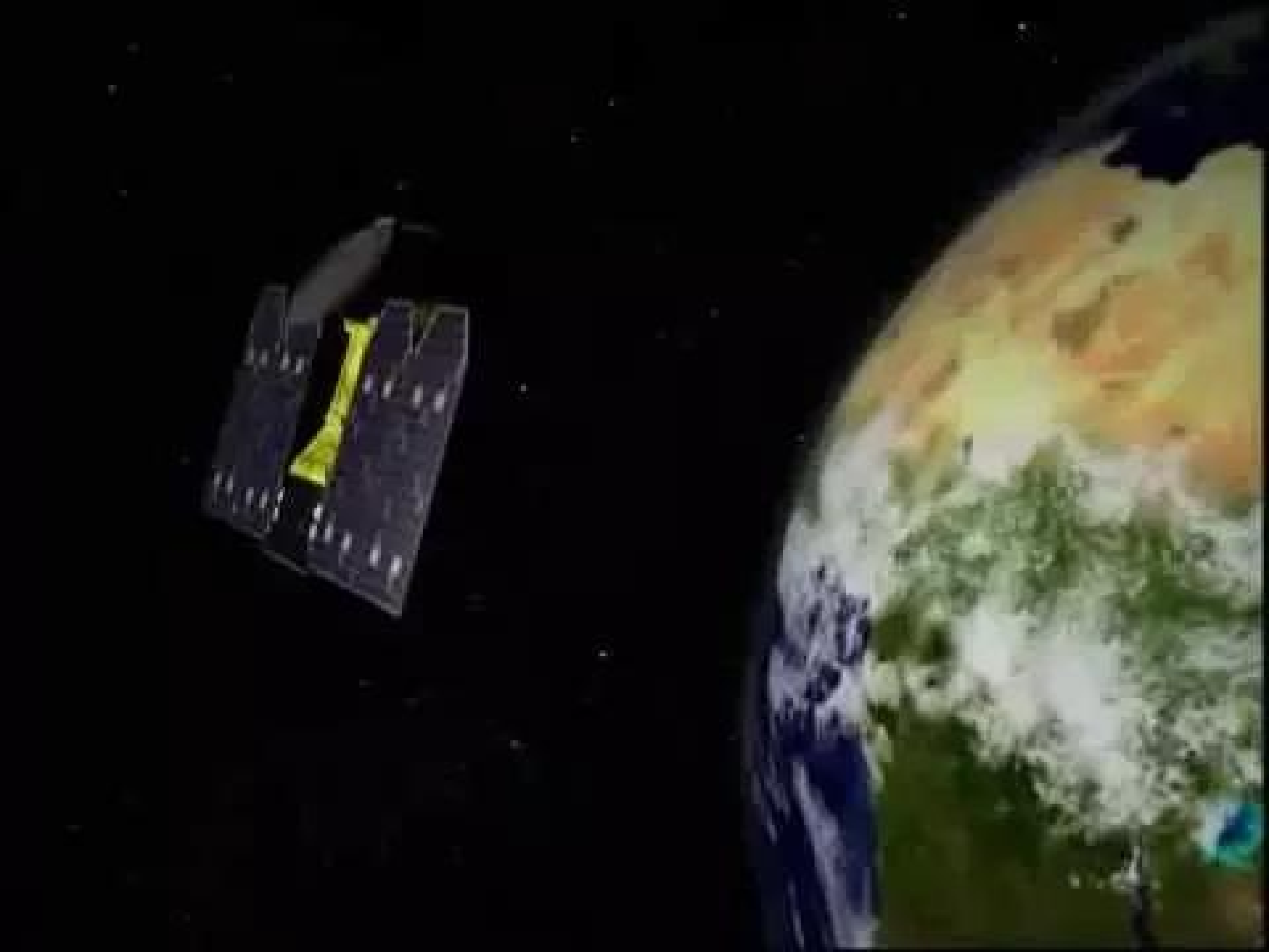

1
00:00:08,780 --> 00:00:06,260
ever wonder how astronomers get those

2
00:00:11,299 --> 00:00:08,790
amazing pictures from space telescopes

3
00:00:15,340 --> 00:00:11,309
it's not quite as simple as pulling out

4
00:00:18,380 --> 00:00:15,350
a camera and snapping a Kodak moment as

5
00:00:20,599 --> 00:00:18,390
the visualization scientist for NASA's

6
00:00:23,269 --> 00:00:20,609
Spitzer Space Telescope and Galaxy

7
00:00:25,099 --> 00:00:23,279
Evolution Explorer dr. Robert hurt

8
00:00:28,099 --> 00:00:25,109
translates the information from

9
00:00:31,250 --> 00:00:28,109
spacecraft into extraordinary images

10
00:00:33,830 --> 00:00:31,260
that help us understand the cosmos well

11
00:00:35,840 --> 00:00:33,840
what we generally do is we'll start with

12
00:00:37,069 --> 00:00:35,850
the core of the sciences that look at

13
00:00:39,410 --> 00:00:37,079

the data will look at the published

14
00:00:41,450 --> 00:00:39,420
paper that tells what the astronomers

15
00:00:43,639 --> 00:00:41,460
discover and then what we want to do is

16
00:00:45,580 --> 00:00:43,649
get into that negative result that thing

17
00:00:48,619 --> 00:00:45,590
that we're trying to teach the public

18
00:00:50,900 --> 00:00:48,629
NASA Spitzer Space Telescope observes

19
00:00:54,979 --> 00:00:50,910
infrared light the Galaxy Evolution

20
00:00:56,660 --> 00:00:54,989
Explorer studies ultraviolet light when

21
00:00:58,639 --> 00:00:56,670
the spacecraft sends us an image it's

22
00:01:01,069 --> 00:00:58,649
actually just a bunch of numbers it's

23
00:01:03,650 --> 00:01:01,079
it's numbers that capture how bright

24
00:01:05,539 --> 00:01:03,660
each part of the sky is at a particular

25
00:01:08,750 --> 00:01:05,549
wavelength of light one that we can't

26
00:01:11,570 --> 00:01:08,760
see hurt is an astronomer and an artist

27
00:01:14,660 --> 00:01:11,580
he uses his computer to ship things that

28
00:01:17,030 --> 00:01:14,670
are invisible to our eyes and makes them

29
00:01:20,300 --> 00:01:17,040
visible so what I have to do is take

30
00:01:22,580 --> 00:01:20,310
this data which effectively counts as as

31
00:01:24,800 --> 00:01:22,590
black-and-white images that come through

32
00:01:26,870 --> 00:01:24,810
colored filters on the tall scope and

33
00:01:29,749 --> 00:01:26,880
what we have to do this take these these

34
00:01:31,700 --> 00:01:29,759
colors at the I can't see and assign

35
00:01:33,920 --> 00:01:31,710
them in two colors that the eye can see

36
00:01:36,890 --> 00:01:33,930
and when we do that we can build up what

37
00:01:40,399 --> 00:01:36,900
we call a representative color image red

38
00:01:43,160 --> 00:01:40,409

shows heat from hot dust blue show star

39
00:01:46,539 --> 00:01:43,170
light which is even hotter and green the

40
00:01:48,710 --> 00:01:46,549
fluorescent light of organic molecules

41
00:01:52,190 --> 00:01:48,720
suddenly we see things around the

42
00:01:54,350 --> 00:01:52,200
universe that we'd never seen before but

43
00:01:56,270 --> 00:01:54,360
what if the story doesn't have a picture

44
00:01:58,760 --> 00:01:56,280
that was the case with a galaxy

45
00:02:01,940 --> 00:01:58,770
discovery that showed black holes stifle

46
00:02:04,249 --> 00:02:01,950
the formation of new stars sometimes we

47
00:02:06,740 --> 00:02:04,259
end up with with science stories they're

48
00:02:09,050 --> 00:02:06,750
actually extremely difficult to tell

49
00:02:11,300 --> 00:02:09,060
just from the data what's a

50
00:02:13,790 --> 00:02:11,310
visualization artists to do

51
00:02:16,490 --> 00:02:13,800
literally have to go back to the drawing

52
00:02:19,400 --> 00:02:16,500
board to tell the story hurts colleague

53
00:02:21,770 --> 00:02:19,410
Tim pile created this artist concept of

54
00:02:23,300 --> 00:02:21,780
a black hole we wouldn't claim that

55
00:02:25,820 --> 00:02:23,310
these things that we have visualized in

56
00:02:27,680 --> 00:02:25,830
our artists conceptions are exactly what

57
00:02:30,140 --> 00:02:27,690
these things look like because literally

58
00:02:32,690 --> 00:02:30,150
we don't know but what we can do is get

59
00:02:35,059 --> 00:02:32,700
as close as we understand today a

60
00:02:37,850 --> 00:02:35,069
spitzer study uncovered evidence of

61
00:02:39,740 --> 00:02:37,860
planet Earth around a dead star though

62
00:02:43,400 --> 00:02:39,750
you'd hardly know it by looking at a

63
00:02:47,120 --> 00:02:43,410

graph so hurt creating an animation of a

64
00:02:49,820 --> 00:02:47,130
star that dies in a fiery blast and the

65
00:02:52,820 --> 00:02:49,830
aftermath it has to tell the story in an

66
00:02:54,920 --> 00:02:52,830
exciting way but also has to be true to

67
00:02:58,059 --> 00:02:54,930
the science has to be realistic armed

68
00:03:00,559 --> 00:02:58,069
with science creativity and inspiration

69
00:03:03,289 --> 00:03:00,569
visualization scientists and artists are

70
00:03:06,470 --> 00:03:03,299
taking us to distant reaches of the

71
00:03:08,900 --> 00:03:06,480
universe we've done visualizations to

72
00:03:11,539 --> 00:03:08,910
show planets around other stars you've

73
00:03:14,059 --> 00:03:11,549
shown but sunsets would look like in

74
00:03:15,440 --> 00:03:14,069
exotic systems astronomers today are

75
00:03:17,990 --> 00:03:15,450
solving some the most interesting

76
00:03:22,069 --> 00:03:18,000
mysteries in the history of mankind and

77
00:03:24,500 --> 00:03:22,079
if we can visually make that exciting to