



SARAS 3 Telescope

Why in News

Recently, the Indian researchers at RRI (Raman Research Institute) in a **study** using the **SARAS 3 radio telescope**, have conclusively **denied a recent claim of the discovery of a radio wave signal from cosmic dawn**.

- In 2018 a team of researchers from **Arizona State University (ASU) and MIT in the US** detected a signal from stars emerging in the early universe using data from the EDGES radio telescope.
- The **Cosmic Dawn** is the period from about 50 million years to one billion years after the Big Bang when the first stars, black holes, and galaxies in the Universe formed.
- The **RRI** is an **autonomous research institute** engaged in research in basic sciences. The institute was founded in 1948 by the Indian physicist and [Nobel Laureate Sir C V Raman](#).

What are Radio Waves and Radio Telescopes?

- Radio waves have the **longest wavelengths in the electromagnetic spectrum**. They range from the length of a football to larger than our planet. Heinrich Hertz proved the existence of radio waves in the late 1880s.
- Radio telescopes **collect weak radio light waves, bring it to a focus, amplify it and make it available for analysis**.
- They help study **naturally occurring radio light from stars, galaxies, black holes, and other astronomical objects**.
- These **specially-designed telescopes observe the longest wavelengths of light**, ranging from 1 millimetre to over 10 metres long. For comparison, visible light waves are only a few hundred nanometers long, and a nanometer is only 1/10,000th the thickness of a piece of paper! In fact, we don't usually refer to radio light by its wavelength, but by its frequency.

What is SARAS-3 Radio Telescope?

- SARAS is a **niche high-risk high-gain experimental effort of RRI**.
- SARAS aims to **design, build and deploy in India a precision radio telescope to detect extremely faint radio wave signals** from the depths of time, from our "Cosmic Dawn" when the first stars and galaxies formed in the early Universe.

What are the Findings?

- SARAS 3 **did not find any evidence of the signal claimed by the EDGES experiment**.
- The presence of the signal is **decisively rejected after a careful assessment** of the measurement uncertainties.
- The detection reported by EDGES was likely contamination of their measurement and not a signal from the depths of space and time.
- However, astronomers still do not know what the actual signal looks like.

PYQ

Consider the following phenomena: (2018)

1. Light is affected by gravity.
2. The Universe is constantly expanding.
3. Matter warps its surrounding space-time.

Which of the above is/are the prediction/predictions of Albert Einstein's General Theory of Relativity, often discussed in media?

- (a) 1 and 2 only
- (b) 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Ans: (d)

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