



2001 Mar 1

169P/NEAT

1
00:00:00,020 --> 00:00:04,020
tone

2
00:00:04,040 --> 00:00:08,070
music

3
00:00:08,090 --> 00:00:12,100
Hi, I am Karl Battams. I am

4
00:00:12,120 --> 00:00:16,130
a computational scientist and astrophysicist from the Naval Research

5
00:00:16,150 --> 00:00:20,200
Lab. Everything you are seeing in this movie

6
00:00:20,220 --> 00:00:24,210
is based on actual data, so actually, every single

7
00:00:24,230 --> 00:00:28,270
dot that you see in this movie is a real comet that has been

8
00:00:28,290 --> 00:00:32,320
discovered or observed by SOHO. SOHO is

9
00:00:32,340 --> 00:00:36,370
the Solar and Heliospheric Observatory, so it's a joint

10
00:00:36,390 --> 00:00:40,400
mission between NASA and the European Space Agency.

11
00:00:40,420 --> 00:00:44,460
SOHO's mission was to study and understand the

12
00:00:44,480 --> 00:00:48,510
sun and the region of space surrounding the sun and all of

13
00:00:48,530 --> 00:00:52,540

cool, awesome, explosive stuff that the sun does. There

14

00:00:52,560 --> 00:00:56,540

was never any intention for SOHO to be

15

00:00:56,560 --> 00:01:00,620

a comet discoverer

16

00:01:00,640 --> 00:01:04,660

The reason SOHO has been so successful at finding these comets is because it has got this

17

00:01:04,680 --> 00:01:08,710

wonderful instrument on the spacecraft that offers us a view

18

00:01:08,730 --> 00:01:12,820

of the inner solar system that we just cannot get from

19

00:01:12,840 --> 00:01:16,840

any telescope on Earth. The different colors in this movie represent

20

00:01:16,860 --> 00:01:20,890

different families or populations of comets

21

00:01:20,910 --> 00:01:24,940

that SOHO is observing. The red comets, these

22

00:01:24,960 --> 00:01:28,990

are Kreutz sungrazer. The green comets are

23

00:01:29,010 --> 00:01:33,030

Maya group comets. The only exception is the yellow one

24

00:01:33,050 --> 00:01:37,090

that you see. These are what we call non-group comets. These do not

25

00:01:37,110 --> 00:01:41,140

belong to any family. You see as these objects

26

00:01:41,160 --> 00:01:45,180

are flying in toward the sun, they are not really going in a straight line, they are following a curve.

27

00:01:45,200 --> 00:01:49,190

That curve is because of the sun's gravity.

28

00:01:49,210 --> 00:01:53,250

The closer a comet gets to the sun, the faster

29

00:01:53,270 --> 00:01:57,320

it goes, and then they slow down again as they move away from the sun.

30

00:01:57,340 --> 00:02:01,370

One of the really awesome facts that I love

31

00:02:01,390 --> 00:02:05,420

about the sungrazers, in particular the Kreutz comets that you are seeing in red,

32

00:02:05,440 --> 00:02:09,500

they are the fastest object

33

00:02:09,520 --> 00:02:13,530

in our solar system that aren't particles.

34

00:02:13,550 --> 00:02:17,580

They get so close to the sun, that they

35

00:02:17,600 --> 00:02:21,660

are traveling at over 600 km/sec, that's not

36

00:02:21,680 --> 00:02:25,680

.2% of the speed of light.

37

00:02:25,700 --> 00:02:29,710

It is just an inconceivable velocity for

38

00:02:29,730 --> 00:02:33,770

pretty much anything that's not particle, but for a big

39

00:02:33,790 --> 00:02:37,800

house-sized chunk of rock and ice, it is truly insane that these objects are going

40

00:02:37,820 --> 00:02:41,860

that fast. Unfortunately, they are getting completely fried in the process,

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00:02:41,880 --> 00:02:45,960

but it is really awesome that they are doing that.

42

00:02:45,980 --> 00:02:49,990

The comets that are flying around the sun and disappearing out of the movie

43

00:02:50,010 --> 00:02:54,020

again, they have survived past the sun. They are not getting completely

44

00:02:54,040 --> 00:02:58,120

vaporized by the intense solar radiation.

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00:02:58,140 --> 00:03:02,140

Any comet that you see in this movie that does not have a label

46

00:03:02,160 --> 00:03:06,160

it means it was discovered by SOHO. I really love

47

00:03:06,180 --> 00:03:10,180

this mission that was designed to do something

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00:03:10,200 --> 00:03:14,240

completely different, just by luck and by chance,

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00:03:14,260 --> 00:03:18,270

it's completely rewritten the history books. More than

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00:03:18,290 --> 00:03:22,300

well over half of the comets we have on official record

51

00:03:22,320 --> 00:03:26,360

now carry SOHO's name, and it was never even intended

52

00:03:26,380 --> 00:03:30,470

to do that. I just love that fact.