SunRISE

Sun Radio Interferometer Space Experiment

NASA's Sun Radio Interferometer Space Experiment (SunRISE) has broad implications for life on Earth and beyond. Using integrated global navigation satellite system (GNSS) and decametric-hectometric (DH) wavelength (0.1–23 MHz) radio receivers, the mission will observe and image radio emissions associated with coronal mass ejections (CMEs) from the Sun. Scientists will use this data to better understand the complex physics of CMEs and solar flares.

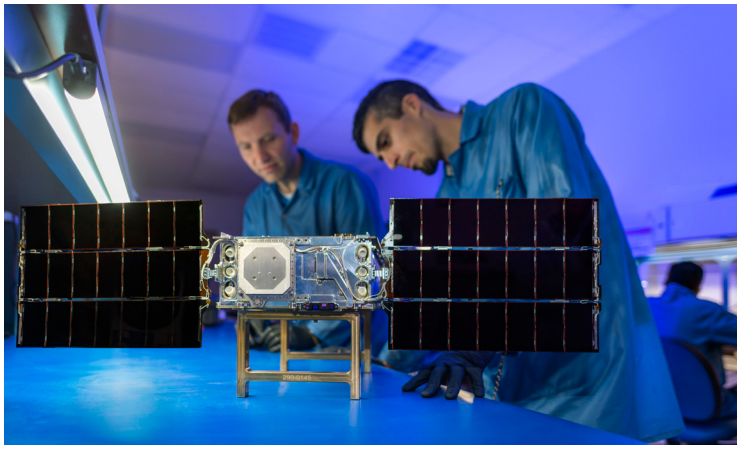
CMEs and solar flares influence solar storms that feed into Earth's complex space weather system, which, like terrestrial weather, can affect earthbound systems like power grids or radio communications. Solar storms can also affect space systems, damaging Earth-orbiting satellites and endangering astronauts. Scientists will use SunRISE data to gather insights into solar physics and space weather to help predict and prepare for these solar storms.

MISSION SPONSOR & PARTNERS

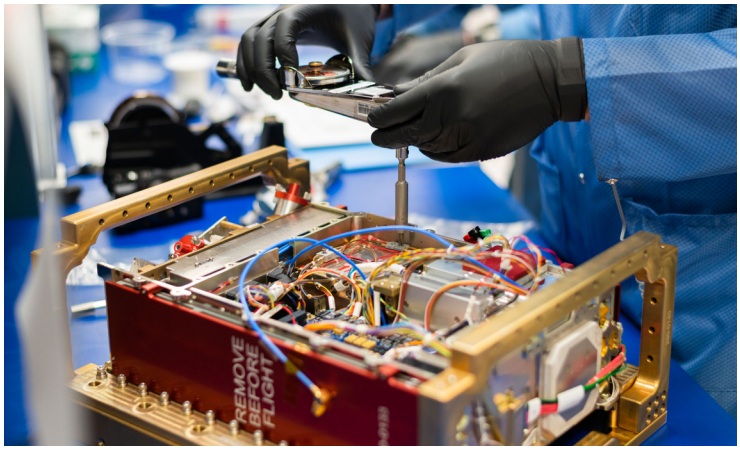
SunRISE is a Mission of Opportunity sponsored by the Heliophysics Division of NASA's Science Mission Directorate. Principal Investigator Dr. Justin Kasper of the University of Michigan will provide the Science Operations Center, which will process the SunRISE data to create science products. NASA's Jet Propulsion Laboratory (JPL) will develop the science payloads and provide overall project management. JPL will also operate the space vehicles. The Space Dynamics Laboratory (SDL) will provide the spacecraft and the associated system-level integration and test.

MISSION INSTRUMENTS

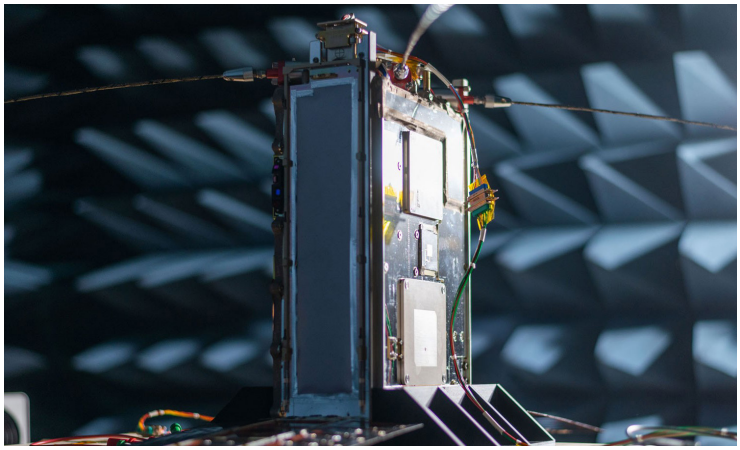
As an industry leader in small satellites, SDL is developing six identical 6U SmallSats with flight software and subsystems for power, command and data handling, communications, thermal management, attitude control, and propulsion. Each SunRISE SmallSat is designed to host a JPL-built science payload, which will receive and record GNSS signals from Earth and DH signals from the Sun. Each SmallSat will weigh 12 kilograms and measure approximately 36 x 24 x 12 centimeters—smaller than a carry-on suitcase.



Engineers inspect the SunRISE space vehicle.



Engineers assemble the SunRISE space vehicle.



The SunRISE space vehicle is tested for electromagnetic compatibility.

UTAH STATE UNIVERSITY
SPACE DYNAMICS LABORATORY®

416 East Innovation Avenue | North Logan, Utah 84341 | info@sdl.usu.edu | www.sdl.usu.edu

SDL/22-2039 Rev. C

MISSION LAUNCH & OPERATIONS

After launch, the SunRISE SmallSats will separate from the launch vehicle just above geostationary orbit. The spacecraft will then operate as a single radio telescope, using cold gas propulsion to maintain a loose formation within about 10 kilometers of each other. Each satellite will download data through NASA's Deep Space Network to the Mission Operations Center at JPL. After initial processing at JPL, the data will be sent to the Science Data System at the University of Michigan, where scientists will combine it to create SunRISE science products. Designed to provide the science community with this first-of-its-kind solar DH data, SunRISE will offer a new view of the Sun.

SDL