

National Aeronautics and
Space Administration



EXPLORE

Small Spacecraft Coordination Group

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Small Spacecraft Coordination Group

- Formed and chartered by NASA to advise the SMD, STMD, and HEOMD Associate Administrators on strategy to guide cross-agency initiatives, policies, and programmatic scope
- Guided by recommendations from the National Academies Achieving Science with CubeSats report and in support of NASA's Strategic Plan



Science
New Observation Methods

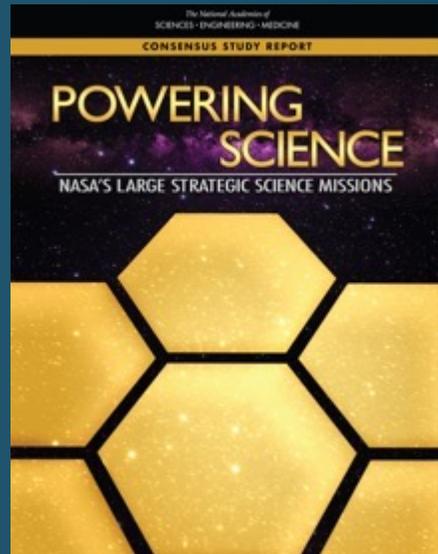


Exploration
Strategic Knowledge Gaps



Technology
Spacecraft Subsystems

National Academies and NASA Reports Impact SmallSat/CubeSat Strategy



HEOMD Human and Exploration Mission Directorate
SMD Science Mission Directorate
STMD Science Technology Mission Directorate

SSCG Roles & Responsibilities



Key Roles & Responsibilities

- Coordination
- Producing Data Products
- Reviewing Agency & Government Documents
- Serve as Representative for Agency/SMD regarding SmallSats

Small Spacecraft Focus Areas of Strategic Emphasis

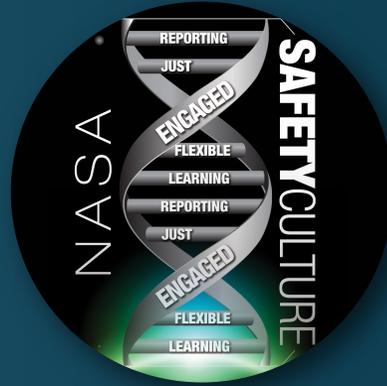
Fundamental to Enabling NASA's Overall Vision for Small Mission Activities



Focus areas guided by National Academies' recommendations



1 - Strategy and Implementation



2 - S&MA, Reliability, and Technical Excellence



3 - Launch Accommodation and Rideshare



4 - Services and Infrastructure



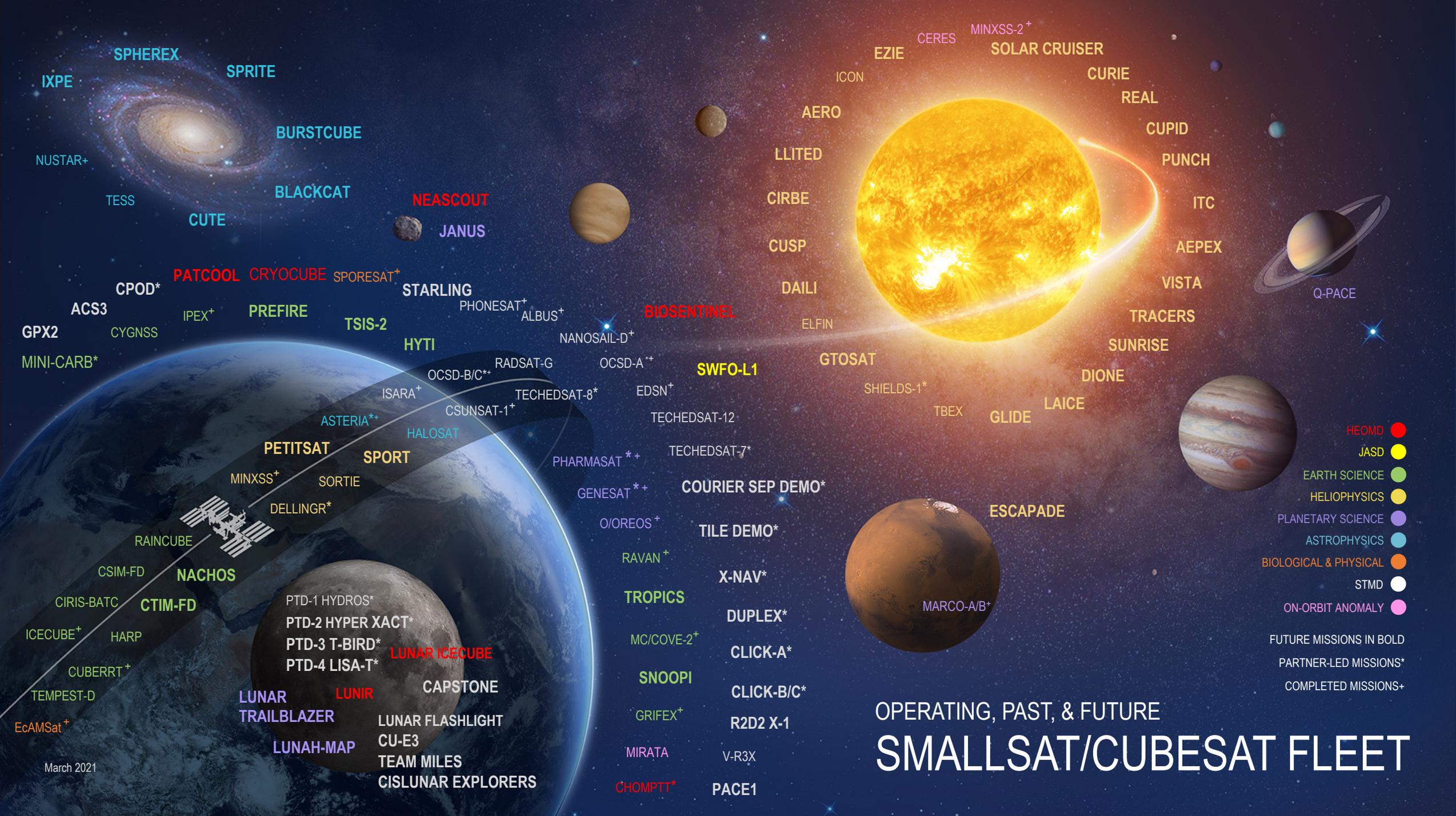
5 - Cybersecurity and Enterprise Protection



6 - Commercial Partnerships and New Space



7 - International Relationships and Outreach



IXPE SPHEREX SPRITE BURSTCUBE
 NUSTAR+ TESS CUTE BLACKCAT
 CPOD* PATCOOL CRYOCUBE SPORESAT+
 ACS3 IPEX+ PREFIRE STARLING
 GPX2 CYGNSS TSIS-2 PHONESAT+ ALBUS+
 MINI-CARB* HYTI NANOSAIL-D+
 OCSD-B/C** RADSAT-G OCSD-A**
 ISARA+ TECHEDSAT-8*
 ASTERIA** HALOSAT CSUNSAT-1+
 PETITSAT SPORT
 MINXSS+ SORTIE
 DELLINGR*
 RAINCUBE NACHOS
 CSIM-FD CTIM-FD
 CIRIS-BATC HARP
 ICECUBE+ CUBERRT+
 TEMPEST-D EcAMSat+
 PTD-1 HYDROS*
 PTD-2 HYPER XACT*
 PTD-3 T-BIRD* LUNAR ICECUBE
 PTD-4 LISA-T*
 LUNAR TRAILBLAZER LUNIR CAPSTONE
 LUNAH-MAP LUNAR FLASHLIGHT
 CU-E3
 TEAM MILES
 CISLUNAR EXPLORERS

NEASCOUT JANUS
 BIOSENTINEL
 SWFO-L1
 COURIER SEP DEMO*
 TILE DEMO*
 X-NAV*
 DUPLEX*
 CLICK-A*
 CLICK-B/C*
 R2D2 X-1
 V-R3X
 PACE1
 CHOMPTT*
 MIRAṬA
 GRIFEX+
 SNOOPI
 MC/COVE-2+
 TROPICS
 RAVAN+
 O/OREOS+
 GENESAT*+
 PHARMASAT*+
 TECHEDSAT-7*
 TECHEDSAT-12
 EDSN+
 GOTOSAT
 SHIELDS-1*
 TBEX
 GLIDE
 LAICE
 ESCAPADE
 MARCO-A/B+
 DAILI
 ELFIN
 CUSP
 CIRBE
 LLITED
 AERO
 ICON
 EZIE
 CERES
 MINXSS-2+
 SOLAR CRUISER
 CURIE
 REAL
 CUPID
 PUNCH
 ITC
 AEPEX
 VISTA
 TRACERS
 SUNRISE
 DIONE
 Q-PACE

- HEOMD ●
- JASD ●
- EARTH SCIENCE ●
- HELIOPHYSICS ●
- PLANETARY SCIENCE ●
- ASTROPHYSICS ●
- BIOLOGICAL & PHYSICAL ●
- STMD ●
- ON-ORBIT ANOMALY ●
- FUTURE MISSIONS IN BOLD
- PARTNER-LED MISSIONS*
- COMPLETED MISSIONS+

OPERATING, PAST, & FUTURE SMALLSAT/CUBESAT FLEET

NASA's SmallSat Missions at a Glance

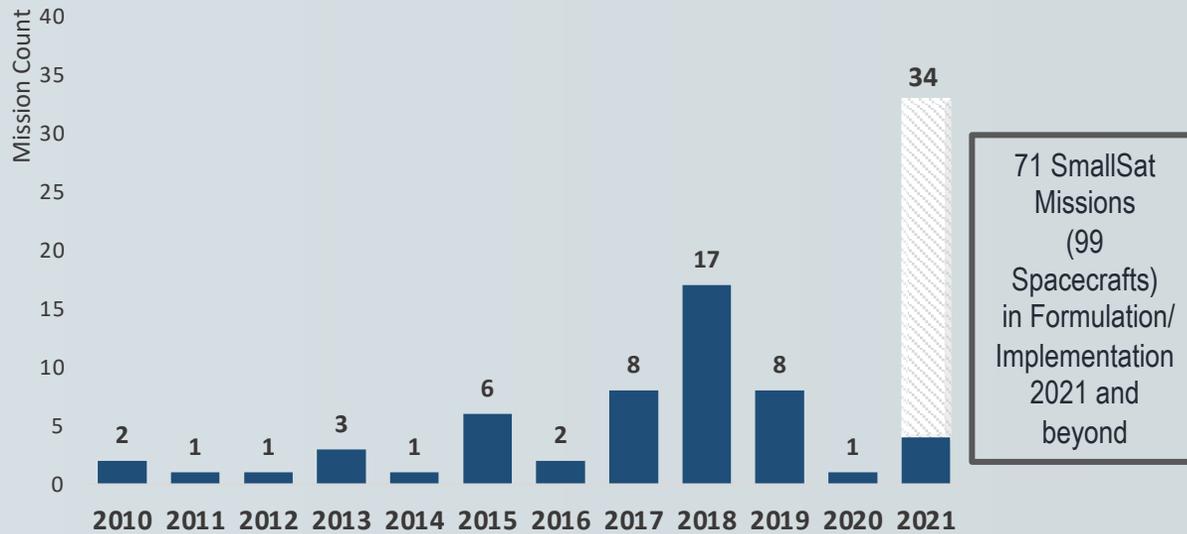
Inclusive of Missions and Studies

Data as of March 2021

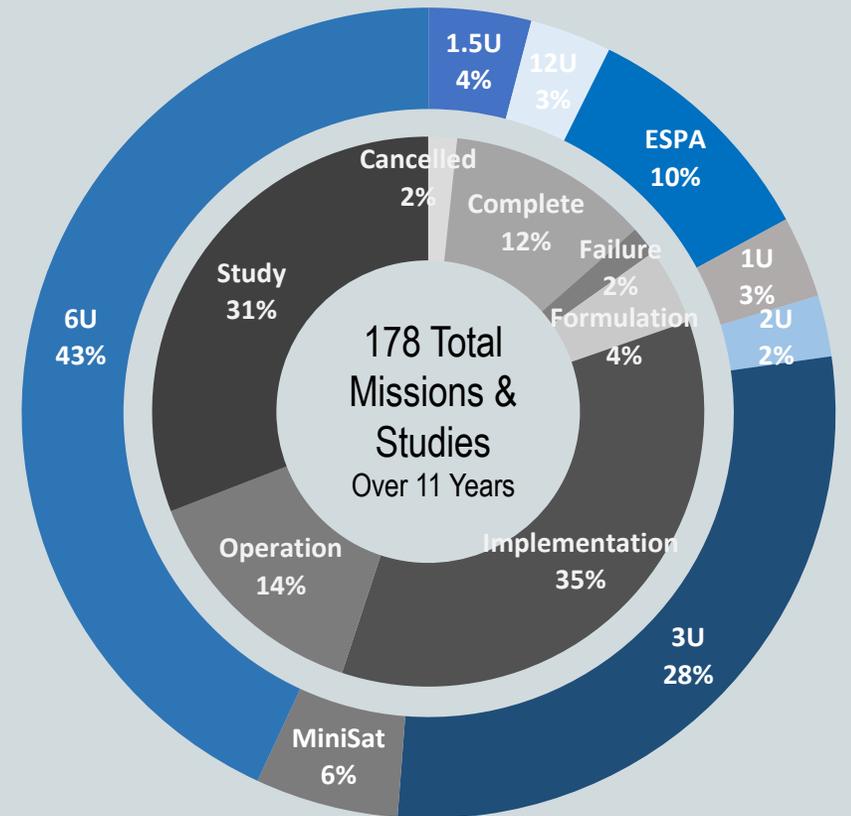
SmallSat/CubeSat Missions by Mission Directorate



Mission Launch Timelines



Mission Phase and Satellite Size



*Data inclusive of missions solicited from 2010-2021.

Current State of SmallSats

Since the National Academies of Science report was released in 2016:

- SMD established a Rideshare policy (SPD-32) and an associated Rideshare office led by Aly Mendoza-Hill
- Science SmallSats/CubeSats have become more capable, 6U form factor or larger, including more constellation awards & studies.
- Science results for SmallSats show great promise
- 7 ESPA-class missions have been selected
- Current solicitations including SmallSats
 - Astro Pioneers, ESSP EVM-3, Astro MIDEX MO
- Current SMD Rideshare Missions
 - IMAP with 4 ESPA-class missions (GLIDE, Solar Cruiser, LTB, & NOAA's SWFO-L1)
 - Psyche w/ Janus twin spacecrafts
 - Landsat-9 with USSF rideshare collaboration
 - JPSS-2 with STMD LOFTID

RainCube/TEMPEST-D Observing Typhoon Trami

Spacecraft constellation separated by 5 minutes revealing 3D storm structure

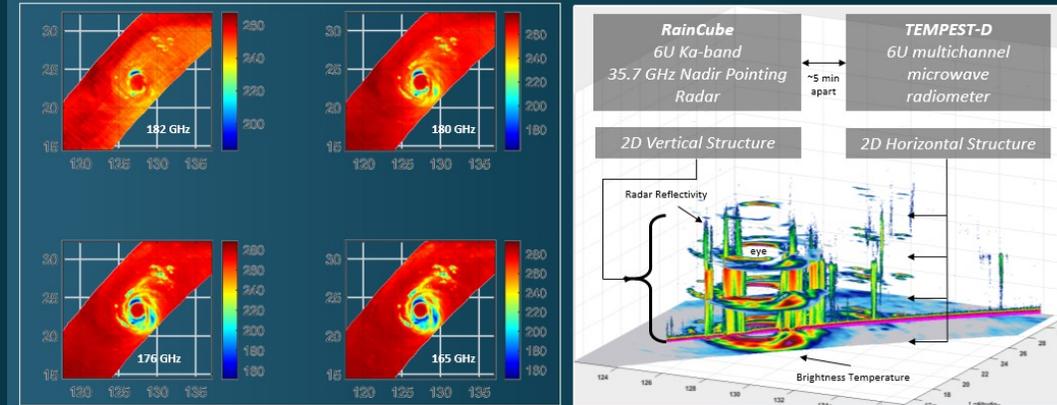


Illustration of complementary nature of these sensors flown in constellation for observing precipitation

CSIM-FD

Compact Solar Irradiance Monitor Flight Demonstration

Measuring solar spectral irradiance (SSI), and how solar variability impacts the Earth's climate, contributing to long-term continuity measurements from SORCE SIM and TSIS SIM



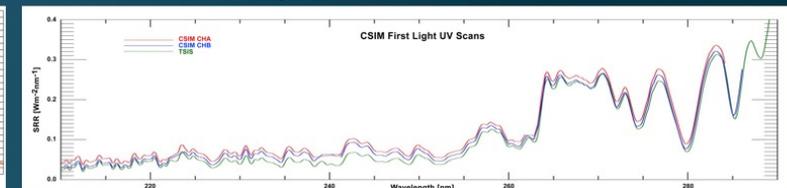
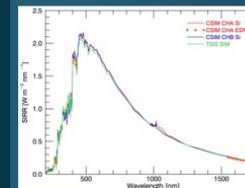
CSIM is 11 kg based on a Blue Canyon Technologies bus



TSIS-1 is 363 kg built by LASP mounted to the ISS



SORCE is 290 kg based on an Orbital LEOStar-2 bus



Latest and First Light uncorrected CSIM data (channels A and B) compared to TSIS data in a portion of the UV spectrum

UV comparison of the first CSIM scan showing excellent agreement to the TSIS spectrum

NASA



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