CIBER-2: Counting of Stars

Why in News

A **NASA** (National Aeronautics and Space Administration) **funded CIBER-2 sounding rocket's** launch window will open at the **White Sands Missile Range** in New Mexico, USA.

- The **aim** of CIBER-2 mission is **to look for evidence of extra stars** that may have been missed in stellar head counts.
- The **ESA (European Space Agency) infrared space observatory Herschel** also counted the number of galaxies in infrared and measured their luminosity previously.

Key Points

- **Sounding Rocket:**
  - Sounding rockets take their name from the nautical term **"to sound,"** which means to **take measurements.**
  - Since 1959, NASA-sponsored space and earth science research has used sounding rockets to test instruments used on satellites and spacecraft and to provide information about the **Sun, stars, galaxies** and **Earth's atmosphere and radiation.**

- **About CIBER-2 (Cosmic Infrared Background Experiment-2):**
    - The mission is the **latest in a series of sounding rocket launches** that began in 2009. The count from the first CIBER mission paved the way to reorganize the research and give the counting of stars another run.
    - The CIBER-2 instrument will **launch aboard a sounding rocket,** a small suborbital rocket that will carry scientific instruments on brief trips into space before it falls back to Earth for recovery.
    - Once above Earth's atmosphere, CIBER-2 will **survey a patch of sky about 4 square degrees -** for reference, the full Moon takes up about half a degree – that includes dozens of galaxy clusters.
    - It **will not actually count individual stars** but it will instead detect the **extragalactic background light,** which is all of the light that has been emitted throughout the history of the Universe.
    - From all of this extragalactic background light, the CIBER-2 **will focus on a portion of this called cosmic infrared background,** which is emitted by some of the most common stars.
        - Essentially, this approach is aiming to look at how bright this light is to give scientists an estimate of how many of these stars are out there.
- **Rough Estimate of Stars:**
    - To get a rough estimate of the total number of stars in the universe, scientists have calculated the **average number of stars in a galaxy –** some estimates put it at about **100 million,** though it could be 10 or more times higher.
    - **Multiplying it by the number of galaxies,** taken to be about **2 trillion** (also very tentative), there are **one hundred quintillion stars (or 1 with 21 zeros after it).**
    - But this calculation **assumes that all stars are inside galaxies,** which might not be true and this is what the **CIBER-2 instrument will try to find out.**
    - The European Space Agency (ESA) says **there could be 100 thousand million stars in the Milky Way alone.**

Source: IE