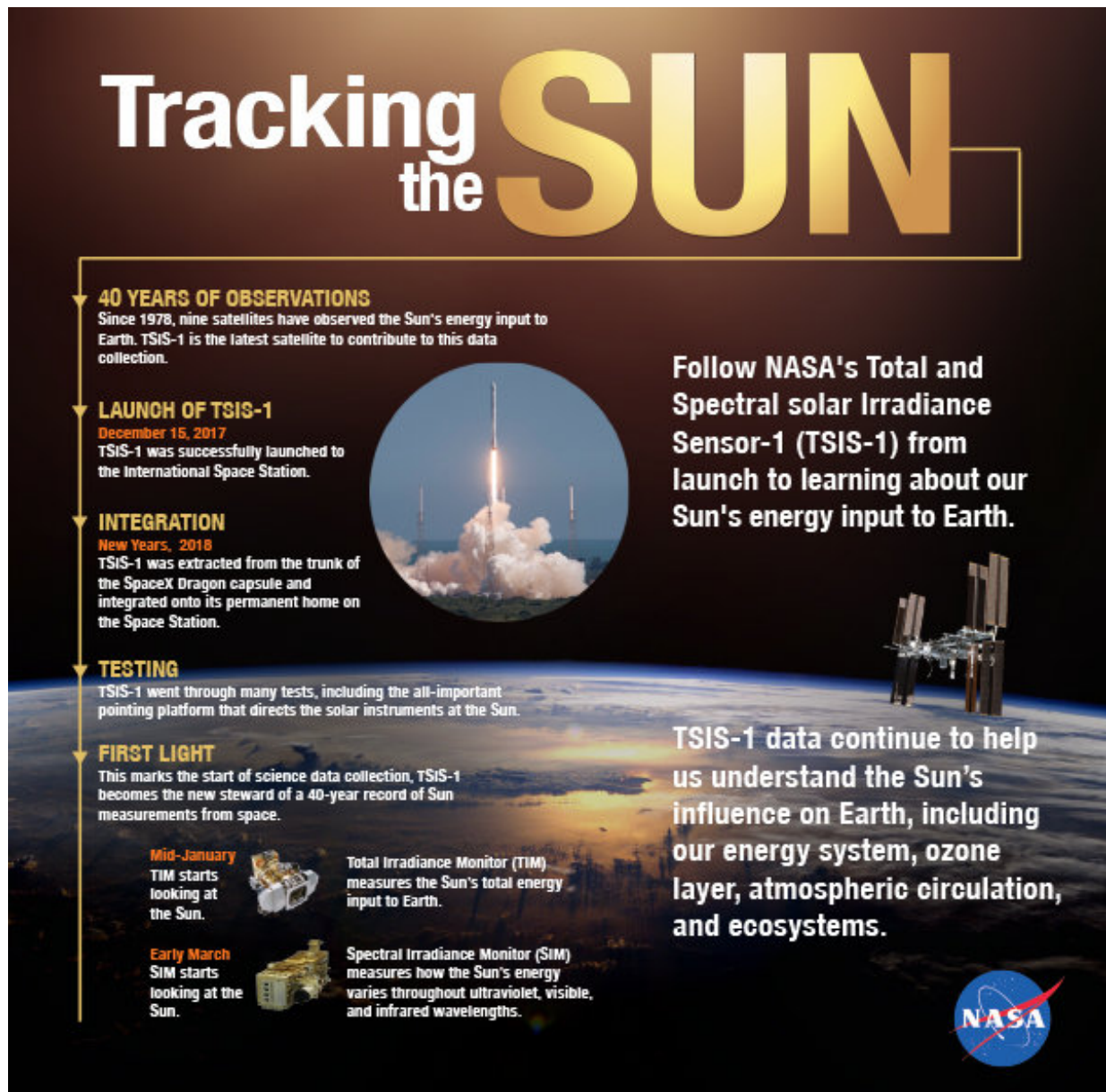


# NASA powers on new instrument staring at the Sun

March 16 2018, by Kasha Patel



## Tracking the SUN

**40 YEARS OF OBSERVATIONS**  
 Since 1978, nine satellites have observed the Sun's energy input to Earth. TSIS-1 is the latest satellite to contribute to this data collection.

**LAUNCH OF TSIS-1**  
 December 15, 2017  
 TSIS-1 was successfully launched to the International Space Station.

**INTEGRATION**  
 New Years, 2018  
 TSIS-1 was extracted from the trunk of the SpaceX Dragon capsule and integrated onto its permanent home on the Space Station.

**TESTING**  
 TSIS-1 went through many tests, including the all-important pointing platform that directs the solar instruments at the Sun.

**FIRST LIGHT**  
 This marks the start of science data collection, TSIS-1 becomes the new steward of a 40-year record of Sun measurements from space.

**Mid-January**  
 TIM starts looking at the Sun.


**Early March**  
 SIM starts looking at the Sun.

**Total Irradiance Monitor (TIM)**  
 measures the Sun's total energy input to Earth.

**Spectral Irradiance Monitor (SIM)**  
 measures how the Sun's energy varies throughout ultraviolet, visible, and infrared wavelengths.

Follow NASA's Total and Spectral solar Irradiance Sensor-1 (TSIS-1) from launch to learning about our Sun's energy input to Earth.

TSIS-1 data continue to help us understand the Sun's influence on Earth, including our energy system, ozone layer, atmospheric circulation, and ecosystems.



Follow NASA's TSIS-1 from its launch to its installation aboard the International Space Station to its collection of science data. Credit: NASA Goddard

NASA has powered on its latest space payload to continue long-term measurements of the Sun's incoming energy. Total and Spectral solar Irradiance Sensor (TSIS-1), installed on the International Space Station, became fully operational with all instruments collecting science data as of this March.

"TSIS-1 extends a long data record that helps us understand the Sun's influence on Earth's radiation budget, ozone layer, atmospheric circulation, and ecosystems, and the effects that solar variability has on the Earth system and climate change," said Dong Wu, TSIS-1 project scientist at NASA's Goddard Space Flight Center in Greenbelt, Maryland.

The instrument was launched from Space Launch Complex 40 at Cape Canaveral Air Force Station in Florida aboard a SpaceX Falcon 9 rocket on Dec. 15, 2017. After a two-week pause, TSIS-1 was extracted from the trunk of the SpaceX Dragon capsule and integrated onto its permanent home on the [space](#) station.

For over two months, the operations team at the University of Colorado Laboratory for Atmospheric and Space Physics (LASP) in Boulder, Colorado have been testing TSIS-1. First, the team tested the all-important pointing platform that directs the solar instruments at the Sun.

Next came testing of the solar instruments. TSIS-1 studies the total amount of light energy emitted by the Sun using the Total Irradiance Monitor, one of two sensors onboard. This sensor's data will give us a better understanding of Earth's primary energy supply and provide

information to help improve models simulating the planet's climate. The monitor first started collecting science data – called "first light" — on January 11th after its doors were opened to fully view the Sun. The sensor extends a 40-year measurement of the Sun's total energy to Earth.

The second onboard sensor, called the Spectral Irradiance Monitor, measures how the Sun's energy is distributed over the ultraviolet, visible and infrared regions of light. Measuring the distribution of the Sun's energy is important because each wavelength of light interacts with Earth's atmosphere differently.

For instance, spectral irradiance measurements of the Sun's ultraviolet radiation are critical to understanding the ozone layer—Earth's natural sunscreen that protects life from harmful radiation. The sensor experienced first light on March 4th when full science data collection began. TSIS-1's Spectral Irradiance Monitor extends a 15-year record of spectral irradiance measurements.

"All systems are operating within their expected ranges," said Peter Pilewskie, TSIS-1 lead scientist LASP. "A lot of hard work remains for the team to interpret and validate the TSIS-1 data."

NASA's Goddard Space Flight Center has overall responsibility for the development and operation of TSIS-1 on the International Space Station for the next 5 years. LASP under contract with NASA, is responsible for providing the solar irradiance measurements and providing them to the Goddard Earth Science Data and Information Services Center, the archive and distribution center for TSIS-1 data, so they are available to the scientific community.

**More information:** For more information on the TSIS-1 mission, visit [www.nasa.gov/tsis-1](http://www.nasa.gov/tsis-1)

Provided by NASA

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