

NASA Marshall Space Flight Center
Huntsville, Alabama



SPACESTATION LIVE



1
00:00:08,549 --> 00:00:07,110
well you see these folks behind me every

2
00:00:10,629 --> 00:00:08,559
week supporting the crew members on the

3
00:00:12,070 --> 00:00:10,639
space station as they perform science

4
00:00:13,749 --> 00:00:12,080
experiments well the person who leads

5
00:00:16,070 --> 00:00:13,759
that team is called a payload operations

6
00:00:18,390 --> 00:00:16,080
director and i'm pleased to be joined by

7
00:00:20,870 --> 00:00:18,400
one of the first of five people who was

8
00:00:23,269 --> 00:00:20,880
asked by nasa to be a payload operations

9
00:00:25,910 --> 00:00:23,279
director that was way back in expedition

10
00:00:28,070 --> 00:00:25,920
2 pat patterson now we're on expedition

11
00:00:29,269 --> 00:00:28,080
47 tell us about the things that that

12
00:00:30,550 --> 00:00:29,279
we've accomplished in that time what

13
00:00:32,229 --> 00:00:30,560

goes through your mind

14

00:00:34,630 --> 00:00:32,239

well first and foremost is the amount of

15

00:00:36,470 --> 00:00:34,640

science that we've accomplished and the

16

00:00:38,069 --> 00:00:36,480

amazing people both here and across the

17

00:00:39,430 --> 00:00:38,079

world that have helped us enable that

18

00:00:40,869 --> 00:00:39,440

science

19

00:00:42,470 --> 00:00:40,879

and you know you didn't start out with

20

00:00:44,549 --> 00:00:42,480

this beautiful room we have behind us

21

00:00:45,670 --> 00:00:44,559

here either tell us about you know i

22

00:00:47,990 --> 00:00:45,680

mean you've had you've added crew

23

00:00:49,830 --> 00:00:48,000

members you've had to add technology too

24

00:00:51,750 --> 00:00:49,840

technology has changed a lot i'm sure

25

00:00:54,069 --> 00:00:51,760

technology has changed in the last 15

26

00:00:56,470 --> 00:00:54,079

years our original room was

27

00:00:58,950 --> 00:00:56,480

90 degrees oriented differently we did

28

00:01:02,389 --> 00:00:58,960

not have our nice big video wall our

29

00:01:04,310 --> 00:01:02,399

computers were not state of the art

30

00:01:06,469 --> 00:01:04,320

our communications we were only dealing

31

00:01:08,390 --> 00:01:06,479

with houston mostly at the beginning now

32

00:01:11,670 --> 00:01:08,400

we interact with the european space

33

00:01:13,590 --> 00:01:11,680

agency the japanese space agency jaxa

34

00:01:14,870 --> 00:01:13,600

and all of our payload developers across

35

00:01:17,030 --> 00:01:14,880

the globe so

36

00:01:18,550 --> 00:01:17,040

communication has improved a lot as well

37

00:01:20,870 --> 00:01:18,560

and the crew members have changed over

38

00:01:23,109 --> 00:01:20,880

that time too and and you have like you

39

00:01:25,030 --> 00:01:23,119

mentioned the the international partners

40

00:01:26,550 --> 00:01:25,040

tell us how that has evolved through the

41

00:01:28,789 --> 00:01:26,560

years working with the crew members and

42

00:01:31,350 --> 00:01:28,799

helping them get that important science

43

00:01:33,830 --> 00:01:31,360

um well we surged between uh we've had

44

00:01:35,510 --> 00:01:33,840

as few as two crew members up to as many

45

00:01:37,830 --> 00:01:35,520

as nine when we had a shuttle dock with

46

00:01:39,590 --> 00:01:37,840

us so that that affects a lot with what

47

00:01:41,109 --> 00:01:39,600

you can do and how you do it and you

48

00:01:43,590 --> 00:01:41,119

guys plan

49

00:01:45,910 --> 00:01:43,600

coordinate and and do it all right right

50

00:01:48,149 --> 00:01:45,920

we're responsible for the nasa science

51
00:01:50,870 --> 00:01:48,159
on board and our job is to make sure

52
00:01:52,230 --> 00:01:50,880
that the crew has everything they need

53
00:01:55,109 --> 00:01:52,240
to execute that science for the

54
00:01:56,789 --> 00:01:55,119
scientist on the ground so i want to ask

55
00:01:58,069 --> 00:01:56,799
you your favorite crew member but i will

56
00:01:59,429 --> 00:01:58,079
ask you about some of your favorite

57
00:02:01,749 --> 00:01:59,439
experiments yeah we'll put you on the

58
00:02:03,190 --> 00:02:01,759
spot uh do you have any over i mean

59
00:02:05,510 --> 00:02:03,200
that's really been a long time what's

60
00:02:07,429 --> 00:02:05,520
that i mean that's since 2001

61
00:02:08,630 --> 00:02:07,439
yeah a lot of experiments how many have

62
00:02:11,029 --> 00:02:08,640
we gotten to i mean it's really

63
00:02:13,430 --> 00:02:11,039

increased we have we're up to over 300

64

00:02:14,790 --> 00:02:13,440

payloads or experiments um asking

65

00:02:16,390 --> 00:02:14,800

somebody their favorites kind of like

66

00:02:18,390 --> 00:02:16,400

asking somebody to name a favorite child

67

00:02:20,790 --> 00:02:18,400

or a pet they're all unique and they all

68

00:02:22,150 --> 00:02:20,800

have soft spots in our hearts but one of

69

00:02:24,869 --> 00:02:22,160

them i wanted to tell you about today

70

00:02:26,550 --> 00:02:24,879

was called spiders in space and we flew

71

00:02:28,710 --> 00:02:26,560

uh two

72

00:02:30,309 --> 00:02:28,720

golden orb spiders that lived onboard

73

00:02:32,949 --> 00:02:30,319

space station for approximately three

74

00:02:35,350 --> 00:02:32,959

months and the goal there was golden orb

75

00:02:37,270 --> 00:02:35,360

spiders spin a web every day so we

76
00:02:38,869 --> 00:02:37,280
wanted to see how they would adapt and

77
00:02:40,949 --> 00:02:38,879
come to find out

78
00:02:42,470 --> 00:02:40,959
they adapted just fine and comparing

79
00:02:44,470 --> 00:02:42,480
that to golden orbs that flew on a

80
00:02:46,390 --> 00:02:44,480
shorter duration shuttle mission the

81
00:02:48,550 --> 00:02:46,400
shuttle spiders spun continuously

82
00:02:51,270 --> 00:02:48,560
whereas the station spiders followed a

83
00:02:53,910 --> 00:02:51,280
timetable they got up in the morning

84
00:02:55,589 --> 00:02:53,920
spun their web hunted their food and

85
00:02:58,070 --> 00:02:55,599
then ate their web and started all over

86
00:03:00,070 --> 00:02:58,080
the next day so it's just amazing how

87
00:03:01,910 --> 00:03:00,080
not only humans but creatures can adapt

88
00:03:04,229 --> 00:03:01,920

as well and that was very popular the

89

00:03:06,390 --> 00:03:04,239

video was very popular on youtube as it

90

00:03:09,030 --> 00:03:06,400

was and you also i see you're leaning

91

00:03:10,070 --> 00:03:09,040

towards the educational side of payloads

92

00:03:11,589 --> 00:03:10,080

tell us about the other one that you

93

00:03:13,030 --> 00:03:11,599

really like the other one is called

94

00:03:15,190 --> 00:03:13,040

spheres which is an acronym like

95

00:03:17,030 --> 00:03:15,200

everything at nasa is in ackermann

96

00:03:19,509 --> 00:03:17,040

sphere stands for

97

00:03:22,149 --> 00:03:19,519

synchronize position hold engage

98

00:03:25,509 --> 00:03:22,159

reorient experiment satellites

99

00:03:27,670 --> 00:03:25,519

that's why it's an acronym that's right

100

00:03:31,270 --> 00:03:27,680

and it's a set of three soccer ball

101

00:03:33,030 --> 00:03:31,280

sized satellites that can be

102

00:03:34,789 --> 00:03:33,040

computer controlled from software that's

103

00:03:36,710 --> 00:03:34,799

uploaded from the ground

104

00:03:39,110 --> 00:03:36,720

and you know the educational part of

105

00:03:41,509 --> 00:03:39,120

spheres is that every six months mit

106

00:03:43,270 --> 00:03:41,519

holds a competition and they design a

107

00:03:45,990 --> 00:03:43,280

scenario and one of the scenarios last

108

00:03:48,550 --> 00:03:46,000

year was they provided a map of

109

00:03:50,630 --> 00:03:48,560

asteroids and solar flares and then the

110

00:03:53,030 --> 00:03:50,640

students had to code the software to get

111

00:03:55,190 --> 00:03:53,040

close to get imagery but not too close

112

00:03:56,869 --> 00:03:55,200

to the solar flare so the finalists

113

00:03:59,110 --> 00:03:56,879

actually go to mit they sit in a big

114

00:04:01,270 --> 00:03:59,120

conference room they have on their big

115

00:04:02,710 --> 00:04:01,280

screen in their conference room um the

116

00:04:04,630 --> 00:04:02,720

satellite's operating with the crew

117

00:04:06,070 --> 00:04:04,640

there and the crew's there scoring it

118

00:04:07,990 --> 00:04:06,080

and at the end there's one team that

119

00:04:09,910 --> 00:04:08,000

wins so it's it's really a neat thing

120

00:04:11,910 --> 00:04:09,920

for us to get to see that interaction

121

00:04:13,270 --> 00:04:11,920

and excitement that's generated and and

122

00:04:15,509 --> 00:04:13,280

you're kind of the behind the scenes in

123

00:04:17,030 --> 00:04:15,519

that you get them ready for that we are

124

00:04:18,949 --> 00:04:17,040

but the other cool thing about spheres

125

00:04:21,110 --> 00:04:18,959

is it's not just an educational payload

126

00:04:22,629 --> 00:04:21,120

it's also a tech demo payload over the

127

00:04:24,870 --> 00:04:22,639

years it's been on board since increment

128

00:04:26,150 --> 00:04:24,880

13. and over the years we've flown

129

00:04:28,710 --> 00:04:26,160

different batteries to help with the

130

00:04:30,390 --> 00:04:28,720

power system we've flown a smartphone to

131

00:04:32,390 --> 00:04:30,400

help with the command and data handling

132

00:04:34,710 --> 00:04:32,400

system we've flown goggles to help with

133

00:04:35,670 --> 00:04:34,720

the imagery system

134

00:04:37,510 --> 00:04:35,680

one

135

00:04:39,670 --> 00:04:37,520

great inventive mind on the earth

136

00:04:42,150 --> 00:04:39,680

thought about they sent up hardware that

137

00:04:44,070 --> 00:04:42,160

connected two spheres with a chamber in

138

00:04:45,909 --> 00:04:44,080

the middle that could hold liquid and

139

00:04:47,510 --> 00:04:45,919

they would move the spheres and see how

140

00:04:49,909 --> 00:04:47,520

the liquid slosh so we were studying the

141

00:04:51,430 --> 00:04:49,919

slash effect and also the every action

142

00:04:52,710 --> 00:04:51,440

has an equal and opposite reaction

143

00:04:54,550 --> 00:04:52,720

effect

144

00:04:56,390 --> 00:04:54,560

that is so interesting and i know

145

00:04:57,909 --> 00:04:56,400

a lot of times when when people ask you

146

00:05:00,310 --> 00:04:57,919

about the payload operations integration

147

00:05:02,310 --> 00:05:00,320

center you always talk about the people

148

00:05:04,550 --> 00:05:02,320

that meant to you over the years it's

149

00:05:06,150 --> 00:05:04,560

it's just

150

00:05:08,150 --> 00:05:06,160

an experience that is very hard to

151

00:05:09,670 --> 00:05:08,160

describe the people it's not just the

152

00:05:11,749 --> 00:05:09,680

people in huntsville are just the people

153

00:05:14,390 --> 00:05:11,759

in houston it's the people in the other

154

00:05:16,710 --> 00:05:14,400

control centers in in moscow in scuba

155

00:05:18,629 --> 00:05:16,720

japan and over popping hop in germany

156

00:05:21,029 --> 00:05:18,639

and all of the payload developers across

157

00:05:23,189 --> 00:05:21,039

the world we're all working towards

158

00:05:24,710 --> 00:05:23,199

expanding our knowledge base and going

159

00:05:26,950 --> 00:05:24,720

for the discovery and learning new

160

00:05:29,510 --> 00:05:26,960

things that will help all of us

161

00:05:30,710 --> 00:05:29,520

go beyond low earth orbit i know we're

162

00:05:31,990 --> 00:05:30,720

grateful that you've been there from the

163

00:05:34,550 --> 00:05:32,000

start and one day i'm going to learn how

164

00:05:36,310 --> 00:05:34,560

to say overflow

165

00:05:37,749 --> 00:05:36,320

takes a lot of practice doesn't roll off

166

00:05:39,430 --> 00:05:37,759

the tongue too easily let's take a live

167

00:05:40,870 --> 00:05:39,440

look into the payload operations

168

00:05:42,469 --> 00:05:40,880

integration center look at those folks

169

00:05:44,150 --> 00:05:42,479

busy at work today thank you very much

170

00:05:45,909 --> 00:05:44,160

pat and if you'd like to ask pat

171

00:05:47,830 --> 00:05:45,919

anything or maybe any of these people

172

00:05:50,070 --> 00:05:47,840

maybe something i didn't ask you'll have

173

00:05:52,390 --> 00:05:50,080

that opportunity this thursday march the

174

00:05:54,310 --> 00:05:52,400

10th from two to 3 central time

175

00:05:56,230 --> 00:05:54,320

during our reddit ask me anything you

176

00:05:57,749 --> 00:05:56,240

ready for that pat i'm ready i will be

177

00:05:59,270 --> 00:05:57,759

joined by other team members here to

178

00:06:00,950 --> 00:05:59,280

answer your questions about supporting

179

00:06:03,110 --> 00:06:00,960

science on the station

180

00:06:04,870 --> 00:06:03,120

you can follow along with the responses

181

00:06:05,909 --> 00:06:04,880

to the questions or just pose one

182

00:06:08,070 --> 00:06:05,919

yourself if you'd like to at the

183

00:06:12,150 --> 00:06:08,080

official reddit ama website that's