1
00:00:00,550 --> 00:00:03,440
Good day, this is Mission Control Houston.

2
00:00:03,440 --> 00:00:07,860
Thank you for joining us for today's
ISS Update this Friday, November 4.

3
00:00:07,860 --> 00:00:10,700
This week has been a busy
week for the crew aboard.

4
00:00:10,700 --> 00:00:15,980
Aboard the International Space Station Monday,
Expedition 29 Commander Mike Fossum had worked

5
00:00:15,980 --> 00:00:22,920
with the Space Dynamically Responding Ultrasonic
Matrix System, also known as SpaceDRUMS.

6
00:00:22,920 --> 00:00:28,060
It's a suite of hardware that uses sound waves
to allow experiment samples to be processed

7
00:00:28,060 --> 00:00:30,660
without ever touching a container wall.

8
00:00:30,660 --> 00:00:33,500
This allows materials to
be produced in microgravity

9
00:00:33,500 --> 00:00:36,900
with an unparalleled quality
of shape and composition.

10
00:00:36,900 --> 00:00:40,750
The goal is to develop advanced materials
of a commercial quantity and quality,

11
00:00:40,750 --> 00:00:44,600

and help improve manufacturing
processes on Earth.

12
00:00:44,600 --> 00:00:47,230
He had also spent time on
the Earth Knowledge Acquired

13
00:00:47,230 --> 00:00:50,190
by Middle School Students,
or EarthKAM, experiment.

14
00:00:50,190 --> 00:00:53,640
EarthKAM is an education activity
that allows middle school students

15
00:00:53,640 --> 00:00:57,450
to program a digital camera aboard
the station to photograph a variety

16
00:00:57,450 --> 00:01:00,100
of geographical targets for
study in the classroom.

17
00:01:00,100 --> 00:01:04,510
Photos are then made available
online for viewing and study

18
00:01:04,510 --> 00:01:06,690
by participating schools around the world.

19
00:01:06,690 --> 00:01:11,020
Educators use the images for
projects involving Earth Science,

20
00:01:11,020 --> 00:01:13,750
geography, physics and social science.

21
00:01:13,750 --> 00:01:18,410
Meanwhile on Monday, Flight Engineer Satoshi
Furukawa had collected and analyzed samples

22
00:01:18,410 --> 00:01:23,950
from the station's Potable Water System using
the Total Organic Carbon Analyzer, or TOCA,

23
00:01:23,950 --> 00:01:26,920
which is necessary for checking
drinking water quality.

24
00:01:26,920 --> 00:01:32,750
Total Organic Carbon is naturally present in the
environment and by itself has no health effects,

25
00:01:32,750 --> 00:01:36,960
but it provides a medium for the formation
of byproducts that may be harmful.

26
00:01:36,960 --> 00:01:41,200
Russian Cosmonaut Sergei Volkov had
updated antivirus software on the laptops

27
00:01:41,200 --> 00:01:43,050
in the station's Russian segment.

28
00:01:43,050 --> 00:01:49,500
He also took surface samples to ensure that
no bacteria or harmful materials were forming.

29
00:01:49,500 --> 00:01:54,680
Tuesday, November 1, the Expedition 29 crew
of the International Space Station had wrapped

30
00:01:54,680 --> 00:02:01,780
up preparations for the arrival of an unpiloted
Russian cargo ship, the ISS Progress 45.

31
00:02:01,780 --> 00:02:07,410
Fossum had spent much of his day working with
free-flying, bowling-ball sized satellites known

32
00:02:07,410 --> 00:02:13,420
as Synchronized Position Hold, Engage,
Reorient, Experimental Satellites, or SPHERES.

33
00:02:13,420 --> 00:02:17,840
During this session, Fossum had attached
a smartphone with a video camera to one

34
00:02:17,840 --> 00:02:20,730
of the satellites to assist
the experiment's sponsors

35
00:02:20,730 --> 00:02:23,970
with the design of a teleoperation interface.

36
00:02:23,970 --> 00:02:28,420
Working in the station's Zvezda
service module, cosmonaut Sergei Volkov

37
00:02:28,420 --> 00:02:33,580
and Japan Aerospace Exploration Agency
astronaut Satoshi Furukawa had conducted a test

38
00:02:33,580 --> 00:02:38,940
of the Kurs automated rendezvous system that
will be used to guide the Progress 45 spacecraft

39
00:02:38,940 --> 00:02:44,100
to the Pirs docking compartment, its port of
call for the next three months, on Wednesday.

40
00:02:44,100 --> 00:02:48,450
The two flight engineers also
reviewed the configuration for TORU,

41
00:02:48,450 --> 00:02:52,830
the Russian telerobotically operated
rendezvous system which the crew can use

42

00:02:52,830 --> 00:02:57,110
to monitor the docking or take control
of the process if difficulties arise.

43
00:02:57,110 --> 00:03:01,920
Later Volkov and Furukawa had set up and tested
the video camera system that will provide a view

44
00:03:01,920 --> 00:03:06,260
of the docking as Progress
45 arrives with its 2.8 tons

45
00:03:06,260 --> 00:03:08,750
of food, fuel and supplies for the crew.

46
00:03:08,750 --> 00:03:12,600
Volkov also had spent time on
Tuesday with the Typology experiment,

47
00:03:12,600 --> 00:03:18,370
which studies a crew member's psychophysical
state during long-duration spaceflight,

48
00:03:18,370 --> 00:03:20,270
as well as the Identification experiment,

49
00:03:20,270 --> 00:03:25,170
which examines the station's dynamic loads
during events such as dockings and reboosts.

50
00:03:25,170 --> 00:03:28,560
On Wednesday, a new Russian
resupply craft arrived

51
00:03:28,560 --> 00:03:33,010
at the International Space
Station at 6:41 a.m. central time.

52
00:03:33,010 --> 00:03:39,490
The ISS Progress 45 had docked to the Pirs

docking compartment after a trip to the station

53
00:03:39,490 --> 00:03:44,220
that began Sunday from Baikonur
Cosmodrome, Kazakhstan.

54
00:03:44,220 --> 00:03:50,020
The crew had opened the Progress hatches
to begin the transfer of 1,653 pounds

55
00:03:50,020 --> 00:03:59,080
of propellant, 110 pounds of oxygen, 926 pounds
of water and 3,108 pounds of maintenance gear,

56
00:03:59,080 --> 00:04:01,440
spare parts and experiment hardware.

57
00:04:01,440 --> 00:04:06,360
Once the station crew members have unloaded the
cargo, Progress 45 will be filled with trash

58
00:04:06,360 --> 00:04:11,500
and station discards, then undocked
from the station in late January.

59
00:04:11,500 --> 00:04:15,780
Following its departure, controllers in
Mission Control, Moscow, will raise its orbit

60
00:04:15,780 --> 00:04:19,300
to 310 miles so that they
can deploy a microsatellite.

61
00:04:19,300 --> 00:04:23,500
Once that microsatellite is deployed,
Progress 45 will then be deorbited

62
00:04:23,500 --> 00:04:26,510
for a destructive re-entry
into Earth's atmosphere.

63
00:04:26,510 --> 00:04:30,600
Also on Wednesday, while Volkov
spent the majority of that day

64
00:04:30,600 --> 00:04:34,320
on Progress transfer activities,
Fossum had continued some science

65
00:04:34,320 --> 00:04:36,980
and exercise activities along with Furukawa.

66
00:04:36,980 --> 00:04:42,280
The two astronauts also conducted an
eye exam to measure their eye pressure.

67
00:04:42,280 --> 00:04:46,230
Fossum loaded new software,
configured a laptop computer

68
00:04:46,230 --> 00:04:49,240
on a science rack in the Destiny laboratory.

69
00:04:49,240 --> 00:04:53,500
The commander took high-resolution
photographs of space-grown crystals as part

70
00:04:53,500 --> 00:04:56,770
of the Binary Colloidal Alloy Test experiment.

71
00:04:56,770 --> 00:04:59,830
The current version of the
ongoing study, called BCAT-6,

72
00:04:59,830 --> 00:05:02,610
may help manufacturers design
new leading edge materials

73
00:05:02,610 --> 00:05:05,890

with molecular precision at the nanoscale.

74
00:05:05,890 --> 00:05:10,560
Furukawa had assisted Volkov with docking
activities at the start of Wednesday

75
00:05:10,560 --> 00:05:16,280
and gathered tools to deploy a router in the
future for the station's computer network.

76
00:05:16,280 --> 00:05:20,490
He also conducted crew departure
preparations with Fossum.

77
00:05:20,490 --> 00:05:24,950
The International Space Station
also reached a milestone in space.

78
00:05:24,950 --> 00:05:27,840
It had been continuously inhabited for 11 years.

79
00:05:27,840 --> 00:05:32,700
Expedition 1 crew members Commander Bill
Shepherd and Flight Engineers Sergei Krikalev

80
00:05:32,700 --> 00:05:38,130
and Yuri Gidzenko began their stay of
136 days aboard the station on Nov.

81
00:05:38,130 --> 00:05:44,500
2, 2000. Following Wednesday's arrival
of the ISS Progress 45 cargo craft,

82
00:05:44,500 --> 00:05:47,200
the Expedition 29 crew members living

83
00:05:47,200 --> 00:05:51,220
and working aboard the International
Space Station spent time unpacking some

84
00:05:51,220 --> 00:05:56,530
of its 2.8 tons of food, fuel
and supplies on Thursday.

85
00:05:56,530 --> 00:05:59,400
Commander Mike Fossum and Flight
Engineers Satoshi Furukawa

86
00:05:59,400 --> 00:06:03,010
and Sergei Volkov also spent
some time Thursday gathering

87
00:06:03,010 --> 00:06:05,760
and packing items for their return to Earth.

88
00:06:05,760 --> 00:06:11,300
The trio is scheduled to undock from the
station in the Soyuz TMA-02M spacecraft on Nov.

89
00:06:11,300 --> 00:06:17,610
21. Remaining aboard the station will be
the Expedition 30 crew of Dan Burbank,

90
00:06:17,610 --> 00:06:21,780
Anton Shkaplerov and Anatoly Ivanishin,
who are currently scheduled to launch

91
00:06:21,780 --> 00:06:27,210
to the orbiting complex aboard the
Soyuz TMA-22 no earlier than Nov.13,

92
00:06:27,210 --> 00:06:29,520
beginning their stay on the station on Nov.

93
00:06:29,520 --> 00:06:34,760
16. In addition to his work with
Progress 45, Volkov spent some time

94
00:06:34,760 --> 00:06:36,460

with the Identification experiment,

95
00:06:36,460 --> 00:06:41,920
which examines the station's dynamic loads
during events such as dockings and reboosts.

96
00:06:41,920 --> 00:06:46,870
As part of an ongoing study to determine the
effects of long-duration spaceflight on vision,

97
00:06:46,870 --> 00:06:50,890
Fossum and Furukawa had conducted
an eye ultrasound exam.

98
00:06:50,890 --> 00:06:55,650
The ultrasound equipment is part of the
station's Health Maintenance System.

99
00:06:55,650 --> 00:06:58,510
Fossum had also worked on the
station's Water Recovery System,

100
00:06:58,510 --> 00:07:01,820
conducting some routine maintenance
and later participated in an interview

101
00:07:01,820 --> 00:07:04,890
with the Houston Chronicle
during an in-flight media event

102
00:07:04,890 --> 00:07:07,780
that was broadcast here on
NASA Television Thursday.

103
00:07:07,780 --> 00:07:12,650
And today, marking the end
of the 21st week in space

104
00:07:12,650 --> 00:07:16,880
for the crew onboard the International

Space Station, just before the hour,

105
00:07:16,880 --> 00:07:19,620
Commander Mike Fossum had
completed a camera checkout

106
00:07:19,620 --> 00:07:24,170
of the Binary Colloidal Alloy experiment
known as BCAT-6 that looks at advances

107
00:07:24,170 --> 00:07:26,350
in manufacturing materials on the nanoscale.

108
00:07:26,350 --> 00:07:31,800
Fossum stored samples from a human body science
study known as Sodium Loading in Microgravity

109
00:07:31,800 --> 00:07:35,410
that studies fluid and salt retention
in the body during spaceflight.

110
00:07:35,410 --> 00:07:38,510
These samples will be stored in the
Minus Eighty Degree Laboratory Freezer

111
00:07:38,510 --> 00:07:41,230
for later return and analysis.

112
00:07:41,230 --> 00:07:46,500
Flight Engineer Satoshi Furukawa will
stow away the colloid experiment hardware

113
00:07:46,500 --> 00:07:48,840
after its operations and will also begin an hour

114
00:07:48,840 --> 00:07:52,550
of his regularly scheduled
two hours of physical fitness.

115

00:07:52,550 --> 00:07:57,940
Meanwhile Sergei Volkov is transferring
a few items from station to Soyuz

116
00:07:57,940 --> 00:08:00,370
for return to Earth in a couple of weeks.

117
00:08:00,370 --> 00:08:03,710
Earlier this morning it was the
non-human crew member, Robonaut 2,

118
00:08:03,710 --> 00:08:06,720
that took center stage even
if for awhile on orbit.

119
00:08:06,720 --> 00:08:08,570
Commander Fossum with Furukawa worked

120
00:08:08,570 --> 00:08:12,800
to assemble the dexterous humanoid
robot in the Destiny laboratory.

121
00:08:12,800 --> 00:08:15,080
Fossum began his morning working with Robonaut

122
00:08:15,080 --> 00:08:18,750
to flex its movable parts
for the second time on orbit.

123
00:08:18,750 --> 00:08:22,710
While the first test performed
last month focused on arm joints,

124
00:08:22,710 --> 00:08:26,130
today's mobility test focused on
hands used here for the first time,

125
00:08:26,130 --> 00:08:29,130
as well as movement of its other joints.

126
00:08:29,130 --> 00:08:33,140
The goal of today's test was to
acquire more data on tactile strength,

127
00:08:33,140 --> 00:08:37,560
range of motion of its arms and
the mechanics of its joints.

128
00:08:37,560 --> 00:08:40,770
About three hours into the testing
however, a sensor issue relative

129
00:08:40,770 --> 00:08:46,460
to the device's computer program for the
neck joints halted the testing for the day

130
00:08:46,460 --> 00:08:48,740
and ended the session prematurely.

131
00:08:48,740 --> 00:08:53,500
Robonaut was powered off for the
day at 6:34 a.m. central time.

132
00:08:53,500 --> 00:08:56,460
The testing will be picked up at a later date.

133
00:08:56,460 --> 00:09:01,700
During Robonaut 2's exercises on orbit,
Flight Engineer Satoshi Furukawa had gathered

134
00:09:01,700 --> 00:09:06,980
and packed items onboard for the
return to Earth on November 21.

135
00:09:06,980 --> 00:09:10,220
Meanwhile Flight Engineer Sergei
Volkov snapped photographs

136
00:09:10,220 --> 00:09:15,740

of the onboard Russian plants experiment
that studies the growth of wheat in space.

137
00:09:15,740 --> 00:09:20,540
He also had spent a few hours unpacking items
from the Progress cargo supply ship that docked

138
00:09:20,540 --> 00:09:24,710
to the station earlier this
week on Wednesday, November 2.

139
00:09:24,710 --> 00:09:29,650
Later today it will be Commander Fossum and
Flight Engineer Sergei Volkov's turn to gather

140
00:09:29,650 --> 00:09:33,840
and pack items in preparation for the
crew's return to Earth on November 21.

141
00:09:33,840 --> 00:09:38,220
In anticipation of the soon-to-arrive
Soyuz carrying the Expedition 30 crew,

142
00:09:38,220 --> 00:09:42,860
Satoshi Furukawa will spend an hour
reviewing Soyuz docking procedures.

143
00:09:42,860 --> 00:09:47,650
He'll also later relocate an Ethernet
cable to the Destiny laboratory.

144
00:09:47,650 --> 00:09:52,340
Sergei Volkov will perform his second half of
his daily exercise before the crew participates

145
00:09:52,340 --> 00:09:55,830
in a tag up conference with the
space station flight director.

146
00:09:55,830 --> 00:09:59,190

The crew will then be scheduled to
go to bed at 4:30 p.m. central time,

147
00:09:59,190 --> 00:10:02,110
closing its 21st week living
and working in space.