
science @

1
00:00:10,150 --> 00:00:07,030
iss transit of venus

2
00:00:13,030 --> 00:00:10,160
presented by science at nasa

3
00:00:14,709 --> 00:00:13,040
in 1768 when james cook sailed out of

4
00:00:16,790 --> 00:00:14,719
plymouth harbor to observe the transit

5
00:00:19,510 --> 00:00:16,800
of venus in tahiti the trip was

6
00:00:21,029 --> 00:00:19,520
tantamount to a voyage through space

7
00:00:22,870 --> 00:00:21,039
the remote island had just been

8
00:00:25,109 --> 00:00:22,880
discovered a year earlier and by all

9
00:00:28,150 --> 00:00:25,119
accounts it was as strange and alien to

10
00:00:30,470 --> 00:00:28,160
europeans as the stars themselves

11
00:00:32,310 --> 00:00:30,480
cook's pinpoint navigation to tahiti and

12
00:00:35,350 --> 00:00:32,320
his subsequent observations of venus

13
00:00:38,470 --> 00:00:35,360

crossing the south pacific sun in 1769

14
00:00:40,470 --> 00:00:38,480
have inspired explorers for centuries

15
00:00:42,709 --> 00:00:40,480
one of those explorers is about to beat

16
00:00:44,709 --> 00:00:42,719
cook at his own game

17
00:00:46,310 --> 00:00:44,719
high above the earth astronaut don

18
00:00:48,229 --> 00:00:46,320
pettit is preparing to photograph the

19
00:00:49,510 --> 00:00:48,239
june 5th transit of venus from space

20
00:00:51,110 --> 00:00:49,520
itself

21
00:00:52,950 --> 00:00:51,120
i've been planning this for a while says

22
00:00:55,830 --> 00:00:52,960
pettit who serves as flight engineer

23
00:00:57,430 --> 00:00:55,840
onboard the international space station

24
00:00:59,990 --> 00:00:57,440
i knew the transit of venus would occur

25
00:01:01,430 --> 00:01:00,000
during my rotation so i brought a solar

26
00:01:03,430 --> 00:01:01,440
filter with me when my expedition

27
00:01:05,590 --> 00:01:03,440
blasted off for the iss in december

28
00:01:07,670 --> 00:01:05,600
2011.

29
00:01:10,469 --> 00:01:07,680
because transits of venus come in pairs

30
00:01:12,070 --> 00:01:10,479
that occur once every 100 years or so

31
00:01:14,149 --> 00:01:12,080
humans have rarely had the chance to

32
00:01:16,710 --> 00:01:14,159
photograph the apparition from earth

33
00:01:19,109 --> 00:01:16,720
much less from earth orbit

34
00:01:21,030 --> 00:01:19,119
the expedition 31 crew will be the first

35
00:01:22,230 --> 00:01:21,040
men in history to see a venus transit

36
00:01:23,510 --> 00:01:22,240
from space

37
00:01:26,070 --> 00:01:23,520
and pettit will be the first to

38
00:01:28,630 --> 00:01:26,080

photograph one says mario runko jr of

39
00:01:30,710 --> 00:01:28,640
the johnson space center

40
00:01:32,710 --> 00:01:30,720
runco an astronaut himself who flew

41
00:01:34,469 --> 00:01:32,720
aboard three shuttle missions is an

42
00:01:36,069 --> 00:01:34,479
expert in the optics of spacecraft

43
00:01:38,149 --> 00:01:36,079
windows

44
00:01:39,429 --> 00:01:38,159
along with his wife susan ranco who was

45
00:01:41,350 --> 00:01:39,439
the coordinator for astronaut

46
00:01:43,270 --> 00:01:41,360
photography at jsc

47
00:01:45,429 --> 00:01:43,280
mario is helping pettit gather the best

48
00:01:46,950 --> 00:01:45,439
possible images of the transit

49
00:01:48,550 --> 00:01:46,960
pettit will be pointing his camera

50
00:01:51,030 --> 00:01:48,560
through the side windows of the space

51
00:01:53,030 --> 00:01:51,040
station's cupola an esa built

52
00:01:56,149 --> 00:01:53,040
observatory module that provides a

53
00:01:58,069 --> 00:01:56,159
wide-angle view of earth and the cosmos

54
00:02:00,789 --> 00:01:58,079
its seven windows are used by the crew

55
00:02:03,109 --> 00:02:00,799
to operate the station's robotic arm

56
00:02:05,030 --> 00:02:03,119
coordinate space stockings and take

57
00:02:06,230 --> 00:02:05,040
science grade photos of the earth and

58
00:02:07,910 --> 00:02:06,240
sky

59
00:02:09,749 --> 00:02:07,920
it's also a favorite hangout for

60
00:02:11,750 --> 00:02:09,759
off-duty astronauts who find the view

61
00:02:13,830 --> 00:02:11,760
exhilarating

62
00:02:15,750 --> 00:02:13,840
for this transit don will be removing

63
00:02:17,670 --> 00:02:15,760

the non-optical quality internal

64
00:02:20,390 --> 00:02:17,680
protective window panes known as scratch

65
00:02:23,270 --> 00:02:20,400
panes which really make crisp sharp and

66
00:02:25,110 --> 00:02:23,280
clear images impossible says runko

67
00:02:27,430 --> 00:02:25,120
this is a huge plus when it comes to

68
00:02:29,589 --> 00:02:27,440
details that will be seen in the imagery

69
00:02:32,070 --> 00:02:29,599
of the sun

70
00:02:35,190 --> 00:02:32,080
pettit describes the camera system

71
00:02:38,150 --> 00:02:35,200
i'll be using a high-end nikon d2xs

72
00:02:41,350 --> 00:02:38,160
camera and a 1200 millimeter lens with a

73
00:02:43,589 --> 00:02:41,360
full aperture white light solar filter

74
00:02:45,430 --> 00:02:43,599
even with this great camera system the

75
00:02:47,110 --> 00:02:45,440
images would be quite soft if the

76
00:02:48,550 --> 00:02:47,120
scratch panes were not removed notes

77
00:02:50,309 --> 00:02:48,560
ronko

78
00:02:52,070 --> 00:02:50,319
this is only the third time that we will

79
00:02:53,509 --> 00:02:52,080
be shooting through the cupula's optical

80
00:02:55,190 --> 00:02:53,519
quality windows

81
00:02:56,790 --> 00:02:55,200
i am hoping this becomes routine in the

82
00:02:58,630 --> 00:02:56,800
future

83
00:03:01,750 --> 00:02:58,640
this month's transit is the bookend of a

84
00:03:04,869 --> 00:03:01,760
2004 to 2012 pair

85
00:03:06,790 --> 00:03:04,879
astronauts were on board the iss in 2004

86
00:03:08,550 --> 00:03:06,800
but they did not see the transit mainly

87
00:03:10,070 --> 00:03:08,560
because they did not have solar filters

88
00:03:11,990 --> 00:03:10,080

on board

89
00:03:14,070 --> 00:03:12,000
tiny venus covers a small fraction of

90
00:03:15,910 --> 00:03:14,080
the solar disk so the sun is still

91
00:03:17,670 --> 00:03:15,920
painfully bright to the human eye even

92
00:03:19,110 --> 00:03:17,680
at mid transit

93
00:03:21,910 --> 00:03:19,120
pettit's foresight to bring a solar

94
00:03:24,630 --> 00:03:21,920
filter with him makes all the difference

95
00:03:26,229 --> 00:03:24,640
how would cook feel about all this

96
00:03:27,990 --> 00:03:26,239
i don't think james cook would be too

97
00:03:30,470 --> 00:03:28,000
envious says runko

98
00:03:32,949 --> 00:03:30,480
after all he did get an all-expense paid

99
00:03:34,869 --> 00:03:32,959
trip to tahiti out of the deal

100
00:03:36,710 --> 00:03:34,879
don's photos will be rapidly posted to

101
00:03:38,789 --> 00:03:36,720
the web during the transit

102
00:03:41,270 --> 00:03:38,799
for links to the historic webcast which

103
00:03:43,030 --> 00:03:41,280
begins on june 5th at approximately 3 pm

104
00:03:45,350 --> 00:03:43,040
pacific daylight time