

Total and Spectral solar Irradiance Sensor (TSIS) Project Status

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<https://www.nasa.gov/goddard/tsis-1>

<https://sunclimate.gsfc.nasa.gov>



TSIS-1 Project Overview



Project Description

- Current status: TSIS-1 on International Space Station (ISS)
 - Launched December 15, 2017
 - Express Logistics Carrier 3, position 5
 - SpaceX Commercial Resupply Service launch
 - Robotic installation/de-installation at end of life
- Category 3, Class C

Science Objective

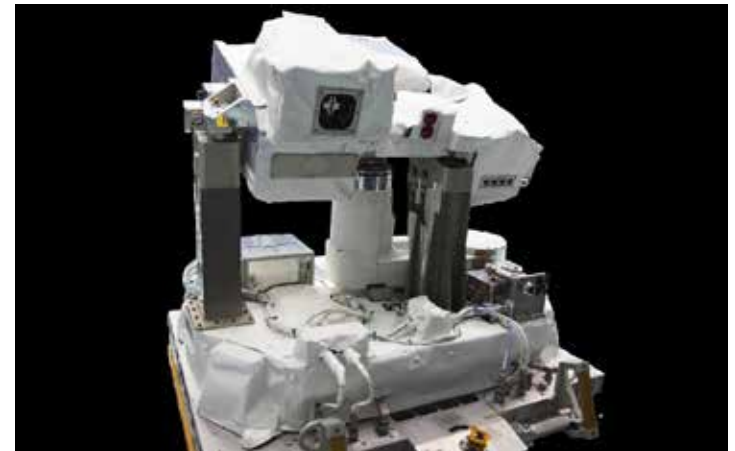
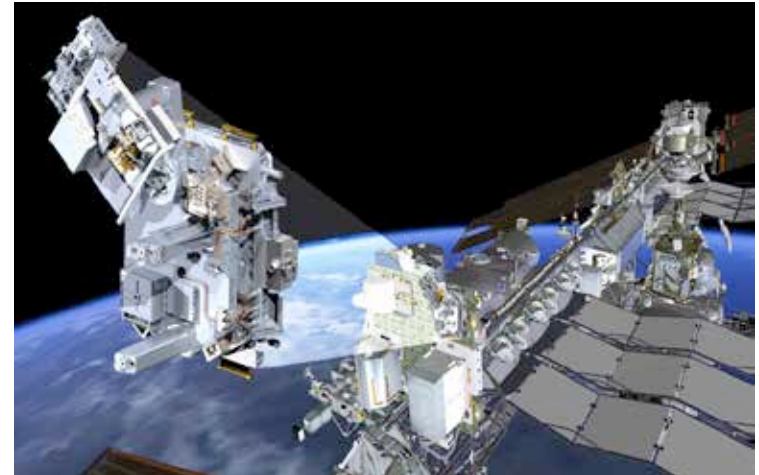
To maintain continuity of the total solar irradiance (TSI) and spectral solar irradiance (SSI) for climate research

Instruments

- Total Irradiance Monitor (TIM)
- Spectral Irradiance Monitor (SIM)

Ground Segment

- Science Operations Center and TSIS Science Data System at LASP
- Goddard Earth Science Data and Information Services Center (GES DISC)
- ISS Payload Operations Integration Center



Partners

ISS program

Prime Contractor

Laboratory for Atmospheric and Space Physics (LASP), University of Colorado (CU)



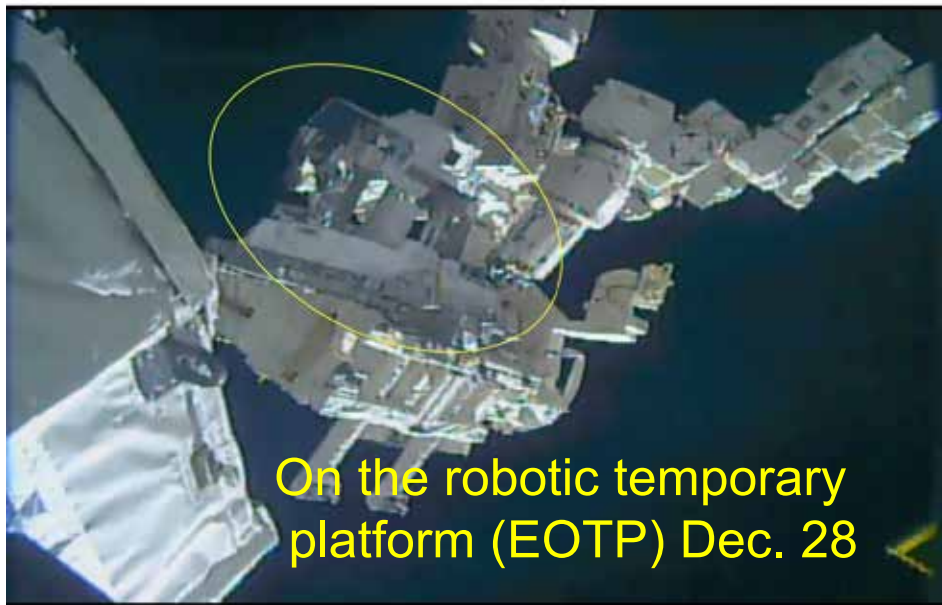
TSIS-1 December 2017 Highlights



Launch
Dec. 15



In the Dragon trunk Dec. 15



On the robotic temporary
platform (EOTP) Dec. 28



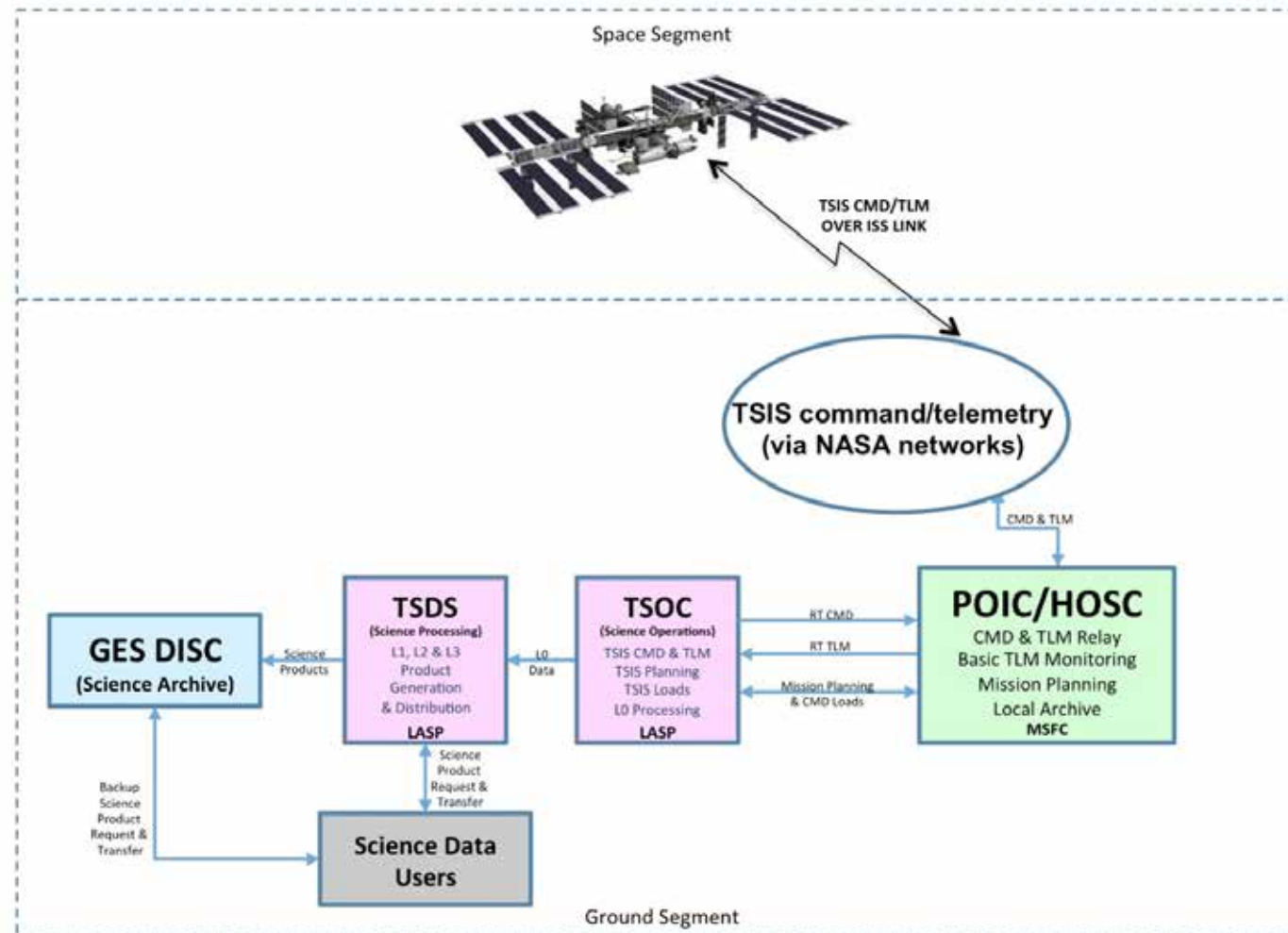
Deployed on ISS ELC 3 Dec. 31



TSIS Architecture



Payload communication through Payload Operations Integration Center (POIC) at Huntsville Operations Services Center



TSOC = TSIS Science Operations Center

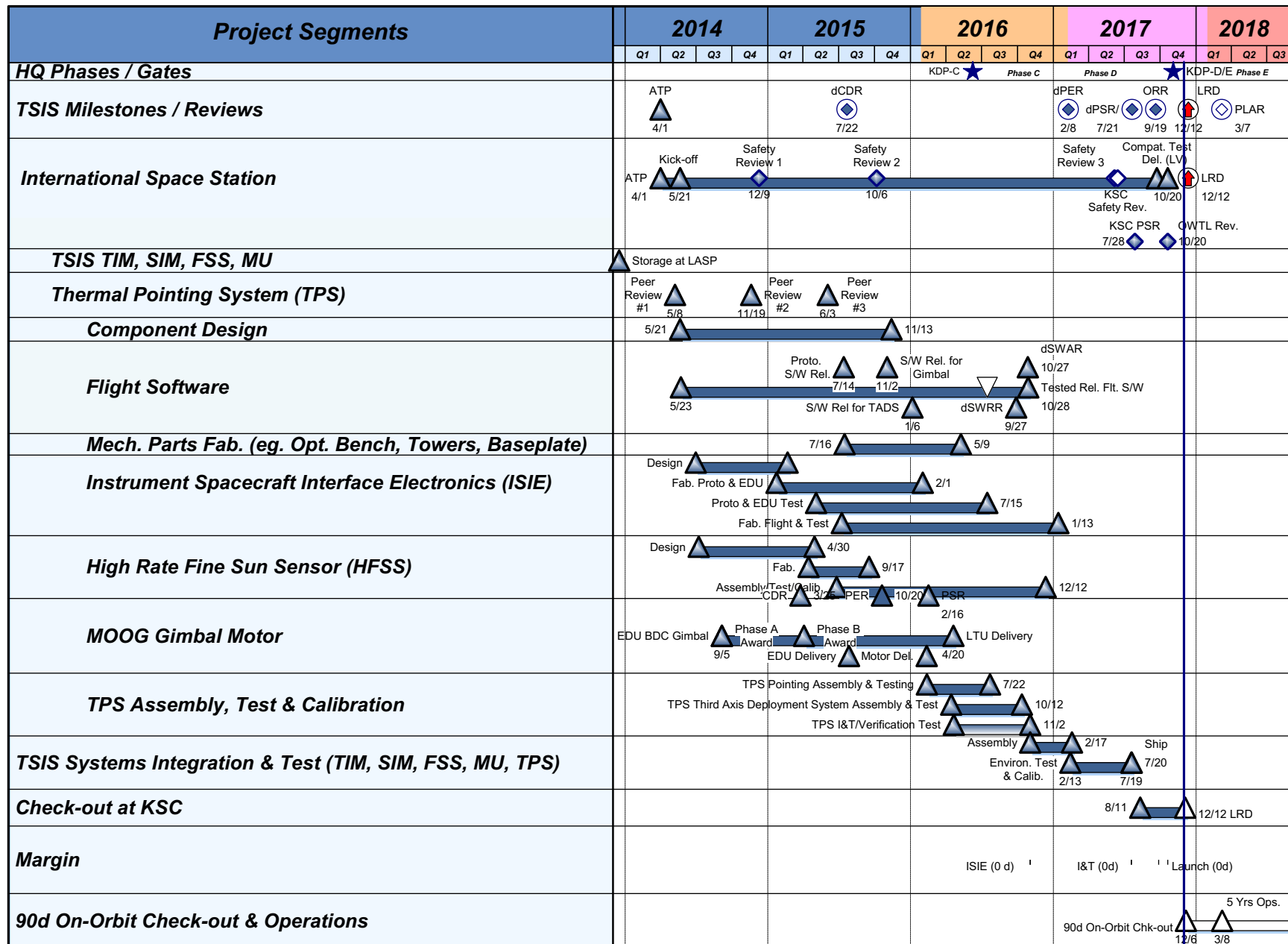
TSDS = TSIS Science Data System

GES DISC = Goddard Earth Science Data and Information Services Center

TSIS Ground Elements	NASA Ground Elements	ISS Ground Elements	External Ground Elements
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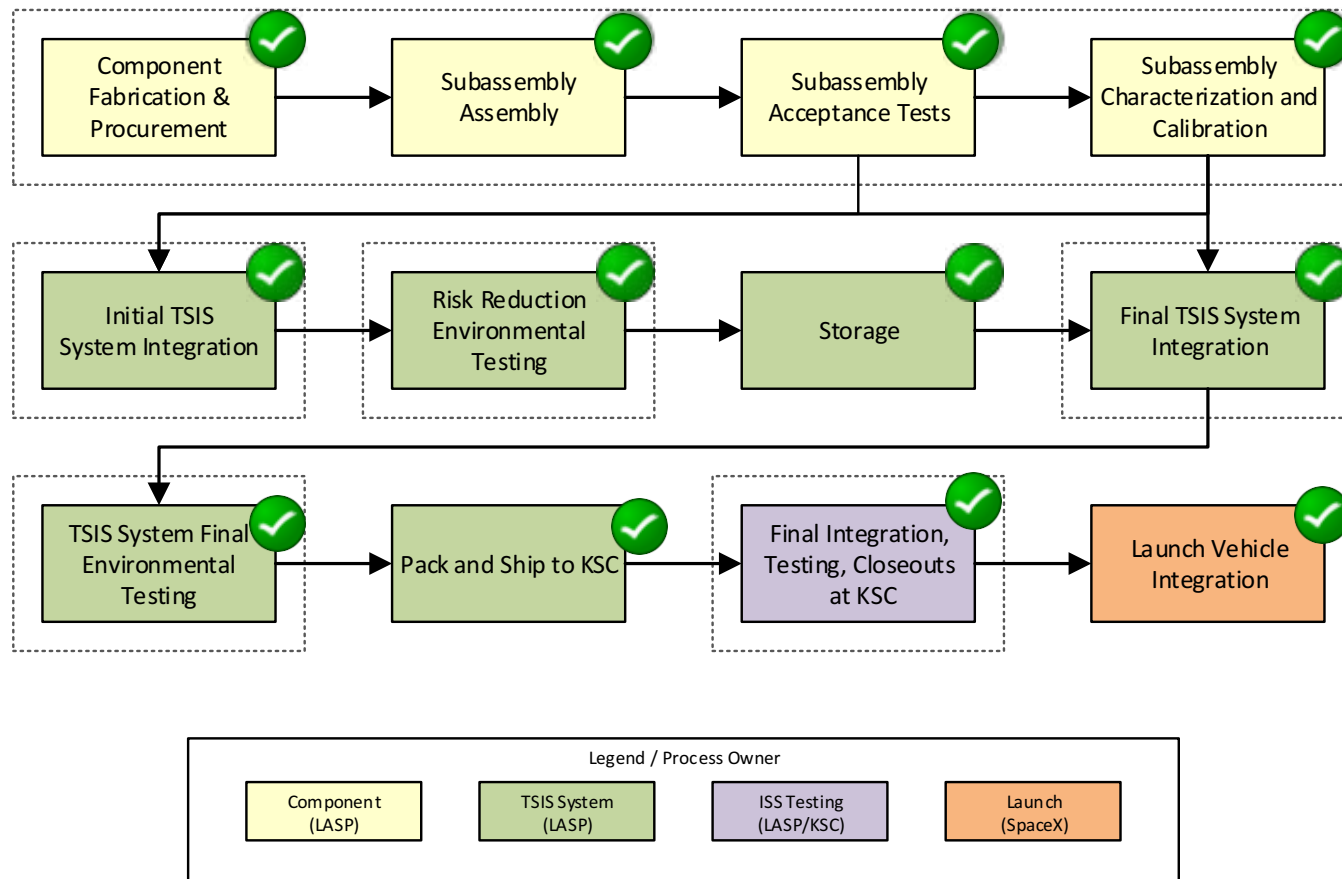


Road from ISS Decision to TSIS-1 Operations





TSIS-1 Integration and Test Summary



- 4 Environmental Tests
- 2 Comprehensive Performance Tests
- 29 Limited Performance Tests
- ~50 Special Performance Tests
- End-to-End Tests
- Simulations



TSIS-1 Project Status



- TSIS on orbit and 90-day commissioning activities complete
- As expected, ISS is a very dynamic environment and the TSIS team is learning more about it
 - Solar array Beta extreme (~26 days per year estimated)
 - Visiting vehicles, Extra Vehicular Activity (EVA) operations, payload maintenance, ISS re-boost, etc. (~17 days per year estimated)
- TSIS-1 transitioned to Earth Science Mission Operations
 - project after successful Post Launch Assessment Review
- 5 year mission with potential 2-year extension
- Expect data available at Goddard Earth Science Data and Information Services Center (GES DISC) within 6 months





TSIS-2 Project Status



- NASA initiated TSIS-2 pre-formulation work in April 2017
 - Two study contracts with LASP in progress to study implementation approaches for TSIS-2
- Per FY2019 President's Budget, NASA is planning to implement TSIS-2 as a CubeSat mission
 - Takes advantage of compact SIM/TIM technology development efforts funded by NASA's Earth Science Technology Office
 - Project will begin formulation in calendar year 2018