



1
00:00:01,500 --> 00:00:10,576
[Music]

2
00:00:11,944 --> 00:00:13,079
>> [Background music] Greetings
from Mission Control Houston

3
00:00:13,079 --> 00:00:15,548
and welcome to Space
Station Live.

4
00:00:15,548 --> 00:00:18,951
It's Friday, September
13th, 2013.

5
00:00:18,951 --> 00:00:20,252
You're joining us here inside

6
00:00:20,252 --> 00:00:22,822
of the International Space
Station Flight Control Room

7
00:00:22,822 --> 00:00:26,659
located at the Johnson Space
Center in Houston, Texas.

8
00:00:26,659 --> 00:00:29,328
Inside the room right now,
the Orbit 2 team currently

9
00:00:29,328 --> 00:00:31,363
on consul monitoring the systems

10
00:00:31,363 --> 00:00:34,834
and the crew onboard the
International Space Station.

11
00:00:34,834 --> 00:00:38,671
Today that team is being led by

Flight Director, Mike Lammers

12

00:00:38,671 --> 00:00:40,973
and joining him at the
CAF COM position serving

13

00:00:40,973 --> 00:00:42,975
as the communication link
between the Astronauts

14

00:00:42,975 --> 00:00:44,577
and the teams on the ground.

15

00:00:44,577 --> 00:00:47,680
Two Astronauts right
now, first of which,

16

00:00:47,680 --> 00:00:51,517
Japanese Astronaut Aki Hoshide,
former space flier onboard

17

00:00:51,517 --> 00:00:55,621
who flew on Expedition
32 and 33 back in 2012,

18

00:00:55,621 --> 00:00:57,990
and also NASA Astronaut
Katie Coleman,

19

00:00:57,990 --> 00:01:03,062
veteran of Expedition
26 and 27 back in 2011.

20

00:01:03,062 --> 00:01:05,131
Meanwhile, onboard the
International Space Station,

21

00:01:05,131 --> 00:01:08,300
the current Expedition
37 right now being led

22

00:01:08,300 --> 00:01:11,303
by Russian Cosmonaut Fyodor
Yurchikhin, veteran space flier

23

00:01:11,303 --> 00:01:13,072
on his 4th space flight.

24

00:01:13,072 --> 00:01:16,575
Joining him from the European
Space Agency is Luca Parmitano

25

00:01:16,575 --> 00:01:20,012
on his first flight and then
NASA Astronaut Karen Nyberg

26

00:01:20,012 --> 00:01:21,514
on her second.

27

00:01:21,514 --> 00:01:25,951
A major event for the
International Space Station

28

00:01:25,951 --> 00:01:27,653
crews this week was the landing

29

00:01:27,653 --> 00:01:32,958
of the three previous Expedition
36 Astronauts and Cosmonauts,

30

00:01:32,958 --> 00:01:35,060
having been onboard the
International Space Station

31

00:01:35,060 --> 00:01:40,933
since back on March 28th
of two Russian Cosmonauts,

32

00:01:40,933 --> 00:01:43,469

Pavel Vinogradov and
Alexander Misurkin

33

00:01:43,469 --> 00:01:45,871
and NASA Astronaut Chris
Cassidy said farewell

34

00:01:45,871 --> 00:01:50,476
after spending 166
days in space.

35

00:01:50,476 --> 00:01:53,913
Pavel Vinogradov was the
Expedition 36 commander

36

00:01:53,913 --> 00:01:56,982
and handed over command of the
International Space Station back

37

00:01:56,982 --> 00:02:01,053
on Monday to fellow Russian
Cosmonaut Fyodor Yurchikhin.

38

00:02:01,053 --> 00:02:04,890
Following that, on Tuesday he
and his two colleagues loaded

39

00:02:04,890 --> 00:02:08,928
into their Soyuz craft,
preparing to come home.

40

00:02:08,928 --> 00:02:11,964
Soyuz TMA-08M was docked
to the Poisk Module

41

00:02:11,964 --> 00:02:14,967
on the Space Station
side of Zvezda.

42

00:02:14,967 --> 00:02:17,803

After the hatch closure
they performed a series

43

00:02:17,803 --> 00:02:19,738
of leak checks to
ensure the integrity

44

00:02:19,738 --> 00:02:21,840
of their vehicle
before preparing

45

00:02:21,840 --> 00:02:23,809
for that eventual undock.

46

00:02:23,809 --> 00:02:27,246
Once the hooks holding the
craft in place retracted,

47

00:02:27,246 --> 00:02:31,116
the springs on the docking
mechanism pushed them away.

48

00:02:31,116 --> 00:02:34,653
The craft departing
and performing a series

49

00:02:34,653 --> 00:02:38,991
of separation burns,
eventually landed in Kazakhstan

50

00:02:38,991 --> 00:02:42,861
at 9:58 p.m. Central
time, the crew being taken

51

00:02:42,861 --> 00:02:45,097
out successfully and
all in good health

52

00:02:45,097 --> 00:02:50,135
by the Landing and

Recovery Forces.

53

00:02:50,135 --> 00:02:55,341

Once out, they were entered
into a number of medical tents

54

00:02:55,341 --> 00:02:57,509

for some initial medical
screening before returning

55

00:02:57,509 --> 00:02:58,911

to their home bases.

56

00:02:58,911 --> 00:03:03,816

Vinogradov and Misurkin heading
back to the Star City, Russia,

57

00:03:03,816 --> 00:03:05,818

where the Cosmonauts
are headquartered

58

00:03:05,818 --> 00:03:07,653

and Chris Cassidy
making his way back here

59

00:03:07,653 --> 00:03:12,324

to the Johnson Space
Center in Texas.

60

00:03:12,324 --> 00:03:15,728

Meanwhile, remaining onboard
the International Space Station,

61

00:03:15,728 --> 00:03:18,163

Fyodor Yurchikhin,
Luca Parmitano

62

00:03:18,163 --> 00:03:20,733

and Karen Nyberg have
been involved in a number

63

00:03:20,733 --> 00:03:24,370
of maintenance and experiment
activities this week,

64

00:03:24,370 --> 00:03:26,572
starting off with
Fyodor Yurchikhin,

65

00:03:26,572 --> 00:03:29,041
current Expedition 37 Commander.

66

00:03:29,041 --> 00:03:32,311
Back on Monday he was helping
to prepare a number of samples

67

00:03:32,311 --> 00:03:34,013
for a return on that
Soyuz craft.

68

00:03:34,013 --> 00:03:35,681
Also taking command

69

00:03:35,681 --> 00:03:38,250
of the International
Space Station on Monday.

70

00:03:38,250 --> 00:03:44,590
On Tuesday he moved on to drying
out a few of the Orlon suits

71

00:03:44,590 --> 00:03:46,925
that the Russians wear
for their space walks,

72

00:03:46,925 --> 00:03:49,895
also activating the device
onboard the International Space

73

00:03:49,895 --> 00:03:52,564

Station that enables them to receive telemetry and data

74

00:03:52,564 --> 00:03:56,435

from the Soyuz craft while it makes its final descent.

75

00:03:56,435 --> 00:03:59,638

On Wednesday, the entire crew enjoyed an off-duty day

76

00:03:59,638 --> 00:04:03,008

following a pretty hectic day supporting that undocking

77

00:04:03,008 --> 00:04:05,477

and sleep shifting over.

78

00:04:05,477 --> 00:04:08,580

Following that, they moved on to resuming all of their work

79

00:04:08,580 --> 00:04:11,150

on Thursday as the crew of Expedition 37.

80

00:04:11,150 --> 00:04:13,319

Fyodor Yurchikhin was doing maintenance

81

00:04:13,319 --> 00:04:15,287

on the Russian Electron System,

82

00:04:15,287 --> 00:04:19,158

one of two systems onboard the International Space Station

83

00:04:19,158 --> 00:04:21,126

responsible for providing oxygen

84

00:04:21,126 --> 00:04:23,462
to the astronauts'
breathing atmosphere

85

00:04:23,462 --> 00:04:24,863
and was also continuing
some work

86

00:04:24,863 --> 00:04:27,366
with the Russian
Matryoshka Experiment,

87

00:04:27,366 --> 00:04:30,402
which is a mannequin-sized doll
onboard the International Space

88

00:04:30,402 --> 00:04:34,006
Station that is used to
track and record the dosage

89

00:04:34,006 --> 00:04:38,177
of radiation these
astronauts are exposed to.

90

00:04:38,177 --> 00:04:39,778
However, today, on Friday,

91

00:04:39,778 --> 00:04:42,414
Yurchikhin will be doing
some more work with some

92

00:04:42,414 --> 00:04:45,117
of the EVA equipment in
addition to those Orlon suits

93

00:04:45,117 --> 00:04:48,253
and photographing them
for a downlink and study

94

00:04:48,253 --> 00:04:49,555

by Russian flight controllers

95

00:04:49,555 --> 00:04:50,989

and scientists down
on the ground.

96

00:04:50,989 --> 00:04:53,959

He will also be working with
the Russian Identification

97

00:04:53,959 --> 00:04:56,595

Experiment, which is an
ongoing investigation

98

00:04:56,595 --> 00:05:00,065

into studying the dynamic
loads onto the Russian segment

99

00:05:00,065 --> 00:05:01,934

of the International
Space Station

100

00:05:01,934 --> 00:05:05,037

that takes place during
different dynamic operations,

101

00:05:05,037 --> 00:05:08,507

such as the undocking that just
happened earlier this week,

102

00:05:08,507 --> 00:05:12,211

also reboosts and even
the physical exercise

103

00:05:12,211 --> 00:05:14,313

by the astronauts onboard.

104

00:05:14,313 --> 00:05:18,350

This helps to determine any of
the micro acceleration that some

105

00:05:18,350 --> 00:05:21,887

of the very delicate
technological experiments are

106

00:05:21,887 --> 00:05:24,022

subjected to.

107

00:05:24,022 --> 00:05:26,291

Aside from that, he will
be doing some preventative

108

00:05:26,291 --> 00:05:29,128

maintenance in the
Russian service module,

109

00:05:29,128 --> 00:05:32,598

cleaning out some of
the ventilation systems.

110

00:05:32,598 --> 00:05:36,402

Moving on, European Space
Agency Astronaut Luca Parmitano,

111

00:05:36,402 --> 00:05:39,605

back on Monday, was
collecting some blood samples

112

00:05:39,605 --> 00:05:41,473

for the Human Research Facility.

113

00:05:41,473 --> 00:05:44,076

Each of these astronauts
serving as kind of guinea pigs

114

00:05:44,076 --> 00:05:46,645

for a number of science
experiments while onboard the

115

00:05:46,645 --> 00:05:48,614

International Space Station.

116

00:05:48,614 --> 00:05:51,717

He was also preparing the
combustion integrated rack

117

00:05:51,717 --> 00:05:54,653

onboard the station for
some experiment work

118

00:05:54,653 --> 00:05:57,689

that has been taking place
over the last two days.

119

00:05:57,689 --> 00:05:59,458

That combustion integrated rack,

120

00:05:59,458 --> 00:06:02,728

the only combustion research
facility onboard the station,

121

00:06:02,728 --> 00:06:05,597

capable of handling
a variety of studies

122

00:06:05,597 --> 00:06:08,000

and safeguarding the rest
of the station structure

123

00:06:08,000 --> 00:06:12,004

from the hazardous materials and
reactions taking place onboard.

124

00:06:12,004 --> 00:06:14,940

Aside from that, on
Monday, Parmitano helped set

125

00:06:14,940 --> 00:06:17,810

up the robotic work station
that he has been training

126

00:06:17,810 --> 00:06:22,381

at alongside Karen Nyberg for
the upcoming Cygnus Vehicle.

127

00:06:22,381 --> 00:06:26,151

Cygnus will be orbital
science's first cargo flight

128

00:06:26,151 --> 00:06:30,022

to the International Space
Station, taking place next week,

129

00:06:30,022 --> 00:06:34,326

scheduled to launch on September
17th and dock September 22nd.

130

00:06:34,326 --> 00:06:38,030

It will be, again, orbital
science's first demonstration

131

00:06:38,030 --> 00:06:39,832

flying the unmanned cargo craft

132

00:06:39,832 --> 00:06:41,767

to the International
Space Station,

133

00:06:41,767 --> 00:06:46,104

bringing the second American
commercial provider online.

134

00:06:46,104 --> 00:06:49,374

On Tuesday, which was undocking
day, Parmitano continued

135

00:06:49,374 --> 00:06:52,578

to work getting that combustion
integrated rack prepared.

136

00:06:52,578 --> 00:06:55,447

He was also in charge of
transferring a number of samples

137

00:06:55,447 --> 00:06:57,983

over to the Soyuz
for return to Earth.

138

00:06:57,983 --> 00:07:01,553

One of those samples that
he was transferring was

139

00:07:01,553 --> 00:07:05,557

from the Imuno Experiment,
which looks to track any

140

00:07:05,557 --> 00:07:09,328

of the immune responses in
the human crew members during

141

00:07:09,328 --> 00:07:10,896

and after their long-term stay

142

00:07:10,896 --> 00:07:12,898

at the International
Space Station,

143

00:07:12,898 --> 00:07:16,602

hoping to provide a better
understanding for scientists

144

00:07:16,602 --> 00:07:17,936

down here on the
ground as they look

145

00:07:17,936 --> 00:07:19,938

to develop pharmacological tools

146

00:07:19,938 --> 00:07:24,209
to help counter any unwanted
immunological side effects

147

00:07:24,209 --> 00:07:26,278
that these astronauts can
experience during their

148

00:07:26,278 --> 00:07:29,515
long-term stay in microgravity.

149

00:07:29,515 --> 00:07:31,483
And on Wednesday,
Parmitano and the rest

150

00:07:31,483 --> 00:07:34,720
of the crew are off-duty, but
on Thursday he moved right back

151

00:07:34,720 --> 00:07:36,455
into some heavy experiment work,

152

00:07:36,455 --> 00:07:40,125
working with the InSPACE-3
Experiment located inside

153

00:07:40,125 --> 00:07:42,327
of the Microgravity
Science Glovebox.

154

00:07:42,327 --> 00:07:46,932
This is a fairly complex fluid
physics experiment looking

155

00:07:46,932 --> 00:07:52,137
at obtaining data on specialized
fluids that contain particles

156

00:07:52,137 --> 00:07:54,373

that are able to change
the physical properties

157

00:07:54,373 --> 00:07:56,508

of those fluids when subjected

158

00:07:56,508 --> 00:08:00,445

to varying strength
magnetic fields.

159

00:08:00,445 --> 00:08:04,783

On Earth, such fluids are used
in materials that are used

160

00:08:04,783 --> 00:08:07,719

for building vibration dampening
systems that can be turned on

161

00:08:07,719 --> 00:08:09,788

and off with those
magnetic fields,

162

00:08:09,788 --> 00:08:13,125

having some very
important implications

163

00:08:13,125 --> 00:08:15,327

in improving the ability
to design structures

164

00:08:15,327 --> 00:08:19,097

such as bridges and buildings
to withstand destructive forces

165

00:08:19,097 --> 00:08:22,568

from things like earthquakes,
so something happening

166

00:08:22,568 --> 00:08:26,471

on a very small scale onboard
the station having a very large

167

00:08:26,471 --> 00:08:29,575

effect for technology
down here on earth.

168

00:08:29,575 --> 00:08:32,244

That InSPACE-3 Experiment
conducted yesterday

169

00:08:32,244 --> 00:08:35,247

and also continuing
on into today.

170

00:08:35,247 --> 00:08:38,283

Aside from that, Parmitano
continuing to gather some items

171

00:08:38,283 --> 00:08:41,219

up for disposal on
that Cygnus vehicle

172

00:08:41,219 --> 00:08:43,221

that will be making
its first flight

173

00:08:43,221 --> 00:08:45,891

to the International
Space Station next week.

174

00:08:45,891 --> 00:08:47,926

Parmitano today, Friday,

175

00:08:47,926 --> 00:08:51,129

is involved in some pretty
heavy maintenance work.

176

00:08:51,129 --> 00:08:55,567

He is working on the station's

major constituent analyzer,

177

00:08:55,567 --> 00:09:00,939
namely removing and replacing
the master spectrometer device.

178

00:09:00,939 --> 00:09:04,176
That mass constituent
analyzer, known as the MCA,

179

00:09:04,176 --> 00:09:08,480
is used onboard to provide
very critical monitoring

180

00:09:08,480 --> 00:09:11,516
of six major atmospheric
gasses inside

181

00:09:11,516 --> 00:09:13,118
of the station atmosphere.

182

00:09:13,118 --> 00:09:17,255
Among those, the primary that
it looks to track are the oxygen

183

00:09:17,255 --> 00:09:20,092
and carbon dioxide levels
inside the atmosphere

184

00:09:20,092 --> 00:09:22,594
to make sure they are
maintained at safe levels.

185

00:09:22,594 --> 00:09:25,430
Also monitoring the
nitrogen partial pressure,

186

00:09:25,430 --> 00:09:26,898
which can then be used

187

00:09:26,898 --> 00:09:29,768

to monitor the station's
internal cabin

188

00:09:29,768 --> 00:09:32,537

for any potential air leakage.

189

00:09:32,537 --> 00:09:36,441

Aside from that, today
Parmitano and right now working

190

00:09:36,441 --> 00:09:38,510

on some more robotics training

191

00:09:38,510 --> 00:09:41,513

for that Cygnus device
with Karen Nyberg.

192

00:09:41,513 --> 00:09:43,849

The two at the Robotic Work
Station right now inside

193

00:09:43,849 --> 00:09:46,585

of the Destiny Laboratory.

194

00:09:46,585 --> 00:09:51,657

And speaking of Karen Nyberg,
also this week doing a lot

195

00:09:51,657 --> 00:09:55,994

of work with that Cygnus vehicle
in preparation for its arrival.

196

00:09:55,994 --> 00:09:59,498

Back on Monday she was
with Parmitano working

197

00:09:59,498 --> 00:10:01,733

at the Robotic Work

Station as they do some more

198

00:10:01,733 --> 00:10:05,103
on orbit training to prepare
for their task of rendezvous

199

00:10:05,103 --> 00:10:07,439
and grapple with the vehicle.

200

00:10:07,439 --> 00:10:10,809
She was also returning
a few items to the Soyuz

201

00:10:10,809 --> 00:10:14,279
for delivery back
down to the ground.

202

00:10:14,279 --> 00:10:17,716
On Tuesday, though, she was
doing some maintenance work

203

00:10:17,716 --> 00:10:21,119
on an experiment facility
inspecting some of the samples

204

00:10:21,119 --> 00:10:22,821
in the Ice Crystal 2 Experiment

205

00:10:22,821 --> 00:10:25,290
over in the Japanese
Experiment Module.

206

00:10:25,290 --> 00:10:28,193
Ice Crystal 2 examining the
growth rate and stability

207

00:10:28,193 --> 00:10:31,563
of ice crystals in
super cold water.

208

00:10:31,563 --> 00:10:35,434

She was also helping Parmitano gather some of those items

209

00:10:35,434 --> 00:10:39,538

that will be stored inside of Cygnus, generally trash

210

00:10:39,538 --> 00:10:43,208

and other items to be discarded for Cygnus's return.

211

00:10:43,208 --> 00:10:47,112

Off duty on Wednesday and moving into Thursday,

212

00:10:47,112 --> 00:10:50,348

Nyberg was doing some routine maintenance onboard the

213

00:10:50,348 --> 00:10:51,550

International Space Station

214

00:10:51,550 --> 00:10:54,086

that these astronauts are routinely tasked with.

215

00:10:54,086 --> 00:10:56,455

She was inside of the crew quarters cleaning out some

216

00:10:56,455 --> 00:10:58,623

of the intake and exhaust ducts.

217

00:10:58,623 --> 00:11:02,027

Also checking the fan and airflow sensors.

218

00:11:02,027 --> 00:11:05,764

Seems like a fairly mundane task, but very important

219

00:11:05,764 --> 00:11:07,165
for these astronauts,

220

00:11:07,165 --> 00:11:11,336
is the microgravity environment
not naturally flowing the air

221

00:11:11,336 --> 00:11:13,538
so ensuring the fans are running

222

00:11:13,538 --> 00:11:18,110
and the atmosphere circulating
inside the station removes any

223

00:11:18,110 --> 00:11:21,446
potential build up of
dangerous carbon dioxide

224

00:11:21,446 --> 00:11:23,815
and ensuring a safe
breathing atmosphere again

225

00:11:23,815 --> 00:11:26,084
for these astronauts.

226

00:11:26,084 --> 00:11:29,254
And then today on Friday, Karen
Nyberg continuing some work

227

00:11:29,254 --> 00:11:31,323
with that InSPACE-3
Experiment inside

228

00:11:31,323 --> 00:11:33,558
of the Microgravity
Sciences Glovebox.

229

00:11:33,558 --> 00:11:36,194

She will also be analyzing
some of the drinking water

230

00:11:36,194 --> 00:11:40,766

for these astronauts from the
water processor assembly using

231

00:11:40,766 --> 00:11:44,202

the total organic carbon
analyzer and again checking

232

00:11:44,202 --> 00:11:48,974

out some of the Cygnus robotics
and also performing a test

233

00:11:48,974 --> 00:11:51,676

of the hardware control
panel, which will be used

234

00:11:51,676 --> 00:11:54,713

to control the vehicle in
its final moments on approach