What is a Pulsar?

1
00:00:17,030 --> 00:00:09,000
Music

2
00:00:17,050 --> 00:00:21,100
Narrator: A pulsar is a rapidly spinning neutron star, which is the small incredibly

3
00:00:21,120 --> 00:00:25,130
dense remnant of much more massive star. A teaspoon of matter

4
00:00:25,150 --> 00:00:29,160
from a neutron star weighs as much as Mount Everest and the neutron star is so compact

5
00:00:29,180 --> 00:00:33,190
that a ball about fifteen miles across contains more matter than our sun.

6
00:00:33,210 --> 00:00:37,210
Neutron stars spin between seven and forty thousand times a

7
00:00:37,230 --> 00:00:41,250
minute and form with incredibly strong magnetic fields. Rapid spin

8
00:00:41,270 --> 00:00:45,370
and intense magnetic fields drive powerful beams of electromagnetic radiation

9
00:00:45,390 --> 00:00:49,420
including gamma rays. As the pulsar rotates, these

10
00:00:49,440 --> 00:00:53,460
beams sweep the sky like a lighthouse. To a distant observer, the pulsar

11
00:00:53,480 --> 00:00:57,490
appears to blink on and off. Pulsars slow down as they

12
00:00:57,510 --> 00:01:01,530
age but some of the oldest pulsars spin hundreds of times a second.

13
00:01:01,550 --> 00:01:05,560

Each of these millisecond pulsars orbits a normal star. Over time,

14
00:01:05,580 --> 00:01:09,650
the impact of gas pulled from the normal star has spun the pulsar up to incredible

15
00:01:09,670 --> 00:01:13,680
speeds. This accretion may be the cause of their weaker

16
00:01:13,700 --> 00:01:17,710
magnetic fields. Despite this, these pulsars also emit gamma

17
00:01:17,730 --> 00:01:18,740
rays.

18
00:01:18,760 --> 00:01:21,750
Music