1
00:00:00,030 --> 00:00:04,050
This is mission control Houston with
a look back of this week in space.

2
00:00:04,050 --> 00:00:14,130
On Monday, Expedition 29 crew members
Anton Shkaplerov, Anatoly Ivanishin

3
00:00:14,130 --> 00:00:17,990
and Dan Burbank were on their way
to the International Space Station

4
00:00:17,990 --> 00:00:22,220
after having launched aboard
the Soyuz TMA-22 spacecraft

5
00:00:22,220 --> 00:00:26,490
from Baikonur Cosmodrome,
Kazakhstan, at 10:14 p.m. CT.

6
00:00:26,490 --> 00:00:28,130
That was last Sunday.

7
00:00:28,130 --> 00:00:34,100
Meanwhile on Monday, aboard the orbiting
outpost, Commander Mike Fossum worked

8
00:00:34,100 --> 00:00:40,170
with the Space Dynamically Responding Ultrasonic
Matrix System, this is also known as SpaceDRUMS,

9
00:00:40,170 --> 00:00:45,480
a suite of hardware that uses sound waves
to allow experiment samples to be processed

10
00:00:45,480 --> 00:00:47,540
without ever touching a container wall.

11
00:00:47,540 --> 00:00:50,780

This allows materials to
be produced in microgravity

12
00:00:50,780 --> 00:00:53,930
with an unparalleled quality
of shape and composition.

13
00:00:53,930 --> 00:00:58,560
The goal is to develop advanced materials
of a commercial quantity and quality,

14
00:00:58,560 --> 00:01:01,950
and help improve manufacturing
processes here on Earth.

15
00:01:01,950 --> 00:01:06,820
Fossum had also participated in the Integrated
Resistance and Aerobic Training Study,

16
00:01:06,820 --> 00:01:12,630
known as Sprint, which involves ultrasound
imagery taken of his leg and a shorter,

17
00:01:12,630 --> 00:01:16,370
more intense workout on the
Advanced Resistive Exercise Device

18
00:01:16,370 --> 00:01:18,960
than station crew members normally perform.

19
00:01:18,960 --> 00:01:25,770
Sprint evaluates the use of high-intensity,
low-volume exercise training to minimize loss

20
00:01:25,770 --> 00:01:28,070
of muscle, bone and cardiovascular function

21
00:01:28,070 --> 00:01:31,460
in station crew members during
long-duration missions.

22
00:01:31,460 --> 00:01:35,140
Fossum is the first to participate
in this new protocol.

23
00:01:35,140 --> 00:01:39,640
Additionally, he had worked with the Binary
Colloidal Alloy Test-6 science payload.

24
00:01:39,640 --> 00:01:44,530
In this experiment, also known as BCAT-6,
station crew members photograph samples

25
00:01:44,530 --> 00:01:47,710
of polymer and colloidal particles
as they change from liquids

26
00:01:47,710 --> 00:01:50,920
to gases, to model that phase change.

27
00:01:50,920 --> 00:01:56,520
The results will help scientists develop
fundamental physics concepts previously cloaked

28
00:01:56,520 --> 00:01:58,890
by the effects of gravity.

29
00:01:58,890 --> 00:02:02,710
Also on Monday, Flight Engineer
Satoshi Furukawa analyzed water samples

30
00:02:02,710 --> 00:02:08,820
from the station's Water Recovery System,
which recycles urine to produce potable water.

31
00:02:08,820 --> 00:02:14,280
Flight Engineer Sergei Volkov worked
with the radiation payload suite.

32

00:02:14,280 --> 00:02:18,900
The Russian payload is designed for
sophisticated radiation studies and is named

33
00:02:18,900 --> 00:02:22,270
after the traditional Russian
set of nested dolls Matryoshka.

34
00:02:22,270 --> 00:02:26,440
Next on Tuesday, the Expedition
29 crew members living

35
00:02:26,440 --> 00:02:28,890
and working aboard the International
Space Station had wrapped

36
00:02:28,890 --> 00:02:31,620
up an abbreviated workday
Tuesday morning as they prepare

37
00:02:31,620 --> 00:02:35,660
to welcome three new crewmates
arriving aboard a Soyuz spacecraft

38
00:02:35,660 --> 00:02:37,860
that occurred early Wednesday morning.

39
00:02:37,860 --> 00:02:42,270
With only a week left in their
mission aboard the orbiting complex,

40
00:02:42,270 --> 00:02:46,740
the three outgoing Expedition 29 crew
members spent some time Tuesday packing

41
00:02:46,740 --> 00:02:50,810
up for their return aboard
the Soyuz TMA-02M spacecraft

42
00:02:50,810 --> 00:02:53,470

that brought them to the station June 9.

43
00:02:53,470 --> 00:02:59,120
Fossum also checked on the Binary Colloidal
Alloy Test science payload, which takes a look

44
00:02:59,120 --> 00:03:05,460
at those colloids, those microscopic
particles suspended in a liquid.

45
00:03:05,460 --> 00:03:10,810
Also meanwhile, Furukawa closed the shutters on
some windows in the U.S. and Japanese segments

46
00:03:10,810 --> 00:03:14,110
of the station to protect them from
contamination from the exhaust plumes

47
00:03:14,110 --> 00:03:17,000
of the Soyuz as it rendezvous with the station.

48
00:03:17,000 --> 00:03:21,750
Then on Tuesday, Volkov had spent several hours
working with a cell cultivation experiment known

49
00:03:21,750 --> 00:03:26,660
as Cascade and later performed routine
maintenance on the life support system

50
00:03:26,660 --> 00:03:29,050
in the Russian segment of the station.

51
00:03:29,050 --> 00:03:33,210
On Wednesday, Expedition 29
expanded to six crew members.

52
00:03:33,210 --> 00:03:38,020
NASA astronaut Dan Burbank and
Russian cosmonauts Anton Shkaplerov

53
00:03:38,020 --> 00:03:42,060
and Anatoly Ivanishin docked
their Soyuz TMA-22 spacecraft

54
00:03:42,060 --> 00:03:48,220
to the Poisk mini-research module
at 11:24 a.m. CT on Wednesday.

55
00:03:48,220 --> 00:03:52,380
They are scheduled to live in
space until March of this year.

56
00:03:52,380 --> 00:03:57,020
Expedition 29 Commander Mike Fossum
and Flight Engineers Satoshi Furukawa

57
00:03:57,020 --> 00:04:01,350
and Sergei Volkov welcomed their new
crewmates when the hatches were opened

58
00:04:01,350 --> 00:04:05,540
at 1:39 a.m. CT on Wednesday morning.

59
00:04:05,540 --> 00:04:09,060
After that welcoming ceremony with
mission officials and family members,

60
00:04:09,060 --> 00:04:12,910
the station residents conducted
the standard crew safety briefing.

61
00:04:12,910 --> 00:04:16,990
The new crew members familiarized
themselves with potential hazards,

62
00:04:16,990 --> 00:04:19,890
safety equipment locations and escape routes.

63
00:04:19,890 --> 00:04:23,170

On Wednesday, Burbank had
prepared for a pair of experiments

64
00:04:23,170 --> 00:04:27,750
that observe a crew member's
adaptation to microgravity.

65
00:04:27,750 --> 00:04:33,040
For the Integrated Immune experiment,
he will be providing saliva samples

66
00:04:33,040 --> 00:04:37,910
to help scientists develop immune monitoring
strategies for long-duration missions.

67
00:04:37,910 --> 00:04:42,620
Another experiment, known as the Reaction self
test, will require the new flight engineer

68
00:04:42,620 --> 00:04:46,870
to take a short test which measures
fatigue resulting from the disruption

69
00:04:46,870 --> 00:04:50,400
of the circadian rhythm while
living and working in space.

70
00:04:50,400 --> 00:04:55,150
On Thursday, the Expedition 29 crew
members focused on orientation activities

71
00:04:55,150 --> 00:04:59,850
and science experiments during their
first full day as a six-member crew.

72
00:04:59,850 --> 00:05:05,410
After docking in the Soyuz TMA-22
spacecraft on early Wednesday morning,

73
00:05:05,410 --> 00:05:10,320

the station's newest residents, Flight
Engineers Dan Burbank, Anton Shkaplerov

74
00:05:10,320 --> 00:05:15,870
and Anatoly Ivanishin, focused on a variety of
orientation activities to familiarize themselves

75
00:05:15,870 --> 00:05:18,880
with their new home aboard the orbiting outpost.

76
00:05:18,880 --> 00:05:23,080
The three new flight engineers also met
with the rest of the Expedition 29 crew

77
00:05:23,080 --> 00:05:25,960
to review emergency roles and responsibilities.

78
00:05:25,960 --> 00:05:30,660
The station crew members have a
little less than a week together

79
00:05:30,660 --> 00:05:35,240
as the Expedition 29 crew before
Fossum, Furukawa and Volkov head home

80
00:05:35,240 --> 00:05:39,940
on Monday aboard the Soyuz TMA-02M
spacecraft that brought them

81
00:05:39,940 --> 00:05:44,150
to the station last summer on June 9.

82
00:05:44,150 --> 00:05:49,620
Their departure will mark the beginning of
Expedition 30, under the command of Dan Burbank.

83
00:05:49,620 --> 00:05:54,230
A formal change-of-command
ceremony is planned for Sunday.

84
00:05:54,230 --> 00:05:57,430
Also on Thursday in the Destiny
laboratory, Fossum replaced

85
00:05:57,430 --> 00:06:01,380
and reconfigured equipment inside the
Combustion Integrated Rack which is part

86
00:06:01,380 --> 00:06:03,850
of the Fluids and Combustion Facility.

87
00:06:03,850 --> 00:06:07,540
The Combustion Integrated
Rack is an experiment facility

88
00:06:07,540 --> 00:06:10,820
that helps researchers study
how different materials combust

89
00:06:10,820 --> 00:06:15,290
in the microgravity environment aboard the
station and can be operated by crew members

90
00:06:15,290 --> 00:06:18,060
or remotely by researchers on Earth.

91
00:06:18,060 --> 00:06:23,230
Also on Thursday, Anatoly Ivanishin worked
with a Russian experiment known as CASCADE,

92
00:06:23,230 --> 00:06:27,380
which investigates cultivation
processes of micro-organism,

93
00:06:27,380 --> 00:06:30,030
animal and human cells in microgravity.

94
00:06:30,030 --> 00:06:35,430
While his Russian cosmonaut crewmates Volkov

and Shkaplerov set aside some time to work

95
00:06:35,430 --> 00:06:40,330
with a variety of experiments including
Plazmida, a Russian bioecology experiment

96
00:06:40,330 --> 00:06:43,630
that will examine the effect of
microgravity on the rate of transfer

97
00:06:43,630 --> 00:06:46,500
and mobilization of bacteria plasmids.

98
00:06:46,500 --> 00:06:52,630
And later yesterday, Fossum and Burbank had took
some time to talk with Kevin Reece from KHOU-TV

99
00:06:52,630 --> 00:06:55,550
in Houston during an in-flight interview.

100
00:06:55,550 --> 00:07:01,130
And finally today, on Friday, November 18,
Commander Fossum and Burbank worked together

101
00:07:01,130 --> 00:07:03,870
on maintenance to the Waste Hygiene Compartment.

102
00:07:03,870 --> 00:07:08,990
Fossum also provided some handover instruction
to Burbank on the Binary Colloidal Alloy Test.

103
00:07:08,990 --> 00:07:11,840
Those are a series of ongoing
science experiments that look

104
00:07:11,840 --> 00:07:18,430
at those microscopic particles that are
suspended in a liquid and they may one day lead

105

00:07:18,430 --> 00:07:22,220
to improvements in manufacturing
processes here on Earth.

106
00:07:22,220 --> 00:07:27,100
Together Fossum and Burbank worked to unpack
the U.S. items that were brought up by Burbank

107
00:07:27,100 --> 00:07:29,430
and his crewmates aboard the Soyuz.

108
00:07:29,430 --> 00:07:33,840
Burbank reviewed the operations of the
on board stationary bicycle as exercise

109
00:07:33,840 --> 00:07:39,920
to mitigate the effects of spaceflight , which
is essential during a long-duration flight.

110
00:07:39,920 --> 00:07:43,700
And earlier this morning, in preparation
for their return to Earth, Sergei Volkov

111
00:07:43,700 --> 00:07:48,280
and Satoshi Furukawa participated in a
conference with specialists on the ground

112
00:07:48,280 --> 00:07:53,770
to review their upcoming decent to Earth
aboard the Soyuz TMA-02M spacecraft.

113
00:07:53,770 --> 00:07:56,470
Fossum, Volkov and Furukawa
are scheduled to land

114
00:07:56,470 --> 00:08:05,310
in Kazakhstan Monday November 21
at 8:24 p.m. CT, 9:24 p.m. EST.

115
00:08:05,310 --> 00:08:08,930

Just during the hour, Commander Mike Fossum
had performed some preventative maintenance

116
00:08:08,930 --> 00:08:12,960
to the Oxygen Generator System
along with Dan Burbank.

117
00:08:12,960 --> 00:08:18,200
He had spent some time cleaning filters and
removing and replacing a hydrogen sensor.

118
00:08:18,200 --> 00:08:22,140
Flight engineer, soon to assume command
of the International Space Station,

119
00:08:22,140 --> 00:08:25,790
Dan Burbank was busy unpacking
items that were brought

120
00:08:25,790 --> 00:08:29,520
up with he and his crew aboard the Soyuz.

121
00:08:29,520 --> 00:08:34,190
Flight Engineers Sergei Volkov and
Anton Shkaplerov have been participating

122
00:08:34,190 --> 00:08:36,940
in space station handover reviews.

123
00:08:36,940 --> 00:08:41,330
While Flight Engineer Satoshi Furukawa
transferred some acoustic measurement data,

124
00:08:41,330 --> 00:08:46,000
after performing a sound level meter
survey of the Oxygen Generator System,

125
00:08:46,000 --> 00:08:51,860
the Water Recovery System and also
of the Japanese Pressurized Module.

126
00:08:51,860 --> 00:08:57,260
He had later followed that data
transfer with an hour of his exercise.

127
00:08:57,260 --> 00:09:00,640
Later today, the six station crew
members will have completed the two hours

128
00:09:00,640 --> 00:09:04,220
of their daily exercise, they
will participate in a conference

129
00:09:04,220 --> 00:09:07,650
with the station flight director,
some evening prep work,

130
00:09:07,650 --> 00:09:11,310
a conference with the station flight
director and wind down their day

131
00:09:11,310 --> 00:09:14,490
with meal time, hygiene and rest.

132
00:09:14,490 --> 00:09:17,770
Anatoly Ivanishin will then
perform some regular maintenance

133
00:09:17,770 --> 00:09:21,800
to the Russian life support
system known as SOZh.

134
00:09:21,800 --> 00:09:25,930
The three new crew members will continue
to settle in to their home and adjust

135
00:09:25,930 --> 00:09:28,750
to their microgravity living space.