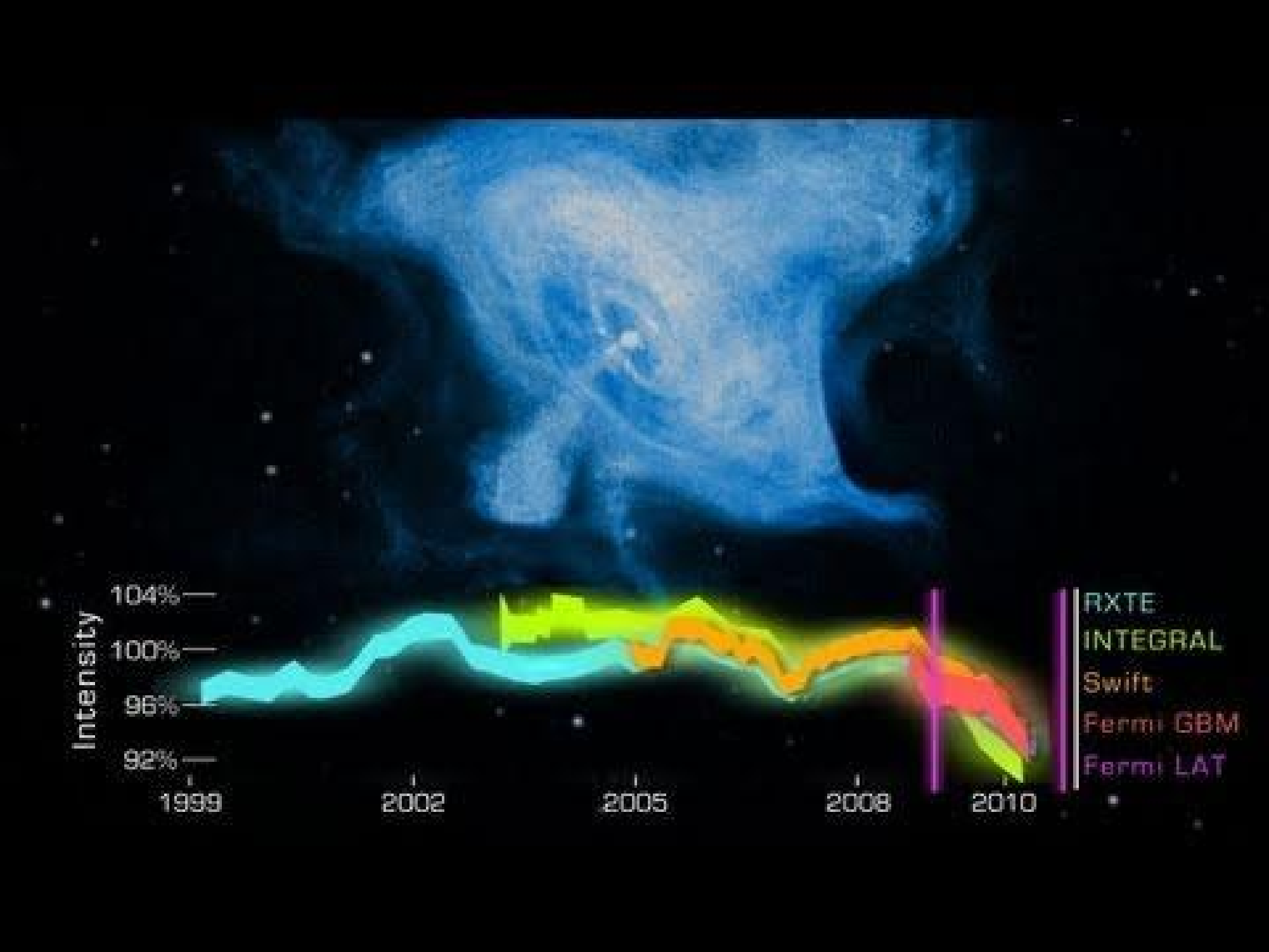
Intensity
104%
100%
96%
92%
1999
2002
2005
2008
2010
RXTE
INTEGRAL
Swift
Fermi GBM
Fermi LAT

1
00:00:00,020 --> 00:00:11,040
Music

2
00:00:11,060 --> 00:00:15,090
Narrator: Nearly a thousand years ago, people saw an exploding star, right here

3
00:00:15,110 --> 00:00:19,150
This is the Crab Nebula, the wreckage of that event.

4
00:00:19,170 --> 00:00:23,200
For most X-ray astronomers, it's the brightest and steadiest beacon in the sky.

5
00:00:23,220 --> 00:00:27,240
But now they realize it's not as steady as they thought.

6
00:00:27,260 --> 00:00:31,250
Several orbiting X-ray observatories have seen unexpected variations.

7
00:00:31,270 --> 00:00:35,270
Most X-ray telescopes don't have sharp enough vision to make images.

8
00:00:35,290 --> 00:00:39,300
Instead, they detect the Crab as a broad source.

9
00:00:39,320 --> 00:00:43,340
From 1999 to 2008, it brightened and faded by as much as

10
00:00:43,360 --> 00:00:47,350
3.5 percent a year. And since 2008, it's

11
00:00:47,370 --> 00:00:51,380
faded by 7 percent. The Gamma-ray Burst Monitor on NASA's

12
00:00:51,400 --> 00:00:55,400
Fermi satellite detected the decline and Fermi also spotted two gamma-ray

13
00:00:55,420 --> 00:00:59,440

flares at even higher energies. What's going on?

14
00:00:59,460 --> 00:01:03,470
Scientists think the X-rays reveal processes deep within the nebula, in a

15
00:01:03,490 --> 00:01:07,490
region powered by a rapidly spinning neutron star, the core of the star

16
00:01:07,510 --> 00:01:11,530
that blew up. This image from NASA's Chandra X-ray Observatory

17
00:01:11,550 --> 00:01:15,550
shows how complex this inner region is. But figuring out

18
00:01:15,570 --> 00:01:19,610
where the Crab's long-term X-ray changes are taking place will require a

19
00:01:19,630 --> 00:01:23,630
new generation of hard X-ray telescopes.

20
00:01:23,650 --> 00:01:27,660
Once regarded as an unchanging standard, the Crab Nebula flickers from energy

21
00:01:27,680 --> 00:01:31,690
ultimately provided by a long-dead star.