



HD

1
00:00:09,990 --> 00:00:07,030
so again nasa astronaut scott kelly

2
00:00:13,110 --> 00:00:10,000
spending an entire year in orbit set to

3
00:00:14,549 --> 00:00:13,120
come home in march of next year and as

4
00:00:16,790 --> 00:00:14,559
mentioned working on that fine motor

5
00:00:19,429 --> 00:00:16,800
skill study one of many one-year

6
00:00:22,070 --> 00:00:19,439
investigations currently taking place on

7
00:00:23,750 --> 00:00:22,080
board the international space station

8
00:00:25,670 --> 00:00:23,760
much of those

9
00:00:27,429 --> 00:00:25,680
set up and subscribed by nasa's human

10
00:00:28,630 --> 00:00:27,439
research program

11
00:00:30,790 --> 00:00:28,640
also has

12
00:00:31,910 --> 00:00:30,800
another set of investigations 10 in

13
00:00:33,670 --> 00:00:31,920

total

14

00:00:35,590 --> 00:00:33,680

that are looking into among other things

15

00:00:37,590 --> 00:00:35,600

the differences that space flight

16

00:00:39,830 --> 00:00:37,600

actually has on scott kelly

17

00:00:41,750 --> 00:00:39,840

when compared to his twin brother mark

18

00:00:43,430 --> 00:00:41,760

kelly former nasa astronaut here on

19

00:00:46,709 --> 00:00:43,440

earth and what we're going to be able to

20

00:00:48,709 --> 00:00:46,719

learn from it lori meigs is standing by

21

00:00:50,630 --> 00:00:48,719

at the payload operations integration

22

00:00:52,630 --> 00:00:50,640

center at nasa's marshall space flight

23

00:00:54,069 --> 00:00:52,640

center with more lori

24

00:00:56,069 --> 00:00:54,079

think about all of the data that comes

25

00:00:57,990 --> 00:00:56,079

back from just one experiment and

26

00:00:59,830 --> 00:00:58,000

imagine trying to make sense of it all

27

00:01:01,670 --> 00:00:59,840

and now you have twice as much data

28

00:01:03,910 --> 00:01:01,680

because you're studying scott kelly in

29

00:01:05,990 --> 00:01:03,920

space and mark kelly on earth i met one

30

00:01:11,429 --> 00:01:06,000

man who's doing just that as part of the

31

00:01:15,429 --> 00:01:13,350

so tell me what is your study

32

00:01:17,910 --> 00:01:15,439

the studies actually to understand an

33

00:01:21,109 --> 00:01:17,920

incredible detail biochemical

34

00:01:22,870 --> 00:01:21,119

physiological and i guess even cellular

35

00:01:24,390 --> 00:01:22,880

what happens to people when they get

36

00:01:26,469 --> 00:01:24,400

launched in the space and they're up

37

00:01:28,630 --> 00:01:26,479

there for a long period of time

38

00:01:29,670 --> 00:01:28,640

our job on this team it's really a team

39

00:01:31,590 --> 00:01:29,680

project

40

00:01:33,749 --> 00:01:31,600

is to be able to integrate massive

41

00:01:36,149 --> 00:01:33,759

amounts of data so a variety of

42

00:01:38,630 --> 00:01:36,159

different labs i'll be collecting data

43

00:01:40,469 --> 00:01:38,640

on one of the brothers it's actually in

44

00:01:42,550 --> 00:01:40,479

space there's another identical twin

45

00:01:46,389 --> 00:01:42,560

brothers on the ground we're going to

46

00:01:48,630 --> 00:01:46,399

compare them one as i say is in space uh

47

00:01:50,630 --> 00:01:48,640

it's living life and experience based

48

00:01:52,069 --> 00:01:50,640

life and the other one's on the ground

49

00:01:54,069 --> 00:01:52,079

and we're going to see how they differ

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00:01:55,429 --> 00:01:54,079

there was a nice control for the others

51

00:01:57,270 --> 00:01:55,439

so to speak

52

00:01:58,950 --> 00:01:57,280

kind of a once in a lifetime chance

53

00:02:00,870 --> 00:01:58,960

right that's for sure there's very

54

00:02:02,789 --> 00:02:00,880

unique mission no question

55

00:02:04,870 --> 00:02:02,799

what excites you about it

56

00:02:06,789 --> 00:02:04,880

i think we're very interested in this

57

00:02:09,510 --> 00:02:06,799

issue of how do

58

00:02:10,550 --> 00:02:09,520

perturbations change people's health if

59

00:02:12,710 --> 00:02:10,560

you will

60

00:02:14,470 --> 00:02:12,720

and there's no bigger perturbation

61

00:02:17,030 --> 00:02:14,480

perhaps than getting launched into space

62

00:02:18,790 --> 00:02:17,040

and spending a year up in space

63

00:02:20,390 --> 00:02:18,800

there just is no other study like that

64

00:02:22,790 --> 00:02:20,400

and we're very interested in just in

65

00:02:24,309 --> 00:02:22,800

general how do perturbations of all

66

00:02:26,390 --> 00:02:24,319

sorts

67

00:02:28,710 --> 00:02:26,400

what do they do to the human body and

68

00:02:31,110 --> 00:02:28,720

we'd like to understand that and ideally

69

00:02:33,670 --> 00:02:31,120

use that information to either

70

00:02:35,270 --> 00:02:33,680

help cure them if a problem arises from

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00:02:37,670 --> 00:02:35,280

this or even prevent

72

00:02:40,150 --> 00:02:37,680

any adverse effects from occurring when

73

00:02:42,550 --> 00:02:40,160

people are put in these rather unusual

74

00:02:44,070 --> 00:02:42,560

situations so what's the process how do

75

00:02:45,589 --> 00:02:44,080

you study it

76

00:02:47,670 --> 00:02:45,599

well what's happening here is we're

77

00:02:49,350 --> 00:02:47,680

drawing blood in urine and actually

78

00:02:51,190 --> 00:02:49,360

they're poop

79

00:02:53,670 --> 00:02:51,200

and we're studying all the biochemical

80

00:02:55,910 --> 00:02:53,680

molecules that are in those basically

81

00:02:58,390 --> 00:02:55,920

all their dna and their rna and their

82

00:03:00,630 --> 00:02:58,400

proteins and their metabolites so all

83

00:03:03,110 --> 00:03:00,640

their whole collection of molecules and

84

00:03:05,030 --> 00:03:03,120

by doing by literally making

85

00:03:06,949 --> 00:03:05,040

millions if not billions of measurements

86

00:03:07,910 --> 00:03:06,959

you can actually see the changes that

87

00:03:09,670 --> 00:03:07,920

occur

88

00:03:11,990 --> 00:03:09,680

when they're first launched in the space

89

00:03:14,229 --> 00:03:12,000

when they're up in space for a while

90

00:03:15,030 --> 00:03:14,239

uh if one of them is actually getting

91

00:03:17,110 --> 00:03:15,040

them

92

00:03:19,190 --> 00:03:17,120

flu vaccination we can see what happens

93

00:03:20,949 --> 00:03:19,200

with their immune response when they're

94

00:03:22,470 --> 00:03:20,959

in space so these are all the things you

95

00:03:24,789 --> 00:03:22,480

can look at

96

00:03:27,270 --> 00:03:24,799

and try and understand what happens with

97

00:03:28,470 --> 00:03:27,280

the human body in these unusual

98

00:03:29,670 --> 00:03:28,480

conditions

99

00:03:32,710 --> 00:03:29,680

and that's where you all come in because

100

00:03:35,430 --> 00:03:32,720

there's so much data that's correct yeah

101
00:03:37,190 --> 00:03:35,440
so our lab is especially known for being

102
00:03:38,550 --> 00:03:37,200
able to take billions of different kinds

103
00:03:40,390 --> 00:03:38,560
of measurements

104
00:03:42,309 --> 00:03:40,400
and pull it all together to try and make

105
00:03:44,470 --> 00:03:42,319
sense of the data otherwise it's just a

106
00:03:46,070 --> 00:03:44,480
lot of measurements and we really want

107
00:03:48,309 --> 00:03:46,080
to try and understand how do you turn

108
00:03:50,470 --> 00:03:48,319
measurements into knowledge how do we

109
00:03:52,869 --> 00:03:50,480
see really the biochemical pathways that

110
00:03:55,589 --> 00:03:52,879
change and what does that mean in terms

111
00:03:57,589 --> 00:03:55,599
of the human body and physiology and

112
00:03:59,110 --> 00:03:57,599
again try and use that information to

113
00:04:00,470 --> 00:03:59,120

help

114

00:04:03,270 --> 00:04:00,480

the individual

115

00:04:04,789 --> 00:04:03,280

you know maybe recover from any adverse

116

00:04:05,990 --> 00:04:04,799

thing that might occur

117

00:04:07,509 --> 00:04:06,000

so does this only have space

118

00:04:09,830 --> 00:04:07,519

applications or does it also have earth

119

00:04:11,910 --> 00:04:09,840

applications well i think it has both

120

00:04:14,070 --> 00:04:11,920

space and earth applications obviously

121

00:04:15,509 --> 00:04:14,080

the space is the immediate one but i

122

00:04:17,749 --> 00:04:15,519

don't think we know

123

00:04:19,749 --> 00:04:17,759

how the human body reacts to all kinds

124

00:04:22,550 --> 00:04:19,759

of different conditions but we'd like to

125

00:04:24,390 --> 00:04:22,560

understand the different kinds of

126

00:04:26,310 --> 00:04:24,400

responses the human body has with

127

00:04:29,030 --> 00:04:26,320

different kinds of stresses

128

00:04:31,990 --> 00:04:29,040

and maybe by understanding one unusual

129

00:04:34,310 --> 00:04:32,000

way like radiation in space or this

130

00:04:35,590 --> 00:04:34,320

launch that would help us learn how to

131

00:04:37,510 --> 00:04:35,600

manage some of the other stress

132

00:04:38,629 --> 00:04:37,520

responses that occur as well we just

133

00:04:39,749 --> 00:04:38,639

don't know