

CIBER-2 instrument of NASA

June 7, 2021

Recently, a NASA-funded rocket's launch window opened at the White Sands Missile Range in New Mexico, USA.

Aim of CIBER

To count the number of stars that exist in the Universe.

While this is not the first time that such a mission has been undertaken, the CIBER-2 instrument has been improved upon to see if any stars had been undercounted in the previous counting attempts.

About Cosmic Infrared Background Experiment-2(CIBER-2)

- The universe contains a mind-boggling number of stars but scientists' best estimates may be an undercount.
- **A NASA-funded sounding rocket is launching with an improved instrument to look for evidence of extra stars** that may have been missed in stellar head counts.
- The Cosmic Infrared Background Experiment-2, or CIBER-2, mission **is the latest in a series of sounding rocket launches that began in 2009.**
- It is led by Michael Zemcov, assistant professor of physics and astronomy at the Rochester Institute of Technology in New York
- **The CIBER-2 instrument, like the earlier CIBER instrument it's based on, will launch aboard a sounding rocket a small suborbital rocket** that carries scientific instruments on brief trips into space before falling 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 won't count stars, but it will detect the diffuse,

cosmos-filling glow known as the extragalactic background light.

- **CIBER-2 was designed to observe an expanded range of wavelengths** from the near-infrared to green visible light to see if it's there.
- **CIBER-2 can also distinguish light from the first galaxies and stars or early direct-collapsing black holes:** Both should have a characteristic portion of their total light missing, the part absorbed by the thick fog of intergalactic hydrogen in the early universe.

Counting of stars by CIBER-2

- Once the instrument is above Earth's atmosphere, it will survey a patch of sky that will include dozens of clusters of galaxies.
- NASA notes that the instrument 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.
- 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.
- The ESA infrared space observatory Herschel also counted the number of galaxies in infrared and measured their luminosity previously.