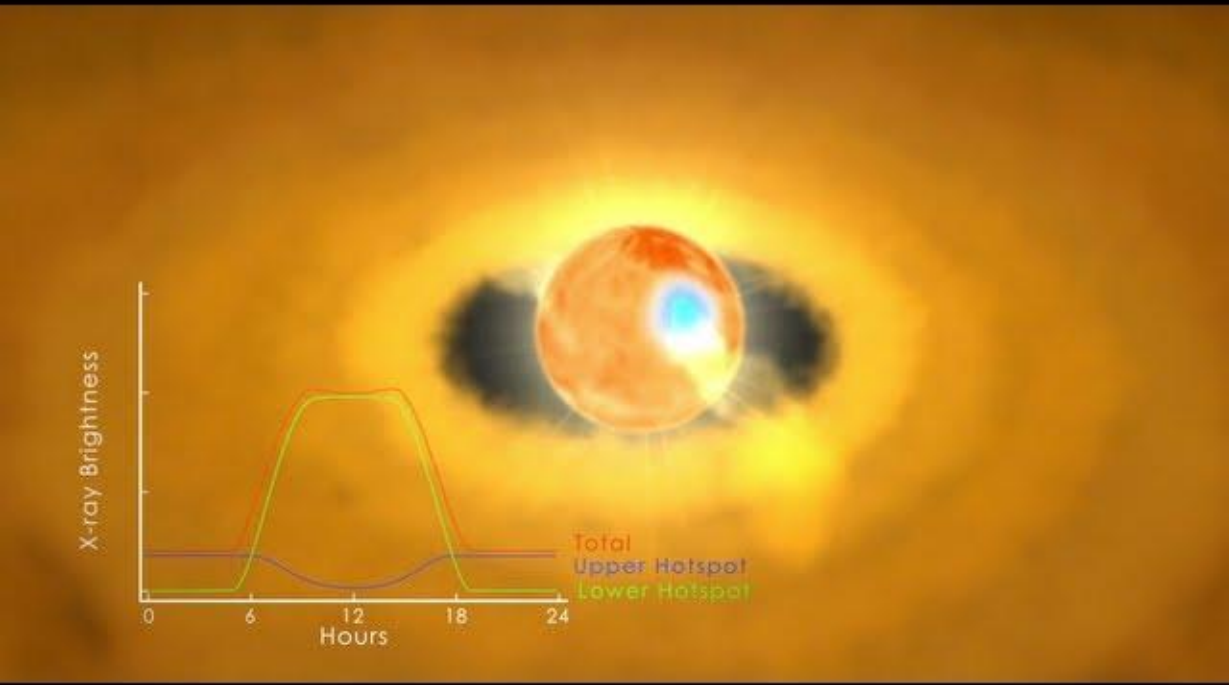
X-ray Brightness
0
6
12
18
24
Hours
Total
Upper Hotspot
Lower Hotspot

1
00:00:08,130 --> 00:00:04,070
Music

2
00:00:08,150 --> 00:00:12,160
Narrator: Not far from the colorful nebula

3
00:00:12,180 --> 00:00:16,190
M78, in a dark cloud where stars are being formed, a young

4
00:00:16,210 --> 00:00:20,220
star announced its presence by lighting up a nebula never cataloged

5
00:00:20,240 --> 00:00:24,250
before. Astronomers first noticed McNeil's Nebula in

6
00:00:24,270 --> 00:00:28,280
2003, which drew their attention to the young star illuminating it,

7
00:00:28,300 --> 00:00:32,320
named V1647 Orionis. The star

8
00:00:32,340 --> 00:00:36,340
sports a pair on intense X-ray "hot spots" thousands of times

9
00:00:36,360 --> 00:00:40,410
hotter than the rest of the star. These spots are thought to be the footprints

10
00:00:40,430 --> 00:00:44,430
of streams that transfer gas from a disk that still surrounds the young

11
00:00:44,450 --> 00:00:48,460
star. Scientists think that magnetic reconnection events--

12
00:00:48,480 --> 00:00:52,480
the energy source for outbursts from our own sun--channel and drive

13
00:00:52,500 --> 00:00:56,530

the gas flows. The star, which spins once in about a day,

14
00:00:56,550 --> 00:01:00,550
rotates faster than the disk, and constantly winds up the

15
00:01:00,570 --> 00:01:04,600
magnetic fields, which release a great deal of energy when they snap back into

16
00:01:04,620 --> 00:01:08,620
lower-energy states. This protostar's X-ray

17
00:01:08,640 --> 00:01:12,660
variations are giving astronomers a rare glimpse of energetic phenomena

18
00:01:12,680 --> 00:01:16,680
accompanying the "toddler" phase of a low-mass star.