

# Sounding rocket will take 1,500 images of sun in five minutes

May 4 2017, by Lina Tran

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The RAISE payload, partially enclosed in a clean tent, is shown after completion of testing before going to the launch pad. Credit: Amir Caspi, Southwest Research Institute

On May 5, 2017, scientists will launch a sounding rocket 200 miles up into the atmosphere, where in just five minutes, it will take 1,500 images of the sun. The NASA-funded RAISE mission is designed to scrutinize split-second changes occurring near the sun's active regions—areas of

intense, complex magnetic activity that can give rise to solar flares, which eject energy and solar material out into space.

Several missions continuously study the sun—such as NASA's Solar Dynamics Observatory, or SDO, and the Solar Terrestrial Relations Observatory, or STEREO—but certain areas of the sun demand especially high-cadence observations in order to understand the rapid changes occurring there. That's where RAISE—short for Rapid Acquisition Imaging Spectrograph Experiment—comes in.

"Dynamic processes happen on all timescales," said Don Hassler, principal investigator for the RAISE mission at the Southwest Research Institute in Boulder, Colorado. "With RAISE, we'll read out an image every two-tenths of a second, so we can study very fast processes and changes on the sun. That's around five to 10 times faster than comparable instruments on other [sounding rocket](#) or satellite missions."

RAISE images are used to create a data product called a spectrogram, which separates light from the sun into all its different wavelength components. By looking at the intensity of light at each wavelength, scientists can assess how solar material and energy moves around the sun, and how that movement evolves into massive solar eruptions.



RAISE goes through a spin-balance test in the Sounding Rocket Payload Facility at the White Sands Missile Range. Credit: Amir Caspi, Southwest Research Institute/Joy Ng, NASA's Goddard Space Flight Center

"RAISE is pushing the limits of high-cadence observations, and doing so is challenging," Hassler said. "But that's exactly what the NASA sounding rocket program is for."

The flight of a sounding rocket is short-lived, and has a parabolic trajectory—the shape of a frown. Most sounding [rocket](#) flights last for 15 to 20 minutes, and just five to six of those minutes are spent making observations from above the atmosphere, observations that can only be done in space. In RAISE's case, the [extreme ultraviolet light](#) the instruments observe can't penetrate Earth's atmosphere. After the flight, the payload parachutes to the ground, where it can be recovered for use again.

This will be the RAISE mission's third flight, and the scientists have continuously updated its technology. For the upcoming flight, they have refurbished the detectors and updated the [flight](#) software, and the payload carries a new diffraction grating, which reflects light and separates it into its separate wavelengths.

The launch window for RAISE opens at 2:25 p.m. EDT at the White Sands Missile Range near Las Cruces, New Mexico. The precise timing of the launch depends on weather conditions, and coordinated timing with other space observatories such as NASA's SDO and IRIS, as well as the joint Japan Aerospace Exploration Agency/NASA's Hinode.

Provided by NASA's Goddard Space Flight Center

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