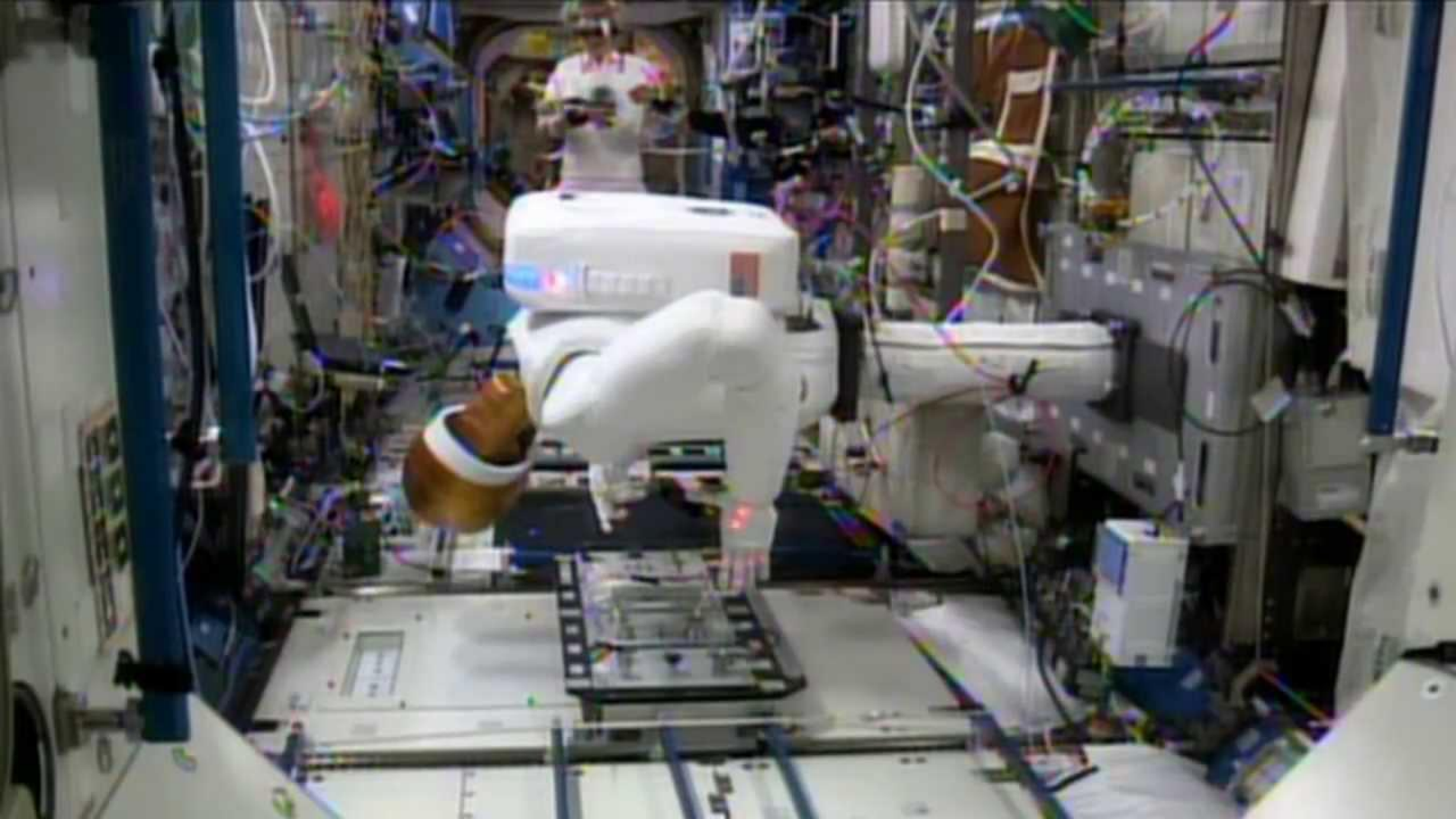

1
00:00:08,790 --> 00:00:06,789
the expedition 36 crew onboard the

2
00:00:10,950 --> 00:00:08,800
international space station has spent a

3
00:00:13,110 --> 00:00:10,960
week concentrating on a lot of

4
00:00:15,509 --> 00:00:13,120
laboratory science in a range of

5
00:00:18,550 --> 00:00:15,519
disciplines all while taking care of the

6
00:00:21,269 --> 00:00:18,560
station and setting up for the going and

7
00:00:23,509 --> 00:00:21,279
coming of russian cargo ships

8
00:00:25,870 --> 00:00:23,519
on monday commander pavel vinogradov

9
00:00:28,630 --> 00:00:25,880
began with the evaluation of his

10
00:00:30,710 --> 00:00:28,640
cardiovascular function during a series

11
00:00:33,110 --> 00:00:30,720
of progressively more strenuous

12
00:00:36,150 --> 00:00:33,120
exercises conducted on a stationary

13
00:00:38,709 --> 00:00:36,160

bicycle that information is added to the

14
00:00:41,190 --> 00:00:38,719
studies that have been ongoing for some

15
00:00:42,709 --> 00:00:41,200
time providing more data for scientists

16
00:00:45,110 --> 00:00:42,719
who are looking at the ways the human

17
00:00:47,029 --> 00:00:45,120
body is affected being in a weightless

18
00:00:48,709 --> 00:00:47,039
environment for an extended period

19
00:00:51,270 --> 00:00:48,719
they're trying to find ways to

20
00:00:53,670 --> 00:00:51,280
counteract the bad effects so future

21
00:00:56,229 --> 00:00:53,680
explorers can stay healthy on longer

22
00:01:01,910 --> 00:00:58,389
also spent time monday then stowing

23
00:01:04,789 --> 00:01:01,920
items into the progress 50 spacecraft in

24
00:01:07,030 --> 00:01:04,799
advance of its undocking on thursday

25
00:01:08,710 --> 00:01:07,040
flight engineer alexander misurkin spent

26
00:01:10,710 --> 00:01:08,720
part of his monday on routine

27
00:01:13,270 --> 00:01:10,720
maintenance tasks in the russian segment

28
00:01:15,350 --> 00:01:13,280
of the station and the afternoon working

29
00:01:17,749 --> 00:01:15,360
along with flight engineer fyodor

30
00:01:20,070 --> 00:01:17,759
yurchikhin on a russian experiment

31
00:01:23,350 --> 00:01:20,080
that's looking into new ways to identify

32
00:01:25,429 --> 00:01:23,360
the sources of depressurization inside a

33
00:01:27,350 --> 00:01:25,439
pressurized vehicle the russian crew

34
00:01:28,469 --> 00:01:27,360
members worked on that experiment known

35
00:01:31,109 --> 00:01:28,479
as bar

36
00:01:33,030 --> 00:01:31,119
throughout most of the days of the week

37
00:01:36,230 --> 00:01:33,040
flight engineer karen nyberg started the

38
00:01:39,109 --> 00:01:36,240

week with robonaut operations she set up

39
00:01:41,590 --> 00:01:39,119
the r2 robot and the tele operations

40
00:01:43,830 --> 00:01:41,600
equipment in the destiny module

41
00:01:45,990 --> 00:01:43,840
monitoring the commanding of tasks from

42
00:01:48,389 --> 00:01:46,000
the ground and directing the robot's

43
00:01:50,630 --> 00:01:48,399
actions with their own motions through

44
00:01:51,749 --> 00:01:50,640
the use of the instrumented gloves and

45
00:01:54,630 --> 00:01:51,759
goggles

46
00:01:57,190 --> 00:01:54,640
the robonaut is a test bed for evolving

47
00:01:59,990 --> 00:01:57,200
robotic operations in space it is

48
00:02:01,910 --> 00:02:00,000
demonstrating what a robot can do and

49
00:02:04,230 --> 00:02:01,920
helping developers as they test the

50
00:02:06,630 --> 00:02:04,240
boundaries of what a robot might do in

51
00:02:09,350 --> 00:02:06,640
the future including helping the human

52
00:02:11,670 --> 00:02:09,360
crew with tasks inside the station

53
00:02:13,030 --> 00:02:11,680
perhaps someday outside the station as

54
00:02:15,190 --> 00:02:13,040
well

55
00:02:17,030 --> 00:02:15,200
flight engineer luca parmitano spent a

56
00:02:18,869 --> 00:02:17,040
good portion of his monday in the

57
00:02:21,830 --> 00:02:18,879
european space agency's columbus

58
00:02:24,550 --> 00:02:21,840
laboratory reinstalling the microscope

59
00:02:26,949 --> 00:02:24,560
and spectrophotometer in the bio lab

60
00:02:28,790 --> 00:02:26,959
which had been removed for refurbishment

61
00:02:31,510 --> 00:02:28,800
back in 2011.

62
00:02:33,830 --> 00:02:31,520
this is the start of bio lab maintenance

63
00:02:35,670 --> 00:02:33,840

in advance of some advanced

64
00:02:37,509 --> 00:02:35,680
extended ground testing and

65
00:02:40,070 --> 00:02:37,519
commissioning to demonstrate that

66
00:02:42,070 --> 00:02:40,080
facility's ability to support some

67
00:02:44,390 --> 00:02:42,080
upcoming experiments looking into the

68
00:02:45,830 --> 00:02:44,400
effects of microgravity on biological

69
00:02:47,910 --> 00:02:45,840
organisms

70
00:02:50,630 --> 00:02:47,920
flight engineer chris cassidy set up the

71
00:02:53,589 --> 00:02:50,640
fluids integration rack for a physical

72
00:02:56,390 --> 00:02:53,599
sciences investigation called advanced

73
00:02:58,390 --> 00:02:56,400
colloids experiment it is the first in a

74
00:03:01,190 --> 00:02:58,400
series of microscopic imaging

75
00:03:03,990 --> 00:03:01,200
investigations of materials that contain

76
00:03:05,350 --> 00:03:04,000
colloidal particles the investigators

77
00:03:08,229 --> 00:03:05,360
are looking into the flow

78
00:03:10,229 --> 00:03:08,239
characteristics and the ordering effects

79
00:03:12,470 --> 00:03:10,239
of those materials

80
00:03:14,070 --> 00:03:12,480
on tuesday vinogradov and yurchikhin

81
00:03:16,470 --> 00:03:14,080
completed their refresher training on

82
00:03:19,030 --> 00:03:16,480
the toru system that's the system that

83
00:03:21,990 --> 00:03:19,040
allows a cosmonaut located in the zvezda

84
00:03:24,390 --> 00:03:22,000
module to take over manual control of an

85
00:03:26,070 --> 00:03:24,400
approaching progress cargo ship

86
00:03:29,110 --> 00:03:26,080
that training in advance of the

87
00:03:31,110 --> 00:03:29,120
departure of 50p and the expected

88
00:03:32,550 --> 00:03:31,120

arrival of a new load of supplies that

89
00:03:35,110 --> 00:03:32,560
are targeted for launch from the

90
00:03:36,789 --> 00:03:35,120
baikonur cosmodrome on saturday

91
00:03:38,470 --> 00:03:36,799
cassidy focused his maintenance

92
00:03:40,869 --> 00:03:38,480
attentions tuesday on the science

93
00:03:43,509 --> 00:03:40,879
hardware working on the marangoni

94
00:03:46,789 --> 00:03:43,519
apparatus in the kibo laboratory that's

95
00:03:48,550 --> 00:03:46,799
an experiment into marangoni convection

96
00:03:51,110 --> 00:03:48,560
that's designed to learn about heat

97
00:03:52,470 --> 00:03:51,120
transfer in microgravity

98
00:03:54,390 --> 00:03:52,480
parmitano took care of station

99
00:03:56,869 --> 00:03:54,400
maintenance that day too including a

100
00:04:00,229 --> 00:03:56,879
routine inspection of the portable fire

101
00:04:02,470 --> 00:04:00,239
extinguishers and breathing apparatuses

102
00:04:04,309 --> 00:04:02,480
he did that in the morning he also took

103
00:04:06,869 --> 00:04:04,319
time to speak with officials of the

104
00:04:09,830 --> 00:04:06,879
european space industries they were all

105
00:04:11,589 --> 00:04:09,840
gathered at the altec center in italy to

106
00:04:12,550 --> 00:04:11,599
talk with him about the progress of his

107
00:04:14,070 --> 00:04:12,560
flight

108
00:04:17,189 --> 00:04:14,080
the science started off the day for

109
00:04:20,310 --> 00:04:17,199
parmitano on wednesday as he initialized

110
00:04:22,550 --> 00:04:20,320
samples for runs in the binary colloidal

111
00:04:24,870 --> 00:04:22,560
alloy test experiment

112
00:04:26,790 --> 00:04:24,880
while karen nyberg gathered up hardware

113
00:04:28,870 --> 00:04:26,800

and installed the centerline berthing

114
00:04:31,590 --> 00:04:28,880
camera in the window of the nader hatch

115
00:04:34,950 --> 00:04:31,600
of node 2. that's to support next

116
00:04:35,909 --> 00:04:34,960
month's arrival of the next h2 transfer

117
00:04:38,070 --> 00:04:35,919
vehicle

118
00:04:39,749 --> 00:04:38,080
then she joined with parmitano and

119
00:04:42,230 --> 00:04:39,759
cassidy for a conference with the

120
00:04:44,230 --> 00:04:42,240
spacewalk specialists in houston as they

121
00:04:46,950 --> 00:04:44,240
reviewed the procedures for the next

122
00:04:48,710 --> 00:04:46,960
round of inspections designed to try to

123
00:04:51,189 --> 00:04:48,720
isolate the cause of last week's

124
00:04:54,550 --> 00:04:51,199
malfunction that allowed water to leak

125
00:04:57,270 --> 00:04:54,560
into parmitano's helmet during spacewalk

126
00:04:59,749 --> 00:04:57,280
the hatch to progress vehicle attached

127
00:05:01,189 --> 00:04:59,759
to the piers module was closed on

128
00:05:02,870 --> 00:05:01,199
wednesday morning

129
00:05:04,710 --> 00:05:02,880
and on thursday vinogradov and

130
00:05:07,189 --> 00:05:04,720
yurchikhin had a conference with the

131
00:05:08,950 --> 00:05:07,199
team in moscow to review procedures that

132
00:05:10,870 --> 00:05:08,960
they would follow in the event there was

133
00:05:13,110 --> 00:05:10,880
an issue and crew members had to take

134
00:05:14,070 --> 00:05:13,120
over manual control to redock that

135
00:05:17,029 --> 00:05:14,080
vehicle

136
00:05:19,510 --> 00:05:17,039
but there were no such issues and 50p

137
00:05:21,830 --> 00:05:19,520
departed the space station on time on

138
00:05:25,510 --> 00:05:21,840

thursday afternoon and was deorbited

139
00:05:27,670 --> 00:05:25,520
above the pacific ocean thursday evening

140
00:05:29,670 --> 00:05:27,680
parmitano spent his thursday morning in

141
00:05:31,430 --> 00:05:29,680
the combustion integrated rack

142
00:05:33,749 --> 00:05:31,440
installing some new hardware components

143
00:05:36,629 --> 00:05:33,759
in the multi-user droplet combustion

144
00:05:39,189 --> 00:05:36,639
apparatus that's in anticipation of the

145
00:05:41,830 --> 00:05:39,199
next set of combustion experiments there

146
00:05:43,909 --> 00:05:41,840
are a few of those such experiments on

147
00:05:47,189 --> 00:05:43,919
board all dedicated to learning the

148
00:05:49,510 --> 00:05:47,199
details about how different fuels burn

149
00:05:52,230 --> 00:05:49,520
when there's no gravity around that's

150
00:05:54,950 --> 00:05:52,240
designed to improve fire safety as well

151
00:05:57,590 --> 00:05:54,960
as fire suppression techniques but also

152
00:06:00,550 --> 00:05:57,600
to learn more about the efficiency of

153
00:06:02,790 --> 00:06:00,560
engines which use liquid fuels

154
00:06:04,870 --> 00:06:02,800
nyberg devoted part of her thursday to

155
00:06:07,749 --> 00:06:04,880
preparing for next month's arrival of

156
00:06:10,790 --> 00:06:07,759
the h2 transfer vehicle by checking out

157
00:06:12,390 --> 00:06:10,800
the htv hardware control panel and then

158
00:06:15,189 --> 00:06:12,400
reviewing the procedures that she'll

159
00:06:17,670 --> 00:06:15,199
follow when she flies canadarm2 to

160
00:06:19,670 --> 00:06:17,680
grapple htv and birth it to the

161
00:06:22,150 --> 00:06:19,680
station's harmony module

162
00:06:23,830 --> 00:06:22,160
later on she joined cassidy the two of

163
00:06:26,230 --> 00:06:23,840

them talked about their mission in

164
00:06:28,390 --> 00:06:26,240
interviews with the washington post and

165
00:06:31,670 --> 00:06:28,400
the portland maine press herald the

166
00:06:34,070 --> 00:06:31,680
newspaper in cassidy's home state

167
00:06:35,909 --> 00:06:34,080
on friday the u.s segment crew members

168
00:06:38,230 --> 00:06:35,919
concentrated on a number of maintenance

169
00:06:41,110 --> 00:06:38,240
tasks that included troubleshooting of

170
00:06:43,270 --> 00:06:41,120
the spacesuit parmitano war last week

171
00:06:45,510 --> 00:06:43,280
and which leaked water into his helmet

172
00:06:48,309 --> 00:06:45,520
there were no obvious indications of the

173
00:06:51,270 --> 00:06:48,319
source of the problem that turned up yet

174
00:06:53,590 --> 00:06:51,280
parmitano prepared to command a robot on

175
00:06:55,830 --> 00:06:53,600
the ground in california

176
00:06:58,469 --> 00:06:55,840
that's part of the surface tele robotics

177
00:07:01,110 --> 00:06:58,479
investigation looking into how the human

178
00:07:03,830 --> 00:07:01,120
crew on board an orbiting vehicle can

179
00:07:05,670 --> 00:07:03,840
command robots which are hundreds or

180
00:07:07,990 --> 00:07:05,680
even thousands of miles away on the

181
00:07:08,790 --> 00:07:08,000
surface of a planet or asteroid or the

182
00:07:10,870 --> 00:07:08,800
moon

183
00:07:13,430 --> 00:07:10,880
in order to have those robots perform

184
00:07:14,870 --> 00:07:13,440
tasks that will help the people explore

185
00:07:16,309 --> 00:07:14,880
those places

186
00:07:18,710 --> 00:07:16,319
the station's russian crew members were

187
00:07:20,950 --> 00:07:18,720
all off duty on friday since they'll be

188
00:07:23,350 --> 00:07:20,960

working all day saturday to support the

189
00:07:25,670 --> 00:07:23,360
arrival of the new progress vehicle

190
00:07:29,670 --> 00:07:25,680
52 progress is to launch from the

191
00:07:32,070 --> 00:07:29,680
baikonur cosmodrome at 3 45 pm saturday

192
00:07:34,710 --> 00:07:32,080
houston time and docked to the station's