
NASA
SPACESTATION
LIVE

1
00:00:09,270 --> 00:00:07,670
so we've been talking a lot about earth

2
00:00:11,190 --> 00:00:09,280
observations from the international

3
00:00:13,110 --> 00:00:11,200
space station this week and one

4
00:00:15,350 --> 00:00:13,120
experiment actually about to celebrate a

5
00:00:17,590 --> 00:00:15,360
very exciting anniversary and that is

6
00:00:19,349 --> 00:00:17,600
the high definition earth viewing to

7
00:00:21,510 --> 00:00:19,359
learn a little bit more i'm joined today

8
00:00:23,349 --> 00:00:21,520
by carlos fontana one of the principal

9
00:00:25,269 --> 00:00:23,359
investigators co-principal investigators

10
00:00:27,589 --> 00:00:25,279
for the project to learn a little bit

11
00:00:29,669 --> 00:00:27,599
more so carlos first off start me off

12
00:00:31,669 --> 00:00:29,679
where did the idea for hdev come from

13
00:00:33,190 --> 00:00:31,679

and what was the original intent of this

14
00:00:35,030 --> 00:00:33,200
payload

15
00:00:38,150 --> 00:00:35,040
a few years ago

16
00:00:40,389 --> 00:00:38,160
the iss technology and science

17
00:00:42,310 --> 00:00:40,399
development office

18
00:00:44,389 --> 00:00:42,320
found themselves in a situation where

19
00:00:46,069 --> 00:00:44,399
there was a space available outside the

20
00:00:48,389 --> 00:00:46,079
columbus module

21
00:00:51,029 --> 00:00:48,399
where the payload had been delayed

22
00:00:53,029 --> 00:00:51,039
and the program wanted to utilize that

23
00:00:54,950 --> 00:00:53,039
space so

24
00:00:58,389 --> 00:00:54,960
the science technology

25
00:01:00,869 --> 00:00:58,399
or technology office came to me and said

26
00:01:02,709 --> 00:01:00,879
what about we put some cameras out there

27
00:01:04,710 --> 00:01:02,719
what would it take to put some cameras

28
00:01:07,190 --> 00:01:04,720
so i drew on a little piece of paper

29
00:01:09,590 --> 00:01:07,200
well we need a camera an encoder and

30
00:01:11,750 --> 00:01:09,600
then we need a router we can put so many

31
00:01:13,270 --> 00:01:11,760
cameras in the enclosure and drew in a

32
00:01:16,870 --> 00:01:13,280
little piece of paper

33
00:01:19,270 --> 00:01:16,880
and my colleagues went on their way

34
00:01:21,109 --> 00:01:19,280
a couple weeks later a few weeks later i

35
00:01:23,510 --> 00:01:21,119
get a call you are the principal

36
00:01:26,710 --> 00:01:23,520
investigator for this payload we are

37
00:01:28,390 --> 00:01:26,720
going to build an enclosure and put it

38
00:01:30,149 --> 00:01:28,400

outside columbus

39
00:01:31,270 --> 00:01:30,159
and the

40
00:01:34,469 --> 00:01:31,280
design

41
00:01:37,830 --> 00:01:34,479
build certification and delivery will be

42
00:01:40,870 --> 00:01:37,840
done in a short period of time and we

43
00:01:43,510 --> 00:01:40,880
broke a record nine months from

44
00:01:45,270 --> 00:01:43,520
conception to delivery and so what was

45
00:01:46,789 --> 00:01:45,280
the real purpose i mean it's more than

46
00:01:48,710 --> 00:01:46,799
just let's put some cameras on the

47
00:01:50,389 --> 00:01:48,720
station what was kind of the scientific

48
00:01:52,550 --> 00:01:50,399
purpose for building this payload and

49
00:01:54,389 --> 00:01:52,560
putting it on the station absolutely as

50
00:01:57,350 --> 00:01:54,399
you know the space environment

51
00:02:00,630 --> 00:01:57,360
and the radiation in space is very harsh

52
00:02:03,749 --> 00:02:00,640
to electronics so you may observe from

53
00:02:07,670 --> 00:02:03,759
time to time that some of our images

54
00:02:10,309 --> 00:02:07,680
have white little dots those are pixels

55
00:02:13,030 --> 00:02:10,319
that are missing because of radiation

56
00:02:16,229 --> 00:02:13,040
and the sensors

57
00:02:19,510 --> 00:02:16,239
get damaged because of it so we are

58
00:02:22,550 --> 00:02:19,520
studying uh you know we count

59
00:02:26,070 --> 00:02:22,560
missing pixels on the images on the

60
00:02:27,670 --> 00:02:26,080
views and specifically on the view on

61
00:02:30,070 --> 00:02:27,680
the nader view

62
00:02:32,150 --> 00:02:30,080
we have seen a couple of pixels missing

63
00:02:35,030 --> 00:02:32,160

but we're very surprised because we

64
00:02:38,229 --> 00:02:35,040
thought it would be much more so the

65
00:02:41,910 --> 00:02:38,239
enclosure where the cameras are are we

66
00:02:44,470 --> 00:02:41,920
think are partially uh protecting uh

67
00:02:47,270 --> 00:02:44,480
radiation from hitting these sensors

68
00:02:48,949 --> 00:02:47,280
okay and so and it wasn't just nasa

69
00:02:51,110 --> 00:02:48,959
people building this payload you guys

70
00:02:53,190 --> 00:02:51,120
also got students involved which is

71
00:02:54,550 --> 00:02:53,200
always very fascinating when you're a

72
00:02:56,150 --> 00:02:54,560
student to say you know my i built

73
00:02:57,830 --> 00:02:56,160
something that went into the space tell

74
00:03:00,869 --> 00:02:57,840
us about how you got students involved

75
00:03:02,149 --> 00:03:00,879
well there is a program called hunch

76
00:03:05,589 --> 00:03:02,159
high school

77
00:03:08,229 --> 00:03:05,599
students united with nasa

78
00:03:10,630 --> 00:03:08,239
for creation of hardware i believe it

79
00:03:13,190 --> 00:03:10,640
stands for and these students

80
00:03:16,149 --> 00:03:13,200
participated with our team and they

81
00:03:18,630 --> 00:03:16,159
built some of the brackets that actually

82
00:03:21,830 --> 00:03:18,640
hold the cameras in place and hold the

83
00:03:25,830 --> 00:03:21,840
encoder so they built part of the little

84
00:03:28,390 --> 00:03:25,840
brackets structural pieces that hold the

85
00:03:30,710 --> 00:03:28,400
payload you can see here the payload on

86
00:03:32,309 --> 00:03:30,720
the right there is an enclosure that's

87
00:03:33,910 --> 00:03:32,319
the finished payload in those little

88
00:03:37,110 --> 00:03:33,920

windows that you see the cameras are

89
00:03:39,190 --> 00:03:37,120
behind and those cameras partially are

90
00:03:42,149 --> 00:03:39,200
held by these brackets that the hunch

91
00:03:43,990 --> 00:03:42,159
folks built very cool and so this video

92
00:03:46,229 --> 00:03:44,000
so april 30th marks the two-year

93
00:03:49,110 --> 00:03:46,239
anniversary of yes

94
00:03:50,710 --> 00:03:49,120
tomorrow so this has been streaming live

95
00:03:52,470 --> 00:03:50,720
the whole time and students were even

96
00:03:54,550 --> 00:03:52,480
involved with the streaming of this

97
00:03:56,550 --> 00:03:54,560
video too so first off tell people where

98
00:03:58,869 --> 00:03:56,560
they can go watch this right now and

99
00:03:59,670 --> 00:03:58,879
again how are students involved in this

100
00:04:02,509 --> 00:03:59,680
well

101
00:04:06,309 --> 00:04:02,519
you can watch this around the clock at

102
00:04:11,509 --> 00:04:06,319
http colon forward slash forward slash

103
00:04:16,390 --> 00:04:12,830
slash

104
00:04:19,509 --> 00:04:16,400
hdf you go to that website and you not

105
00:04:22,069 --> 00:04:19,519
only see the downlink but you see the

106
00:04:24,629 --> 00:04:22,079
track of the station going over the

107
00:04:28,070 --> 00:04:24,639
earth so you can tell when the station

108
00:04:31,670 --> 00:04:28,080
is at night time and unfortunately when

109
00:04:32,629 --> 00:04:31,680
it's night you cannot see much with hdf

110
00:04:33,830 --> 00:04:32,639
but then

111
00:04:36,710 --> 00:04:33,840
as you see

112
00:04:38,550 --> 00:04:36,720
the station come into the daylight uh

113
00:04:41,590 --> 00:04:38,560

there is the picture yes

114
00:04:42,550 --> 00:04:41,600
and so you can watch this around the

115
00:04:44,629 --> 00:04:42,560
clock

116
00:04:47,030 --> 00:04:44,639
and

117
00:04:49,909 --> 00:04:47,040
we have sometimes we've had

118
00:04:52,629 --> 00:04:49,919
to get take the payload off the air for

119
00:04:54,310 --> 00:04:52,639
several reasons and we get calls you

120
00:04:56,390 --> 00:04:54,320
know there are

121
00:04:59,350 --> 00:04:56,400
folks in europe folks all over the world

122
00:05:02,070 --> 00:04:59,360
and they say where is my h death

123
00:05:06,150 --> 00:05:02,080
now there's other ustream

124
00:05:09,590 --> 00:05:06,160
also streams hdf and you stream it makes

125
00:05:11,830 --> 00:05:09,600
hdf available to many people out there

126
00:05:14,710 --> 00:05:11,840
there is an outfit that builds little

127
00:05:17,270 --> 00:05:14,720
boxes that tell you when this station is

128
00:05:19,670 --> 00:05:17,280
coming above you and shows you the hdf

129
00:05:22,390 --> 00:05:19,680
images so there's several

130
00:05:27,510 --> 00:05:22,400
companies that have used

131
00:05:29,749 --> 00:05:27,520
hdf as well as museums schools and uh

132
00:05:32,310 --> 00:05:29,759
universities so how is how are school

133
00:05:33,350 --> 00:05:32,320
how have schools been using hdev with

134
00:05:36,310 --> 00:05:33,360
students

135
00:05:38,550 --> 00:05:36,320
it's a very interesting we got a call

136
00:05:39,749 --> 00:05:38,560
from our partners in europe and germany

137
00:05:41,590 --> 00:05:39,759
in particular

138
00:05:43,430 --> 00:05:41,600

and they were very interested in

139
00:05:44,950 --> 00:05:43,440
development developing

140
00:05:47,510 --> 00:05:44,960
materials

141
00:05:50,070 --> 00:05:47,520
curricula for the students

142
00:05:53,909 --> 00:05:50,080
in their geography lessons and what

143
00:05:57,909 --> 00:05:53,919
better than using live views from earth

144
00:06:00,629 --> 00:05:57,919
and identify those land masses now hdf

145
00:06:03,510 --> 00:06:00,639
has a limited capability but you can

146
00:06:06,070 --> 00:06:03,520
control certain functions you can switch

147
00:06:08,870 --> 00:06:06,080
cameras the forward viewing camera the

148
00:06:09,830 --> 00:06:08,880
native viewing camera the aft cameras

149
00:06:12,550 --> 00:06:09,840
through

150
00:06:15,110 --> 00:06:12,560
just a workstation that's connected

151
00:06:17,430 --> 00:06:15,120
through our systems and so you can

152
00:06:20,550 --> 00:06:17,440
command the cameras so we

153
00:06:21,590 --> 00:06:20,560
partnered with a university of bonn in

154
00:06:24,390 --> 00:06:21,600
germany

155
00:06:26,390 --> 00:06:24,400
and we schedule their participation

156
00:06:28,150 --> 00:06:26,400
where they can command the camera so the

157
00:06:30,710 --> 00:06:28,160
students comment the camera switch

158
00:06:32,870 --> 00:06:30,720
cameras and see the results as they're

159
00:06:34,309 --> 00:06:32,880
flying over certain

160
00:06:36,710 --> 00:06:34,319
parts of the world that they're

161
00:06:38,870 --> 00:06:36,720
interested in okay well so we're about

162
00:06:41,110 --> 00:06:38,880
to hit the two-year mark how

163
00:06:42,950 --> 00:06:41,120

how has it been going you you mentioned

164
00:06:45,350 --> 00:06:42,960
you've only seen a couple of pixels had

165
00:06:47,990 --> 00:06:45,360
the cameras held up as well as you

166
00:06:49,510 --> 00:06:48,000
thought are they much exceeding

167
00:06:52,150 --> 00:06:49,520
exceeding

168
00:06:54,390 --> 00:06:52,160
every expectation now radiation

169
00:06:57,270 --> 00:06:54,400
sometimes affects electronics and we

170
00:06:59,430 --> 00:06:57,280
have encoders we have switchers and we

171
00:07:02,710 --> 00:06:59,440
have had a few instances where all of a

172
00:07:04,950 --> 00:07:02,720
sudden the system locks up we have not

173
00:07:07,430 --> 00:07:04,960
only seen that on the external payload

174
00:07:08,870 --> 00:07:07,440
but also inside the vehicle with our

175
00:07:09,909 --> 00:07:08,880
television system

176
00:07:10,790 --> 00:07:09,919
so

177
00:07:12,150 --> 00:07:10,800
we

178
00:07:13,990 --> 00:07:12,160
rigorously

179
00:07:16,550 --> 00:07:14,000
studied what happened

180
00:07:19,350 --> 00:07:16,560
component by component analyze the the

181
00:07:21,189 --> 00:07:19,360
telemetry and it was just a latch what

182
00:07:23,670 --> 00:07:21,199
you call a latch up

183
00:07:25,270 --> 00:07:23,680
and um so

184
00:07:28,150 --> 00:07:25,280
all we did is what you do with your

185
00:07:31,430 --> 00:07:28,160
computer when it freezes up we

186
00:07:34,390 --> 00:07:31,440
cycled it rebooted it in some cases

187
00:07:36,309 --> 00:07:34,400
powered it down powered back up bingo

188
00:07:39,670 --> 00:07:36,319

there it is sometimes the simple stuff

189
00:07:41,830 --> 00:07:39,680
works absolutely absolutely so what's

190
00:07:43,189 --> 00:07:41,840
what's next for hdev you know it's been

191
00:07:44,869 --> 00:07:43,199
two years how long do you think the

192
00:07:47,029 --> 00:07:44,879
experiment's going to go and you know

193
00:07:49,670 --> 00:07:47,039
what what's maybe the next step is there

194
00:07:51,990 --> 00:07:49,680
going to be an hdev2 well

195
00:07:54,710 --> 00:07:52,000
as i said before the reason why we're on

196
00:07:57,830 --> 00:07:54,720
board is because a payload was late

197
00:08:03,430 --> 00:07:57,840
so that payload will be taken into space

198
00:08:05,110 --> 00:08:03,440
now with spacex 13. that is sometime in

199
00:08:09,430 --> 00:08:05,120
2017

200
00:08:11,670 --> 00:08:09,440
and when this payload arrives our hdf

201
00:08:13,350 --> 00:08:11,680
will be taken robotically off the

202
00:08:15,589 --> 00:08:13,360
columbus module

203
00:08:16,629 --> 00:08:15,599
and the new payload will be placed where

204
00:08:19,270 --> 00:08:16,639
we were

205
00:08:20,629 --> 00:08:19,280
and they bring it down so i'm looking at

206
00:08:24,150 --> 00:08:20,639
the fall

207
00:08:25,270 --> 00:08:24,160
of 2017 year and a half from from now

208
00:08:28,309 --> 00:08:25,280
more or less

209
00:08:31,430 --> 00:08:28,319
and we expect hdf to continue working

210
00:08:32,550 --> 00:08:31,440
the way it has been for two years now

211
00:08:36,389 --> 00:08:32,560
when

212
00:08:39,269 --> 00:08:36,399
we bring down hdf or take it off station

213
00:08:40,389 --> 00:08:39,279

we have been looking at the

214
00:08:42,389 --> 00:08:40,399
any

215
00:08:45,190 --> 00:08:42,399
places where we can

216
00:08:47,670 --> 00:08:45,200
attach a new payload build a new payload

217
00:08:49,990 --> 00:08:47,680
however there aren't very many places we

218
00:08:52,150 --> 00:08:50,000
need data we need power we need certain

219
00:08:54,470 --> 00:08:52,160
requirements so i'm thinking that rather

220
00:08:56,790 --> 00:08:54,480
than replacing their hardware we may

221
00:08:59,670 --> 00:08:56,800
just replace the function because we're

222
00:09:02,310 --> 00:08:59,680
putting new high-definition cameras so

223
00:09:05,509 --> 00:09:02,320
we may just leverage the function of

224
00:09:07,829 --> 00:09:05,519
those cameras and train them to the

225
00:09:11,350 --> 00:09:07,839
earth when they're not being used and

226
00:09:13,910 --> 00:09:11,360
have that as a substitute or future hdf

227
00:09:17,190 --> 00:09:13,920
we're working that plan it's not a done

228
00:09:19,670 --> 00:09:17,200
deal but that would make sense okay well

229
00:09:21,430 --> 00:09:19,680
again the high definition earth viewing

230
00:09:22,870 --> 00:09:21,440
cameras marking their two-year

231
00:09:24,470 --> 00:09:22,880
anniversary now on board the

232
00:09:26,230 --> 00:09:24,480
international space station been

233
00:09:27,990 --> 00:09:26,240
providing some spectacular views and

234
00:09:29,110 --> 00:09:28,000
they will be for only another year and a

235
00:09:31,030 --> 00:09:29,120
half so if you haven't been checking

236
00:09:33,110 --> 00:09:31,040
them out make sure you go do that right

237
00:09:34,630 --> 00:09:33,120
now carlos thanks again so much for

238
00:09:36,470 --> 00:09:34,640

joining me always a pleasure to talk to

239
00:09:38,630 --> 00:09:36,480
you here in mission control