
NASA

1
00:00:00,000 --> 00:00:03,740
\h Music.

2
00:00:03,740 --> 00:00:10,570
\h NARRATOR: Recent shuttle missions to the International Space Station have added to the outside of th

3
00:00:10,570 --> 00:00:17,630
\h now the crew of space shuttle Discovery's STS-120 mission will add to the inside, as well.

4
00:00:17,630 --> 00:00:25,430
\h Riding in the cargo bay of space shuttle Discovery is a module called Harmony that will link laboratories

5
00:00:25,430 --> 00:00:31,030
\h and Europe and Japan's space agencies. It will also give ISS crews more room

6
00:00:31,030 --> 00:00:37,320
\h to work and live in by expanding the station to about 18,000 cubic feet.

7
00:00:37,320 --> 00:00:41,730
\h This morning we take a look at this important mission. Live from

8
00:00:41,730 --> 00:00:50,570
\h NASA's Kennedy Space Center in Florida, this is the STS-120 webcast.

9
00:00:50,570 --> 00:00:55,630
\h STEPHANIE STILSON: Welcome, I'm your host, Stephanie Stilson, Discovery's flow director at Kenned

10
00:00:55,630 --> 00:00:59,550
\h We are joined today by our special guest, astronaut Sandra Magnus,

11
00:00:59,550 --> 00:01:04,760
\h a mission specialist who flew aboard space shuttle Atlantis during mission STS-112.

12
00:01:04,760 --> 00:01:10,090
\h She will tell us about spaceflight and will answer some of our viewers' questions.

13
00:01:10,090 --> 00:01:14,550

\h Sandy, you flew with STS-120 Commander Pam Melroy and worked with

14
00:01:14,550 --> 00:01:18,580
\h International Space Station Commander Peggy Whitson during STS-112.

15
00:01:18,580 --> 00:01:20,740
\h How do you think this flight will go for both of them?

16
00:01:20,740 --> 00:01:25,100
\h SANDRA MAGNUS: Oh, they'll have a great mission. They're both hard workers. They're both great pe

17
00:01:25,100 --> 00:01:30,430
\h They've got some great crews. They've got a difficult mission, but they're going to do a great job. It'll be

18
00:01:30,430 --> 00:01:33,100
\h STILSON: The module Discovery will be carrying is called Harmony,

19
00:01:33,100 --> 00:01:37,990
\h and it will be an addition to the International Space Station in many ways.

20
00:01:37,990 --> 00:01:45,430
\h NARRATOR: Harmony, also known as Node 2, will connect more than laboratories at the International S

21
00:01:45,430 --> 00:01:49,820
\h It is literally a link between what the station has accomplished so far and

22
00:01:49,820 --> 00:01:54,870
\h its potential to dramatically improve research in microgravity.

23
00:01:54,870 --> 00:01:59,420
\h Harmony, which was built in Italy, is also a link between the space station

24
00:01:59,420 --> 00:02:03,710
\h and students on Earth who chose the name for the module.

25
00:02:03,710 --> 00:02:08,400
\h Once attached to NASA's Destiny laboratory, Harmony will extend the living

26
00:02:08,400 --> 00:02:15,390
\h area inside the International Space Station to about 18,000 cubic feet.

27
00:02:15,390 --> 00:02:24,250
\h Unlike most other modules on the station, Harmony has six hatches, or doorways, that can hold other st

28
00:02:24,250 --> 00:02:32,110
\h Upcoming space shuttle missions will carry a set of new research labs to the station that will connect to

29
00:02:32,110 --> 00:02:40,370
\h When the work is complete, Harmony will be the center of the most advanced laboratory complex ever f

30
00:02:40,370 --> 00:02:46,630
\h STILSON: As we said, Pam Melroy will command the mission, which will be her third. George Zamka is

31
00:02:46,630 --> 00:02:51,240
\h Scott Parazynski, Stephanie Wilson, Douglas Wheelock, Dan Tani and

32
00:02:51,240 --> 00:02:54,990
\h Paolo Nespoli will serve in many roles as mission specialists.

33
00:02:54,990 --> 00:03:00,020
\h Commander Melroy recently talked about the mission's unique role.

34
00:03:00,020 --> 00:03:03,590
\h PAM MELROY: Well, this is a pretty complex assembly mission,

35
00:03:03,590 --> 00:03:06,560
\h and that’s because we actually have two goals that we’re trying to achieve.

36
00:03:06,560 --> 00:03:12,560
\h Usually when we have an assembly mission, there’s one big element that we’re delivering and activating

37
00:03:12,560 --> 00:03:22,130
\h we actually have two things that we’re doing. Our first activity will be to deliver the Node 2, which is nam

38
00:03:22,130 --> 00:03:30,520

\h and it's essentially the hub of all the scientific laboratory sections of the space station. So we'll be delive

39
00:03:30,520 --> 00:03:35,370
\h We're actually going to be stowing it temporarily on the side of Node 1,

40
00:03:35,370 --> 00:03:40,680
\h Unity, because it doesn't go into its final location after we've undocked,

41
00:03:40,680 --> 00:03:44,190
\h because we're actually docked to the place that it's finally going to go.

42
00:03:44,190 --> 00:03:47,970
\h So you can imagine there's a lot of complexity associated with moving that

43
00:03:47,970 --> 00:03:55,060
\h element around. In addition, we’re taking the P6 solar array, which currently sits on top of the Z1 truss,

44
00:03:55,060 --> 00:04:05,700
\h where it’s been since 2000 when it was delivered just after the first people started living aboard the spac

45
00:04:05,700 --> 00:04:07,000
\h And we’re going to be moving it all the way out to the end of the port truss.

46
00:04:07,000 --> 00:04:11,090
\h STILSON: Sandy, all space station segments undergo a rigorous prelaunch regimen.

47
00:04:11,090 --> 00:04:14,860
\h Tell us a little about Harmony's history since arriving at Kennedy Space Center.

48
00:04:14,860 --> 00:04:21,020
\h MAGNUS: Certainly. The Harmony module came to Kennedy Space Center from its assembly factory in

49
00:04:21,020 --> 00:04:26,690
\h in June 2003 aboard an Italian cargo airplane. Harmony was driven to the

50
00:04:26,690 --> 00:04:30,100
\h Space Station Processing Facility here at Kennedy so technicians and

51
00:04:30,100 --> 00:04:35,560
\h engineers could run tests and ready critical elements of the module for launch. From there,

52
00:04:35,560 --> 00:04:40,110
\h the 31,000-pound segment was packed into a cargo container shaped like the

53
00:04:40,110 --> 00:04:43,480
\h shuttle's cargo bay and driven carefully to the launch pad.

54
00:04:43,480 --> 00:04:48,660
\h It's now inside Discovery's cargo bay and it's ready to take its place in space.

55
00:04:48,660 --> 00:04:52,710
\h STILSON: Once Harmony is connected to the station in its temporary position,

56
00:04:52,710 --> 00:04:55,960
\h the crew will move another segment of the space station to its permanent place.

57
00:04:55,960 --> 00:04:59,390
\h The P6 truss segment that Commander Melroy just talked about will be

58
00:04:59,390 --> 00:05:02,420
\h detached and moved to the far left side of the long girder that crosses the

59
00:05:02,420 --> 00:05:07,780
\h center of the outpost. For the seven-person crew of Discovery and the

60
00:05:07,780 --> 00:05:10,030
\h three people aboard the International Space Station,

61
00:05:10,030 --> 00:05:15,700
\h the mission will be a complex mix of spacewalks, robotic arm maneuvers and plenty of tasks inside

62
00:05:15,700 --> 00:05:21,430
\h the shuttle and the station. Astronaut Scott Parazynski talked about the work.

63
00:05:21,430 --> 00:05:25,200

\h SCOTT PARAZYNSKI: We'll demate the cooling loops, the ammonia fluid lines.

64
00:05:25,200 --> 00:05:29,750
\h We'll demate power and data connectors, also on spacewalks,

65
00:05:29,750 --> 00:05:35,090
\h and then the robotic crew from inside the space station will grapple the P6.

66
00:05:35,090 --> 00:05:38,670
\h Dan Tani and I, my spacewalking partner on EVA2,

67
00:05:38,670 --> 00:05:49,500
\h will unbolt the P6 and then the P6 will be lifted off its perch on top of the station and over the course of t

68
00:05:49,500 --> 00:05:53,190
\h involving a handoff to the shuttle arm and then back to the space station arm,

69
00:05:53,190 --> 00:05:58,060
\h we'll get it into position for EVA3 when Doug Wheelock and myself will

70
00:05:58,060 --> 00:06:07,080
\h essentially reverse this whole process. We'll guide the P6 into place, giving verbal commands to the rob

71
00:06:07,080 --> 00:06:14,670
\h and once it's exactly where we want it, we'll bolt the two structures together.

72
00:06:14,670 --> 00:06:19,050
\h STILSON: Discovery carries another important element for the space station on STS-120:

73
00:06:19,050 --> 00:06:25,770
\h new crew member Daniel Tani. Tani will take the place of Clayton Anderson, who will ride Discovery bac

74
00:06:25,770 --> 00:06:31,800
\h He will also help move Harmony to its permanent home at the end of the Destiny lab after Discovery lea

75
00:06:31,800 --> 00:06:35,260
\h To make Tani comfortable during his two-month stay at the station,

76
00:06:35,260 --> 00:06:38,810
\h NASA has packed food and clothing the astronaut chose.

77
00:06:38,810 --> 00:06:42,430
\h The supplies are tucked into several lockers on Discovery's middeck and

78
00:06:42,430 --> 00:06:45,820
\h will be transferred to the station while the orbiter is docked.

79
00:06:45,820 --> 00:06:49,770
\h It may not sound like much room for all the things one would need for months in space,

80
00:06:49,770 --> 00:06:56,190
\h but every single shuttle locker can be packed full of supplies. To show just how much a locker can hold,

81
00:06:56,190 --> 00:07:02,090
\h we brought this mock-up locker over from the Flight Crew Equipment area here at Kennedy.

82
00:07:02,090 --> 00:07:05,180
\h MAGNUS: Lockers can be packed with special equipment, clothing and food.

83
00:07:05,180 --> 00:07:08,520
\h This one is a test unit that engineers can practice with.

84
00:07:08,520 --> 00:07:15,010
\h We stuff these full of food like this, and we just open it up and chow down.

85
00:07:15,010 --> 00:07:20,100
\h STILSON: How do you keep all this stuff from floating around out of control inside the shuttle or the stati

86
00:07:20,100 --> 00:07:23,800
\h MAGNUS: You can open the locker and there's usually trays in there.

87
00:07:23,800 --> 00:07:26,430
\h You can pull out the trays and so you can just target a smaller section,

88
00:07:26,430 --> 00:07:30,690

\h and they have nets and things over them to keep things from exploding out of them when we open them

89
00:07:30,690 --> 00:07:37,230
\h STILSON: How do you know which locker to open?

90
00:07:37,230 --> 00:07:44,290
\h MAGNUS: There's a lot of smart people on the ground that figure out ahead of time how to pack the thin

91
00:07:44,290 --> 00:07:46,300
\h and they have nice labels on the front: food, clothing, onboard documentation and various types of comp

92
00:07:46,300 --> 00:07:49,050
\h other things that we need. So we know exactly where to go.

93
00:07:49,050 --> 00:07:52,280
\h STILSON: Well, how many times during a mission do you have to access the locker?

94
00:07:52,280 --> 00:07:55,450
\h MAGNUS: We actually get in and out of the lockers all day long. Of course,

95
00:07:55,450 --> 00:07:55,680
\h all your meals are in lockers, so you're opening that frequently,

96
00:07:55,680 --> 00:07:58,780
\h your clothing to get dressed in the morning and change clothes in the evening

97
00:07:58,780 --> 00:08:01,690
\h and, of course, all the equipment that we need to use.

98
00:08:01,690 --> 00:08:03,000
\h We get in and out of there a lot.

99
00:08:03,000 --> 00:08:05,610
\h STILSON: Speaking of important aspects of the space station, several guests of the

100
00:08:05,610 --> 00:08:10,150
\h nasa.gov Web site posted questions recently for Sandy.

101
00:08:10,150 --> 00:08:14,060
\h Among them, Molly from Wayne asks simply, "Do astronauts have fun in space?"

102
00:08:14,060 --> 00:08:20,540
\h MAGNUS: Yes we do. It's a lot of fun. You're working very hard during a shuttle mission, it feels like you

103
00:08:20,540 --> 00:08:23,610
\h but you're floating and that adds a lot of fun to our work.

104
00:08:23,610 --> 00:08:26,300
\h STILSON: Great. Our next question comes from Silvio of Italy.

105
00:08:26,300 --> 00:08:29,450
\h During Shuttle missions and ISS, how many "free time" slots do astronauts have,

106
00:08:29,450 --> 00:08:31,760
\h other than for sleeping?

107
00:08:31,760 --> 00:08:34,130
\h MAGNUS: For a shuttle mission, you really don't get a lot of free time.

108
00:08:34,130 --> 00:08:38,240
\h We usually have about a half a day off, 10 days or so into the mission,

109
00:08:38,240 --> 00:08:44,100
\h and you spend a little bit of that time catching up on your work, because invariably there's something yo

110
00:08:44,100 --> 00:08:47,360
\h But you do end up with a little bit of time to look out the window and

111
00:08:47,360 --> 00:08:50,690
\h just think about where you are and how special of a place it is.

112
00:08:50,690 --> 00:08:55,930
\h STILSON: Speaking of having a lot to do, Katie from Malvern asks, "Does each astronaut get assigned

113
00:08:55,930 --> 00:08:59,780

\h MAGNUS: Yes we do. Again, on shuttle missions, because you're so very busy,

114
00:08:59,780 --> 00:09:02,980
\h you want to practice for what you're going to do in space before you

115
00:09:02,980 --> 00:09:08,100
\h go, so everyone has very specific tasks, whether it's working the robot arm, working on the spacewalks,

116
00:09:08,100 --> 00:09:12,040
\h directing the spacewalks or even working on the locker in the stowage and

117
00:09:12,040 --> 00:09:15,870
\h keeping track of things, so we're all very practiced at our specific job.

118
00:09:15,870 --> 00:09:20,620
\h STILSON: Corey from Phonexville wants to know about the launch. He asks, "Is it scary launching up in

119
00:09:20,620 --> 00:09:24,450
\h MAGNUS: You know, I was wondering if I was going to be scared or not when I did my first launch,

120
00:09:24,450 --> 00:09:29,550
\h and it turns out I was just so excited about it, it was so thrilling to finally get to go do this, I was not fright

121
00:09:29,550 --> 00:09:35,350
\h STILSON: Regarding this mission in particular, and with what you know about the space station,

122
00:09:35,350 --> 00:09:40,570
\h Justin from Tuscaloosa asks what the biggest challenge will be during the STS-120 mission.

123
00:09:40,570 --> 00:09:43,520
\h MAGNUS: The biggest challenge actually in the mission itself is, as you heard Pam talk about,

124
00:09:43,520 --> 00:09:49,520
\h they have to not only take Harmony out of the payload bay and attach it to the station,

125
00:09:49,520 --> 00:09:53,790
\h they also have to move the P6 truss out to the very end of the truss, and that's

126
00:09:53,790 --> 00:09:57,280
\h going to involve some complex robotics and some complex spacewalks.

127
00:09:57,280 --> 00:10:01,560
\h And in the meantime, on the inside, Dan and Clay are very busily switching

128
00:10:01,560 --> 00:10:05,180
\h their things so that Dan can set up and get ready to live on the station and

129
00:10:05,180 --> 00:10:08,660
\h Clay can bring all of his things and come home.

130
00:10:08,660 --> 00:10:12,980
\h STILSON: Well, finally, we wanted to give everyone a chance to experience a mission through the eyes

131
00:10:12,980 --> 00:10:16,310
\h We've prepared some video highlights from mission STS-112, which was the last mission you flew on. S

132
00:10:16,310 --> 00:10:20,950
\h would you go through the video with us and tell us what you're seeing?

133
00:10:20,950 --> 00:10:24,320
\h MAGNUS: Certainly. I'd love to. Of course, right before launch,

134
00:10:24,320 --> 00:10:28,210
\h you get into your pressure suits and make sure they're functional,

135
00:10:28,210 --> 00:10:31,310
\h and you're looking forward to getting out to the launch pad and getting

136
00:10:31,310 --> 00:10:34,830
\h strapped into the orbiter, and it takes a few hours to do that.

137
00:10:34,830 --> 00:10:40,160
\h I was the last one in, so I didn't have to lay on my back for very long until it was time for launch.

138
00:10:40,160 --> 00:10:45,290

\h And six seconds before launch,the main engines light. We do that to make sure that they're working pro

139
00:10:45,290 --> 00:10:49,660
\h You feel the sway of the whole stack, and then at T-0, at launch,

140
00:10:49,660 --> 00:10:54,700
\h the solid rocket boosters light and it's noisy. It's vibrating, everything's rattling around.

141
00:10:54,700 --> 00:10:57,670
\h You hear a lot of roaring; even though you have a helmet on, it's still noisy.

142
00:10:57,670 --> 00:11:03,010
\h I was trying to watch the computer screens; they were bouncing all over the place. And it stays like that

143
00:11:03,010 --> 00:11:06,540
\h and then the solid rocket boosters fall off. We have another six-and-a-half minutes,

144
00:11:06,540 --> 00:11:10,030
\h we get to orbit. We turn ourselves into an orbiter and live at home,

145
00:11:10,030 --> 00:11:13,750
\h and a couple days later, we're already ready to dock to the space station,

146
00:11:13,750 --> 00:11:19,250
\h open the hatch and meet the space station crew. Peggy and her crew had

147
00:11:19,250 --> 00:11:23,030
\h been up there for four months already. We didn't have a lot of time to talk.

148
00:11:23,030 --> 00:11:25,480
\h We immediately had to get to work. As I mentioned,

149
00:11:25,480 --> 00:11:30,930
\h shuttle missions are very busy. Peggy and I got started on the robotics, using the station robotic arm to

150
00:11:30,930 --> 00:11:34,540
\h S1 truss out of the payload bay and swing it around and attach it.

151
00:11:34,540 --> 00:11:40,720
\h While we're working on the robotics to get the S1 attached, the spacewalkers are getting ready for their

152
00:11:40,720 --> 00:11:44,750
\h they're going to go out immediately after we attach the truss. Working the robot arm is difficult.

153
00:11:44,750 --> 00:11:48,130
\h It takes two people. We do not have any windows,

154
00:11:48,130 --> 00:11:52,440
\h we're triangulating with different camera views to keep track of where the truss is.

155
00:11:52,440 --> 00:11:55,080
\h We have to move it very slowly because it's very heavy,

156
00:11:55,080 --> 00:12:02,920
\h 45,000 pounds. And we very slowly move it into place and the spacewalkers then come out, and it's the

157
00:12:02,920 --> 00:12:07,190
\h And they connect all of the data cables and the power cables and the thermal cables.

158
00:12:07,190 --> 00:12:13,710
\h And the S1 contained the radiators, basically the cooling system for the station. And once we had every

159
00:12:13,710 --> 00:12:17,480
\h the ground immediately started to deploy the radiators, and here you see them turning the radiators to th

160
00:12:17,480 --> 00:12:24,980
\h and they'll sort of unfold like accordions. Meanwhile, the spacewalk was continuing.

161
00:12:24,980 --> 00:12:28,410
\h They had a lot more work to do in some other areas.

162
00:12:28,410 --> 00:12:32,080
\h After maybe nine days or so, we got everything done.

163
00:12:32,080 --> 00:12:36,620

\h We really had come together almost like a big family and it was time to say goodbye,

164
00:12:36,620 --> 00:12:42,040
\h and that was sort of sad. I know the station crew was happy to see us go and I think they were equally h

165
00:12:42,040 --> 00:12:47,340
\h because we just sort of brought our own little whirlwind tornado of activity while we were there.

166
00:12:47,340 --> 00:12:49,740
\h But we shut the hatches, said goodbye.

167
00:12:49,740 --> 00:12:57,580
\h We had to depressurize, and left three people living aboard the space station while we prepared to undo

168
00:12:57,580 --> 00:13:03,590
\h And we have a very nice tradition on the station where they'll ring us off with the bell and announce that

169
00:13:03,590 --> 00:13:11,090
\h and we knew that was officially the end of our docked stay, and home we go.

170
00:13:11,090 --> 00:13:17,710
\h What's really neat though, before we depart from the station completely,

171
00:13:17,710 --> 00:13:23,600
\h we do a fly-around. We do sort of a big loop where we can see the station, we can see the part of the st

172
00:13:23,600 --> 00:13:25,990
\h and we do a lot of photography for the photo documentation of the station. About a day later, we've pacl

173
00:13:25,990 --> 00:13:31,700
\h we've turned ourselves back into a heavy glider and we come home. And it seems like the mission went

174
00:13:31,700 --> 00:13:35,410
\h it's almost a dream by the time you land and you look back at the last 11 days or so.

175
00:13:35,410 --> 00:13:38,750
\h And it's hard to believe you were up in space at the space station,

176
00:13:38,750 --> 00:13:46,220
\h adding a piece of it and being successful. And now your mission's over and you go back to work.

177
00:13:46,220 --> 00:13:50,330
\h STILSON: That's just amazing. Well, thank you very much for that in-depth look at spaceflight from a un

178
00:13:50,330 --> 00:13:52,760
\h and thanks for being our guest today.

179
00:13:52,760 --> 00:13:54,910
\h MAGNUS: You're welcome. It was my pleasure.

180
00:13:54,910 --> 00:14:01,020
\h STILSON: Well, that's going to wrap it up for this preview of mission STS-120 aboard Space Shuttle Dis