



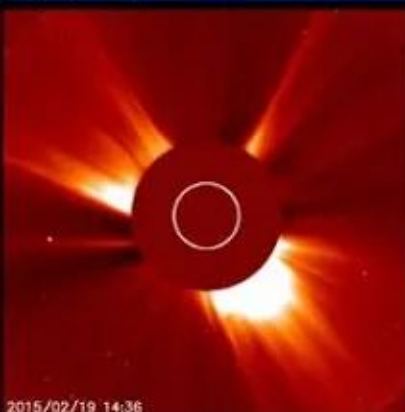
2010/01/01 02:42



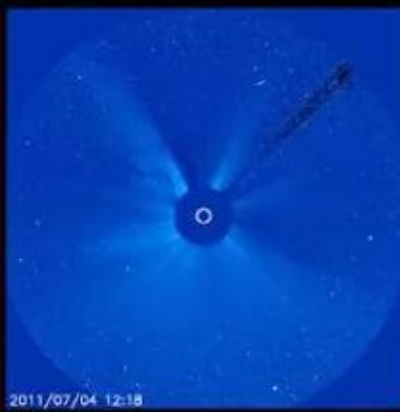
1998/06/01 00:58



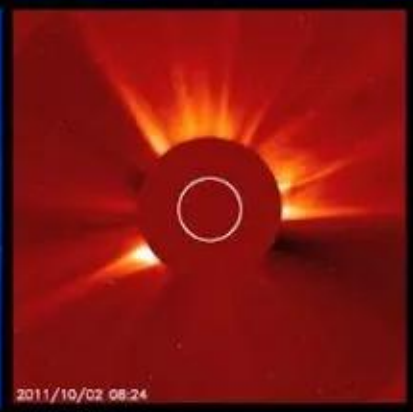
2010/01/01 03:18



2015/02/19 14:36



2011/07/04 12:18



2011/10/02 08:24



1
00:00:04,849 --> 00:00:02,470

[Music]

2
00:00:06,590 --> 00:00:04,859

my name is Carl bottoms I'm a

3
00:00:08,419 --> 00:00:06,600

computational scientist at a Naval

4
00:00:10,129 --> 00:00:08,429

Research Lab and for nearly seventeen

5
00:00:12,799 --> 00:00:10,139

years I've been in charge of NASA's

6
00:00:14,299 --> 00:00:12,809

sungrazer project sungrazer project is a

7
00:00:16,250 --> 00:00:14,309

citizen science project that allows

8
00:00:18,710 --> 00:00:16,260

anyone in the world to discover new

9
00:00:21,130 --> 00:00:18,720

comets that are seen in images recorded

10
00:00:23,509 --> 00:00:21,140

by the joint ISA NASA Soho satellite

11
00:00:26,839 --> 00:00:23,519

recently the project has reached a very

12
00:00:29,269 --> 00:00:26,849

special milestone Soho has found 4,000

13
00:00:31,310 --> 00:00:29,279

previously unknown comets in nearly 25

14

00:00:33,260 --> 00:00:31,320

years so I want to share with you my

15

00:00:36,620 --> 00:00:33,270

favorite comments that Soho has

16

00:00:38,900 --> 00:00:36,630

discovered these were a pair of bright

17

00:00:40,790 --> 00:00:38,910

comets both members of what's known as

18

00:00:42,740 --> 00:00:40,800

the Kreutz group which is a very large

19

00:00:45,560 --> 00:00:42,750

family of comets that all follow the

20

00:00:47,150 --> 00:00:45,570

same path in space unfortunately unlike

21

00:00:49,369 --> 00:00:47,160

nearly all of Soho's comets

22

00:00:53,150 --> 00:00:49,379

these guys will completely vaporize by

23

00:00:54,830 --> 00:00:53,160

the sun's radiation most of Soho's

24

00:00:56,240 --> 00:00:54,840

comments are what we call Sungrazers

25

00:00:58,939 --> 00:00:56,250

which means they follow an orbit that

26
00:01:00,619 --> 00:00:58,949
almost grazes the surface of the Sun but

27
00:01:02,119 --> 00:01:00,629
we've also discovered a lot of comets

28
00:01:05,539 --> 00:01:02,129
that stayed just a bit further away from

29
00:01:07,490 --> 00:01:05,549
the Sun and unlike Sungrazers managed to

30
00:01:11,030 --> 00:01:07,500
at least partially survive passing by

31
00:01:13,340 --> 00:01:11,040
the Sun this comet Soho's 420 second

32
00:01:15,469 --> 00:01:13,350
discovery was found back in 2002

33
00:01:17,440 --> 00:01:15,479
here we see it swinging around the Sun

34
00:01:19,700 --> 00:01:17,450
at a seemingly safe distance

35
00:01:22,219 --> 00:01:19,710
unfortunately it kind of looks to me

36
00:01:23,749 --> 00:01:22,229
like this comet may have turned entirely

37
00:01:26,330 --> 00:01:23,759
towards the stored x' the end of the

38
00:01:28,850 --> 00:01:26,340

movie it it can be hard to know the

39

00:01:30,679 --> 00:01:28,860

exact fate of comets like this because

40

00:01:32,149 --> 00:01:30,689

they're often impossible to locate from

41

00:01:33,550 --> 00:01:32,159

the earth because it's so close to the

42

00:01:35,840 --> 00:01:33,560

Sun

43

00:01:37,640 --> 00:01:35,850

one of the great things about Soho's

44

00:01:39,980 --> 00:01:37,650

Comet discoveries is they also teach us

45

00:01:41,840 --> 00:01:39,990

things about the Sun here we see what

46

00:01:43,700 --> 00:01:41,850

looks like a typical bright Sun grazer

47

00:01:45,830 --> 00:01:43,710

racing through the Lascaux cameras and

48

00:01:48,410 --> 00:01:45,840

in this case disappearing behind Lascaux

49

00:01:50,330 --> 00:01:48,420

solid occulting disk and normally this

50

00:01:53,090 --> 00:01:50,340

is the last we see of them but this

51
00:01:55,850 --> 00:01:53,100
comment to our absolute astonishment was

52
00:01:58,100 --> 00:01:55,860
also visible in images of recorded by

53
00:02:00,050 --> 00:01:58,110
NASA's Solar Dynamics Observatory

54
00:02:02,360 --> 00:02:00,060
which looks at the sun's million-degree

55
00:02:04,730 --> 00:02:02,370
atmosphere and extreme ultraviolet light

56
00:02:06,020 --> 00:02:04,740
this was the first time anyone had ever

57
00:02:08,630 --> 00:02:06,030
seen something like this we were

58
00:02:11,240 --> 00:02:08,640
completely blown away by this result and

59
00:02:14,330 --> 00:02:11,250
we can use comets like this almost like

60
00:02:16,430 --> 00:02:14,340
remote probes they allow us to learn

61
00:02:19,640 --> 00:02:16,440
about the environment close to the Sun

62
00:02:22,810 --> 00:02:19,650
by watching how the comic is reacting

63
00:02:24,949 --> 00:02:22,820

within that really extreme environment

64

00:02:27,320 --> 00:02:24,959

finally this is certainly not the

65

00:02:29,780 --> 00:02:27,330

biggest or brightest comet soko has ever

66

00:02:32,930 --> 00:02:29,790

found for me it's absolutely one of the

67

00:02:34,699 --> 00:02:32,940

most important this is so host 4,000

68

00:02:36,560 --> 00:02:34,709

common discovery that's a truly

69

00:02:38,509 --> 00:02:36,570

remarkable milestone for this mission

70

00:02:41,539 --> 00:02:38,519

duration particularly as it was never

71

00:02:44,720 --> 00:02:41,549

designed to look at or discover comets

72

00:02:46,660 --> 00:02:44,730

this milestone is also a huge testament

73

00:02:48,620 --> 00:02:46,670

to the NASA and ASA

74

00:02:50,930 --> 00:02:48,630

scientists and engineers and support

75

00:02:53,210 --> 00:02:50,940

teams that have kept Soho running so

76

00:02:56,449 --> 00:02:53,220

well all these years and of course

77

00:02:58,850 --> 00:02:56,459

probably most of all it's a testament to

78

00:03:02,330 --> 00:02:58,860

the army of citizen scientists who have

79

00:03:05,180 --> 00:03:02,340

contributed so much free time to

80

00:03:07,490 --> 00:03:05,190

scouring the Soho images and in helping

81

00:03:10,430 --> 00:03:07,500

us realize all of this incredible size

82

00:03:11,860 --> 00:03:10,440

of getting so far here's hoping for

83

00:03:18,100 --> 00:03:11,870

another four thousand comets

84

00:03:19,540 --> 00:03:18,110

[Music]