16,800
about are we talking about a little

66
00:02:20,869 --> 00:02:18,239
robot down here on earth yes we are

67
00:02:22,790 --> 00:02:20,879
we're talking about um a mer sized robot

68
00:02:24,710 --> 00:02:22,800
so those are the the last two rovers

69
00:02:27,030 --> 00:02:24,720
that were on mars the newer robot

70
00:02:29,430 --> 00:02:27,040
curiosity is quite a bit larger

71
00:02:33,190 --> 00:02:29,440
so it's about a meter by a meter by a

72
00:02:34,630 --> 00:02:33,200
meter a robot called k10 that we have at

73
00:02:37,190 --> 00:02:34,640
ames research center we've been using

74
00:02:39,190 --> 00:02:37,200
for about five or six years now

75
00:02:41,030 --> 00:02:39,200
so we're very experienced using it so we

76
00:02:43,430 --> 00:02:41,040
didn't we didn't want to have too many

77
00:02:47,030 --> 00:02:43,440
new variables in this experiment we're

78
00:02:49,509 --> 00:02:47,040
running off of our experiences doing

79
00:02:52,150 --> 00:02:49,519
analog missions where we've gone out to

80
00:02:54,070 --> 00:02:52,160
the arctic and you know california place

81
00:02:56,309 --> 00:02:54,080
deserts in california

82
00:02:59,030 --> 00:02:56,319
and arizona where we've tested the robot

83
00:03:00,550 --> 00:02:59,040
and done simulated uh science missions

84
00:03:04,149 --> 00:03:00,560
so we want to keep the sort of the

85
00:03:06,149 --> 00:03:04,159
robotic side of this test as you know uh

86
00:03:07,830 --> 00:03:06,159
as familiar as possible and really look

87
00:03:09,670 --> 00:03:07,840
more at sort of the human factor side

88
00:03:11,589 --> 00:03:09,680

look at the crew

89
00:03:13,990 --> 00:03:11,599
interaction with the robot that's really

90
00:03:16,869 --> 00:03:14,000
where our science is in this case uh

91
00:03:19,110 --> 00:03:16,879
robots are fun i mean for everybody uh

92
00:03:21,270 --> 00:03:19,120
you know and astronauts have as much fun

93
00:03:22,710 --> 00:03:21,280
with it as anybody else so

94
00:03:24,470 --> 00:03:22,720
they're neat because you can sort of

95
00:03:26,149 --> 00:03:24,480
they move around they do things and you

96
00:03:27,910 --> 00:03:26,159
can kind of relate to them

97
00:03:29,910 --> 00:03:27,920
how exciting is it for you to see a

98
00:03:31,750 --> 00:03:29,920
project come to fruition like this it's

99
00:03:33,670 --> 00:03:31,760
great i you know i haven't had much

100
00:03:36,229 --> 00:03:33,680
experience on the on the human space

101
00:03:37,750 --> 00:03:36,239
flight side of nasa's house we've mostly

102
00:03:40,149 --> 00:03:37,760
worked you play with robots i play with

103
00:03:41,830 --> 00:03:40,159
robots exactly so um you know we've

104
00:03:43,830 --> 00:03:41,840
worked sort of with the mars program in

105
00:03:46,630 --> 00:03:43,840
the past we've looked at

106
00:03:48,309 --> 00:03:46,640
um we have looked at robots uh to aid

107
00:03:50,149 --> 00:03:48,319
human exploration but we haven't

108
00:03:52,390 --> 00:03:50,159
actually flown anything with team of

109
00:03:54,149 --> 00:03:52,400
space flight before so

110
00:03:55,990 --> 00:03:54,159
um so even though we're not our

111
00:03:57,429 --> 00:03:56,000
project's not flying any hardware we're

112
00:03:59,509 --> 00:03:57,439
only flying software because we only

113
00:04:00,869 --> 00:03:59,519

need to send the gui up to the station

114
00:04:02,390 --> 00:04:00,879
for for the

115
00:04:04,070 --> 00:04:02,400
crew to control the hardware on the

116
00:04:05,509 --> 00:04:04,080
ground

117
00:04:06,710 --> 00:04:05,519
there's still a lot of things you have

118
00:04:09,990 --> 00:04:06,720
to do to make sure that everything's

119
00:04:12,390 --> 00:04:10,000
safe surprisingly even with software

120
00:04:14,070 --> 00:04:12,400
so for me it's a very new experience and

121
00:04:16,949 --> 00:04:14,080
it's really exciting because yeah i can

122
00:04:19,110 --> 00:04:16,959
say i've flown something now so

123
00:04:21,430 --> 00:04:19,120
i really like it it's fun

124
00:04:23,830 --> 00:04:21,440
and for more information on surface tele

125
00:04:25,189 --> 00:04:23,840
robotics and other investigations go to