

# 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.