



1
00:00:03,500 --> 00:00:02,060
and this month we are highlighting many

2
00:00:05,930 --> 00:00:03,510
of the technology tests and

3
00:00:08,150 --> 00:00:05,940
demonstrations aboard the ISS the

4
00:00:09,980 --> 00:00:08,160
technology we are talking about today

5
00:00:11,450 --> 00:00:09,990
actually allows us to have an

6
00:00:13,850 --> 00:00:11,460
International Space Station where

7
00:00:16,880 --> 00:00:13,860
astronauts can live and work in a

8
00:00:19,429 --> 00:00:16,890
comfortable environment Lori Meggs is at

9
00:00:20,810 --> 00:00:19,439
NASA's payload operations integration

10
00:00:23,290 --> 00:00:20,820
Center at the Marshall Space Flight

11
00:00:25,519 --> 00:00:23,300
Center to tell us more Laurie

12
00:00:26,870 --> 00:00:25,529
breathing in fresh air and drinking

13
00:00:28,400 --> 00:00:26,880

clean water are probably some of the

14

00:00:30,439 --> 00:00:28,410

things we take for granted here on earth

15

00:00:32,810 --> 00:00:30,449

but in space it's a well thought out

16

00:00:34,370 --> 00:00:32,820

process that has taken years to develop

17

00:00:35,870 --> 00:00:34,380

we're talking about the environmental

18

00:00:37,459 --> 00:00:35,880

control and life support system or

19

00:00:39,799 --> 00:00:37,469

equalists and that's technology

20

00:00:41,600 --> 00:00:39,809

development that helps our astronauts be

21

00:00:43,670 --> 00:00:41,610

able to live and breathe in space on the

22

00:00:46,130 --> 00:00:43,680

orbiting laboratory joining me now is J

23

00:00:48,350 --> 00:00:46,140

Perry he has been with E Class and the

24

00:00:50,900 --> 00:00:48,360

development for more than 20 years J

25

00:00:52,639 --> 00:00:50,910

first of all tell us about o'clock in

26
00:00:55,670 --> 00:00:52,649
technology development this is really

27
00:00:57,110 --> 00:00:55,680
the pinnacle it sure is and what the

28
00:01:00,729 --> 00:00:57,120
environmental control life support

29
00:01:03,799 --> 00:01:00,739
system does is that it helps provide

30
00:01:06,289 --> 00:01:03,809
purified air good breathing air and also

31
00:01:08,420 --> 00:01:06,299
purified water and also maintains the

32
00:01:10,820 --> 00:01:08,430
temperature and humidity in the cabin it

33
00:01:12,050 --> 00:01:10,830
also helps with recycling resources so

34
00:01:13,820 --> 00:01:12,060
that we don't have to take as much from

35
00:01:16,190 --> 00:01:13,830
the ground and it keeps and it helps us

36
00:01:18,800 --> 00:01:16,200
to make sure that the they operating the

37
00:01:20,359 --> 00:01:18,810
space station or the vehicle is is much

38
00:01:21,679 --> 00:01:20,369

more economical yeah it's pretty

39
00:01:23,780 --> 00:01:21,689
expensive we were talking about how much

40
00:01:26,060 --> 00:01:23,790
it costs to take a gallon of water oh

41
00:01:27,859 --> 00:01:26,070
yes I want to tell folks how much that

42
00:01:29,480 --> 00:01:27,869
is well you know tens of thousands of

43
00:01:31,760 --> 00:01:29,490
dollars just for a leader and you

44
00:01:33,230 --> 00:01:31,770
multiply that by four and you can get

45
00:01:35,090 --> 00:01:33,240
pretty expensive so that's why this

46
00:01:37,580 --> 00:01:35,100
technology development is so important

47
00:01:40,130 --> 00:01:37,590
how does it work well the life support

48
00:01:42,560 --> 00:01:40,140
system uses a variety of processes you

49
00:01:45,499 --> 00:01:42,570
know we use chemical reactions we use

50
00:01:47,030 --> 00:01:45,509
adsorption processes which an adsorption

51
00:01:49,609 --> 00:01:47,040
process is sort of like a sponge you

52
00:01:51,319 --> 00:01:49,619
know you you take this carbon dioxide

53
00:01:53,990 --> 00:01:51,329
out with sort of a sponge-like material

54
00:01:55,910 --> 00:01:54,000
and then you can release it and send it

55
00:01:57,679 --> 00:01:55,920
to Thor another reactor or vent it

56
00:02:00,889 --> 00:01:57,689
overboard just to get it out of the

57
00:02:03,530 --> 00:02:00,899
cabin we also use a lot of processes

58
00:02:05,929 --> 00:02:03,540
that change phases so just like your air

59
00:02:07,459 --> 00:02:05,939
conditioner in your home there is a

60
00:02:09,499 --> 00:02:07,469
similar type device onboard the

61
00:02:12,199 --> 00:02:09,509
spacecraft in the space station that

62
00:02:13,200 --> 00:02:12,209
does the same thing and we've built on a

63
00:02:15,120 --> 00:02:13,210

lot of history

64

00:02:17,280 --> 00:02:15,130
from Skylab to Space Lab this is how

65

00:02:19,290 --> 00:02:17,290
we've learned this technology and how it

66

00:02:20,490 --> 00:02:19,300
works but we're looking at the future

67

00:02:22,050 --> 00:02:20,500
now tell us what we're doing for a

68

00:02:24,150 --> 00:02:22,060
future deep space exploration

69

00:02:25,650 --> 00:02:24,160
yes Laurie the the life support system

70

00:02:27,420 --> 00:02:25,660
development has been a progression you

71

00:02:29,550 --> 00:02:27,430
know going all the way back to the

72

00:02:32,790 --> 00:02:29,560
mercury days and then through to Skylab

73

00:02:34,560 --> 00:02:32,800
space lab Apollo etc and then on to

74

00:02:36,600 --> 00:02:34,570
Space Station in fact some of the space

75

00:02:39,930 --> 00:02:36,610
station processes used onboard our

76
00:02:42,420 --> 00:02:39,940
legacy from Skylab and the shuttle

77
00:02:43,980 --> 00:02:42,430
program the Space Lab programs and then

78
00:02:45,570 --> 00:02:43,990
what we were looking at as far as being

79
00:02:48,330 --> 00:02:45,580
able to go into the deep space

80
00:02:50,610 --> 00:02:48,340
applications and in destinations we're

81
00:02:52,410 --> 00:02:50,620
trying to build on and learn from what

82
00:02:54,380 --> 00:02:52,420
we're learning with operations on the

83
00:02:56,580 --> 00:02:54,390
station how to improve these processes

84
00:02:59,580 --> 00:02:56,590
get to a point where we don't rely on

85
00:03:01,770 --> 00:02:59,590
ground-based resupply like we do now and

86
00:03:04,590 --> 00:03:01,780
that way we can go economically to these

87
00:03:07,740 --> 00:03:04,600
deep space destinations and you actually

88
00:03:09,930 --> 00:03:07,750

have a module a working module that has

89

00:03:12,600 --> 00:03:09,940

a lot of pieces in there a lot of a lot

90

00:03:14,640 --> 00:03:12,610

of flight hardware or development test

91

00:03:16,830 --> 00:03:14,650

development right we have a engineering

92

00:03:19,080 --> 00:03:16,840

development facility in which we have

93

00:03:21,570 --> 00:03:19,090

the carbon dioxide removal equipment

94

00:03:23,820 --> 00:03:21,580

trace contaminant

95

00:03:25,890 --> 00:03:23,830

carbon dioxide reduction in oxygen

96

00:03:27,450 --> 00:03:25,900

generation equipment and these are

97

00:03:31,410 --> 00:03:27,460

varying engineering development

98

00:03:33,540 --> 00:03:31,420

Fidelity's carbon dioxide removal and

99

00:03:36,180 --> 00:03:33,550

trace contaminants are very high

100

00:03:39,570 --> 00:03:36,190

functional fidelity and also they're

101
00:03:41,640 --> 00:03:39,580
very much the same type of fit and form

102
00:03:45,120 --> 00:03:41,650
in other words the packaging of those

103
00:03:46,980 --> 00:03:45,130
pieces of equipment our other pieces of

104
00:03:48,990 --> 00:03:46,990
equipment are very much engineering

105
00:03:50,520 --> 00:03:49,000
oriented and so their packaging is

106
00:03:53,670 --> 00:03:50,530
different but their function is really

107
00:03:55,170 --> 00:03:53,680
really high very much identical to what

108
00:03:56,640 --> 00:03:55,180
station has and you're going to have to

109
00:03:58,610 --> 00:03:56,650
learn how to make that packaging even

110
00:04:01,140 --> 00:03:58,620
smaller farther right that's correct

111
00:04:03,000 --> 00:04:01,150
let's talk about finally some of the

112
00:04:05,040 --> 00:04:03,010
spin-off technologies the things that we

113
00:04:07,260 --> 00:04:05,050

use here on earth that have come from

114

00:04:09,750 --> 00:04:07,270

the equalist technology development okay

115

00:04:12,150 --> 00:04:09,760

we have a variety of both spin in and

116

00:04:15,090 --> 00:04:12,160

spin out actually you know spin in ours

117

00:04:17,670 --> 00:04:15,100

is that some of the adsorbent materials

118

00:04:20,880 --> 00:04:17,680

and catalysts that we use really come

119

00:04:22,410 --> 00:04:20,890

from industry you know for pollution

120

00:04:26,280 --> 00:04:22,420

control and things of that

121

00:04:29,130 --> 00:04:26,290

nature however you know we also have

122

00:04:31,650 --> 00:04:29,140

importance as far as for instance in

123

00:04:34,980 --> 00:04:31,660

water purification in areas of the world

124

00:04:37,440 --> 00:04:34,990

where purified water is a very hard

125

00:04:40,290 --> 00:04:37,450

commodity to come by many of the

126
00:04:42,540 --> 00:04:40,300
technologies used onboard the station to

127
00:04:44,760 --> 00:04:42,550
purify water for the crew to drink have

128
00:04:46,620 --> 00:04:44,770
been put on portable platforms to take

129
00:04:49,110 --> 00:04:46,630
into these remote areas to provide

130
00:04:50,370 --> 00:04:49,120
people with purified water at the same

131
00:04:52,560 --> 00:04:50,380
time we're learning more and more about

132
00:04:55,230 --> 00:04:52,570
you having to deal with our carbon

133
00:04:58,610 --> 00:04:55,240
dioxide emissions from industry power

134
00:05:02,130 --> 00:04:58,620
plants and one of the more interesting

135
00:05:04,920 --> 00:05:02,140
sources is in producing cement which we

136
00:05:06,480 --> 00:05:04,930
use a lot of them on earth that's one of

137
00:05:09,720 --> 00:05:06,490
the greatest sources of carbon dioxide

138
00:05:11,250 --> 00:05:09,730

production into our atmosphere and so

139

00:05:12,720 --> 00:05:11,260

we're working very hard right now to

140

00:05:14,820 --> 00:05:12,730

take some of our carbon dioxide

141

00:05:17,010 --> 00:05:14,830

reduction processes starting with what's

142

00:05:19,950 --> 00:05:17,020

used on station and expanding out and

143

00:05:22,890 --> 00:05:19,960

applying that to controlling emissions

144

00:05:24,900 --> 00:05:22,900

produced by cement manufacturing very

145

00:05:26,610 --> 00:05:24,910

interesting work Jay and here's to 20

146

00:05:27,990 --> 00:05:26,620

more years of you and Nicholas all right

147

00:05:29,490 --> 00:05:28,000

thank you all right thanks Jay

148

00:05:31,380 --> 00:05:29,500

to find out more about this and other

149

00:05:34,290 --> 00:05:31,390

technologies that are making use of the

150

00:05:37,080 --> 00:05:34,300

ISS join us for our destination station

151

00:05:38,700 --> 00:05:37,090

forum on October 27th from the US Space

152

00:05:41,340 --> 00:05:38,710

and Rocket Center here in Huntsville it

153

00:05:42,810 --> 00:05:41,350

will be broadcast live on NASA TV and

154

00:05:44,670 --> 00:05:42,820

feature experts in many of the

155

00:05:47,010 --> 00:05:44,680

technology demonstration fields such as

156

00:05:50,340 --> 00:05:47,020

eclipse that will be from 9 to 10 a.m.

157

00:05:51,720 --> 00:05:50,350

Central time again on NASA TV that's it

158

00:05:53,700 --> 00:05:51,730

for us at the payload operations