



1
00:00:02,000 --> 00:00:02,300
To understand a changing climate

2
00:00:02,300 --> 00:00:05,400
scientists need sophisticated tools.

3
00:00:05,400 --> 00:00:07,000
So, how do you develop

4
00:00:07,000 --> 00:00:09,100
advanced technologies to study

5
00:00:09,100 --> 00:00:11,600
essential aspects of the climate

6
00:00:11,600 --> 00:00:13,500
during a global pandemic?

7
00:00:13,500 --> 00:00:15,100
With teams socially distant

8
00:00:15,100 --> 00:00:16,000
they're working from

9
00:00:16,000 --> 00:00:19,000
spare bedrooms and at tables in their backyards.

10
00:00:19,000 --> 00:00:20,700
It's tough!

11
00:00:20,700 --> 00:00:23,200
It's not easy to turn a wrench from home.

12
00:00:23,200 --> 00:00:25,200
But, uh, we also work with some

13
00:00:25,200 --> 00:00:28,100

very clever, some very innovative people

14

00:00:28,100 --> 00:00:30,400

who have figured out

15

00:00:30,400 --> 00:00:34,300

methodologies to actually test things--

16

00:00:34,300 --> 00:00:36,200

really!-- from home, you know, remotely.

17

00:00:36,200 --> 00:00:39,700

So the longer we're stuck at home

18

00:00:39,700 --> 00:00:41,900

and the itchier we are to get back to work

19

00:00:41,900 --> 00:00:43,900

the more creative we can get to

20

00:00:43,900 --> 00:00:45,900

finding ways to perform those tests.

21

00:00:45,900 --> 00:00:48,500

We have electrical ground support

22

00:00:48,500 --> 00:00:50,600

equipment that we hook up to the network--

23

00:00:50,600 --> 00:00:52,100

—the computer networks at Goddard--

24

00:00:52,100 --> 00:00:53,200

and we VPN into them...

25

00:00:53,200 --> 00:00:54,700

and we can actually

26

00:00:54,700 --> 00:00:55,460

turn on power supplies

27

00:00:55,460 --> 00:00:57,800

and power up the components from home.

28

00:00:57,800 --> 00:01:00,500

What they're powering up...is this.

29

00:01:00,500 --> 00:01:02,010

It's the spacecraft

30

00:01:02,010 --> 00:01:03,370

that headlines NASA's mission

31

00:01:03,370 --> 00:01:04,600

called PACE.

32

00:01:04,600 --> 00:01:05,920

From orbit it will study

33

00:01:05,920 --> 00:01:09,500

Earth's oceans, biogeochemistry, ecology,

34

00:01:09,500 --> 00:01:12,730

the carbon cycle, aerosols, and clouds.

35

00:01:12,730 --> 00:01:16,480

PACE is a climate change observatory...

36

00:01:16,480 --> 00:01:17,400

...and climate change continues

37

00:01:17,400 --> 00:01:20,000

even during the pandemic,

38

00:01:20,000 --> 00:01:21,400

so the mission's research goals

39

00:01:21,400 --> 00:01:22,900

can't wait.

40

00:01:22,900 --> 00:01:24,400

But that said...

41

00:01:24,400 --> 00:01:25,700

Progress is being made,

42

00:01:25,700 --> 00:01:28,400

but not in the way one typically

43

00:01:28,400 --> 00:01:31,100

thinks about construction of

44

00:01:31,100 --> 00:01:32,500

a satellite observatory.

45

00:01:32,500 --> 00:01:33,900

The technological advances

46

00:01:33,900 --> 00:01:37,000

are great, and they really do help us

47

00:01:37,000 --> 00:01:39,200

but they're still not as good

48

00:01:39,200 --> 00:01:40,400

as a face-to-face.

49

00:01:40,400 --> 00:01:41,500

It's been lovely

50

00:01:41,500 --> 00:01:42,070

being home with my wife

51

00:01:42,070 --> 00:01:43,000

and my daughter.

52

00:01:43,000 --> 00:01:45,700

I can't complain about that!

53

00:01:45,700 --> 00:01:46,800

But it's not the same

54

00:01:46,800 --> 00:01:47,700

as getting out to work

55

00:01:47,700 --> 00:01:48,800

and seeing everybody.

56

00:01:48,800 --> 00:01:51,600

There's going to be, probably,

57

00:01:51,600 --> 00:01:53,300

a meaningful cultural shift

58

00:01:53,300 --> 00:01:56,050

in how a project of this size

59

00:01:56,050 --> 00:01:57,570

y'know, somewhere between 400

60

00:01:57,570 --> 00:02:02,020

and 500 people right now

61

00:02:02,020 --> 00:02:03,200

learn how to interact with each other

62

00:02:03,200 --> 00:02:04,140

going forward.

63

00:02:04,140 --> 00:02:05,040

I don't think meetings will be

64

00:02:05,040 --> 00:02:06,200
structured the same way

65

00:02:06,200 --> 00:02:07,400
and that might actually make us

66

00:02:07,400 --> 00:02:08,400
more productive.

67

00:02:08,400 --> 00:02:11,000
There's that serendipity

68

00:02:11,000 --> 00:02:15,300
that's disappeared, and also that

69

00:02:15,300 --> 00:02:17,700
everything has to be planned

70

00:02:17,700 --> 00:02:18,900
ahead of time.

71

00:02:18,900 --> 00:02:23,850
Nothing beats the personal interaction

72

00:02:23,850 --> 00:02:27,800
especially when you're having to

73

00:02:27,800 --> 00:02:31,200
describe the type of engineering

74

00:02:31,200 --> 00:02:33,740
features that we're talking about.

75

00:02:33,740 --> 00:02:37,930
It's really hard sometimes to point out

76

00:02:37,930 --> 00:02:42,980

small pins that we're referring to.

77

00:02:42,980 --> 00:02:45,600

We really have to be face-to-face

78

00:02:45,600 --> 00:02:47,000

to show you, no, I'm talking

79

00:02:47,000 --> 00:02:48,600

about this specific one.

80

00:02:48,600 --> 00:02:50,100

Virtual meetings do not

81

00:02:50,100 --> 00:02:53,480

take over the importance of that.

82

00:02:53,480 --> 00:02:55,700

I think that me and my co-lead

83

00:02:55,700 --> 00:02:57,500

have been equally productive

84

00:02:57,500 --> 00:02:59,600

because we can do absolutely 100%

85

00:02:59,600 --> 00:03:01,700

of our work remotely.

86

00:03:01,700 --> 00:03:02,900

And I think that moving forward

87

00:03:02,900 --> 00:03:05,400

it's going to lend to, you know, instead

88

00:03:05,400 --> 00:03:07,300

of just working remotely one day a week

89

00:03:07,300 --> 00:03:09,600

maybe I try doing two days a week.

90

00:03:09,600 --> 00:03:12,100

because it really is working out well.

91

00:03:12,100 --> 00:03:13,600

Eventually we will come to a point

92

00:03:13,600 --> 00:03:15,900

where we need to get back in there

93

00:03:15,900 --> 00:03:17,850

and put things together...the hardware.

94

00:03:17,850 --> 00:03:20,150

The team has done, I would say,

95

00:03:20,150 --> 00:03:22,700

a Herculean effort. There is

96

00:03:22,700 --> 00:03:25,300

a large aspect of the mission

97

00:03:25,300 --> 00:03:27,300

that is more than just

98

00:03:27,300 --> 00:03:28,800

hands-on labor.

99

00:03:28,800 --> 00:03:31,300

There's a lot of people who are doing that.

100

00:03:31,300 --> 00:03:33,000

But there's also a lot of people

101

00:03:33,000 --> 00:03:35,900

that have to do paperwork.

102

00:03:35,900 --> 00:03:38,000

You know, drawings, work orders,

103

00:03:38,000 --> 00:03:41,700

procedures, software development,

104

00:03:41,700 --> 00:03:43,700

access to these computer systems

105

00:03:43,700 --> 00:03:45,500

for testing.

106

00:03:45,500 --> 00:03:49,800

It's just hard-- emotionally, mentally.

107

00:03:49,800 --> 00:03:51,800

This is a difficult thing

108

00:03:51,800 --> 00:03:53,000

to overcome.

109

00:03:53,000 --> 00:03:55,800

True. Spaceflight and scientific research

110

00:03:55,800 --> 00:03:58,000

are all about teamwork,

111

00:03:58,000 --> 00:04:01,300

and this is a tough time to be part of a team.

112

00:04:01,300 --> 00:04:03,100

But this team knows why

113

00:04:03,100 --> 00:04:05,600

this mission matters so much.

114

00:04:05,600 --> 00:04:06,800

The biggest uncertainty in our future

115

00:04:06,800 --> 00:04:09,000

is our climate. And understanding the ocean

116

00:04:09,000 --> 00:04:11,700

that controls a large percentage of that

117

00:04:11,700 --> 00:04:14,600

climate behavior is crucial

118

00:04:14,600 --> 00:04:16,400

and that's what PACE is going

119

00:04:16,400 --> 00:04:17,300

to bring us, better understanding

120

00:04:17,300 --> 00:04:19,300

of ocean that controls our climate

121

00:04:19,300 --> 00:04:20,500

which is pretty much our house.

122

00:04:20,500 --> 00:04:23,200

And that's why, pandemic or no pandemic,

123

00:04:23,200 --> 00:04:25,700

this team isn't slowing down.

124

00:04:25,700 --> 00:04:28,600

I think it's very challenging to make

125

00:04:28,600 --> 00:04:31,100

any of these people stop work, right?

126

00:04:31,100 --> 00:04:35,500

It goes so much against our natural

127

00:04:35,500 --> 00:04:38,800

desire to want to build, want to achieve,

128

00:04:38,800 --> 00:04:41,200

want to innovate.

129

00:04:41,200 --> 00:04:43,850

I mean, we're creative people!