1
00:00:09,030 --> 00:00:06,389
greetings from mission control houston

2
00:00:10,870 --> 00:00:09,040
and welcome to space station live

3
00:00:12,629 --> 00:00:10,880
it's a fairly busy week for the

4
00:00:13,910 --> 00:00:12,639
astronauts on board the international

5
00:00:15,829 --> 00:00:13,920
space station

6
00:00:17,750 --> 00:00:15,839
quite a bit of research and maintenance

7
00:00:19,750 --> 00:00:17,760
work being conducted as they move

8
00:00:22,150 --> 00:00:19,760
throughout the week pavel vinogradov

9
00:00:24,070 --> 00:00:22,160
current commander of expedition 36 has

10
00:00:25,269 --> 00:00:24,080
quite a few tasks on his schedule he'll

11
00:00:28,310 --> 00:00:25,279
be studying

12
00:00:30,390 --> 00:00:28,320
our cardiac bioelectric activity of

13
00:00:31,990 --> 00:00:30,400

his own body while it rests this one of

14
00:00:33,510 --> 00:00:32,000
the many biological experiments that

15
00:00:35,670 --> 00:00:33,520
these astronauts

16
00:00:37,590 --> 00:00:35,680
do as expedition crew members on board

17
00:00:39,510 --> 00:00:37,600
the international space station serving

18
00:00:41,270 --> 00:00:39,520
as guinea pigs themselves for many of

19
00:00:43,430 --> 00:00:41,280
these experiments

20
00:00:45,190 --> 00:00:43,440
throughout the week vinogradov has also

21
00:00:46,630 --> 00:00:45,200
been involved in a lot of

22
00:00:49,110 --> 00:00:46,640
maintenance activities throughout the

23
00:00:51,270 --> 00:00:49,120
russian segment cleaning out many of the

24
00:00:53,750 --> 00:00:51,280
ventilation systems and taking

25
00:00:55,830 --> 00:00:53,760
photographs we'll also be replacing

26
00:00:58,150 --> 00:00:55,840
quite a few of the fan screens inside of

27
00:00:59,910 --> 00:00:58,160
this ventilation system and also doing

28
00:01:01,750 --> 00:00:59,920
some inspection and photography of the

29
00:01:02,790 --> 00:01:01,760
windows inside of the zvezda's service

30
00:01:04,549 --> 00:01:02,800
module

31
00:01:05,750 --> 00:01:04,559
he'll be sending these photos down to

32
00:01:07,990 --> 00:01:05,760
the ground

33
00:01:10,630 --> 00:01:08,000
to russian controllers in koryov just

34
00:01:12,950 --> 00:01:10,640
outside of moscow as they continue to

35
00:01:15,270 --> 00:01:12,960
take a look at the windows just always

36
00:01:17,190 --> 00:01:15,280
checking for any possible imperfections

37
00:01:18,950 --> 00:01:17,200
or damage from potential micro

38
00:01:20,310 --> 00:01:18,960

meteoroids

39
00:01:21,990 --> 00:01:20,320
he'll also be

40
00:01:23,670 --> 00:01:22,000
doing some more work inside the rusted

41
00:01:24,830 --> 00:01:23,680
segment replacing some directional

42
00:01:27,030 --> 00:01:24,840
airflow

43
00:01:29,109 --> 00:01:27,040
sensors second russian cosmonaut

44
00:01:31,670 --> 00:01:29,119
alexander misurkin doing a few

45
00:01:33,350 --> 00:01:31,680
biological studies himself on starting

46
00:01:35,270 --> 00:01:33,360
off mornings with the sprout ii

47
00:01:37,190 --> 00:01:35,280
experiment which looks to observe the

48
00:01:39,429 --> 00:01:37,200
liquid components of a crew member's

49
00:01:40,469 --> 00:01:39,439
body such as the cellular liquids and

50
00:01:42,310 --> 00:01:40,479
blood flow

51
00:01:43,270 --> 00:01:42,320
while in this microgravity environment

52
00:01:45,429 --> 00:01:43,280
of space

53
00:01:47,429 --> 00:01:45,439
his task list is also loaded throughout

54
00:01:49,910 --> 00:01:47,439
the week with a lot of experiment work

55
00:01:51,590 --> 00:01:49,920
beginning to set up the molnaya gamma

56
00:01:54,149 --> 00:01:51,600
experiment which will look at gamma

57
00:01:55,670 --> 00:01:54,159
radiation splashes an optical radiation

58
00:01:57,350 --> 00:01:55,680
during terrestrial lightning and

59
00:01:59,429 --> 00:01:57,360
thunderstorm conditions

60
00:02:02,149 --> 00:01:59,439
using three sensors this is an external

61
00:02:03,830 --> 00:02:02,159
payload attached to the outboard

62
00:02:05,910 --> 00:02:03,840
section of the russian segment onboard

63
00:02:07,590 --> 00:02:05,920

the international space station he'll

64
00:02:10,150 --> 00:02:07,600
also be taking a few measurements from

65
00:02:12,949 --> 00:02:10,160
the russian matroyska experiment this is

66
00:02:14,229 --> 00:02:12,959
a upper torso mannequin size doll on

67
00:02:16,949 --> 00:02:14,239
board the station with a number of

68
00:02:19,670 --> 00:02:16,959
dosimeters placed throughout it that

69
00:02:21,670 --> 00:02:19,680
serves as a radiation monitoring device

70
00:02:23,190 --> 00:02:21,680
giving information to teams down on the

71
00:02:25,030 --> 00:02:23,200
ground just how much radiation these

72
00:02:27,110 --> 00:02:25,040
astronauts are being exposed to during

73
00:02:28,309 --> 00:02:27,120
their expedition space flights he'll

74
00:02:29,830 --> 00:02:28,319
also be

75
00:02:31,910 --> 00:02:29,840
throughout the week taking some

76
00:02:34,309 --> 00:02:31,920
observations for the russian signer

77
00:02:37,110 --> 00:02:34,319
investigation which looks at the world's

78
00:02:39,910 --> 00:02:37,120
ocean areas on a specific latitude belt

79
00:02:41,910 --> 00:02:39,920
searching for bioproductive water areas

80
00:02:43,750 --> 00:02:41,920
for both commercial fishing and

81
00:02:45,910 --> 00:02:43,760
biological research

82
00:02:47,670 --> 00:02:45,920
studies he'll also be doing a few

83
00:02:50,070 --> 00:02:47,680
maintenance tasks himself on the russian

84
00:02:52,309 --> 00:02:50,080
systems specifically focusing on the

85
00:02:54,790 --> 00:02:52,319
russian electron system which is one of

86
00:02:56,630 --> 00:02:54,800
the oxygen generating devices on board

87
00:02:58,470 --> 00:02:56,640
the international space station you can

88
00:03:00,229 --> 00:02:58,480

see a picture taken with the previous

89
00:03:03,030 --> 00:03:00,239
expedition crew here holding up some of

90
00:03:05,270 --> 00:03:03,040
those electron generators nasa astronaut

91
00:03:07,190 --> 00:03:05,280
chris cassidy pretty much focusing his

92
00:03:08,790 --> 00:03:07,200
entire week on preparation for some

93
00:03:09,990 --> 00:03:08,800
upcoming spacewalks that he'll be

94
00:03:11,509 --> 00:03:10,000
undertaking

95
00:03:13,910 --> 00:03:11,519
he'll be stepping outside into the

96
00:03:16,550 --> 00:03:13,920
vacuum of space on two spacewalks over

97
00:03:18,390 --> 00:03:16,560
two weeks joining him will be issa

98
00:03:22,550 --> 00:03:18,400
astronaut luca parmitano

99
00:03:24,710 --> 00:03:22,560
cassidy designated ev1 parmitano ev2

100
00:03:26,789 --> 00:03:24,720
this will be cassidy's fifth and sixth

101
00:03:29,190 --> 00:03:26,799
spacewalks of his career

102
00:03:32,070 --> 00:03:29,200
he already has 23 and a half hours of

103
00:03:34,149 --> 00:03:32,080
spacewalking time in four previous evas

104
00:03:37,430 --> 00:03:34,159
including the unplanned ammonia leak

105
00:03:39,270 --> 00:03:37,440
repair that took back on may 11th

106
00:03:41,509 --> 00:03:39,280
cassidy will be

107
00:03:43,589 --> 00:03:41,519
preparing his emu or extra vehicular

108
00:03:45,350 --> 00:03:43,599
mobility unit the spacesuit that he'll

109
00:03:47,430 --> 00:03:45,360
be wearing throughout this

110
00:03:48,869 --> 00:03:47,440
spacewalking procedure

111
00:03:50,550 --> 00:03:48,879
checking out the

112
00:03:53,270 --> 00:03:50,560
glove heaters and also the battery

113
00:03:55,509 --> 00:03:53,280

systems and doing an on-orbit fit check

114
00:03:57,750 --> 00:03:55,519
verification he'll be joining that fit

115
00:04:00,309 --> 00:03:57,760
check verification by parmitano and

116
00:04:02,710 --> 00:04:00,319
fellow nasa astronaut karen nyberg we'll

117
00:04:04,869 --> 00:04:02,720
also be going over the procedures in a

118
00:04:06,309 --> 00:04:04,879
conference with spacewalk officers down

119
00:04:07,509 --> 00:04:06,319
here on the ground in mission control

120
00:04:09,910 --> 00:04:07,519
houston

121
00:04:11,830 --> 00:04:09,920
also doing a software review

122
00:04:14,550 --> 00:04:11,840
of what's known as the doug the dynamic

123
00:04:17,189 --> 00:04:14,560
onboard ubiquitous graphics system

124
00:04:19,189 --> 00:04:17,199
aside from all of this eva preparation

125
00:04:21,590 --> 00:04:19,199
throughout the week and over the weekend

126
00:04:23,909 --> 00:04:21,600
chris cassidy will also be doing quite a

127
00:04:25,510 --> 00:04:23,919
few experimental works

128
00:04:28,070 --> 00:04:25,520
he'll be working with the

129
00:04:30,070 --> 00:04:28,080
binary colloidal alloy tests preparing a

130
00:04:32,469 --> 00:04:30,080
few samples for

131
00:04:34,310 --> 00:04:32,479
installation in this experiment

132
00:04:36,710 --> 00:04:34,320
also known as bcat

133
00:04:39,350 --> 00:04:36,720
for short this experiment looks to

134
00:04:41,510 --> 00:04:39,360
document the formation of crystals

135
00:04:43,430 --> 00:04:41,520
from microscopic spheres known as

136
00:04:45,510 --> 00:04:43,440
colloids while they're suspended in a

137
00:04:47,670 --> 00:04:45,520
liquid in microgravity

138
00:04:50,070 --> 00:04:47,680

he'll also be conducting his own monthly

139
00:04:52,469 --> 00:04:50,080
periodic fitness evaluation which will

140
00:04:53,590 --> 00:04:52,479
be performed on the sevis

141
00:04:55,189 --> 00:04:53,600
one of the

142
00:04:56,950 --> 00:04:55,199
exercise devices onboard the

143
00:04:58,790 --> 00:04:56,960
international space station

144
00:05:00,790 --> 00:04:58,800
also chris cassidy will be getting in

145
00:05:03,270 --> 00:05:00,800
some more time throughout the week on

146
00:05:05,590 --> 00:05:03,280
the spheres experiment spheres standing

147
00:05:08,629 --> 00:05:05,600
for the synchronized positioned hold

148
00:05:10,870 --> 00:05:08,639
engage reorient experimental satellites

149
00:05:13,110 --> 00:05:10,880
to these small self-contained bowling

150
00:05:15,430 --> 00:05:13,120
ball sized objects which are used for a

151
00:05:17,510 --> 00:05:15,440
number of different exciting experiments

152
00:05:20,390 --> 00:05:17,520
including formation flying in the

153
00:05:22,310 --> 00:05:20,400
development of algorithms by

154
00:05:24,310 --> 00:05:22,320
students and teams from schools across

155
00:05:26,469 --> 00:05:24,320
the country they get a chance to follow

156
00:05:29,189 --> 00:05:26,479
along with the expedition astronauts

157
00:05:30,629 --> 00:05:29,199
watching as these satellites conduct

158
00:05:33,110 --> 00:05:30,639
various flying

159
00:05:35,749 --> 00:05:33,120
maneuvers such as rendezvous and docking

160
00:05:38,310 --> 00:05:35,759
and also again that formation flying

161
00:05:39,909 --> 00:05:38,320
so cassidy doing a few spheres test runs

162
00:05:41,670 --> 00:05:39,919
throughout the week

163
00:05:43,110 --> 00:05:41,680

moving on our third russian cosmonaut

164
00:05:44,790 --> 00:05:43,120
fyodor yurchikhin one of the newer

165
00:05:45,830 --> 00:05:44,800
members on board the international space

166
00:05:46,950 --> 00:05:45,840
station

167
00:05:49,670 --> 00:05:46,960
quite a bit of

168
00:05:51,749 --> 00:05:49,680
maintenance work on his task list over

169
00:05:53,830 --> 00:05:51,759
the week inside of the russian segment

170
00:05:55,830 --> 00:05:53,840
he'll be installing two adjustable

171
00:05:57,830 --> 00:05:55,840
length hoses inside of the russian gas

172
00:06:00,550 --> 00:05:57,840
liquid mixture filter

173
00:06:03,510 --> 00:06:00,560
also taking some time to conduct the

174
00:06:04,950 --> 00:06:03,520
russian bar experiment which looks to

175
00:06:07,350 --> 00:06:04,960
develop various

176
00:06:09,830 --> 00:06:07,360
methods for detecting depressurization

177
00:06:10,790 --> 00:06:09,840
in any of the modules on the russian

178
00:06:13,590 --> 00:06:10,800
segment

179
00:06:15,029 --> 00:06:13,600
he'll be working that in in tandem with

180
00:06:16,710 --> 00:06:15,039
controllers down on the ground which

181
00:06:18,950 --> 00:06:16,720
would be simulating a number of

182
00:06:21,110 --> 00:06:18,960
different test runs for him

183
00:06:22,469 --> 00:06:21,120
we'll also have some standard

184
00:06:24,390 --> 00:06:22,479
software

185
00:06:26,950 --> 00:06:24,400
loading activities on some of the

186
00:06:29,189 --> 00:06:26,960
russian laptops just doing a few updates

187
00:06:31,350 --> 00:06:29,199
to some of their controlling systems

188
00:06:33,510 --> 00:06:31,360

also getting his hands on some of the

189
00:06:34,870 --> 00:06:33,520
experiment work on the russian segment

190
00:06:36,790 --> 00:06:34,880
he'll be working with the russian

191
00:06:38,710 --> 00:06:36,800
identification

192
00:06:40,150 --> 00:06:38,720
experiment that's an ongoing

193
00:06:42,070 --> 00:06:40,160
investigation

194
00:06:43,830 --> 00:06:42,080
looking into the various dynamic loads

195
00:06:45,749 --> 00:06:43,840
that the international space station's

196
00:06:46,710 --> 00:06:45,759
russian segment structure is subjected

197
00:06:49,430 --> 00:06:46,720
to

198
00:06:51,830 --> 00:06:49,440
during different dynamic operations

199
00:06:53,909 --> 00:06:51,840
some of these dynamic operations include

200
00:06:56,469 --> 00:06:53,919
docking and visiting vehicles

201
00:06:59,029 --> 00:06:56,479
also station reboots

202
00:07:01,990 --> 00:06:59,039
the physical exercise of the astronauts

203
00:07:04,390 --> 00:07:02,000
themselves and also up any extra

204
00:07:06,390 --> 00:07:04,400
vehicular activity or spacewalks uh the

205
00:07:07,510 --> 00:07:06,400
russians having just completed one back

206
00:07:09,990 --> 00:07:07,520
in uh

207
00:07:11,749 --> 00:07:10,000
late june and the us

208
00:07:14,629 --> 00:07:11,759
os crew members getting ready to

209
00:07:17,029 --> 00:07:14,639
complete two over the next two weeks

210
00:07:19,110 --> 00:07:17,039
european astronaut luca parmitano

211
00:07:21,350 --> 00:07:19,120
joining cassidy and much of his

212
00:07:23,749 --> 00:07:21,360
activities this week as they continue to

213
00:07:25,510 --> 00:07:23,759

prepare for those uh two upcoming

214
00:07:27,990 --> 00:07:25,520
spacewalks

215
00:07:30,390 --> 00:07:28,000
he'll be doing a an on-orbit fit check

216
00:07:33,189 --> 00:07:30,400
verification of his own spacesuit

217
00:07:34,870 --> 00:07:33,199
along with cassidy he'll also be

218
00:07:36,710 --> 00:07:34,880
responsible for doing a checkout of

219
00:07:40,550 --> 00:07:36,720
their safer devices

220
00:07:42,870 --> 00:07:40,560
the safer are small nitrogen gas-powered

221
00:07:44,950 --> 00:07:42,880
backpacks that the astronauts wear

222
00:07:46,629 --> 00:07:44,960
sort of acting as their life jacket

223
00:07:49,110 --> 00:07:46,639
during these

224
00:07:50,790 --> 00:07:49,120
spacewalks aside from the regular

225
00:07:52,390 --> 00:07:50,800
contingent of tethers and hand grips

226
00:07:54,550 --> 00:07:52,400
that they use to keep attached to the

227
00:07:56,230 --> 00:07:54,560
station the safer can serve as a last

228
00:07:58,790 --> 00:07:56,240
resort should the astronauts begin to

229
00:08:00,790 --> 00:07:58,800
float away free from the station getting

230
00:08:02,710 --> 00:08:00,800
them back to safety

231
00:08:04,629 --> 00:08:02,720
parmitano also

232
00:08:06,710 --> 00:08:04,639
scheduled to do his own monthly periodic

233
00:08:07,670 --> 00:08:06,720
fitness evaluation also on that sevis

234
00:08:08,869 --> 00:08:07,680
device

235
00:08:10,710 --> 00:08:08,879
and then doing

236
00:08:13,189 --> 00:08:10,720
some pretty major

237
00:08:15,430 --> 00:08:13,199
maintenance tasks on board the station

238
00:08:17,270 --> 00:08:15,440

for their various uh eclipse or the

239
00:08:19,830 --> 00:08:17,280
environmental uh

240
00:08:22,309 --> 00:08:19,840
regeneration systems he'll be inside of

241
00:08:24,869 --> 00:08:22,319
the european columbus module

242
00:08:27,670 --> 00:08:24,879
working on removing and replacing the

243
00:08:28,869 --> 00:08:27,680
columbus's water processing assembly

244
00:08:30,950 --> 00:08:28,879
number two

245
00:08:32,870 --> 00:08:30,960
and also replacing some

246
00:08:35,269 --> 00:08:32,880
items inside of the waste and hygiene

247
00:08:36,949 --> 00:08:35,279
compartment he'll be replacing some of

248
00:08:39,029 --> 00:08:36,959
the piping between the pump separator

249
00:08:42,070 --> 00:08:39,039
and the pre-treat and water pump

250
00:08:43,509 --> 00:08:42,080
then our final expedition 36 crew member

251
00:08:45,190 --> 00:08:43,519
karen nyberg

252
00:08:46,790 --> 00:08:45,200
doing some robotics workstation

253
00:08:48,310 --> 00:08:46,800
checkouts over

254
00:08:49,509 --> 00:08:48,320
the rest of the week

255
00:08:51,030 --> 00:08:49,519
she'll be

256
00:08:53,269 --> 00:08:51,040
responsible for conducting all the

257
00:08:55,750 --> 00:08:53,279
robotic operations during cassidy and

258
00:08:57,590 --> 00:08:55,760
luca parmitano's spacewalks controlling

259
00:09:00,150 --> 00:08:57,600
the station's canada arm tour the

260
00:09:02,470 --> 00:09:00,160
robotic arm she'll be doing a checkout

261
00:09:04,870 --> 00:09:02,480
of that display and control panel also

262
00:09:07,829 --> 00:09:04,880
continuing with a lot of

263
00:09:10,389 --> 00:09:07,839

giving a hand with all the space suit or

264
00:09:12,949 --> 00:09:10,399
the emu preparations and going over all

265
00:09:15,509 --> 00:09:12,959
the space walk procedures

266
00:09:17,590 --> 00:09:15,519
she'll be doing her own review of the

267
00:09:19,990 --> 00:09:17,600
space station's robotic arm of the

268
00:09:21,750 --> 00:09:20,000
remote manipulator systems doug

269
00:09:23,670 --> 00:09:21,760
the doug again standing for dynamic

270
00:09:25,829 --> 00:09:23,680
onboard ubiquitous graphics she'll be

271
00:09:28,070 --> 00:09:25,839
doing that review with uh spacewalk

272
00:09:30,470 --> 00:09:28,080
officers down here on the ground

273
00:09:32,870 --> 00:09:30,480
aside from that uh quite a bit of

274
00:09:34,710 --> 00:09:32,880
experiment work for her

275
00:09:37,910 --> 00:09:34,720
aside from

276
00:09:39,269 --> 00:09:37,920
doing some earth cam setup the earth cam

277
00:09:41,110 --> 00:09:39,279
is the earth knowledge acquired by

278
00:09:42,949 --> 00:09:41,120
middle school students i shall be

279
00:09:45,030 --> 00:09:42,959
setting that up

280
00:09:46,230 --> 00:09:45,040
towards the end of the week

281
00:09:47,750 --> 00:09:46,240
and

282
00:09:49,910 --> 00:09:47,760
preparing that for middle school

283
00:09:52,310 --> 00:09:49,920
students to control and take photos of

284
00:09:53,910 --> 00:09:52,320
various locations around the world

285
00:09:56,310 --> 00:09:53,920
she'll also be working inside of the

286
00:09:58,389 --> 00:09:56,320
combustion integrated rack removing and

287
00:10:01,110 --> 00:09:58,399
replacing one of the multi-user droplet

288
00:10:02,949 --> 00:10:01,120

combustion apparatus fuel reservoirs

289
00:10:04,790 --> 00:10:02,959
these reservoirs are used to contain the

290
00:10:07,110 --> 00:10:04,800
liquid fuel used during droplet

291
00:10:08,870 --> 00:10:07,120
combustion experiments that combustion

292
00:10:11,190 --> 00:10:08,880
integrated racket self-contained rack

293
00:10:12,870 --> 00:10:11,200
onboard the international space station

294
00:10:15,350 --> 00:10:12,880
for various combustion experiments