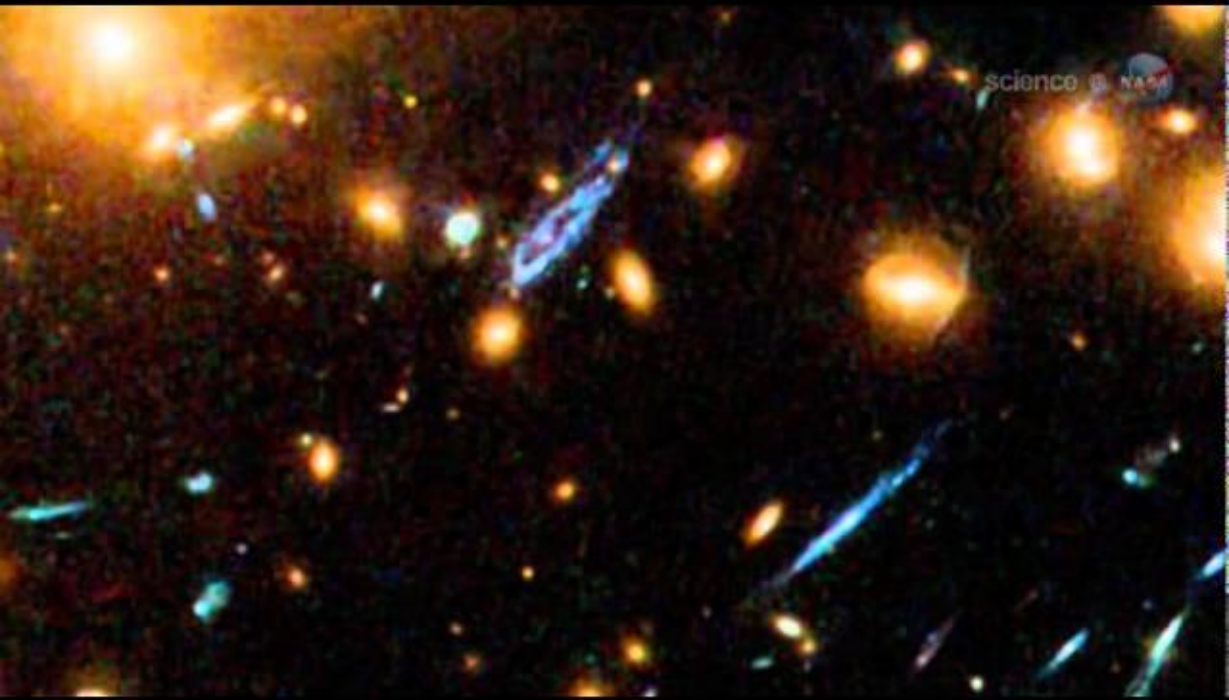
science @ NASA

1
00:00:10,070 --> 00:00:07,990
600 mysteries in the night sky presented

2
00:00:12,150 --> 00:00:10,080
by science at nasa

3
00:00:13,749 --> 00:00:12,160
the universe is a big place and there

4
00:00:16,710 --> 00:00:13,759
are a lot of things out there that

5
00:00:19,349 --> 00:00:16,720
astronomers can't identify nasa's fermi

6
00:00:20,790 --> 00:00:19,359
space telescope has just found about 600

7
00:00:22,550 --> 00:00:20,800
examples

8
00:00:24,870 --> 00:00:22,560
the fermi team recently released the

9
00:00:27,109 --> 00:00:24,880
second catalog of gamma-ray sources

10
00:00:28,390 --> 00:00:27,119
detected by their satellite's large area

11
00:00:30,390 --> 00:00:28,400
telescope

12
00:00:32,950 --> 00:00:30,400
of the 1807

13
00:00:34,630 --> 00:00:32,960

sources found nearly one-third are

14
00:00:36,549 --> 00:00:34,640
complete mysteries

15
00:00:38,229 --> 00:00:36,559
no one knows what they are

16
00:00:40,229 --> 00:00:38,239
fermi sees gamma rays coming from

17
00:00:42,229 --> 00:00:40,239
directions in the sky where there are no

18
00:00:44,630 --> 00:00:42,239
obvious objects likely to produce this

19
00:00:46,950 --> 00:00:44,640
kind of radiation says david thompson

20
00:00:48,470 --> 00:00:46,960
fermi's deputy project scientist

21
00:00:50,389 --> 00:00:48,480
it's a puzzle

22
00:00:52,549 --> 00:00:50,399
gamma rays are by their very nature

23
00:00:54,709 --> 00:00:52,559
heralds of great energy and violence

24
00:00:56,709 --> 00:00:54,719
they are a super energetic form of light

25
00:00:59,029 --> 00:00:56,719
produced by sources such as black holes

26
00:01:00,950 --> 00:00:59,039
and massive exploding stars

27
00:01:03,590 --> 00:01:00,960
gamma rays are so energetic that

28
00:01:05,910 --> 00:01:03,600
ordinary lenses and mirrors do not work

29
00:01:07,670 --> 00:01:05,920
as a result gamma-ray telescopes can't

30
00:01:10,390 --> 00:01:07,680
always get a sharp enough focus to

31
00:01:12,789 --> 00:01:10,400
determine exactly where the sources are

32
00:01:14,469 --> 00:01:12,799
and therein lies the mystery

33
00:01:17,109 --> 00:01:14,479
for two-thirds of the new catalog

34
00:01:19,429 --> 00:01:17,119
sources the fermi scientists can with at

35
00:01:21,590 --> 00:01:19,439
least reasonable certainty locate a

36
00:01:24,149 --> 00:01:21,600
known gamma-ray-producing object such as

37
00:01:26,630 --> 00:01:24,159
a pulsar or blazar but the remaining

38
00:01:29,429 --> 00:01:26,640

third the mystery sources have the

39
00:01:31,990 --> 00:01:29,439
researchers stumped at least for now and

40
00:01:33,510 --> 00:01:32,000
they are the most tantalizing

41
00:01:35,510 --> 00:01:33,520
some of the mystery sources could be

42
00:01:37,510 --> 00:01:35,520
clouds of dark matter something that's

43
00:01:39,590 --> 00:01:37,520
never been seen before

44
00:01:42,069 --> 00:01:39,600
about 85 percent of the gravitational

45
00:01:44,469 --> 00:01:42,079
mass of the universe is dark matter the

46
00:01:46,310 --> 00:01:44,479
stuff we see makes up the rest

47
00:01:48,550 --> 00:01:46,320
dark matter is something that pulls on

48
00:01:51,190 --> 00:01:48,560
things with the force of its gravity but

49
00:01:53,670 --> 00:01:51,200
can't be detected in any other way

50
00:01:56,709 --> 00:01:53,680
it doesn't shine doesn't emit or scatter

51
00:01:59,109 --> 00:01:56,719
light hence the name dark matter

52
00:02:01,510 --> 00:01:59,119
astronomers are not able to detect dark

53
00:02:04,630 --> 00:02:01,520
matter directly using optical or radio

54
00:02:06,469 --> 00:02:04,640
telescopes but dark matter just might

55
00:02:08,229 --> 00:02:06,479
shine in gamma rays

56
00:02:10,150 --> 00:02:08,239
we've been using fermi to search for

57
00:02:12,070 --> 00:02:10,160
dark matter for a long time says the

58
00:02:14,390 --> 00:02:12,080
principal investigator for the large

59
00:02:16,309 --> 00:02:14,400
area telescope peter michelson of

60
00:02:17,990 --> 00:02:16,319
stanford university

61
00:02:19,990 --> 00:02:18,000
some researchers believe that when two

62
00:02:22,550 --> 00:02:20,000
dark matter antiparticles bump into each

63
00:02:23,830 --> 00:02:22,560

other they will annihilate producing

64
00:02:25,830 --> 00:02:23,840
gamma rays

65
00:02:28,150 --> 00:02:25,840
concentrated clouds of dark matter could

66
00:02:30,550 --> 00:02:28,160
form a gamma ray source at specific

67
00:02:32,229 --> 00:02:30,560
wavelengths detectable by fermi

68
00:02:34,630 --> 00:02:32,239
if we see a bump in the gamma ray

69
00:02:36,869 --> 00:02:34,640
spectrum a narrow spectral line at high

70
00:02:39,110 --> 00:02:36,879
energies corresponding to the energy of

71
00:02:41,830 --> 00:02:39,120
the annihilating particles we could be

72
00:02:44,229 --> 00:02:41,840
the first to apprehend dark matter says

73
00:02:45,910 --> 00:02:44,239
michelson so far however the team

74
00:02:48,070 --> 00:02:45,920
doesn't have enough data on the mystery

75
00:02:49,670 --> 00:02:48,080
sources to confirm or rule out the dark

76
00:02:51,750 --> 00:02:49,680
matter hypothesis

77
00:02:55,190 --> 00:02:51,760
other possibilities include undiscovered

78
00:02:57,110 --> 00:02:55,200
pulsars supernova remnants and colliding

79
00:02:58,790 --> 00:02:57,120
clusters of galaxies

80
00:03:01,670 --> 00:02:58,800
the scientists plan to continue

81
00:03:03,910 --> 00:03:01,680
observing until they have some answers

82
00:03:05,910 --> 00:03:03,920
for more news about mysteries in space