



1
00:00:01,667 --> 00:00:05,304
Good day and welcome to Mission
Control Houston, where the team

2
00:00:05,304 --> 00:00:08,207
of flight controllers is
watching over the activities

3
00:00:08,207 --> 00:00:11,544
of the three-person crew aboard
the International Space Station.

4
00:00:11,544 --> 00:00:14,647
Today Jerry Jason is the flight
director in charge the team

5
00:00:14,647 --> 00:00:17,016
and Mark Reagan is the
spacecraft communicator.

6
00:00:17,016 --> 00:00:18,851
He'll be talking with
the crew as needed

7
00:00:18,851 --> 00:00:21,654
to coordinate activities
aboard space station.

8
00:00:21,654 --> 00:00:25,724
Of course Expedition 35 is
the Expedition this period,

9
00:00:25,724 --> 00:00:29,495
and that is made up of Commander
Chris Hadfield the first

10
00:00:29,495 --> 00:00:32,131
Canadian commander of the
International Space Station,

11
00:00:32,131 --> 00:00:35,701
NASA astronaut Tom Marshburn
a physician the spending four

12
00:00:35,701 --> 00:00:37,103
and a half months on orbit

13
00:00:37,103 --> 00:00:41,073
and Roman Romanenko a Russian
Federal Space Agency cosmonaut

14
00:00:41,073 --> 00:00:44,243
making his second trip
to the space station.

15
00:00:45,444 --> 00:00:47,980
Today is mostly focused
on the upcoming departure

16
00:00:47,980 --> 00:00:50,516
of the Dragon spacecraft
which is going

17
00:00:50,516 --> 00:00:52,885
to be carrying important
scientific samples back

18
00:00:52,885 --> 00:00:54,520
to Earth for analysis.

19
00:00:54,520 --> 00:00:59,125
The crew today did some last
of the early packing activities

20
00:00:59,125 --> 00:01:01,460
and will be putting the
final research samples

21
00:01:01,460 --> 00:01:04,130

into the SpaceX Dragon
cargo vehicle

22

00:01:04,130 --> 00:01:07,666

on Sunday before the
hatches are closed.

23

00:01:07,666 --> 00:01:09,235

Dragon will be unberthed

24

00:01:09,235 --> 00:01:12,438

from the Harmony module common
berthing mechanism port it's

25

00:01:12,438 --> 00:01:13,839

attached to on Monday.

26

00:01:13,839 --> 00:01:16,609

The start of operations has
been adjusted just a little

27

00:01:16,609 --> 00:01:18,010

bit earlier.

28

00:01:18,010 --> 00:01:21,981

Preparations will begin now at
3:20 AM central time on Monday

29

00:01:21,981 --> 00:01:25,718

with the unberthing beginning
at 4:05 AM and release expected

30

00:01:25,718 --> 00:01:29,822

about 6:49 AM central time.

31

00:01:29,822 --> 00:01:33,092

Splashdown off the coast of
Baja California is expected

32

00:01:33,092 --> 00:01:37,730

about 20 minutes after noon
central time on Monday.

33

00:01:37,730 --> 00:01:41,734

NASA TV live coverage of Dragon
spacecraft departure begins

34

00:01:41,734 --> 00:01:45,137

at 4 AM central time Monday.

35

00:01:45,137 --> 00:01:47,072

Chris Hadfield started
his morning

36

00:01:47,072 --> 00:01:52,011

by performing a water sample
analysis using the Total Organic

37

00:01:52,011 --> 00:01:57,016

Carbon Analyzer or TOCA as it's
called in NASA nomenclature.

38

00:01:57,016 --> 00:02:00,019

Later on he removed the
sample processing unit

39

00:02:00,019 --> 00:02:03,722

from the Coarsening In Solid
Liquid Mixtures experiment

40

00:02:03,722 --> 00:02:08,127

and downloaded some of the
data from that experiment.

41

00:02:08,127 --> 00:02:09,662

That's one of experiments
that was carried

42

00:02:09,662 --> 00:02:12,798

up on Dragon three weeks ago and
it'll be returned to scientists

43

00:02:12,798 --> 00:02:15,534

at Northwestern University
near Chicago just days

44

00:02:15,534 --> 00:02:17,803

after it left the station.

45

00:02:17,803 --> 00:02:21,040

That's very important
to them as they want

46

00:02:21,040 --> 00:02:23,542

to analyze those samples
as quickly as possible

47

00:02:23,542 --> 00:02:26,412

since they tend to
degrade if left in storage.

48

00:02:26,412 --> 00:02:30,482

Hadfield also worked with the
Binary Colloidal Alloy Test

49

00:02:30,482 --> 00:02:34,119

which examines very, very
tiny particles that are

50

00:02:34,119 --> 00:02:35,654

of spread throughout liquid.

51

00:02:35,654 --> 00:02:38,691

That's known as colloid
suspension and commonly found

52

00:02:38,691 --> 00:02:40,025

in things such as milk,

53

00:02:40,025 --> 00:02:44,763

paint and electric polishing
compounds and food products.

54

00:02:44,763 --> 00:02:48,300

Tom Marshburn meanwhile is
continuing checkout activities

55

00:02:48,300 --> 00:02:51,837

of the Marangoni
Inside experiment.

56

00:02:51,837 --> 00:02:56,375

Marangoni convection is the flow
that is driven by the presence

57

00:02:56,375 --> 00:02:59,545

of a surface tension
gradient that is produced

58

00:02:59,545 --> 00:03:03,782

by temperature differences
within the liquid gas interface.

59

00:03:03,782 --> 00:03:07,886

Convection in liquid
silicon oil is generated

60

00:03:07,886 --> 00:03:10,322

by heating one disc hot hotter

61

00:03:10,322 --> 00:03:12,157

than the other disk
in this experiment.

62

00:03:12,157 --> 00:03:16,328

Scientists are trying to observe
flow patterns of how fluids move

63

00:03:16,328 --> 00:03:20,132
to learn more about how heat
is transferred in microgravity.

64

00:03:20,132 --> 00:03:22,868
The experiment is a Japan
Aerospace Exploration

65

00:03:22,868 --> 00:03:27,072
Agency-sponsored experiment.

66

00:03:27,072 --> 00:03:29,341
Marshburn's been working
in the Destiny laboratory

67

00:03:29,341 --> 00:03:31,977
on that experiment
all week long.

68

00:03:31,977 --> 00:03:34,913
. Marshburn also working in
the Columbus laboratory today

69

00:03:34,913 --> 00:03:38,984
to prepare for the first run of
the Seedling Growth experiment.

70

00:03:38,984 --> 00:03:41,620
That's inside the
European Space Agency lab.

71

00:03:41,620 --> 00:03:44,790
That experiment looks at
how plants grow in space.

72

00:03:44,790 --> 00:03:48,527
He'll be taking images of
plants and downlinking them

73

00:03:48,527 --> 00:03:50,562

to Earth throughout the
their growth period.

74

00:03:50,562 --> 00:03:52,965

And then the plants are going
to be harvested and returned

75

00:03:52,965 --> 00:03:57,002

to Earth for analysis by the
scientists with the experiment.

76

00:03:57,002 --> 00:03:59,171

Results of that research
may be able

77

00:03:59,171 --> 00:04:04,310

to help researchers improve
food production on the ground

78

00:04:04,310 --> 00:04:06,879

and that could also
help food production

79

00:04:06,879 --> 00:04:09,181

for future long-duration
missions

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00:04:09,181 --> 00:04:12,551

to the other destinations in our
solar system such as asteroids,

81

00:04:12,551 --> 00:04:14,486

Lagrange points,
the moon or Mars.

82

00:04:14,486 --> 00:04:19,058

A little bit later
on today Marshburn

83

00:04:19,058 --> 00:04:21,994

and Hadfield will continue
their transfer operations

84

00:04:21,994 --> 00:04:24,363
for the Dragon cargo craft.

85

00:04:24,363 --> 00:04:27,966
They will also complete some
onboard training in preparation

86

00:04:27,966 --> 00:04:30,602
for Monday's departure
of the cargo vehicle.

87

00:04:30,602 --> 00:04:34,006
Marshburn and Hadfield will
be at the controls Canadarm2

88

00:04:34,006 --> 00:04:38,844
for the unberthing
and release of Dragon.

89

00:04:38,844 --> 00:04:41,914
Roman Romanenko today is working
on some preventive maintenance

90

00:04:41,914 --> 00:04:43,749
in the Zvezda service module.

91

00:04:43,749 --> 00:04:46,051
He's also replacing one
of the shutoff valves

92

00:04:46,051 --> 00:04:48,520
for the water storage tanks

93

00:04:48,520 --> 00:04:50,689
in the Russian section
of the station.

94

00:04:50,689 --> 00:04:54,993

Space station mission managers
are in the midst of a meeting

95

00:04:54,993 --> 00:04:57,696

to review Dragon
departure preparations.

96

00:04:57,696 --> 00:04:59,898

We expect a Go/No Go decision

97

00:04:59,898 --> 00:05:04,136

from that meeting a little
bit later on this morning.

98

00:05:04,136 --> 00:05:08,006

Overnight Mission Control Moscow
directed a slight increase

99

00:05:08,006 --> 00:05:10,576

to the space station
orbital altitude.

100

00:05:10,576 --> 00:05:12,878

That's to adjust
phasing for the arrival

101

00:05:12,878 --> 00:05:16,148

of three more crew
members for Expedition 35.

102

00:05:16,148 --> 00:05:18,050

Pavel Vinogradov,
Alexander Misurkin

103

00:05:18,050 --> 00:05:21,153

and NASA's Chris Cassidy
are scheduled to launch

104

00:05:21,153 --> 00:05:23,188
from the Baikonur
Cosmodrome in Kazakhstan

105
00:05:23,188 --> 00:05:27,159
at 3:43 PM central
time next Thursday.

106
00:05:27,159 --> 00:05:28,594
They'll be docking
with the space station

107
00:05:28,594 --> 00:05:29,995
about six hours later

108
00:05:29,995 --> 00:05:34,133
in the first single orbit
rendezvous for humans.

109
00:05:34,133 --> 00:05:36,201
Tested that capability

110
00:05:36,201 --> 00:05:39,905
on Progress unmanned vehicles
previously but never on humans.

111
00:05:39,905 --> 00:05:41,807
The launch coverage will begin

112
00:05:41,807 --> 00:05:44,943
at 2:30 PM central
time March 28.

113
00:05:44,943 --> 00:05:48,046
The launch again
scheduled for 3:43 PM.

114
00:05:48,046 --> 00:05:51,717
Docking coverage will
begin on NASA TV at 8:45 PM

115

00:05:51,717 --> 00:05:54,953
with the docking set
for 9:32 PM and then

116

00:05:54,953 --> 00:05:58,023
at 10:30 PM NASA TV
will begin coverage

117

00:05:58,023 --> 00:06:01,093
for the Soyuz hatch opening
and welcoming ceremonies.

118

00:06:01,093 --> 00:06:04,163
That hatch opening is
scheduled for 11:10 PM

119

00:06:04,163 --> 00:06:07,499
on Thursday central time.

120

00:06:09,268 --> 00:06:12,604
Today that trio is on the ground

121

00:06:12,604 --> 00:06:15,474
at the Baikonur Cosmodrome,
Kazakhstan.

122

00:06:15,474 --> 00:06:18,277
On the left in this crew
portrait is Chris Cassidy,

123

00:06:18,277 --> 00:06:20,045
in the middle Pavel Vinogradov

124

00:06:20,045 --> 00:06:22,848
and on the right
Alexander Misurkin.

125

00:06:22,848 --> 00:06:25,751

The three crew members are
making final preparations

126

00:06:25,751 --> 00:06:27,653
for launch.

127

00:06:27,653 --> 00:06:30,155
All systems on the International
Space Station continuing