

Dark energy

September 27, 2021

In news— Recently, an international team of researchers made the first putative direct detection of dark energy.

XENON1T experiment and key findings-

- The XENON1T experiment is the world's most sensitive dark matter experiment and was operated deep underground at the **INFN Laboratori Nazionali del Gran Sasso in Italy**.
- The finding also suggests that experiments like XENON1T, which are designed to detect dark matter, could also be used to detect dark energy.

What is Dark energy?

- Dark energy is an unknown form of energy that affects the universe on the largest scales.
- The **first observational evidence for its existence came from measurements of supernovae**, which showed that the universe does not expand at a constant rate and rather, the expansion of the universe is accelerating.

What is dark matter?

- First, it is dark, meaning that it is not in the form of stars and planets that we see.
- Observations show that there is far too little visible matter in the universe to make up the 27% required by the observations.
- Second, it is not in the form of dark clouds of normal matter, matter made up of particles called baryons.
- Third, dark matter is not antimatter, because we do not see the unique gamma rays that are produced when antimatter annihilates with matter.

Both Dark matter and Dark energy are the same?

- About 27% of the universe is dark matter and 68% is dark energy.
- While **dark matter attracts and holds galaxies together, dark energy repels and causes the expansion of the universe.**
- Despite both components being invisible, we know a lot more about dark matter, since its existence was suggested as early as the 1920s, while dark energy wasn't discovered until 1998.