1
00:00:09,320 --> 00:00:07,610
as we near the end of another year it's

2
00:00:11,690 --> 00:00:09,330
always a good time to gain perspective

3
00:00:13,910 --> 00:00:11,700
on just how far we've come with Space

4
00:00:16,250 --> 00:00:13,920
Station Space Station research as well

5
00:00:18,019 --> 00:00:16,260
as where we're headed Lori Meggs at the

6
00:00:19,970 --> 00:00:18,029
payload Operations Center at NASA's

7
00:00:21,650 --> 00:00:19,980
Marshall Space Flight Center is going to

8
00:00:26,300 --> 00:00:21,660
give us a little bit more information on

9
00:00:28,400 --> 00:00:26,310
that Lori it's been an exciting and

10
00:00:30,470 --> 00:00:28,410
record-breaking year for research on the

11
00:00:32,780 --> 00:00:30,480
International Space Station I recently

12
00:00:35,479 --> 00:00:32,790
spoke with NASA's chief scientist Ellen

13
00:00:39,229 --> 00:00:35,489

stofan to get her take on just how

14
00:00:41,750 --> 00:00:39,239
valuable this orbiting laboratory is it

15
00:00:43,549 --> 00:00:41,760
really runs the gamut we just took up a

16
00:00:45,650 --> 00:00:43,559
nurse new earth science instrument

17
00:00:47,299 --> 00:00:45,660
that's going to be measuring ocean winds

18
00:00:48,709 --> 00:00:47,309
really critical to be measuring it at

19
00:00:50,209 --> 00:00:48,719
different times of the day so that we

20
00:00:52,670 --> 00:00:50,219
can get a much better handle on how the

21
00:00:54,920 --> 00:00:52,680
ocean interacts with the atmosphere we

22
00:00:56,959 --> 00:00:54,930
also announced new findings from the

23
00:00:58,580 --> 00:00:56,969
Alpha Magnetic Spectrometer onboard the

24
00:01:01,220 --> 00:00:58,590
International Space Station that's doing

25
00:01:03,260 --> 00:01:01,230
work in cosmology what are the

26
00:01:05,240 --> 00:01:03,270
fundamental particles that make up the

27
00:01:08,000 --> 00:01:05,250
universe how do they work is there Dark

28
00:01:09,770 --> 00:01:08,010
Matter huge basic questions and we're

29
00:01:12,380 --> 00:01:09,780
addressing them using the International

30
00:01:14,359 --> 00:01:12,390
Space Station in addition and you know

31
00:01:16,280 --> 00:01:14,369
it just it gets almost you're you're

32
00:01:18,320 --> 00:01:16,290
thinking how can how can we be doing so

33
00:01:21,740 --> 00:01:18,330
much we have experiments that have

34
00:01:23,120 --> 00:01:21,750
included a 3d printer to start testing

35
00:01:25,100 --> 00:01:23,130
can we eventually get to a point where

36
00:01:26,450 --> 00:01:25,110
we can produce parts for the

37
00:01:28,429 --> 00:01:26,460
International Space Station on the

38
00:01:30,620 --> 00:01:28,439

International Space Station rather than

39
00:01:32,870 --> 00:01:30,630
bringing them for Earth we took up

40
00:01:34,580 --> 00:01:32,880
rodents for the first time since the

41
00:01:37,039 --> 00:01:34,590
shuttle days and we're going to be using

42
00:01:38,569 --> 00:01:37,049
these rodents as model systems to better

43
00:01:42,469 --> 00:01:38,579
understand the effects of microgravity

44
00:01:44,270 --> 00:01:42,479
on the human system and using those mice

45
00:01:45,830 --> 00:01:44,280
potentially for drug development things

46
00:01:47,569 --> 00:01:45,840
that happen to the human body in space

47
00:01:49,940 --> 00:01:47,579
like bone density loss and muscle

48
00:01:52,190 --> 00:01:49,950
wasting are things that happen to us as

49
00:01:55,160 --> 00:01:52,200
we age so can we use the fact that these

50
00:01:56,959 --> 00:01:55,170
processes occur very rapidly in space to

51
00:01:59,959 --> 00:01:56,969
develop new treatments that benefit us

52
00:02:01,940 --> 00:01:59,969
right here on earth so direct benefits

53
00:02:03,709 --> 00:02:01,950
to the world of science direct benefits

54
00:02:05,539 --> 00:02:03,719
to human health that's the kind of

55
00:02:07,250 --> 00:02:05,549
research we do every day up on the

56
00:02:09,380 --> 00:02:07,260
International Space Station

57
00:02:11,270 --> 00:02:09,390
as the chief scientist though I'm sure

58
00:02:12,560 --> 00:02:11,280
you want to see more there's more that

59
00:02:14,630 --> 00:02:12,570
can be done what do you tell folks about

60
00:02:17,210 --> 00:02:14,640
that you know that's why this extension

61
00:02:19,160 --> 00:02:17,220
to 20-24 was so important to me because

62
00:02:21,200 --> 00:02:19,170
as a researcher you really want to be

63
00:02:23,570 --> 00:02:21,210

able to say can I come up with the

64
00:02:26,630 --> 00:02:23,580
theory come up with an experiment send

65
00:02:29,240 --> 00:02:26,640
it up to the ISS see what my results are

66
00:02:31,130 --> 00:02:29,250
and tweak my experiment go further go to

67
00:02:33,230 --> 00:02:31,140
the next step and that's what that

68
00:02:35,300 --> 00:02:33,240
10-year extension of the ISS has given

69
00:02:37,490 --> 00:02:35,310
us and so the rodent research I was

70
00:02:39,620 --> 00:02:37,500
talking about we're just beginning we're

71
00:02:42,350 --> 00:02:39,630
going to have rodents model system fruit

72
00:02:43,400 --> 00:02:42,360
fly experiments going up on the ISS that

73
00:02:46,010 --> 00:02:43,410
are really going to help us start

74
00:02:48,110 --> 00:02:46,020
addressing questions on how do we send

75
00:02:49,880 --> 00:02:48,120
humans on that long journey to Mars that

76
00:02:52,310 --> 00:02:49,890
eight-month journey to Mars eight months

77
00:02:53,960 --> 00:02:52,320
back time on the Martian surface that a

78
00:02:56,000 --> 00:02:53,970
lot that's a lot of time out of the

79
00:02:58,790 --> 00:02:56,010
Earth's protective environment that

80
00:03:00,230 --> 00:02:58,800
protects us from space radiation so we

81
00:03:01,730 --> 00:03:00,240
have a lot of research to do on the

82
00:03:03,680 --> 00:03:01,740
International Space Station over the

83
00:03:05,180 --> 00:03:03,690
next ten years to really get ready for

84
00:03:07,610 --> 00:03:05,190
that journey to Mars and we're excited

85
00:03:09,830 --> 00:03:07,620
about it and the space station is also

86
00:03:12,170 --> 00:03:09,840
given researchers who may not have ever

87
00:03:13,699 --> 00:03:12,180
gotten anything in microgravity that

88
00:03:15,620 --> 00:03:13,709

given them an opportunity it's easier

89
00:03:17,210 --> 00:03:15,630
now to get on the space station right it

90
00:03:20,000 --> 00:03:17,220
is easier we're really working at NASA

91
00:03:21,560 --> 00:03:20,010
to try to make the ISS a researcher

92
00:03:24,380 --> 00:03:21,570
friendly environment and through our

93
00:03:26,570 --> 00:03:24,390
efforts as well as cases which is the

94
00:03:29,270 --> 00:03:26,580
organization that runs on our national

95
00:03:31,370 --> 00:03:29,280
laboratory on the space station we're

96
00:03:33,229 --> 00:03:31,380
trying to get new partners not just our

97
00:03:36,400 --> 00:03:33,239
traditional research crowd but can we

98
00:03:39,020 --> 00:03:36,410
get pharmaceutical companies can we get

99
00:03:40,580 --> 00:03:39,030
companies that do materials research can

100
00:03:42,740 --> 00:03:40,590
they start seeing the benefits of doing

101
00:03:44,930 --> 00:03:42,750
microgravity research so we really want

102
00:03:46,280 --> 00:03:44,940
to exploit not just the scientific

103
00:03:47,840 --> 00:03:46,290
potential of the International Space

104
00:03:50,570 --> 00:03:47,850
Station but its potential commercial

105
00:03:52,610 --> 00:03:50,580
uses for getting ready to have a crew

106
00:03:54,350 --> 00:03:52,620
member on the space station for a year

107
00:03:56,000 --> 00:03:54,360
and we'll learn things from that that

108
00:03:58,400 --> 00:03:56,010
will help us in that future deep space

109
00:03:59,840 --> 00:03:58,410
exploration right the one-year mission

110
00:04:01,400 --> 00:03:59,850
is something that we've really been

111
00:04:02,780 --> 00:04:01,410
looking forward to in the human research

112
00:04:04,430 --> 00:04:02,790
program because there are a lot of

113
00:04:06,350 --> 00:04:04,440

things that happened again to the human

114
00:04:08,300 --> 00:04:06,360
body in space from again the muscle

115
00:04:09,770 --> 00:04:08,310
wasting bone density loss the rise in

116
00:04:12,560 --> 00:04:09,780
inter-cranial pressure that affects

117
00:04:14,360 --> 00:04:12,570
vision changes in the immune system our

118
00:04:16,490 --> 00:04:14,370
crews mostly go out for six months so

119
00:04:19,550 --> 00:04:16,500
okay what happens after six months to

120
00:04:20,780 --> 00:04:19,560
those effects Plateau did they lessen do

121
00:04:22,580 --> 00:04:20,790
they get worse though

122
00:04:24,920 --> 00:04:22,590
are things we really want to know and so

123
00:04:26,810 --> 00:04:24,930
by having the two astronauts up there

124
00:04:28,700 --> 00:04:26,820
for a year Russian astronaut u.s.

125
00:04:31,010 --> 00:04:28,710
astronaut it's a great opportunity to

126
00:04:32,330 --> 00:04:31,020
really push that envelope and what we

127
00:04:35,150 --> 00:04:32,340
understand about the effects of

128
00:04:37,250 --> 00:04:35,160
microgravity and again critical for this

129
00:04:38,810 --> 00:04:37,260
much longer trip to Mars the other

130
00:04:41,510 --> 00:04:38,820
exciting aspect of course of the

131
00:04:43,550 --> 00:04:41,520
one-year mission is that Scott Kelly was

132
00:04:45,890 --> 00:04:43,560
going up for a year happens to have a

133
00:04:47,660 --> 00:04:45,900
twin brother Mark Kelly former astronaut

134
00:04:48,980 --> 00:04:47,670
who's here on the ground and so not only

135
00:04:51,170 --> 00:04:48,990
are we going to be doing the one-year

136
00:04:52,970 --> 00:04:51,180
studies of the long-duration effects

137
00:04:55,250 --> 00:04:52,980
we're also doing a number of twin

138
00:04:56,720 --> 00:04:55,260

studies to say okay we've got one in

139
00:04:58,520 --> 00:04:56,730
space and one on the ground same

140
00:05:01,070 --> 00:04:58,530
genetics what can we learn from that

141
00:05:03,620 --> 00:05:01,080
really exciting what do you tell folks

142
00:05:06,890 --> 00:05:03,630
who say a space station that didn't mean

143
00:05:08,930 --> 00:05:06,900
anything to me you know I really try to

144
00:05:11,090 --> 00:05:08,940
focus on this fact that that when we're

145
00:05:14,270 --> 00:05:11,100
working off the earth we're working for

146
00:05:15,500 --> 00:05:14,280
the Earth from the rapid scat instrument

147
00:05:17,600 --> 00:05:15,510
that we just put up to help measure

148
00:05:19,670 --> 00:05:17,610
ocean winds was which is going to be

149
00:05:21,950 --> 00:05:19,680
able to allow us to do better weather

150
00:05:23,930 --> 00:05:21,960
forecasting better understanding of the

151
00:05:26,690 --> 00:05:23,940
climate that's something that affects us

152
00:05:28,880 --> 00:05:26,700
directly right here on earth from things

153
00:05:30,670 --> 00:05:28,890
like again bone density loss okay that's

154
00:05:32,810 --> 00:05:30,680
what happens to us as we age

155
00:05:34,700 --> 00:05:32,820
osteoporosis we're looking into

156
00:05:36,650 --> 00:05:34,710
developing new treatments based on what

157
00:05:38,570 --> 00:05:36,660
we're doing on the space station so

158
00:05:40,790 --> 00:05:38,580
while we're not right here on earth

159
00:05:42,800 --> 00:05:40,800
everything we do is to benefit the earth

160
00:05:45,500 --> 00:05:42,810
and those technologies that we develop

161
00:05:47,090 --> 00:05:45,510
are being done right here on earth we

162
00:05:49,040 --> 00:05:47,100
send them up to space and test them and

163
00:05:51,320 --> 00:05:49,050

there's huge numbers of spin-offs that

164
00:05:55,760 --> 00:05:51,330
come from that the benefits of the ISS

165
00:05:57,410 --> 00:05:55,770
to me are just endless and taking a live

166
00:05:59,630 --> 00:05:57,420
look into the payload operations

167
00:06:01,910 --> 00:05:59,640
integration Center the stockings are

168
00:06:05,540 --> 00:06:01,920
hung on their signs so gently with care

169
00:06:07,310 --> 00:06:05,550
hoping st. Nicholas soon be here so we

170
00:06:08,990 --> 00:06:07,320
want to wish everyone happy holidays

171
00:06:10,370 --> 00:06:09,000
Merry Christmas and a Happy New Year

172
00:06:13,280 --> 00:06:10,380
from the payload operations integration

173
00:06:15,320 --> 00:06:13,290
Center and please join us next week next

174
00:06:17,690 --> 00:06:15,330
Wednesday will have a special 30-minute