Supernova and Black Holes

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Why is in news? Mysterious Circles of Radio Emission Detected in Space May Come From Supernova Explosions or Massive Black Holes

A new research offers plausible explanations for **mysterious hazy circles of radio emission** deep in celestial space called **Odd Radio Circles** (ORCs) detected recently using some of the most sensitive international radio telescopes.

Astronomers recently identified these ORCs using the **Square Kilometer Array** (SKA) in Australia & South Africa, the **Giant Metrewave Radio Telescope** (GMRT) in India, and the **Low-Frequency Array** (LOFAR) in the Netherlands.

Such objects are seen only in radio and not in any other form of radiation.

Some of these objects could be 1 million light-years across, about 10 times larger than our Milky Way.

The ORCs are considered mysterious, as these objects could not be explained with any previously known astrophysical phenomena.

Scientist at Aryabhatta Research Institute of observational sciences (ARIES), Nainital (an autonomous institute of DST, Govt. of India) in his research has proved that **some of these ORCs could be remnants of thermonuclear supernovas** triggered by the explosion of a white dwarf star in a binary system heavier than 1.4 times the mass of the Sun.

The **Square Kilometer Array** (SKA) in Australia & South Africa, **the world's most powerful radio telescope with international co-operation**, includes participation by scientists and engineers working in various institutes under India's Ministry of Science & Technology, many more of these objects will be detected in the future.

Supernova - A supernova is the **explosion of a massive star**. It is the largest explosion that takes place in space, which releasing enormous amount of energy.

Black hole - A black hole is a place in space where gravity pulls so much that even light cannot escape. The gravity is so strong because matter has been squeezed into a tiny space. This can happen when a star is dying.

Black holes can be big or small.

Scientists think the smallest black holes are as small as just one atom. These black holes are very tiny but have the mass of a large mountain.

Another kind of black hole is called "**stellar**." Its mass can be up to 20 times more than the mass of the sun.

The largest black holes are called '**supermassive**' and they have masses that are more than 1 million suns together.

The **supermassive black hole at the center of the Milky Way galaxy** is called **Sagittarius A**.

It has a mass equal to about 4 million suns and would fit inside a very large ball that could hold a few million Earths.