

Multi-slit Solar Explorer (MUSE) and HelioSwarm missions by NASA

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In news- Recently, NASA selected two more missions called Multi-slit Solar Explorer (MUSE) and HelioSwarm missions that will help understand the dynamics of the Sun, the Sun-Earth connection, and the constantly changing space environment.

About MUSE and HelioSwarm missions-

MUSE mission-

- **The primary goal of the MUSE mission is to investigate the causes of coronal heating and instability, such as flares and coronal mass ejections**, and gain insight into the basic plasma properties of the corona.
- It will **offer deeper insight into the physics of the solar atmosphere by using a powerful instrument known as a multi-slit spectrometer to observe the Sun's extreme ultraviolet radiation** and obtain the highest resolution images ever captured of the solar transition region and the corona.
- MUSE will obtain high-resolution images of the evolution of solar flare ribbons in a field of view focused on a large, active region on the Sun.
- It will also **provide complementary observations from heliophysics research** such as the Extreme UltraViolet Spectroscopic Telescope and ground-based observatories.
- It will provide more insight into space weather and complements a host of other missions within the heliophysics mission fleet.
- **The principal investigator for this mission is** Bart DePontieu of the Lockheed Martin Advanced Technology

Center (LMATC) of Palo Alto, California.

HelioSwarm mission-

- **It is a constellation or “swarm” of nine spacecraft that will capture the first multiscale in-space measurements of fluctuations in the magnetic field** and motions of the solar wind known as solar wind turbulence.
- The Sun’s outermost atmospheric layer, the heliosphere, encompasses an enormous region of the solar system.
- Solar winds spread through the heliosphere, and their interactions with planetary magnetospheres and disruptions such as coronal mass ejections affect their turbulence.
- **HelioSwarm consists of one hub spacecraft and eight co-orbiting small satellites that range in distance from each other and the hub spacecraft.**
- The hub spacecraft will maintain **radio contact with each small satellite.**
- The technical innovation of HelioSwarm’s small satellites operating together as a constellation provides the unique ability to investigate turbulence and its evolution in the solar wind.
- This mission’s **principal investigator is Harlan Spence from the University of New Hampshire.**