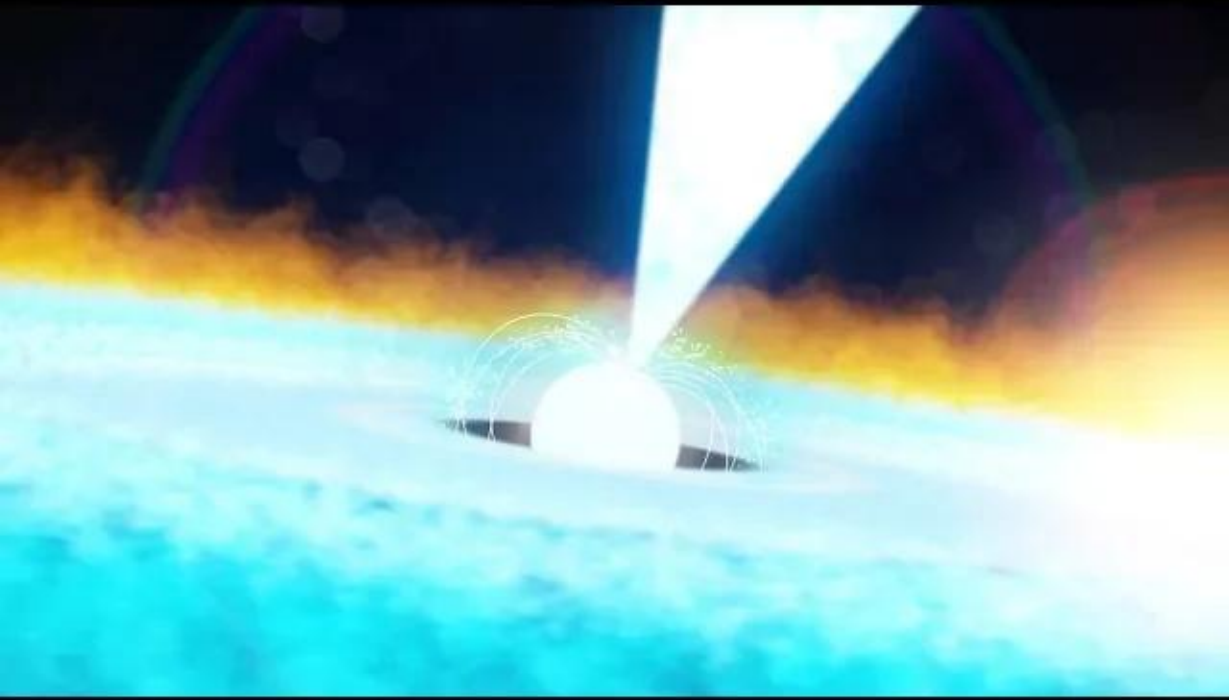

1
00:00:05,349 --> 00:00:03,669
on august 21st 2019 nasa's nicer

2
00:00:07,349 --> 00:00:05,359
telescope on the international space

3
00:00:08,950 --> 00:00:07,359
station observed its brightest x-ray

4
00:00:12,070 --> 00:00:08,960
burst to date

5
00:00:14,390 --> 00:00:12,080
the flare-up came from saks j1808 a

6
00:00:15,589 --> 00:00:14,400
binary system about 11 000 light years

7
00:00:18,230 --> 00:00:15,599
away

8
00:00:20,950 --> 00:00:18,240
here a pulsar a rapidly spinning neutron

9
00:00:22,630 --> 00:00:20,960
star draws gas from its companion an

10
00:00:24,550 --> 00:00:22,640
object called a brown dwarf that is

11
00:00:26,070 --> 00:00:24,560
larger than a planet but less massive

12
00:00:28,230 --> 00:00:26,080
than a star

13
00:00:30,790 --> 00:00:28,240

hydrogen gas from the brown dwarf forms

14
00:00:32,549 --> 00:00:30,800
an accretion disk around the pulsar

15
00:00:33,830 --> 00:00:32,559
every few years the disk becomes

16
00:00:35,510 --> 00:00:33,840
unstable

17
00:00:38,229 --> 00:00:35,520
this sends a rush of gas toward the

18
00:00:40,310 --> 00:00:38,239
pulsar that makes it brighten and x-rays

19
00:00:42,470 --> 00:00:40,320
the pulsar super-strong magnetic field

20
00:00:44,549 --> 00:00:42,480
sweeps up the gas and channels it to the

21
00:00:46,549 --> 00:00:44,559
object's surface

22
00:00:48,869 --> 00:00:46,559
hydrogen nuclei falling to the pulsar

23
00:00:51,029 --> 00:00:48,879
surface fuse together producing energy

24
00:00:52,150 --> 00:00:51,039
and forming helium nuclei which settle

25
00:00:54,150 --> 00:00:52,160
out below

26
00:00:55,670 --> 00:00:54,160
this process is similar to what happens

27
00:00:57,830 --> 00:00:55,680
inside our sun

28
00:00:59,830 --> 00:00:57,840
then when the conditions are just right

29
00:01:02,709 --> 00:00:59,840
the entire helium layer ignites in a

30
00:01:05,030 --> 00:01:02,719
brief but intense thermonuclear fireball

31
00:01:07,270 --> 00:01:05,040
astronomers call this a type 1 x-ray

32
00:01:08,789 --> 00:01:07,280
burst here's how it happened

33
00:01:10,870 --> 00:01:08,799
the explosion first blows off the

34
00:01:12,630 --> 00:01:10,880
hydrogen layer which expands and

35
00:01:14,710 --> 00:01:12,640
ultimately dissipates

36
00:01:16,230 --> 00:01:14,720
then the rising radiation builds to the

37
00:01:18,950 --> 00:01:16,240
point where it blows off the helium

38
00:01:20,950 --> 00:01:18,960

layer which overtakes the hydrogen shell

39
00:01:23,910 --> 00:01:20,960
some of the x-rays emitted in the blast

40
00:01:25,990 --> 00:01:23,920
scatter off of the accretion disk

41
00:01:29,510 --> 00:01:26,000
the fireball then quickly cools and the

42
00:01:31,910 --> 00:01:29,520
helium settles back onto the surface

43
00:01:33,910 --> 00:01:31,920
it was all over in 20 seconds but nicer

44
00:01:35,510 --> 00:01:33,920
data clearly show important details that

45
00:01:36,870 --> 00:01:35,520
haven't been seen together in other

46
00:01:38,230 --> 00:01:36,880
bursts

47
00:01:40,069 --> 00:01:38,240
this will help scientists better