

What are Pulsars?

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About Pulsar:

- Pulsars are **rapidly rotating neutron stars** that **blast out pulses** of radiation **at regular intervals** ranging from seconds to milliseconds.
- Pulsars **have very strong magnetic fields**, which **funnel jets of particles out** along the two magnetic poles. These **accelerated particles produce very powerful beams of light**.
- Often, the **magnetic field is not aligned with the spin axis**, so those **beams of particles and light** are **swept around as the star rotates**.
- The **periodicity** of pulsars is **caused by** these **beams of light crossing the line of sight on Earth**, with the pulsar appearing to 'switch off' at points when the light is facing away from us. The time between these pulses is the 'period' of the pulsar.
- Pulsars have been **primarily observed at radio wavelengths**.
- Pulsar masses range between 1.18 and 1.97 times that of the Sun, but most pulsars have a mass 1.35 times that of the Sun.

What is a Neutron Star?

- **Neutron stars** are **highly dense remnants of massive stars** that have collapsed, composed mainly of neutrons and other elementary particles.
- Neutron stars are **formed when a massive star runs out of fuel and collapses**.
- The very central region of the star – **the core** – **collapses, crushing together every proton and electron into a neutron**.
- If the core of the collapsing star is between about 1 and 3 solar masses, these newly-created neutrons can stop the collapse, leaving behind a neutron star.

What is the Green Bank Telescope (GBT)?

- With a 100 m × 110 m off-axis paraboloid dish, the GBT is the **largest fully steerable radio telescope on Earth**.
 - It is located at Green Bank Observatory in the National Radio Quiet Zone in Green Bank, **West Virginia, U.S.**
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Q1: What is a neutron?

Neutrons, along with protons, are subatomic particles found inside the nucleus of every atom. The only exception is hydrogen, where the nucleus contains only a single proton. Neutrons have a neutral electric charge (neither negative nor positive) and have slightly more mass than positively charged protons. “Free” neutrons are those no longer confined inside a nucleus. These free neutrons are produced by fission and fusion processes.

Source: [New millisecond pulsar discovered](#)

Source: <https://vajiramandravi.com/current-affairs/pulsars/>

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