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FUEL AIR F32Z RAD
17/13 15:54:13

PAO

WEDNESDAY, APRIL 17 ON NASA TV

Orbital Sciences Antares Test Flight Launch

4:00pm CT / 5:00pm ET

1
00:00:00,800 --> 00:00:02,435
[Silence]

2
00:00:02,435 --> 00:00:03,636
>> Amiko Kauderer: Good morning.

3
00:00:03,636 --> 00:00:05,337
Welcome to the International
Space Station Flight

4
00:00:05,337 --> 00:00:06,472
Control Room.

5
00:00:06,472 --> 00:00:08,574
It's a busy day aboard
the International Space

6
00:00:08,574 --> 00:00:09,942
Station today.

7
00:00:09,942 --> 00:00:11,544
I have a very special guest,
who knows all about that kind

8
00:00:11,544 --> 00:00:12,745
of work that takes place.

9
00:00:12,745 --> 00:00:14,013
>> Mike Fossum: They're
all busy days [laughter].

10
00:00:14,013 --> 00:00:15,081
>> Amiko Kauderer: [Laughter]
They're all busy days.

11
00:00:15,081 --> 00:00:16,849
I feel like I'm doing
a sportscast here.

12

00:00:16,849 --> 00:00:19,785

So, as I said, we have a
very special guest with --

13

00:00:19,785 --> 00:00:21,153

here with us today,
who knows all

14

00:00:21,153 --> 00:00:23,222

about those busy days aboard
the International Space Station.

15

00:00:23,222 --> 00:00:27,726

Three time space flier, most
recently, Expedition 28 and 29,

16

00:00:27,726 --> 00:00:29,662

where he served as Commander
of the Space Station.

17

00:00:29,662 --> 00:00:31,063

>> Mike Fossum: Yeah.

18

00:00:31,063 --> 00:00:32,965

>> Amiko Kauderer: And here he
is, NASA astronaut, Mike Fossum.

19

00:00:32,965 --> 00:00:34,266

Welcome.

20

00:00:34,266 --> 00:00:35,167

>> Mike Fossum: Hey, Amiko,
it's great to be with you,

21

00:00:35,167 --> 00:00:36,802

back on NASA TV today.

22

00:00:36,802 --> 00:00:38,337

>> Amiko Kauderer: Yes,

welcome, as always,

23

00:00:38,337 --> 00:00:40,072

and we always love
to have you here.

24

00:00:40,072 --> 00:00:42,675

So, as I mentioned, let's
just get right into it...

25

00:00:42,675 --> 00:00:43,742

>> Mike Fossum: Sure.

26

00:00:43,742 --> 00:00:45,144

>> Amiko Kauderer:

...because there's a lot

27

00:00:45,144 --> 00:00:46,212

of work that's going on aboard
the International Space Station.

28

00:00:46,212 --> 00:00:49,682

Some activity took
place on -- yesterday.

29

00:00:49,682 --> 00:00:51,083

>> Mike Fossum: Right.

30

00:00:51,083 --> 00:00:52,251

>> Amiko Kauderer: Yesterday,
early morning we had a Progress,

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00:00:52,251 --> 00:00:55,087

Progress 49, that
departed the Space Station.

32

00:00:55,087 --> 00:00:58,190

I know you guys received
and saw...

33

00:00:58,190 --> 00:00:59,525

>> Mike Fossum: Oh, you bet.

34

00:00:59,525 --> 00:01:00,659

>> Amiko Kauderer: ...the cargo vehicles coming and going.

35

00:01:00,659 --> 00:01:02,628

So, talk to me a little about what your role is

36

00:01:02,628 --> 00:01:03,829

on these vehicles, when -- [inaudible].

37

00:01:03,829 --> 00:01:05,631

>> Mike Fossum: Well, the Progress is a cargo ship

38

00:01:05,631 --> 00:01:08,134

that the Russians launch from Kazakhstan,

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00:01:08,134 --> 00:01:10,503

from their launch facility there.

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00:01:10,503 --> 00:01:13,539

The rocket itself is very much like the Soyuz rocket

41

00:01:13,539 --> 00:01:17,042

that we fly, and -- but instead of the people on top,

42

00:01:17,042 --> 00:01:20,246

you have the cargo ship on top, called Progress.

43

00:01:20,246 --> 00:01:24,483
And it's loaded with, you know,
1,000 pounds or so of equipment,

44

00:01:24,483 --> 00:01:29,622
supplies; everything from
clothes, running shoes, to food,

45

00:01:29,622 --> 00:01:31,524
to new pieces of equipment,

46

00:01:31,524 --> 00:01:34,293
either to install new
experiments onboard

47

00:01:34,293 --> 00:01:37,263
or just replacement parts for
the, kind of care and feeding

48

00:01:37,263 --> 00:01:38,731
and maintaining of
the Space Station.

49

00:01:38,731 --> 00:01:40,099
>> Amiko Kauderer: Okay.

50

00:01:40,099 --> 00:01:41,500
>> Mike Fossum: Get all that
good stuff off over the course

51

00:01:41,500 --> 00:01:44,737
of a few weeks, as you kind of
go [inaudible], and of course,

52

00:01:44,737 --> 00:01:46,438
the best thing's right on top;

53

00:01:46,438 --> 00:01:48,474
they always put some
fresh fruit.

54

00:01:48,474 --> 00:01:51,410

So you open the hatch, and
right -- you know, very quickly,

55

00:01:51,410 --> 00:01:54,647

you get to the fresh
oranges, bananas, apples.

56

00:01:54,647 --> 00:01:56,081

Actually, not bananas.

57

00:01:56,081 --> 00:01:57,249

No, I have seen bananas.

58

00:01:57,249 --> 00:01:58,484

Those are a little harder...

59

00:01:58,484 --> 00:01:59,218

>> Amiko Kauderer: Those
are the first, I bet, to...

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00:01:59,218 --> 00:02:00,352

[laughter]

61

00:02:00,352 --> 00:02:01,320

>> Mike Fossum: Yeah,
they eat those first,

62

00:02:01,320 --> 00:02:02,855

and even some onions
and garlic...

63

00:02:02,855 --> 00:02:03,923

>> Amiko Kauderer: Wow.

64

00:02:03,923 --> 00:02:04,623

>> Mike Fossum: ...to
have a little bit

65

00:02:04,623 --> 00:02:05,925
of fresh stuff onboard.

66

00:02:05,925 --> 00:02:08,627
Once you get it emptied
out, then it's time

67

00:02:08,627 --> 00:02:11,363
to start filling it back up,
and, so that's how we take

68

00:02:11,363 --> 00:02:15,968
out the trash, is to fill these
kind of cargo ships with all

69

00:02:15,968 --> 00:02:17,369
of the things you
need to get rid of.

70

00:02:17,369 --> 00:02:20,639
We can't just -- we can't just
open a hatch and throw it out;

71

00:02:20,639 --> 00:02:22,208
we use these cargo ships.

72

00:02:22,208 --> 00:02:25,644
And the Progress cargo ship
burns up on its way back

73

00:02:25,644 --> 00:02:27,646
into the atmosphere,
and so you pretty much

74

00:02:27,646 --> 00:02:28,847
incinerate everything.

75

00:02:28,847 --> 00:02:30,216

>> Amiko Kauderer: Okay, great.

76

00:02:30,216 --> 00:02:31,951

And I think we're looking at
video now from this morning --

77

00:02:31,951 --> 00:02:33,953

I mean, not this morning,
but yesterday morning's...

78

00:02:33,953 --> 00:02:34,787

>> Mike Fossum: Right.

79

00:02:34,787 --> 00:02:35,788

>> Amiko Kauderer: ...departure

80

00:02:35,788 --> 00:02:36,889

from the International
Space Station.

81

00:02:36,889 --> 00:02:39,425

The Progress backs away,
fires its thruster,

82

00:02:39,425 --> 00:02:41,327

and backed away to
a safe distance.

83

00:02:41,327 --> 00:02:43,629

It actually has not
de-orbited yet.

84

00:02:43,629 --> 00:02:45,564

I understand Progress 49 is --

85

00:02:45,564 --> 00:02:47,733

they're going to be doing
some radar system testing...

86

00:02:47,733 --> 00:02:49,001
>> Mike Fossum: Right.

87
00:02:49,001 --> 00:02:50,135
>> Amiko Kauderer: ...for
-- over the next few days,

88
00:02:50,135 --> 00:02:52,571
I believe, on the 21st,
[inaudible] on the 21st,

89
00:02:52,571 --> 00:02:56,008
and then on the 26th will
de-orbit and it'll...

90
00:02:56,008 --> 00:02:56,842
>> Mike Fossum: You bet.

91
00:02:56,842 --> 00:02:57,643
>> Amiko Kauderer: ...be gone...

92
00:02:57,643 --> 00:02:58,811
>> Mike Fossum: The view...

93
00:02:58,811 --> 00:03:00,145
>> Amiko Kauderer:
...will take out the trash.

94
00:03:00,145 --> 00:03:01,513
>> Mike Fossum: ...we have
right now is a little confusing,

95
00:03:01,513 --> 00:03:02,615
because that's actually the
view from the Progress, as --

96
00:03:02,615 --> 00:03:03,716
it has a camera that
looks at the station,

97

00:03:03,716 --> 00:03:06,051

and that's used particularly
for the docking,

98

00:03:06,051 --> 00:03:08,387

but also for the
undocking, and so the view

99

00:03:08,387 --> 00:03:10,456

that we had there was
of the Space Station

100

00:03:10,456 --> 00:03:12,291

as the Progress is backing away.

101

00:03:12,291 --> 00:03:13,325

>> Amiko Kauderer: Okay.

102

00:03:13,325 --> 00:03:14,026

>> Mike Fossum: So,
it's kind of cool.

103

00:03:14,026 --> 00:03:15,160

>> Amiko Kauderer: Yeah.

104

00:03:15,160 --> 00:03:16,362

I think even from that
camera view sometimes

105

00:03:16,362 --> 00:03:17,429

when we're seeing the
docking or the undocking,

106

00:03:17,429 --> 00:03:18,597

you can actually see
the crosshairs of...

107

00:03:18,597 --> 00:03:19,598

>> Mike Fossum: You bet.

108

00:03:19,598 --> 00:03:20,399

>> Amiko Kauderer:

...where they line

109

00:03:20,399 --> 00:03:21,166

up on the docking mechanism.

110

00:03:21,166 --> 00:03:22,301

>> Mike Fossum: Oh, yeah.

111

00:03:22,301 --> 00:03:23,135

When you get in close,

you can see that, too.

112

00:03:23,135 --> 00:03:24,503

>> Amiko Kauderer: Okay, great.

113

00:03:24,503 --> 00:03:25,838

And, so, let's talk about a

few other of the cargo ships,

114

00:03:25,838 --> 00:03:28,240

and also just the importance

of those cargo supply ships.

115

00:03:28,240 --> 00:03:28,941

>> Mike Fossum: Right.

116

00:03:28,941 --> 00:03:29,942

>> Amiko Kauderer: So,

117

00:03:29,942 --> 00:03:31,377

what other cargo

supply ships do we have?

118

00:03:31,377 --> 00:03:33,712

>> Mike Fossum: For the

ATV, it's a Russian cargo --

119

00:03:33,712 --> 00:03:36,482

or, I'm sorry, it's a
European-built cargo ship

120

00:03:36,482 --> 00:03:38,917

that we've had several onboard.

121

00:03:38,917 --> 00:03:42,655

There -- I've -- the next
one's due in a month or so;

122

00:03:42,655 --> 00:03:45,424

I've actually lost track
of exactly when that's due.

123

00:03:45,424 --> 00:03:48,294

It's a very large ship
that comes up, again,

124

00:03:48,294 --> 00:03:51,497

with a large amount of
supplies and a large capacity

125

00:03:51,497 --> 00:03:53,098

for hauling things away.

126

00:03:53,098 --> 00:03:57,569

And we have the SpaceX Dragon.

127

00:03:57,569 --> 00:03:58,771

>> Amiko Kauderer: Yeah.

128

00:03:58,771 --> 00:03:59,905

>> Mike Fossum: We've had
several of those dock,

129

00:03:59,905 --> 00:04:02,141

and what makes the

Dragon unique,

130

00:04:02,141 --> 00:04:07,279

is that the Dragon spaceship
actually re-enters using a heat

131

00:04:07,279 --> 00:04:09,181

shield and is recovered.

132

00:04:09,181 --> 00:04:12,217

And, so that's our way right now
of getting the largest amount

133

00:04:12,217 --> 00:04:15,988

of things back to the Earth,
and so we're returning --

134

00:04:15,988 --> 00:04:17,356

some of the scientific
experiments

135

00:04:17,356 --> 00:04:20,559

that we're doing onboard
require us to prepare samples,

136

00:04:20,559 --> 00:04:26,031

whether it's biologic samples
from humans or material samples

137

00:04:26,031 --> 00:04:29,168

from things we've processed in
furnaces and stuff like that.

138

00:04:29,168 --> 00:04:30,636

So now with the SpaceX Dragon,

139

00:04:30,636 --> 00:04:32,504

we can get those
samples back to Earth.

140

00:04:32,504 --> 00:04:37,943

The other cargo ship is the HTV,

141

00:04:37,943 --> 00:04:40,579

which is a Japanese-built
cargo ship

142

00:04:40,579 --> 00:04:44,350

and works pretty much the same
as the Progress and the ATV.

143

00:04:44,350 --> 00:04:46,885

I know the acronyms
get confusing.

144

00:04:46,885 --> 00:04:48,020

>> Amiko Kauderer: [Laughter].

145

00:04:48,020 --> 00:04:49,088

>> Mike Fossum: So, it
burns up on the way in.

146

00:04:49,088 --> 00:04:50,456

And we're very close.

147

00:04:50,456 --> 00:04:53,258

Orbital Sciences
Corporation is very close

148

00:04:53,258 --> 00:04:55,861

to launching their first
rocket tomorrow afternoon

149

00:04:55,861 --> 00:04:58,063

at about 4 o'clock Central Time.

150

00:04:58,063 --> 00:05:01,700

We're all waiting with great
anticipation for that event,

151

00:05:01,700 --> 00:05:03,936
and they're close to
launching their next --

152

00:05:03,936 --> 00:05:07,806
their first Cygnus resupply
ship to the station, also.

153

00:05:07,806 --> 00:05:11,276
So there's quite a
number of different ships

154

00:05:11,276 --> 00:05:13,212
and options that we have.

155

00:05:13,212 --> 00:05:15,814
>> Amiko Kauderer: And, so --
and very important, obviously,

156

00:05:15,814 --> 00:05:18,250
to talk about those -- the
capabilities of those vehicles

157

00:05:18,250 --> 00:05:19,752
and the cargo craft
that's coming.

158

00:05:19,752 --> 00:05:21,420
Let's talk a little
about the capability

159

00:05:21,420 --> 00:05:22,888
of the Space Station itself.

160

00:05:22,888 --> 00:05:24,156
>> Mike Fossum: Sure.

161

00:05:24,156 --> 00:05:25,924

>> Amiko Kauderer: I think
the number one is science

162

00:05:25,924 --> 00:05:30,162
on the Space Station, and today
there has been a lot of --

163

00:05:30,162 --> 00:05:32,131
actually, all week there's
been a lot of activity

164

00:05:32,131 --> 00:05:33,799
on science experiments,

165

00:05:33,799 --> 00:05:37,236
one of which Tom Marshburn
has been working on with most

166

00:05:37,236 --> 00:05:39,671
of the day, and one that
you are familiar with.

167

00:05:39,671 --> 00:05:42,374
These are those bowling ball
size [laughter] satellites,

168

00:05:42,374 --> 00:05:44,042
they're three different
color orbs.

169

00:05:44,042 --> 00:05:44,843
>> Mike Fossum: SPHERES.

170

00:05:44,843 --> 00:05:46,245
>> Amiko Kauderer: SPHERES.

171

00:05:46,245 --> 00:05:48,580
>> Mike Fossum: And I apologize,
I don't remember the acronym.

172

00:05:48,580 --> 00:05:49,982

We just know it as
SPHERES, and they are large.

173

00:05:49,982 --> 00:05:50,816

>> Amiko Kauderer:
It's a long one,

174

00:05:50,816 --> 00:05:52,851

Synchronized Position Hold...

175

00:05:52,851 --> 00:05:53,919

>> Mike Fossum: There you go.

176

00:05:53,919 --> 00:05:54,753

>> Amiko Kauderer:
...Engage, Reorient...

177

00:05:54,753 --> 00:05:56,455

>> Mike Fossum: Oh, very good.

178

00:05:56,455 --> 00:05:57,523

>> Amiko Kauderer: ...right?

179

00:05:57,523 --> 00:05:58,290

>> Mike Fossum: [Laughter]
They're large;

180

00:05:58,290 --> 00:05:59,458

they're about the size --

181

00:05:59,458 --> 00:06:00,893

actually, a little bigger
than a bowling ball,

182

00:06:00,893 --> 00:06:03,228

they're about the
size of a basketball.

183
00:06:03,228 --> 00:06:06,198
It's a cooperative effort.

184
00:06:06,198 --> 00:06:09,735
And these SPHERES,
they're actually --

185
00:06:09,735 --> 00:06:11,637
we call them satellites,

186
00:06:11,637 --> 00:06:14,373
and they can maneuver
inside the station.

187
00:06:14,373 --> 00:06:17,209
Not throughout the whole
station; they require kind

188
00:06:17,209 --> 00:06:21,580
of a positioning system, and
we have to set these sensors

189
00:06:21,580 --> 00:06:23,315
up inside the module,

190
00:06:23,315 --> 00:06:26,285
and we usually use the
Japanese laboratory.

191
00:06:26,285 --> 00:06:30,656
And then, the individual
satellites -- this --

192
00:06:30,656 --> 00:06:33,725
can determine their location.

193
00:06:33,725 --> 00:06:35,794
They can determine the location

194
00:06:35,794 --> 00:06:38,464
of the other free-flying
satellites,

195
00:06:38,464 --> 00:06:41,333
and they can do things like
maneuver around each other.

196
00:06:41,333 --> 00:06:43,435
It's actually kind of strange,

197
00:06:43,435 --> 00:06:45,737
once you get these things
set up, and there's a lot

198
00:06:45,737 --> 00:06:46,872
of work to get them set up.

199
00:06:46,872 --> 00:06:47,840
>> Amiko Kauderer: Sure.

200
00:06:47,840 --> 00:06:49,208
>> Mike Fossum: They
use just CO2,

201
00:06:49,208 --> 00:06:51,710
carbon dioxide, little
thrusters...

202
00:06:51,710 --> 00:06:52,711
>> Amiko Kauderer: Okay.

203
00:06:52,711 --> 00:06:53,512
>> Mike Fossum: ...just
compressed gas,

204
00:06:53,512 --> 00:06:55,481
to maneuver around.

205

00:06:55,481 --> 00:06:58,584

But as you turn them
loose, get them activated,

206

00:06:58,584 --> 00:07:01,186

and they come up, and they
go through different kinds

207

00:07:01,186 --> 00:07:03,755

of maneuvers, and
they're for -- we're --

208

00:07:03,755 --> 00:07:07,426

we use it as a tool for -- I
mean, it's hardcore science,

209

00:07:07,426 --> 00:07:12,164

but it's also -- it's
also used by students,

210

00:07:12,164 --> 00:07:13,866

and they have student
competitions

211

00:07:13,866 --> 00:07:16,401

where they program them
to do certain maneuvers,

212

00:07:16,401 --> 00:07:19,605

and then they're evaluated based
on how precise they were able

213

00:07:19,605 --> 00:07:20,973

to -- the students were able

214

00:07:20,973 --> 00:07:23,609

to direct the satellites
to do the maneuvers.

215

00:07:23,609 --> 00:07:26,044

What a cool project for
students to work on.

216

00:07:26,044 --> 00:07:26,879

>> Amiko Kauderer:
It -- it looks --

217

00:07:26,879 --> 00:07:28,013

it looks cool; it sounds cool.

218

00:07:28,013 --> 00:07:31,149

It would be great as a
person here on Earth,

219

00:07:31,149 --> 00:07:34,219

being able see my project
up there on Space Station,

220

00:07:34,219 --> 00:07:35,120

and you guys working with it.

221

00:07:35,120 --> 00:07:36,154

>> Mike Fossum: Absolutely.

222

00:07:36,154 --> 00:07:37,256

>> Amiko Kauderer:
Moving right along,

223

00:07:37,256 --> 00:07:38,590

because we have a lot
to talk about here.

224

00:07:38,590 --> 00:07:39,825

>> Mike Fossum: You bet.

225

00:07:39,825 --> 00:07:40,792

>> Amiko Kauderer: So,
Cassidy was working earlier

226

00:07:40,792 --> 00:07:42,361
with the Combustion
Integrated Rack.

227

00:07:42,361 --> 00:07:47,065
And, just explain what that
facility is and what it serves.

228

00:07:47,065 --> 00:07:48,400
>> Mike Fossum: Well, there's --

229

00:07:48,400 --> 00:07:50,636
we have several different
combustion facilities onboard.

230

00:07:50,636 --> 00:07:55,040
The Combustion Integrated
Rack has a burn chamber,

231

00:07:55,040 --> 00:07:57,442
a combustion chamber,
down inside the rack,

232

00:07:57,442 --> 00:08:00,579
where we use different fuels

233

00:08:00,579 --> 00:08:03,115
and we can actually control
the atmosphere that's

234

00:08:03,115 --> 00:08:04,883
in the combustion chamber.

235

00:08:04,883 --> 00:08:08,253
We're looking very detailed
physics of the flame,

236

00:08:08,253 --> 00:08:12,391
of combustion, with a

lot of sensors peering

237

00:08:12,391 --> 00:08:14,960
through these special
quartz glass windows

238

00:08:14,960 --> 00:08:17,429
to gather information
about that,

239

00:08:17,429 --> 00:08:19,898
because things burn
differently in zero-G.

240

00:08:19,898 --> 00:08:23,502
And without the effects of
gravity, the hot air rising,

241

00:08:23,502 --> 00:08:27,072
and we can study what's
called the boundary --

242

00:08:27,072 --> 00:08:30,175
the boundary equations for
flame, and it's really getting

243

00:08:30,175 --> 00:08:32,110
into the chemistry
and the physics

244

00:08:32,110 --> 00:08:35,681
as they all come together to
try to understand the borders,

245

00:08:35,681 --> 00:08:38,016
they're right there at the
edge of combustibility.

246

00:08:38,016 --> 00:08:38,650
Will it burn?

247

00:08:38,650 --> 00:08:39,518

Will it not burn?

248

00:08:39,518 --> 00:08:40,886

What are the physics?

249

00:08:40,886 --> 00:08:42,254

What are the optics?

250

00:08:42,254 --> 00:08:44,089

What are the signatures that
it gives off when it's burning?

251

00:08:44,089 --> 00:08:45,457

>> Amiko Kauderer: Okay.

252

00:08:45,457 --> 00:08:46,825

>> Mike Fossum: That's in the
Combustion Integrated Rack.

253

00:08:46,825 --> 00:08:49,761

They're also working in the
Microgravity Science Glovebox.

254

00:08:49,761 --> 00:08:50,429

>> Amiko Kauderer: Yeah.

255

00:08:50,429 --> 00:08:51,663

I was going to ask.

256

00:08:51,663 --> 00:08:52,164

This is a thing that you
actually see them put their

257

00:08:52,164 --> 00:08:52,864

hands in.

258

00:08:52,864 --> 00:08:53,298
>> Mike Fossum: Right.

259
00:08:53,298 --> 00:08:54,499
You...

260
00:08:54,499 --> 00:08:55,500
>> Amiko Kauderer: And I
think Cassidy was working

261
00:08:55,500 --> 00:08:56,735
with that one on a
-- yet another --

262
00:08:56,735 --> 00:08:58,704
speaking of playing with
fire, we're actually looking

263
00:08:58,704 --> 00:08:59,972
at a live view here...

264
00:08:59,972 --> 00:09:01,373
>> Mike Fossum: We're looking
at live video right now.

265
00:09:01,373 --> 00:09:02,975
>> Amiko Kauderer: ...of another
experiment, known as the BASS,

266
00:09:02,975 --> 00:09:05,110
the Burning and Suppression
Experiment.

267
00:09:05,110 --> 00:09:06,745
So can you talk to me
a little about this?

268
00:09:06,745 --> 00:09:08,246
>> Mike Fossum: Well,
this is looking at more --

269

00:09:08,246 --> 00:09:10,682

instead of the exotic
fuels, this is looking

270

00:09:10,682 --> 00:09:12,751

at more common things,
including things

271

00:09:12,751 --> 00:09:16,388

that we have onboard this
spacecraft: things that we used

272

00:09:16,388 --> 00:09:20,592

to build the panels out of, the
clothing, and other equipment.

273

00:09:20,592 --> 00:09:22,294

And, what we're looking
at is the --

274

00:09:22,294 --> 00:09:26,098

is, again, we're looking at
the details of the combustion,

275

00:09:26,098 --> 00:09:29,134

because we find in the
zero gravity environment,

276

00:09:29,134 --> 00:09:30,535

things burn differently.

277

00:09:30,535 --> 00:09:33,405

Now, one of the applications
of this is --

278

00:09:33,405 --> 00:09:38,210

actually goes into
smoke detectors' design,

279

00:09:38,210 --> 00:09:39,878

because the smoke
detectors that we have

280

00:09:39,878 --> 00:09:41,980

in our homes have all
been optimized based

281

00:09:41,980 --> 00:09:46,084

on certain assumptions
for combustion products.

282

00:09:46,084 --> 00:09:47,619

What does a fire give off?

283

00:09:47,619 --> 00:09:50,789

Because the smoke sensors
don't measure the fire;

284

00:09:50,789 --> 00:09:53,725

they're measuring the smoke
and the gases that come off

285

00:09:53,725 --> 00:09:54,960

of that fire and find their way

286

00:09:54,960 --> 00:09:57,629

to the smoke sensor,
our smoke detector.

287

00:09:57,629 --> 00:10:00,732

And, so, we're -- and, so,
the ones on the Space Station,

288

00:10:00,732 --> 00:10:03,101

the ones we've used in space
historically have been based

289

00:10:03,101 --> 00:10:06,571

on [ringing] Earth
type of measurements

290
00:10:06,571 --> 00:10:08,940
for combustion products
[ringing],

291
00:10:08,940 --> 00:10:13,345
and so we're now looking to see
what the differences might be

292
00:10:13,345 --> 00:10:17,582
in the different [ringing]
kind of combustion situations,

293
00:10:17,582 --> 00:10:19,317
very controlled, in a glove box,

294
00:10:19,317 --> 00:10:21,053
where you can control
it very carefully...

295
00:10:21,053 --> 00:10:22,187
>> Amiko Kauderer: Yeah.

296
00:10:22,187 --> 00:10:23,455
>> Mike Fossum: ...to
understand that better.

297
00:10:23,455 --> 00:10:26,124
>> Amiko Kauderer: And,
obviously, for safety reasons,

298
00:10:26,124 --> 00:10:28,360
that has some applications
not only there in space

299
00:10:28,360 --> 00:10:30,929
but also here on Earth, so
perhaps we can have some --

300

00:10:30,929 --> 00:10:33,198

find some advancements
in detection

301

00:10:33,198 --> 00:10:34,533

and suppression of fires.

302

00:10:34,533 --> 00:10:35,367

>> Mike Fossum: Absolutely.

303

00:10:35,367 --> 00:10:36,168

>> Amiko Kauderer: [Inaudible].

304

00:10:36,168 --> 00:10:37,002

>> Mike Fossum: Absolutely.

305

00:10:37,002 --> 00:10:38,236

>> Amiko Kauderer: Very good.

306

00:10:38,236 --> 00:10:40,872

Well, leading into -- fires
is a topic of Earth Day,

307

00:10:40,872 --> 00:10:43,208

but this has some
-- we have some --

308

00:10:43,208 --> 00:10:45,377

several other little things
that we can talk about as far

309

00:10:45,377 --> 00:10:50,282

as Earth, and how the Space
Station relates to Earth Day.

310

00:10:50,282 --> 00:10:52,217

Earth Day is a very
important day for us here

311

00:10:52,217 --> 00:10:54,119
on Earth [laughter], obviously.

312

00:10:54,119 --> 00:10:56,922
And as well as aboard the
International Space Station.

313

00:10:56,922 --> 00:11:02,594
Earth Day is coming up on
the 26th -- 22nd, and we --

314

00:11:02,594 --> 00:11:04,196
although here, I think we tend

315

00:11:04,196 --> 00:11:05,931
to take the whole
month as Earth Day.

316

00:11:05,931 --> 00:11:08,667
So, first of all, talk to
me a little about Earth ops,

317

00:11:08,667 --> 00:11:10,235
because everybody wants
to know about the photos

318

00:11:10,235 --> 00:11:11,870
and the pictures that you
take, and they're lovely,

319

00:11:11,870 --> 00:11:13,238
and beautiful, but why do we --

320

00:11:13,238 --> 00:11:15,273
why are we so interested
in seeing our Earth

321

00:11:15,273 --> 00:11:16,908

from the International
Space Station?

322

00:11:16,908 --> 00:11:18,243

>> Mike Fossum: Well, the
value is getting the --

323

00:11:18,243 --> 00:11:21,646

getting humans up there
to look back at the Earth

324

00:11:21,646 --> 00:11:23,215

from a different point of view,

325

00:11:23,215 --> 00:11:25,617

because you can see
things differently.

326

00:11:25,617 --> 00:11:28,954

You can see things in
perspective that you can't see,

327

00:11:28,954 --> 00:11:32,324

necessarily, when you're
up close on the ground.

328

00:11:32,324 --> 00:11:34,960

And a good example is, a couple
of years ago I was on orbit

329

00:11:34,960 --> 00:11:37,395

when we had a lot of fires
across the United States,

330

00:11:37,395 --> 00:11:39,564

particularly in the
state of Texas,

331

00:11:39,564 --> 00:11:42,334

and we could see these

individual fires,

332

00:11:42,334 --> 00:11:45,971
and you could even name
some of them, you know,

333

00:11:45,971 --> 00:11:48,640
by just knowing the
geography, and I --

334

00:11:48,640 --> 00:11:50,609
you know, and knowing
that that's Bastrop,

335

00:11:50,609 --> 00:11:52,410
and I recognized
the Bastrop area,

336

00:11:52,410 --> 00:11:54,279
and the fire that was there.

337

00:11:54,279 --> 00:11:58,550
But, you also see -- I mean,
the plumes from these fires

338

00:11:58,550 --> 00:12:00,986
that are all joining
together and actually flowing

339

00:12:00,986 --> 00:12:03,522
out across the Gulf of Mexico,

340

00:12:03,522 --> 00:12:05,824
and so you could
see the smoke haze

341

00:12:05,824 --> 00:12:07,692
that was actually
influencing other people,

342

00:12:07,692 --> 00:12:10,295

and they had no idea where
this haze was coming from.

343

00:12:10,295 --> 00:12:12,364

We could see that
that's happening.

344

00:12:12,364 --> 00:12:15,867

You can see that very
frequently in other areas, too.

345

00:12:15,867 --> 00:12:20,438

In the -- on the continent of
Africa, and even in Australia,

346

00:12:20,438 --> 00:12:23,742

where some of these wildfires
are pretty extensive,

347

00:12:23,742 --> 00:12:25,710

and you can see where
the effects

348

00:12:25,710 --> 00:12:30,148

of those go a thousand miles
downwind, as you can see that.

349

00:12:30,148 --> 00:12:32,317

Same for dust storms.

350

00:12:32,317 --> 00:12:35,587

Gives you the appreciation of
seeing the Earth from above

351

00:12:35,587 --> 00:12:37,222

and how fragile it really is.

352

00:12:37,222 --> 00:12:40,091

And to look at the horizon, and
we think atmosphere, you know,

353

00:12:40,091 --> 00:12:42,928

a little bit of stuff in the
air, it's not a big deal.

354

00:12:42,928 --> 00:12:45,297

When you get up there, and you
realize you can put your arm

355

00:12:45,297 --> 00:12:47,732

out, and the atmosphere is
about half the thickness

356

00:12:47,732 --> 00:12:50,836

of your little finger, because
you can see it, and that's,

357

00:12:50,836 --> 00:12:53,271

you know, when you realize
that's a pretty small shell.

358

00:12:53,271 --> 00:12:55,273

We think of the atmosphere
as being

359

00:12:55,273 --> 00:12:58,310

so extensive, and it's not.

360

00:12:58,310 --> 00:12:59,678

It's really not.

361

00:12:59,678 --> 00:13:02,581

There's a -- it's a thin layer
around this planet, and so,

362

00:13:02,581 --> 00:13:05,550

you know, these things always
come back, and there's --

363

00:13:05,550 --> 00:13:08,987

you can't just do something
here and make a big difference.

364

00:13:08,987 --> 00:13:10,222

We all need to do it together.

365

00:13:10,222 --> 00:13:11,189

>> Amiko Kauderer: Right, right.

366

00:13:11,189 --> 00:13:12,290

So, this leads me to --

367

00:13:12,290 --> 00:13:14,993

we had asked some folks
out on social media

368

00:13:14,993 --> 00:13:16,461

to send us your questions,
and so,

369

00:13:16,461 --> 00:13:17,562

they have a few questions
for you.

370

00:13:17,562 --> 00:13:18,697

>> Mike Fossum: Good.

371

00:13:18,697 --> 00:13:19,698

>> Amiko Kauderer: And
one of them relates much

372

00:13:19,698 --> 00:13:21,299

of what you were
just talking about.

373

00:13:21,299 --> 00:13:24,803

This one comes on a -- to

us on Facebook from Kirk.

374

00:13:24,803 --> 00:13:27,706

"Using the ECLSS, this is the
Environmental Control Life

375

00:13:27,706 --> 00:13:31,042

Support System, to sustain
life, and looking at the Earth

376

00:13:31,042 --> 00:13:34,012

from aboard ISS, I
would be interested

377

00:13:34,012 --> 00:13:36,114

to hear your personal
opinion about your --

378

00:13:36,114 --> 00:13:38,350

our planet's environment."

379

00:13:38,350 --> 00:13:42,420

>> Mike Fossum: Okay Well -- and
Kirk, that's a great question.

380

00:13:42,420 --> 00:13:43,889

Onboard the station -- well,

381

00:13:43,889 --> 00:13:48,260

on the planet we have natural
systems that, you know,

382

00:13:48,260 --> 00:13:51,196

take care of us in so
many different ways.

383

00:13:51,196 --> 00:13:54,432

We have plants that give
off the oxygen that we need,

384

00:13:54,432 --> 00:13:57,235

and at the same time they absorb
the carbon dioxide that's one

385

00:13:57,235 --> 00:13:58,837

of our waste products.

386

00:13:58,837 --> 00:14:02,073

Our water is purified, and
wastes find their way in.

387

00:14:02,073 --> 00:14:03,375

We try to purify them,

388

00:14:03,375 --> 00:14:08,246

but eventually they really
get purified by evaporating,

389

00:14:08,246 --> 00:14:10,448

collecting in clouds,
coming down in rain,

390

00:14:10,448 --> 00:14:13,785

and then we have fresh water
that gathers in rivers and lakes

391

00:14:13,785 --> 00:14:15,921

that we draw from for
our drinking water.

392

00:14:15,921 --> 00:14:19,958

So in two real simple things,
those kind of systems --

393

00:14:19,958 --> 00:14:22,827

you know, those processes don't
work on board the Space Station;

394

00:14:22,827 --> 00:14:25,397

we'd need huge modules
full of plants

395

00:14:25,397 --> 00:14:29,401
to absorb enough carbon dioxide
and give us enough oxygen,

396

00:14:29,401 --> 00:14:31,303
and so we have to
come up with systems

397

00:14:31,303 --> 00:14:34,406
that can replicate the Earth's
natural systems to do it

398

00:14:34,406 --> 00:14:38,777
in a much more -- and
take up a lot less space,

399

00:14:38,777 --> 00:14:41,780
and do it in a controlled
way, in a reliable way.

400

00:14:41,780 --> 00:14:44,149
And, so we're learning, you
know, how to do those kind

401

00:14:44,149 --> 00:14:47,652
of things, you know, onboard the
station with systems that do all

402

00:14:47,652 --> 00:14:50,722
of the above, including
purifying the water to a --

403

00:14:50,722 --> 00:14:53,491
because we can't afford
to drink water one time...

404

00:14:53,491 --> 00:14:54,592

>> Amiko Kauderer: Right.

405

00:14:54,592 --> 00:14:55,360

>> Mike Fossum: ...and
then throw it away.

406

00:14:55,360 --> 00:14:56,661

>> Amiko Kauderer: Right.

407

00:14:56,661 --> 00:14:57,829

>> Mike Fossum: We have to
get it -- you know, purify,

408

00:14:57,829 --> 00:15:00,765

separate it out, and
recover as much as we can.

409

00:15:00,765 --> 00:15:02,167

>> Amiko Kauderer: So,

410

00:15:02,167 --> 00:15:03,568

living aboard the International
Space Station is teaching a lot

411

00:15:03,568 --> 00:15:06,037

of these -- is teaching us a lot
of these things that we may need

412

00:15:06,037 --> 00:15:07,939

to use here on Earth
to help [inaudible].

413

00:15:07,939 --> 00:15:09,908

>> Mike Fossum: It
does give us the --

414

00:15:09,908 --> 00:15:11,609

we're learning a
lot in how to --

415

00:15:11,609 --> 00:15:13,678

particularly the water
purification area...

416

00:15:13,678 --> 00:15:15,080

>> Amiko Kauderer: Sure.

417

00:15:15,080 --> 00:15:16,715

>> Mike Fossum: ...that we can
use, and it's starting to show

418

00:15:16,715 --> 00:15:19,217

up in disaster relief in
Third World countries,

419

00:15:19,217 --> 00:15:20,719

and things like that.

420

00:15:20,719 --> 00:15:22,887

And, you really -- when
we talk about space ships,

421

00:15:22,887 --> 00:15:26,224

Space Station being a space
ship, and we need to do this,

422

00:15:26,224 --> 00:15:28,393

we're on spaceship
Earth, too [laughter].

423

00:15:28,393 --> 00:15:29,627

>> Amiko Kauderer: Right.

424

00:15:29,627 --> 00:15:32,564

Well, so, like I said,
tons of activity happening.

425

00:15:32,564 --> 00:15:35,800

This Friday, we have an

EVA; this is a spacewalk.

426

00:15:35,800 --> 00:15:39,037

It's going to be a Russian
spacewalk with Vinogradov

427

00:15:39,037 --> 00:15:41,873

and Romanenko, and do
you -- can you tell...

428

00:15:41,873 --> 00:15:42,574

>> Mike Fossum: Sure.

429

00:15:42,574 --> 00:15:43,408

>> Amiko Kauderer: ...

430

00:15:43,408 --> 00:15:44,109

[inaudible] a little about that?

431

00:15:44,109 --> 00:15:45,243

>> Mike Fossum: Sure.

432

00:15:45,243 --> 00:15:46,378

Yeah, we're -- it's --
the crew looks forward

433

00:15:46,378 --> 00:15:48,380

to doing the spacewalks,
because it's a chance

434

00:15:48,380 --> 00:15:51,316

to do something very
challenging,

435

00:15:51,316 --> 00:15:53,518

and step outside
and do some work.

436

00:15:53,518 --> 00:15:56,254

There -- for this
particular one --

437
00:15:56,254 --> 00:15:59,124
the biggest one is
installing a new experiment,

438
00:15:59,124 --> 00:16:01,393
or aspects of a new
experiment on the outside

439
00:16:01,393 --> 00:16:03,094
of the Russian part
of the Space Station.

440
00:16:03,094 --> 00:16:05,063
They're going to do a little
maintenance, and they're going

441
00:16:05,063 --> 00:16:08,700
to remove a few things that
are no longer needed and,

442
00:16:08,700 --> 00:16:11,036
quite literally, throw
them away, literally,

443
00:16:11,036 --> 00:16:14,272
by throwing them, and in a
controlled way throw them

444
00:16:14,272 --> 00:16:16,674
so they're going a little
slower than the Space Station,

445
00:16:16,674 --> 00:16:19,744
and they'll drop out of orbit
in -- within a few weeks.

446
00:16:19,744 --> 00:16:20,545

>> Amiko Kauderer: Wow.

447

00:16:20,545 --> 00:16:21,946

>> Mike Fossum: And this --

448

00:16:21,946 --> 00:16:25,917

I've lost track now of how many
spacewalks Pavel Vinogradov has.

449

00:16:25,917 --> 00:16:26,351

>> Amiko Kauderer: Right.

450

00:16:26,351 --> 00:16:27,452

He's...

451

00:16:27,452 --> 00:16:28,586

>> Mike Fossum: He's
a very experienced --

452

00:16:28,586 --> 00:16:30,922

a very experienced space
flier and spacewalker.

453

00:16:30,922 --> 00:16:32,991

It's going to be
fun to watch him

454

00:16:32,991 --> 00:16:34,959

as he teaches the
new guy, the rookie.

455

00:16:34,959 --> 00:16:35,960

>> Amiko Kauderer: As are you.

456

00:16:35,960 --> 00:16:36,795

I think you know
something about that.

457

00:16:36,795 --> 00:16:38,129

You've done seven spacewalks...

458

00:16:38,129 --> 00:16:38,830

>> Mike Fossum: Right.

459

00:16:38,830 --> 00:16:39,531

>> Amiko Kauderer: So...

460

00:16:39,531 --> 00:16:40,899

>> Mike Fossum: You bet.

461

00:16:40,899 --> 00:16:42,133

>> Amiko Kauderer: ...with three spaceflights under the belt.

462

00:16:42,133 --> 00:16:44,002

I have a question here that came to us from Twitter.

463

00:16:44,002 --> 00:16:45,804

It comes from Irish Space Blog.

464

00:16:45,804 --> 00:16:50,475

He says, "Mike, does the view of Earth from Cupola differ greatly

465

00:16:50,475 --> 00:16:53,311

from the view during an EVA?"

466

00:16:53,311 --> 00:16:54,712

>> Mike Fossum: Wow.

467

00:16:54,712 --> 00:16:56,548

You know, I think the biggest difference is, even when you're

468

00:16:56,548 --> 00:17:00,185

in the Cupola, you know, you're up against windows.

469

00:17:00,185 --> 00:17:02,754

It's really cool, you know,
to be able to do that,

470

00:17:02,754 --> 00:17:05,023

to see the Earth, to see
the horizons, because most

471

00:17:05,023 --> 00:17:08,259

of the windows on the Space
Station look straight down,

472

00:17:08,259 --> 00:17:11,162

and as you're passing over
things at five miles a second,

473

00:17:11,162 --> 00:17:13,631

as you're trying to get a photo
or just appreciate the view,

474

00:17:13,631 --> 00:17:17,368

it's kind of coming, and then
it's gone, and, so, it's --

475

00:17:17,368 --> 00:17:18,570

it happens fairly quickly.

476

00:17:18,570 --> 00:17:21,406

In the Cupola, you can see
that horizon and stuff.

477

00:17:21,406 --> 00:17:26,377

Outside, it's -- it can be
almost overwhelming at times,

478

00:17:26,377 --> 00:17:29,447

because, instead of
looking through, you know,

479

00:17:29,447 --> 00:17:33,218
panes of glass -- multiple panes
of glass that are inches thick,

480

00:17:33,218 --> 00:17:34,919
you're looking through
a fishbowl, you know,

481

00:17:34,919 --> 00:17:35,954
that's on your head...

482

00:17:35,954 --> 00:17:37,288
>> Amiko Kauderer: Right.

483

00:17:37,288 --> 00:17:38,490
>> Mike Fossum: ...and you're
out there, and you can see

484

00:17:38,490 --> 00:17:40,391
around and really see
the entire Space Station,

485

00:17:40,391 --> 00:17:42,327
which you don't get
the chance to see

486

00:17:42,327 --> 00:17:44,829
through the other
windows, and see the Earth

487

00:17:44,829 --> 00:17:46,698
in its magnificence,
as it's kind

488

00:17:46,698 --> 00:17:48,600
of rolling by underneath you.

489

00:17:48,600 --> 00:17:49,767
>> Amiko Kauderer: Well,

490

00:17:49,767 --> 00:17:51,069

I'm sure it's a true
honor to be able to be...

491

00:17:51,069 --> 00:17:52,470

>> Mike Fossum: Oh, it is.

492

00:17:52,470 --> 00:17:53,571

>> Amiko Kauderer: ...one of the
people who actually get to go

493

00:17:53,571 --> 00:17:56,674

and venture outside
the Space Station, so.

494

00:17:56,674 --> 00:17:59,277

>> Mike Fossum: It -- yes, it
is -- I mean, it is an honor.

495

00:17:59,277 --> 00:18:01,146

It is -- it's not all fun.

496

00:18:01,146 --> 00:18:02,113

>> Amiko Kauderer: Right.

497

00:18:02,113 --> 00:18:03,481

>> Mike Fossum: It's
a lot of work,

498

00:18:03,481 --> 00:18:05,183

and it's a little bit scary out
there, even after, you know,

499

00:18:05,183 --> 00:18:07,886

seven spacewalks, about
48 hours working outside.

500

00:18:07,886 --> 00:18:08,653

>> Amiko Kauderer: Right.

501

00:18:08,653 --> 00:18:09,787

Well, this just brings me

502

00:18:09,787 --> 00:18:11,923

to one other question

we received on Twitter.

503

00:18:11,923 --> 00:18:13,391

This one comes from

Amanda Hannah.

504

00:18:13,391 --> 00:18:15,693

She wanted to know, "Is

it fun to do a spacewalk?"

505

00:18:15,693 --> 00:18:17,295

And, "What did you

do on your EVA?"

506

00:18:17,295 --> 00:18:18,796

Knowing that you

did seven, maybe...

507

00:18:18,796 --> 00:18:19,731

>> Mike Fossum: Okay.

508

00:18:19,731 --> 00:18:20,565

>> Amiko Kauderer:

...you can talk

509

00:18:20,565 --> 00:18:21,266

about the last one [inaudible].

510

00:18:21,266 --> 00:18:22,400

>> Mike Fossum: Okay.

511

00:18:22,400 --> 00:18:23,668

Well, Amanda, it's fun,
but it's not all fun,

512

00:18:23,668 --> 00:18:26,004

and I think that that's really
important to understand.

513

00:18:26,004 --> 00:18:28,706

It's serious work;
it's dangerous work.

514

00:18:28,706 --> 00:18:31,109

It's probably the most dangerous
thing we do besides launch

515

00:18:31,109 --> 00:18:33,945

and landing, because
there's risks associated

516

00:18:33,945 --> 00:18:36,347

with being outside in
your own spaceship.

517

00:18:36,347 --> 00:18:40,018

In this case, a spacesuit has
to collect that carbon dioxide,

518

00:18:40,018 --> 00:18:42,453

provide your oxygen,
provide your cooling,

519

00:18:42,453 --> 00:18:44,389

and all those kind of things.

520

00:18:44,389 --> 00:18:46,658

It's mentally challenging;
it's physically challenging.

521

00:18:46,658 --> 00:18:48,326

You train a lot for it.

522

00:18:48,326 --> 00:18:51,329

And, so, it's very
personally rewarding to go out

523

00:18:51,329 --> 00:18:54,532

and to be able to do
that, but there's --

524

00:18:54,532 --> 00:18:57,101

it's also a little scary out
there, so you need to hang on;

525

00:18:57,101 --> 00:19:01,039

you need to double, triple check
the safety tethers and make sure

526

00:19:01,039 --> 00:19:02,840

that you're following
the procedures,

527

00:19:02,840 --> 00:19:04,943

and you're not getting
careless or too comfortable.

528

00:19:04,943 --> 00:19:06,911

So, I say you're
always a little scared;

529

00:19:06,911 --> 00:19:08,546

I think that's a good thing.

530

00:19:08,546 --> 00:19:12,250

My last spacewalk
was during STS-135,

531

00:19:12,250 --> 00:19:15,720

the last space shuttle
mission, and our job there was

532

00:19:15,720 --> 00:19:19,424

to take a pump module that had failed on the Space Station,

533

00:19:19,424 --> 00:19:22,260

and this is a 1400-pound pump module.

534

00:19:22,260 --> 00:19:24,529

It didn't weigh that, but it still has that mass.

535

00:19:24,529 --> 00:19:25,463

>> Amiko Kauderer:

This is the --

536

00:19:25,463 --> 00:19:26,664

this was the last space shuttle...

537

00:19:26,664 --> 00:19:29,534

>> Mike Fossum: Last space shuttle mission, right.

538

00:19:29,534 --> 00:19:30,368

>> Amiko Kauderer: [Inaudible] space shuttle mission.

539

00:19:30,368 --> 00:19:32,203

And, so, were you with the...

540

00:19:32,203 --> 00:19:34,105

>> Mike Fossum: I was living onboard the station,

541

00:19:34,105 --> 00:19:37,642

and when the space shuttle Atlantis came up with her crew,

542

00:19:37,642 --> 00:19:40,578
and then Ron Garan and I were
the expedition crewmembers

543
00:19:40,578 --> 00:19:41,646
that did the spacewalk...

544
00:19:41,646 --> 00:19:42,780
>> Amiko Kauderer: Right.

545
00:19:42,780 --> 00:19:43,581
>> Mike Fossum: ...we
moved the pump module.

546
00:19:43,581 --> 00:19:45,416
It was an ammonia pump, part

547
00:19:45,416 --> 00:19:47,118
of the Space Station's
cooling system

548
00:19:47,118 --> 00:19:49,554
that had failed a couple
of years before that.

549
00:19:49,554 --> 00:19:53,057
We moved that and put it in
the payload bay of the --

550
00:19:53,057 --> 00:19:55,460
of the space shuttle Atlantis,
so they could bring it back

551
00:19:55,460 --> 00:19:58,529
for analysis, and we
moved a new experiment,

552
00:19:58,529 --> 00:20:02,834
the Remote Refueling Mission,
it was a Goddard experiment

553

00:20:02,834 --> 00:20:05,403

that was brought up in the space shuttle, and we moved that,

554

00:20:05,403 --> 00:20:07,905

placed it on the outside of the station,

555

00:20:07,905 --> 00:20:11,743

and then robotically it was moved to its position

556

00:20:11,743 --> 00:20:14,112

on the truss of the station,

557

00:20:14,112 --> 00:20:17,115

where they've been doing ongoing experiments with that --

558

00:20:17,115 --> 00:20:19,150

with that Goddard payload, and it's very exciting

559

00:20:19,150 --> 00:20:20,051

to see them doing that.

560

00:20:20,051 --> 00:20:21,452

>> Amiko Kauderer: Okay.

561

00:20:21,452 --> 00:20:23,488

And also, real quick, this one's going to be a Russian spacewalk,

562

00:20:23,488 --> 00:20:26,958

and so I know that at times we use some

563

00:20:26,958 --> 00:20:28,559

of our U.S. equipment...

564

00:20:28,559 --> 00:20:29,627

>> Mike Fossum: Sure.

565

00:20:29,627 --> 00:20:30,962

>> Amiko Kauderer:
...on their spacesuits

566

00:20:30,962 --> 00:20:32,196

for their [inaudible], Hadfield
was installing the lights

567

00:20:32,196 --> 00:20:33,464

on their Orlan suits,

568

00:20:33,464 --> 00:20:35,733

and Cassidy was configuring
the cameras.

569

00:20:35,733 --> 00:20:38,336

Can you talk to me about
some of what your role is,

570

00:20:38,336 --> 00:20:39,504

if you were not on a...

571

00:20:39,504 --> 00:20:40,338

>> Mike Fossum: Sure.

572

00:20:40,338 --> 00:20:41,306

>> Amiko Kauderer: ...spacewalk,

573

00:20:41,306 --> 00:20:42,507

and it was the Russian
[inaudible].

574

00:20:42,507 --> 00:20:43,207

>> Mike Fossum: Well, just

supporting the other --

575

00:20:43,207 --> 00:20:44,409
the other crewmembers,

576

00:20:44,409 --> 00:20:45,943
and I supported a Russian
spacewalk while I was

577

00:20:45,943 --> 00:20:47,412
up there, too.

578

00:20:47,412 --> 00:20:51,983
We set them up, and in this case
Roman Romanenko will be wearing

579

00:20:51,983 --> 00:20:54,919
a helmet camera that's a U.S.
helmet camera will be mounted

580

00:20:54,919 --> 00:20:58,189
on his suit, so we'll be able
to watch him as he's working.

581

00:20:58,189 --> 00:21:01,125
There's several different tools
that we -- that we share, and,

582

00:21:01,125 --> 00:21:02,527
so kind of set him up.

583

00:21:02,527 --> 00:21:05,263
I helped the crew some with
some of their fit checks

584

00:21:05,263 --> 00:21:09,200
and had some ideas for -- you
know, for helping them out.

585

00:21:09,200 --> 00:21:12,303

The U.S. crewmembers will
also be kind of assisting

586

00:21:12,303 --> 00:21:13,938

as they close the hatches,

587

00:21:13,938 --> 00:21:17,108

and their airlock system works
just a little differently

588

00:21:17,108 --> 00:21:20,378

than ours, and our guys
will be supporting some

589

00:21:20,378 --> 00:21:23,081

of the pressure checks to
make sure that the hatches --

590

00:21:23,081 --> 00:21:25,817

none of the hatches associated
with that are leaking.

591

00:21:25,817 --> 00:21:26,517

>> Amiko Kauderer: Okay.

592

00:21:26,517 --> 00:21:27,352

>> Mike Fossum: So...

593

00:21:27,352 --> 00:21:27,919

>> Amiko Kauderer: Very good.

594

00:21:27,919 --> 00:21:29,253

Well, thank...

595

00:21:29,253 --> 00:21:30,288

>> Mike Fossum: It'll be --
it'll be an exciting thing.

596

00:21:30,288 --> 00:21:30,988

>> Amiko Kauderer:

It will be exciting.

597

00:21:30,988 --> 00:21:32,123

I think it always is.

598

00:21:32,123 --> 00:21:33,091

I think that's about all
the time that we have.

599

00:21:33,091 --> 00:21:34,392

>> Mike Fossum: [Chuckles] Okay.

600

00:21:34,392 --> 00:21:34,892

>> Amiko Kauderer: I really
appreciate you coming out,

601

00:21:34,892 --> 00:21:35,593

as always.

602

00:21:35,593 --> 00:21:36,894

It's always a pleasure.

603

00:21:36,894 --> 00:21:40,498

And, again, that spacewalk
will be happening on Friday.

604

00:21:40,498 --> 00:21:42,567

You can watch it here on
NASA Television beginning

605

00:21:42,567 --> 00:21:44,369

at 8:30 a.m. Central Time.

606

00:21:44,369 --> 00:21:45,570

>> Mike Fossum: Very good.

607

00:21:45,570 --> 00:21:46,404

>> Amiko Kauderer: Thanks
so much for coming out.

608

00:21:46,404 --> 00:21:47,238

>> Mike Fossum: Thanks, Amiko...

609

00:21:47,238 --> 00:21:48,373

>> Amiko Kauderer: Thank you.

610

00:21:48,373 --> 00:21:49,006

>> Mike Fossum: ...always
great to be here.

611

00:21:49,006 --> 00:21:49,507

Thanks, everybody.