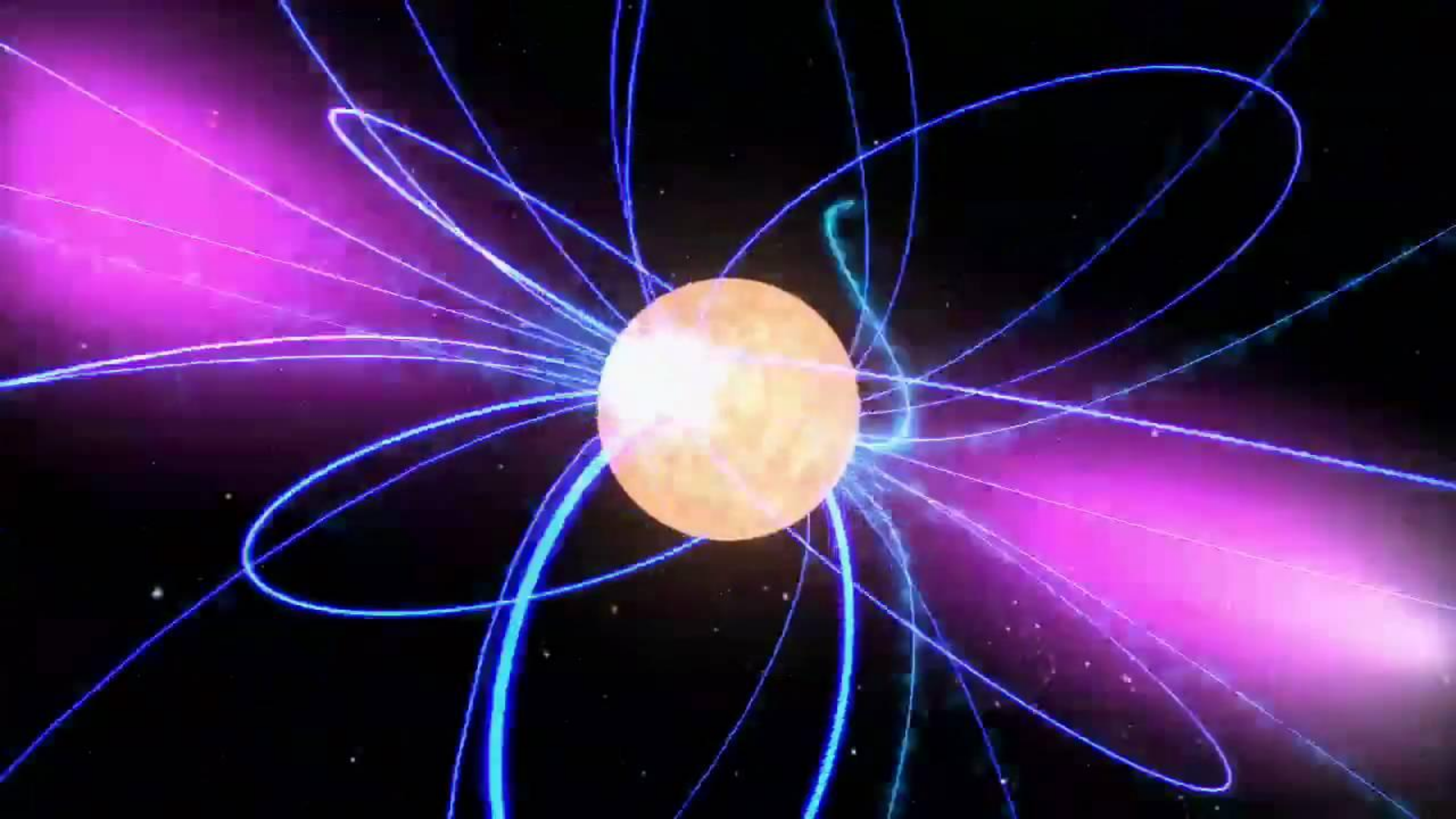

1
00:00:20,120 --> 00:00:18,200
welcome to glassed cast I'm Dave

2
00:00:23,000 --> 00:00:20,130
Thompson a deputy project scientist for

3
00:00:24,710 --> 00:00:23,010
glassed for a while we've been telling

4
00:00:27,050 --> 00:00:24,720
you about all the great things this

5
00:00:30,560 --> 00:00:27,060
revolutionary telescope will do well

6
00:00:33,080 --> 00:00:30,570
we're elated glassed is now in space it

7
00:00:41,520 --> 00:00:33,090
has a new name and it's keeping us very

8
00:00:46,799 --> 00:00:45,119
last June the last rose from a Florida

9
00:00:50,970 --> 00:00:46,809
launch pad on board a Delta two rocket

10
00:00:53,639 --> 00:00:50,980
and thundered into the sky launch day

11
00:00:55,770 --> 00:00:53,649
was very exciting that ride into space

12
00:01:04,350 --> 00:00:55,780
was the missions riskiest and most

13
00:01:08,850 --> 00:01:06,410

for two weeks following launch

14
00:01:11,730 --> 00:01:08,860
controllers carefully checked out the

15
00:01:13,710 --> 00:01:11,740
spacecraft's various systems could glass

16
00:01:15,930 --> 00:01:13,720
communicate properly did it know where

17
00:01:17,960 --> 00:01:15,940
it was pointing were the solar panels

18
00:01:21,030 --> 00:01:17,970
and batteries providing enough power

19
00:01:23,430 --> 00:01:21,040
once we knew we had a healthy spacecraft

20
00:01:30,480 --> 00:01:23,440
it was time to turn on the two science

21
00:01:33,900 --> 00:01:30,490
instruments the large area telescope or

22
00:01:37,170 --> 00:01:33,910
lap maps gamma rays over the entire sky

23
00:01:39,780 --> 00:01:37,180
every three hours and his glass main

24
00:01:42,450 --> 00:01:39,790
detector the other instrument is called

25
00:01:44,880 --> 00:01:42,460
the gamma-ray burst monitor or GBM it

26
00:01:47,249 --> 00:01:44,890
looks for spectacular flashes of gamma

27
00:01:49,530 --> 00:01:47,259
rays from among other things the birth

28
00:01:55,889 --> 00:01:49,540
of black holes far across the universe

29
00:01:58,560 --> 00:01:55,899
with the instruments checked out and

30
00:02:02,749 --> 00:01:58,570
calibrated there was one formality left

31
00:02:06,330 --> 00:02:02,759
give blast a proper name for more than

32
00:02:09,359 --> 00:02:06,340
12,000 suggestions NASA christened its

33
00:02:13,289 --> 00:02:09,369
newest observatory Jeremy gamma-ray

34
00:02:15,930 --> 00:02:13,299
Space Telescope the new name honors

35
00:02:18,720 --> 00:02:15,940
Nobel Prize winner Enrico Fermi a

36
00:02:21,390 --> 00:02:18,730
pioneer in high-energy physics and

37
00:02:24,360 --> 00:02:21,400
astrophysics his work provided the first

38
00:02:27,410 --> 00:02:24,370

insights into the powerful processes the

39
00:02:30,300 --> 00:02:27,420
telescope will help us better understand

40
00:02:33,120 --> 00:02:30,310
so what are we seeing with the Fermi

41
00:02:36,360 --> 00:02:33,130
telescope here's a quick look with its

42
00:02:38,460 --> 00:02:36,370
first four days of observations the LAT

43
00:02:40,800 --> 00:02:38,470
proved itself the remarkable instrument

44
00:02:42,420 --> 00:02:40,810
we knew it to be a detector on an

45
00:02:46,140 --> 00:02:42,430
earlier satellite took more than a year

46
00:02:48,660 --> 00:02:46,150
to record this level of detail much as a

47
00:02:51,630 --> 00:02:48,670
painters brush adds life to a scene with

48
00:02:55,350 --> 00:02:51,640
each stroke the lap adds another layer

49
00:02:57,210 --> 00:02:55,360
of detail with every orbit this bright

50
00:03:00,509 --> 00:02:57,220
band is the Milky Way the plane of our

51
00:03:02,640 --> 00:03:00,519
galaxy these gamma rays arise when

52
00:03:05,490 --> 00:03:02,650
high-velocity particles called cosmic

53
00:03:08,310 --> 00:03:05,500
rays collide with gas atoms in the

54
00:03:11,009 --> 00:03:08,320
galaxy's disc a small fraction of these

55
00:03:13,280 --> 00:03:11,019
gamma rays may come from the mutual

56
00:03:15,240 --> 00:03:13,290
annihilation of exotic particles

57
00:03:17,640 --> 00:03:15,250
scientists have proposed such

58
00:03:18,120 --> 00:03:17,650
undiscovered particles as a possible

59
00:03:22,440 --> 00:03:18,130
explanation

60
00:03:25,230 --> 00:03:22,450
nation for mysterious dark matter with

61
00:03:28,080 --> 00:03:25,240
our gamma ray vision some sources glow

62
00:03:31,620 --> 00:03:28,090
especially brightly these are pulsars

63
00:03:36,420 --> 00:03:31,630

the dense fast spinning and intensely

64
00:03:38,700 --> 00:03:36,430
magnetic leftovers of exploded stars the

65
00:03:41,250 --> 00:03:38,710
Veila pulsars the brightest persistent

66
00:03:43,800 --> 00:03:41,260
source in the gamma-ray sky although we

67
00:03:46,020 --> 00:03:43,810
don't know all of the details pulsars

68
00:03:49,740 --> 00:03:46,030
emit light house like beams of radiation

69
00:03:54,650 --> 00:03:49,750
when a beam sweeps past us we see the

70
00:03:57,660 --> 00:03:54,660
emission spike or pulse hence the name

71
00:03:59,670 --> 00:03:57,670
this animation of lat images shows the

72
00:04:02,520 --> 00:03:59,680
on-again off-again nature of the veil a

73
00:04:06,110 --> 00:04:02,530
pulsar it's gamma rays actually cycle

74
00:04:08,970 --> 00:04:06,120
about 20 times faster than shown here

75
00:04:10,890 --> 00:04:08,980
most of the 1800 pulsars we know about

76
00:04:13,650 --> 00:04:10,900
were first identified by their radio

77
00:04:17,070 --> 00:04:13,660
emissions but not this one named Jim

78
00:04:19,800 --> 00:04:17,080
Inga it was confirmed as a pulsar by X

79
00:04:21,840 --> 00:04:19,810
and gamma-ray satellites we suspect that

80
00:04:23,880 --> 00:04:21,850
there are many other radio quiet pulsars

81
00:04:25,860 --> 00:04:23,890
like it there radio beams don't

82
00:04:29,580 --> 00:04:25,870
intercept the earth but their gamma-ray

83
00:04:32,760 --> 00:04:29,590
pulses do in fact farrah me has already

84
00:04:34,950 --> 00:04:32,770
found one it lurks in this expanding

85
00:04:37,560 --> 00:04:34,960
shell of gas shown here at radio

86
00:04:40,890 --> 00:04:37,570
wavelengths formed when a star exploded

87
00:04:49,970 --> 00:04:40,900
about 10,000 years ago the shell is a

88
00:04:55,170 --> 00:04:51,960

everything about this X and gamma-ray

89
00:04:56,670 --> 00:04:55,180
source said it was a pulsar except no

90
00:04:59,130 --> 00:04:56,680
one had seen pulses at any other

91
00:05:01,980 --> 00:04:59,140
wavelengths but Jeremy detected them

92
00:05:05,610 --> 00:05:01,990
this is the first pulsar ever seen that

93
00:05:08,190 --> 00:05:05,620
blinks only in gamma rays it radiates

94
00:05:14,170 --> 00:05:08,200
more energy in fact in gamma rays than

95
00:05:19,879 --> 00:05:17,600
this is just the beginning we expect

96
00:05:22,490 --> 00:05:19,889
that Fermi will discover dozens of new

97
00:05:24,590 --> 00:05:22,500
pulsars within its first year the

98
00:05:26,719 --> 00:05:24,600
telescope is also giving us new insights

99
00:05:29,740 --> 00:05:26,729
into gamma ray bursts and the massive

100
00:05:33,110 --> 00:05:29,750
jets that erupt from distant galaxies