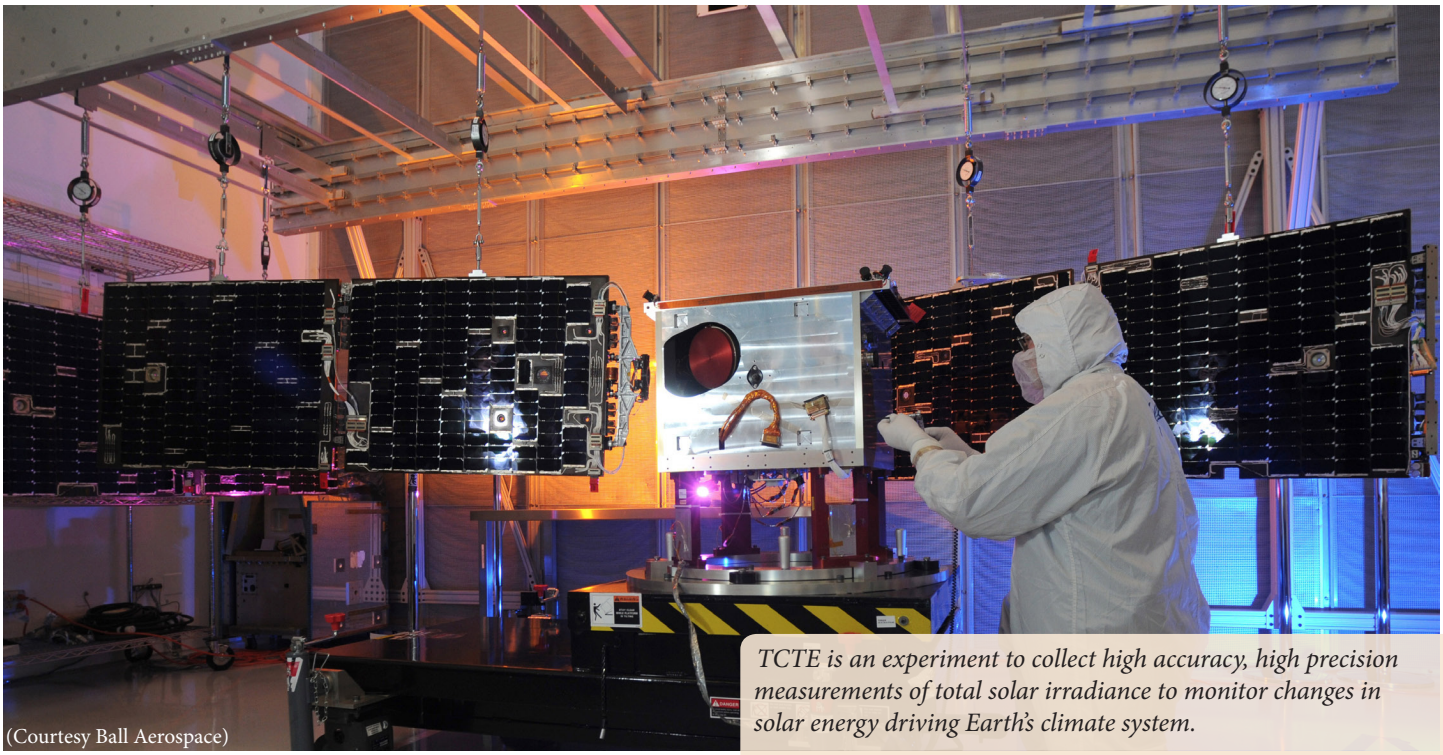
TCTE

Total Solar Irradiance Calibration Transfer Experiment/TIM

Laboratory for Atmospheric and Space Physics
University of Colorado **Boulder**



(Courtesy Ball Aerospace)

TCTE is an experiment to collect high accuracy, high precision measurements of total solar irradiance to monitor changes in solar energy driving Earth's climate system.

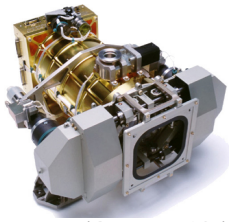
Frequently Asked Questions

What is the purpose of the TCTE mission?

The Total Solar Irradiance Calibration Transfer Experiment (TCTE) is a collaborative effort between NASA and the National Oceanic and Atmospheric Administration (NOAA) designed to monitor changes in solar irradiance at the top of the Earth's atmosphere. TCTE launched as one of five payloads on the Ball Aerospace-built STPSat-3 satellite, which is able to support a variety of experimental payloads at different low-Earth orbits.

What does the TIM instrument measure?

The Total Irradiance Monitor (TIM) measures the Sun's net energy output, or total solar irradiance (TSI). TSI is the spatially and spectrally integrated solar radiation incident at the top of the Earth's atmosphere. TIM continues a solar climate data record, which began from space in 1978, and is used to determine the sensitivity of the Earth's climate to the natural effects of solar forcing. TSI measurements monitor the incident sunlight to the Earth's atmosphere using an ambient temperature active cavity radiometer. Relative changes in solar irradiance are measured to better than 0.001%/yr, allowing determination of possible long-term variations in the Sun's output.



(Courtesy LASP)

Quick Facts

Launch date: November 19, 2013
Launch location: Wallops Island, VA
Launch vehicle: Minotaur I
Mission target: Low-Earth orbit
Primary duration: 18 months
Project description: TCTE is a joint NASA/NOAA mission that measures total solar irradiance to monitor changes in incident solar energy at the top of the Earth's atmosphere.
LASP provided:
- The Total Irradiance Monitor (TIM)
- TIM Principal Investigator, Greg Kopp

Other organizations involved:
- NASA
- United States Air Force
- Ball Aerospace
- NOAA

What will the results of TCTE indicate?

Incident sunlight is the dominant energy force driving Earth's climate. In order to understand the causes of climate change, TCTE is monitoring fluctuations in total solar irradiance. Continuing solar irradiance measurements will help maintain accuracy in this critical long-term data record by overlapping with existing (SORCE/TIM) and planned future (JPSS/TSIS/TIM) instruments.

To read more about the TCTE mission, visit:
http://lasp.colorado.edu/home/missions-projects/quick-facts-tcte.

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