1
00:00:05,349 --> 00:00:02,710
most days on orbit crew members also

2
00:00:07,110 --> 00:00:05,359
spend time looking out the window often

3
00:00:10,230 --> 00:00:07,120
they take pictures of what they're

4
00:00:11,910 --> 00:00:10,240
looking at there are other uh

5
00:00:13,509 --> 00:00:11,920
cameras on the outside of the station

6
00:00:16,470 --> 00:00:13,519
that are doing some of the same thing

7
00:00:19,269 --> 00:00:16,480
it's no secret that the views of earth

8
00:00:21,029 --> 00:00:19,279
from space are pretty spectacular

9
00:00:22,630 --> 00:00:21,039
in fact there are four new cameras on

10
00:00:25,109 --> 00:00:22,640
board the station that are giving the

11
00:00:27,349 --> 00:00:25,119
most unique views that we've ever seen

12
00:00:29,509 --> 00:00:27,359
let's go join lori meggs at the payload

13
00:00:30,870 --> 00:00:29,519

operations integration center at nasa's

14
00:00:33,110 --> 00:00:30,880
marshall space flight center in

15
00:00:35,190 --> 00:00:33,120
huntsville alabama to learn more about

16
00:00:37,350 --> 00:00:35,200
the high definition earth viewing

17
00:00:39,270 --> 00:00:37,360
experiment to date there have been more

18
00:00:41,190 --> 00:00:39,280
than 22 million views of the high

19
00:00:42,470 --> 00:00:41,200
definition earth viewing cameras those

20
00:00:44,150 --> 00:00:42,480
are four cameras that are attached to

21
00:00:46,869 --> 00:00:44,160
the outside of the space station the

22
00:00:49,029 --> 00:00:46,879
stream video live video of earth back

23
00:00:51,189 --> 00:00:49,039
and for use online and they're looking

24
00:00:53,590 --> 00:00:51,199
at how they react in a harsh environment

25
00:00:55,189 --> 00:00:53,600
of space an analysis of that data could

26
00:00:57,830 --> 00:00:55,199
lead to what types of cameras are the

27
00:00:59,270 --> 00:00:57,840
best to use on future space missions we

28
00:01:00,950 --> 00:00:59,280
spoke with the associate program

29
00:01:03,349 --> 00:01:00,960
scientist for crew of the observations

30
00:01:06,230 --> 00:01:03,359
will stefanoff and he tells us more yeah

31
00:01:08,870 --> 00:01:06,240
the hdev is currently capturing a lot of

32
00:01:11,109 --> 00:01:08,880
web traffic uh because it's

33
00:01:13,590 --> 00:01:11,119
it's a first for a number of reasons uh

34
00:01:15,749 --> 00:01:13,600
it's the first continuous hd

35
00:01:17,030 --> 00:01:15,759
downlink from the iss i mean we've had

36
00:01:18,630 --> 00:01:17,040
other cameras up there before but they

37
00:01:20,550 --> 00:01:18,640
have sort of been spotty coverage this

38
00:01:22,310 --> 00:01:20,560

is the first one that's on all the time

39
00:01:24,710 --> 00:01:22,320
uh it's actually four cameras four

40
00:01:26,550 --> 00:01:24,720
commercial off the shelf hd cameras in

41
00:01:28,230 --> 00:01:26,560
an enclosure that's uh built to test

42
00:01:30,230 --> 00:01:28,240
temperature control

43
00:01:32,630 --> 00:01:30,240
and the cameras the main purpose of this

44
00:01:34,230 --> 00:01:32,640
of the hdr project is not to take earth

45
00:01:36,469 --> 00:01:34,240
imagery that's that's just a very cool

46
00:01:38,870 --> 00:01:36,479
added bonus of it uh the real purpose is

47
00:01:41,350 --> 00:01:38,880
to test how long these cameras can

48
00:01:43,190 --> 00:01:41,360
survive in the in the space environment

49
00:01:45,030 --> 00:01:43,200
before they degrade so much through

50
00:01:46,630 --> 00:01:45,040
things like cosmic ray hits that they're

51
00:01:48,149 --> 00:01:46,640
not usable anymore

52
00:01:50,310 --> 00:01:48,159
so with the four cameras there's one

53
00:01:51,910 --> 00:01:50,320
pointed in the in the ram direction at

54
00:01:54,630 --> 00:01:51,920
the for the forward velocity vector of

55
00:01:55,990 --> 00:01:54,640
the iss there's two facing aft and one

56
00:01:57,910 --> 00:01:56,000
facing nader looking right down on the

57
00:02:00,310 --> 00:01:57,920
earth and the way the camera the way the

58
00:02:02,630 --> 00:02:00,320
system is currently set up right now

59
00:02:04,230 --> 00:02:02,640
they the video feeds cycle through all

60
00:02:07,350 --> 00:02:04,240
four cameras

61
00:02:09,029 --> 00:02:07,360
um but there's two educational

62
00:02:11,510 --> 00:02:09,039
educational opportunities are coming up

63
00:02:12,309 --> 00:02:11,520

that we're working with student groups

64
00:02:16,710 --> 00:02:12,319
in

65
00:02:18,150 --> 00:02:16,720
the german space agency dlr

66
00:02:20,070 --> 00:02:18,160
and also the university of houston clear

67
00:02:21,990 --> 00:02:20,080
lake has a group of students also that

68
00:02:24,150 --> 00:02:22,000
will be looking at the camera both to

69
00:02:26,309 --> 00:02:24,160
collect data for specific areas but also

70
00:02:27,670 --> 00:02:26,319
to monitor the primary purpose of the

71
00:02:29,670 --> 00:02:27,680
experiment see how long it see how the

72
00:02:31,110 --> 00:02:29,680
cameras are degrading over time

73
00:02:33,910 --> 00:02:31,120
and so those programs are just getting

74
00:02:36,070 --> 00:02:33,920
spun up but in the meantime yeah the

75
00:02:37,670 --> 00:02:36,080
hdev is returning spectacular hd views

76
00:02:39,509 --> 00:02:37,680
of the earth

77
00:02:41,670 --> 00:02:39,519
other firsts for it it's the it's the

78
00:02:44,949 --> 00:02:41,680
first payload that was completely

79
00:02:47,910 --> 00:02:44,959
robotically removed from the spacex

80
00:02:50,229 --> 00:02:47,920
spacecraft and installed on the iss

81
00:02:51,750 --> 00:02:50,239
it's the first one to use four cameras

82
00:02:54,070 --> 00:02:51,760
simultaneously

83
00:02:55,830 --> 00:02:54,080
for commercial off the shelf cameras

84
00:02:58,309 --> 00:02:55,840
and it's also useful for showing not

85
00:03:00,070 --> 00:02:58,319
only just views of the earth but also

86
00:03:01,589 --> 00:03:00,080
when the feed cuts out just because

87
00:03:04,229 --> 00:03:01,599
there are times when the iss can't

88
00:03:06,149 --> 00:03:04,239

transmit data to the earth that gives

89
00:03:07,670 --> 00:03:06,159
gives the person viewing it kind of a

90
00:03:09,270 --> 00:03:07,680
sense of what it's like to actually work

91
00:03:10,070 --> 00:03:09,280
with the iss there are points in time

92
00:03:12,070 --> 00:03:10,080
where

93
00:03:13,750 --> 00:03:12,080
neither the sensors nor the crew can

94
00:03:15,830 --> 00:03:13,760
actually talk to the earth fortunately

95
00:03:17,670 --> 00:03:15,840
those those periods are fairly short but

96
00:03:19,910 --> 00:03:17,680
by viewing the hdf feed you kind of see

97
00:03:21,830 --> 00:03:19,920
exactly what that periodicity is

98
00:03:23,430 --> 00:03:21,840
yeah it's kind of a first to have this

99
00:03:25,350 --> 00:03:23,440
much excitement about just looking at

100
00:03:26,630 --> 00:03:25,360
the earth by by folks around the world

101
00:03:29,110 --> 00:03:26,640
with social media and things like that

102
00:03:30,710 --> 00:03:29,120
it's really made this explode i'm sure

103
00:03:32,949 --> 00:03:30,720
yeah well it's it's it's a it's a new

104
00:03:34,149 --> 00:03:32,959
view of the earth i mean i mean the crew

105
00:03:36,550 --> 00:03:34,159
photography you've had that kind of

106
00:03:37,990 --> 00:03:36,560
detail before but it's still imagery you

107
00:03:39,910 --> 00:03:38,000
know i mean i mean we also have the time

108
00:03:42,229 --> 00:03:39,920
lapse imagery that's been developed from

109
00:03:44,309 --> 00:03:42,239
camera sequences which is also provides

110
00:03:46,149 --> 00:03:44,319
a really spectacular view of what it's

111
00:03:47,430 --> 00:03:46,159
actually like to look out the window at

112
00:03:49,110 --> 00:03:47,440
the iss

113
00:03:51,430 --> 00:03:49,120

but the hd camera yeah is capturing it

114
00:03:52,789 --> 00:03:51,440
kind of in real time you know so it is

115
00:03:55,750 --> 00:03:52,799
really like you're on the iss looking

116
00:03:57,190 --> 00:03:55,760
out the window are you surprised by how

117
00:03:59,270 --> 00:03:57,200
much people are excited about this and

118
00:04:00,949 --> 00:03:59,280
want to see it

119
00:04:02,789 --> 00:04:00,959
not not so much i'm not that surprised

120
00:04:04,630 --> 00:04:02,799
because uh just from from the crew earth

121
00:04:06,550 --> 00:04:04,640
observations facility we've kind of

122
00:04:08,229 --> 00:04:06,560
always known that that people are just

123
00:04:09,910 --> 00:04:08,239
really excited and interested to see

124
00:04:10,789 --> 00:04:09,920
views of the earth from space

125
00:04:14,869 --> 00:04:10,799
and

126
00:04:16,229 --> 00:04:14,879
connection you know this this is a view

127
00:04:18,469 --> 00:04:16,239
that's not coming from a robotic

128
00:04:19,590 --> 00:04:18,479
satellite it's actually coming from a

129
00:04:21,990 --> 00:04:19,600
spaceship

130
00:04:23,350 --> 00:04:22,000
that has people on it uh i think that

131
00:04:25,430 --> 00:04:23,360
resonates with people that that gets a

132
00:04:27,030 --> 00:04:25,440
deeper connection than just say looking

133
00:04:29,350 --> 00:04:27,040
at a landsat image

134
00:04:31,510 --> 00:04:29,360
you know or some or another sensor image

135
00:04:33,430 --> 00:04:31,520
uh it's it's very easy to interpret it's

136
00:04:35,350 --> 00:04:33,440
a true color image it's basically what

137
00:04:37,189 --> 00:04:35,360
you'd see flying out of an airplane just

138
00:04:39,510 --> 00:04:37,199

it's a very higher plane

139
00:04:40,950 --> 00:04:39,520
a little bit higher um so

140
00:04:42,710 --> 00:04:40,960
what will we see next i know you've

141
00:04:44,150 --> 00:04:42,720
probably got to stay one step ahead with

142
00:04:46,469 --> 00:04:44,160
technology and

143
00:04:48,870 --> 00:04:46,479
earth observations what's next well we

144
00:04:51,270 --> 00:04:48,880
have um right now we have two sensors

145
00:04:54,070 --> 00:04:51,280
which are going up on on iss this year

146
00:04:56,070 --> 00:04:54,080
one is uh the cats cloud atmospheric

147
00:04:58,070 --> 00:04:56,080
profiling lidar system so it's a laser

148
00:05:00,070 --> 00:04:58,080
system which is going to be looking at

149
00:05:01,990 --> 00:05:00,080
particulates in the atmosphere and also

150
00:05:03,029 --> 00:05:02,000
being used to look at storm circulation

151
00:05:04,629 --> 00:05:03,039
patterns

152
00:05:06,469 --> 00:05:04,639
and then there's also the rapid scat

153
00:05:07,990 --> 00:05:06,479
sensor which is a radar sensor and what

154
00:05:10,310 --> 00:05:08,000
that's going to be looking at are sea

155
00:05:13,350 --> 00:05:10,320
surface wind patterns and both of those

156
00:05:15,029 --> 00:05:13,360
tie into how earth's climate

157
00:05:16,070 --> 00:05:15,039
is changing over time with rising

158
00:05:18,310 --> 00:05:16,080
temperatures

159
00:05:19,830 --> 00:05:18,320
how circulation patterns are changing

160
00:05:21,590 --> 00:05:19,840
and then we'll also have further down

161
00:05:23,350 --> 00:05:21,600
the line we have other sensors coming

162
00:05:25,830 --> 00:05:23,360
online which will look at other other

163
00:05:28,230 --> 00:05:25,840

elements of the atmosphere

164
00:05:30,150 --> 00:05:28,240
sensors which will look at the solar

165
00:05:32,150 --> 00:05:30,160
input into the system you know sensors

166
00:05:33,510 --> 00:05:32,160
specifically designed to look at solar

167
00:05:35,430 --> 00:05:33,520
irradiance

168
00:05:37,590 --> 00:05:35,440
those are coming down the line

169
00:05:38,550 --> 00:05:37,600
there's also more hyperspectral

170
00:05:40,070 --> 00:05:38,560
instruments

171
00:05:42,310 --> 00:05:40,080
coming down the line so that we'll be

172
00:05:44,550 --> 00:05:42,320
able to get more detailed information

173
00:05:46,550 --> 00:05:44,560
about land surface processes than we

174
00:05:48,390 --> 00:05:46,560
currently have from sensors on the iss

175
00:05:50,710 --> 00:05:48,400
and that's been useful hyco has been

176
00:05:52,950 --> 00:05:50,720
extremely useful to the epa and everyone

177
00:05:54,550 --> 00:05:52,960
yeah the epa has used it uh there's a

178
00:05:57,350 --> 00:05:54,560
wide variety of scientists around the

179
00:05:58,950 --> 00:05:57,360
world who are using it for research um

180
00:06:00,710 --> 00:05:58,960
it's been useful for yeah contaminant

181
00:06:03,270 --> 00:06:00,720
water contaminant studies it's useful

182
00:06:04,550 --> 00:06:03,280
for mapping shallow water bathymetry

183
00:06:05,749 --> 00:06:04,560
and people are actually starting to use

184
00:06:06,710 --> 00:06:05,759
it now to look at the land surface as

185
00:06:08,070 --> 00:06:06,720
well

186
00:06:10,070 --> 00:06:08,080
and it was specifically designed to look

187
00:06:11,909 --> 00:06:10,080
at coastal areas but it can also collect

188
00:06:14,230 --> 00:06:11,919

useful data over the land too

189
00:06:15,110 --> 00:06:14,240
so we have a number in fact just this

190
00:06:16,070 --> 00:06:15,120
morning

191
00:06:17,909 --> 00:06:16,080
cases

192
00:06:19,670 --> 00:06:17,919
informed us of three new proposals that

193
00:06:21,590 --> 00:06:19,680
were accepted which will be using hico

194
00:06:24,390 --> 00:06:21,600
data to look at both water and land

195
00:06:26,469 --> 00:06:24,400
processes i'm just glad to see the iss

196
00:06:28,629 --> 00:06:26,479
sort of coming into its own as a remote

197
00:06:30,230 --> 00:06:28,639
sensing platform i mean i've worked for

198
00:06:31,350 --> 00:06:30,240
years as a researcher with the more

199
00:06:33,830 --> 00:06:31,360
traditional

200
00:06:35,110 --> 00:06:33,840
robotic satellite sensors and and those

201
00:06:38,070 --> 00:06:35,120
are well designed for the data they

202
00:06:39,590 --> 00:06:38,080
collect but the iss allows us to collect

203
00:06:41,430 --> 00:06:39,600
in some ways a fundamentally different

204
00:06:42,390 --> 00:06:41,440
kind of data because it goes over

205
00:06:44,230 --> 00:06:42,400
different spots of the earth at

206
00:06:45,909 --> 00:06:44,240
different times during the day so it

207
00:06:48,070 --> 00:06:45,919
allows us to view things that we haven't

208
00:06:49,830 --> 00:06:48,080
really seen before from a remote sensing

209
00:06:52,390 --> 00:06:49,840
perspective and that's really exciting

210
00:06:54,230 --> 00:06:52,400
as a scientist and somebody who's now

211
00:06:57,909 --> 00:06:54,240
you know has the has the privilege of

212
00:07:00,150 --> 00:06:57,919
kind of helping to develop the iss

213
00:07:02,390 --> 00:07:00,160

you've seen some of those views from the

214
00:07:06,230 --> 00:07:02,400
high definition earth viewing experiment

215
00:07:08,950 --> 00:07:06,240
before that's operating all of the time

216
00:07:11,430 --> 00:07:08,960
as will stefanov explain that's four

217
00:07:12,629 --> 00:07:11,440
high definition video cameras looking

218
00:07:13,670 --> 00:07:12,639
forward

219
00:07:19,430 --> 00:07:13,680
and

220
00:07:22,230 --> 00:07:19,440
orbits providing some some really nice

221
00:07:25,110 --> 00:07:22,240
views of the earth as it tests out how

222
00:07:27,510 --> 00:07:25,120
well the the cameras themselves work the

223
00:07:29,830 --> 00:07:27,520
primary goal of the experiment to make

224
00:07:31,189 --> 00:07:29,840
sure that those things are working you

225
00:07:34,070 --> 00:07:31,199
can get a look at the video that's

226
00:07:35,670 --> 00:07:34,080
coming from those cameras by checking

227
00:07:39,350 --> 00:07:35,680
out the web address here