



National Aeronautics and
Space Administration



Athena

NASA Langley Research Center

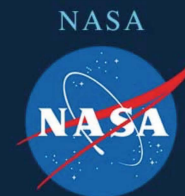
Athena: Technology Demonstration of an Earth Radiation Budget Sensorcraft

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NovaWurks





Opportunity to Demonstrate Future ERB Sensorcraft



*Demonstrate Intelligent and Strategic Collaboration and Integration
of both hardware and partners
(USSF/NOAA/NASA/NovaWurks)*

➤ What is Athena?

- Athena is a technology demonstration of the NovaWurks Hyper-Integrated Satlet (HISat) disaggregated small-satellite platform for making earth science remote sensing measurements
- LaRC provides a demonstration payload utilizing spare CERES flight hardware to integrate into a series of satlets to create a free-flying sensorcraft

➤ Why Athena and why now?

- This demonstration mission leverages timely opportunities with key partnerships and makes use of hardware LaRC has on-hand; it also gives the center the chance to prove our ability to use this technology for innovative science measurements – **no one else in NASA is doing this**

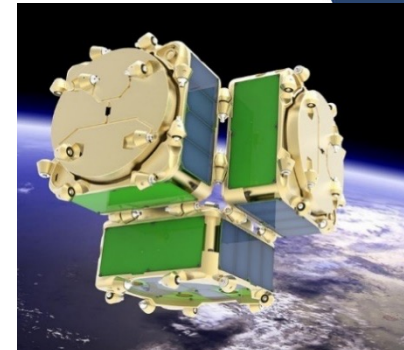
➤ Flight plan: 3 month checkout + 12 month operation for NASA

- Then transferred to SSC for follow-on evaluation
- Demonstrate ability to complete ERB Outgoing Longwave Radiance (OLR) observations from a conformable bus

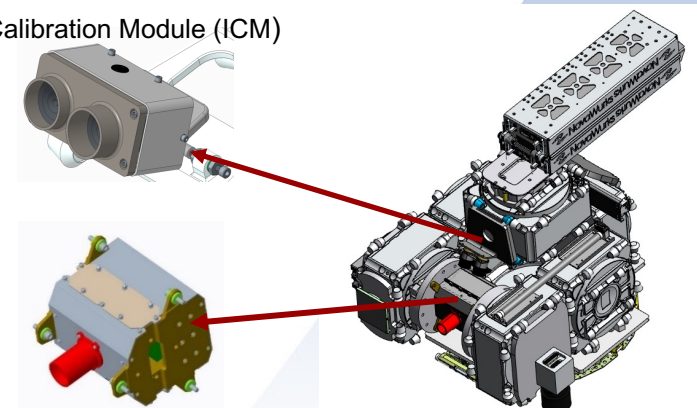
~ Sapientia Opportuna ~



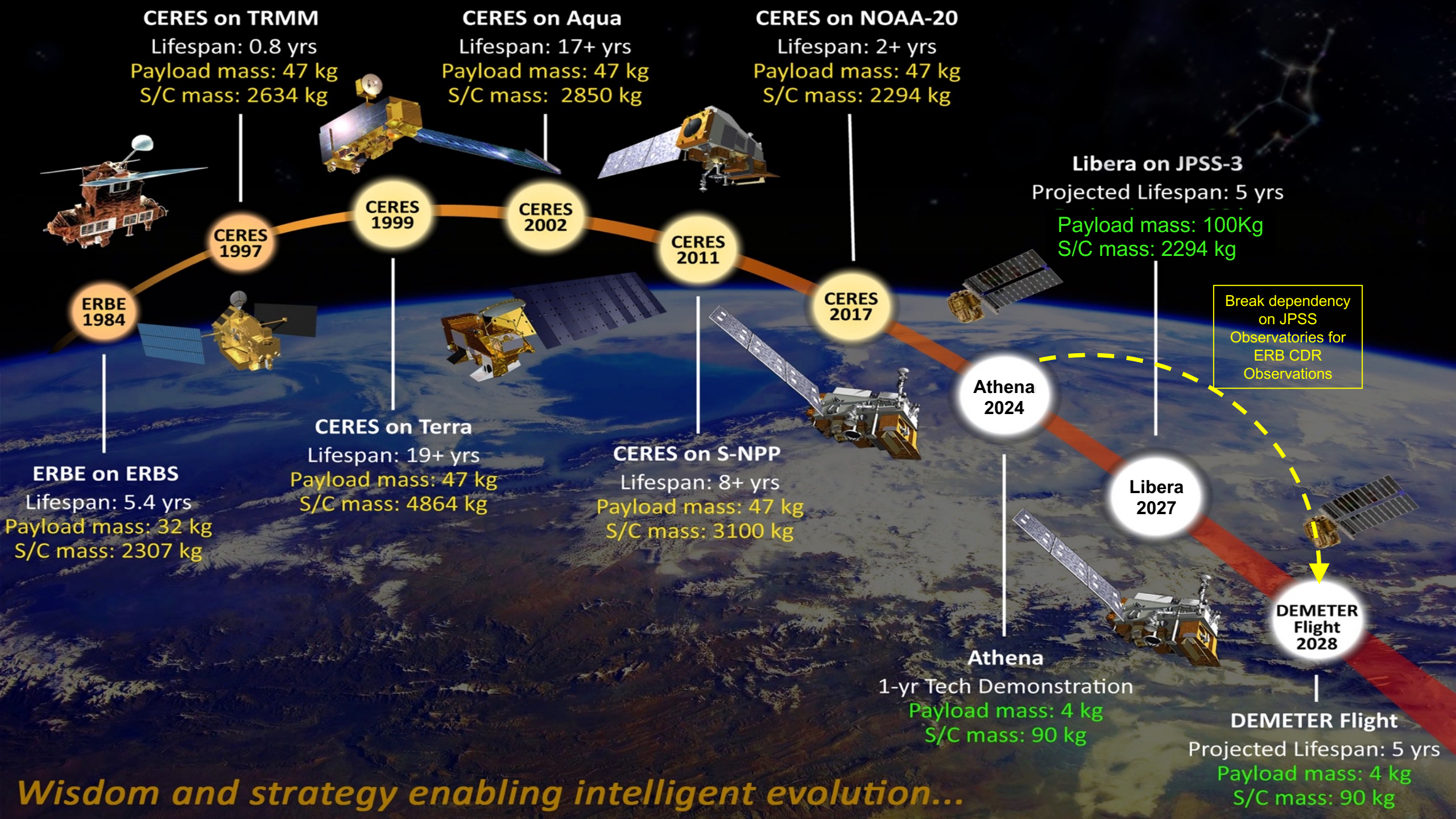
Measures 20 x 20 x 10 cm



Internal Calibration Module (ICM)



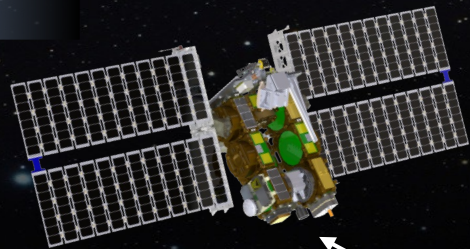
Optical Module (OM)



Wisdom and strategy enabling intelligent evolution...

Athena/EPIC – Mission Architecture

Space Segment



Athena/EPIC SensorCraft

Athena/EPIC

Multi-Agency Integrated Science payload/bus demonstration platform utilizing a conformable bus architecture to demonstrate rapid configurability and on-orbit performance capability

Ground Segment

MMC -Mission Management Center
SMD – Stored Mission Data Center
NovaWurks Los Alamitos, CA



Space/Ground Communications
Location: Multiple

POT – Payload Operations Team (POT)

The POT manages the operation of Athena remotely from LaRC. NASA LaRC, Hampton, VA

SIPS - Science Investigator Processing System

Responsible for the processing, archival and distribution of Athena data. NASA LaRC, Hampton, VA

Launch Segment

Vehicle: SpaceX Falcon-9
Location: Vandenberg, CA



Commands
Science Data, Telemetry

Commands
Science Data, Telemetry

Payload Planning

Science Data, Telemetry

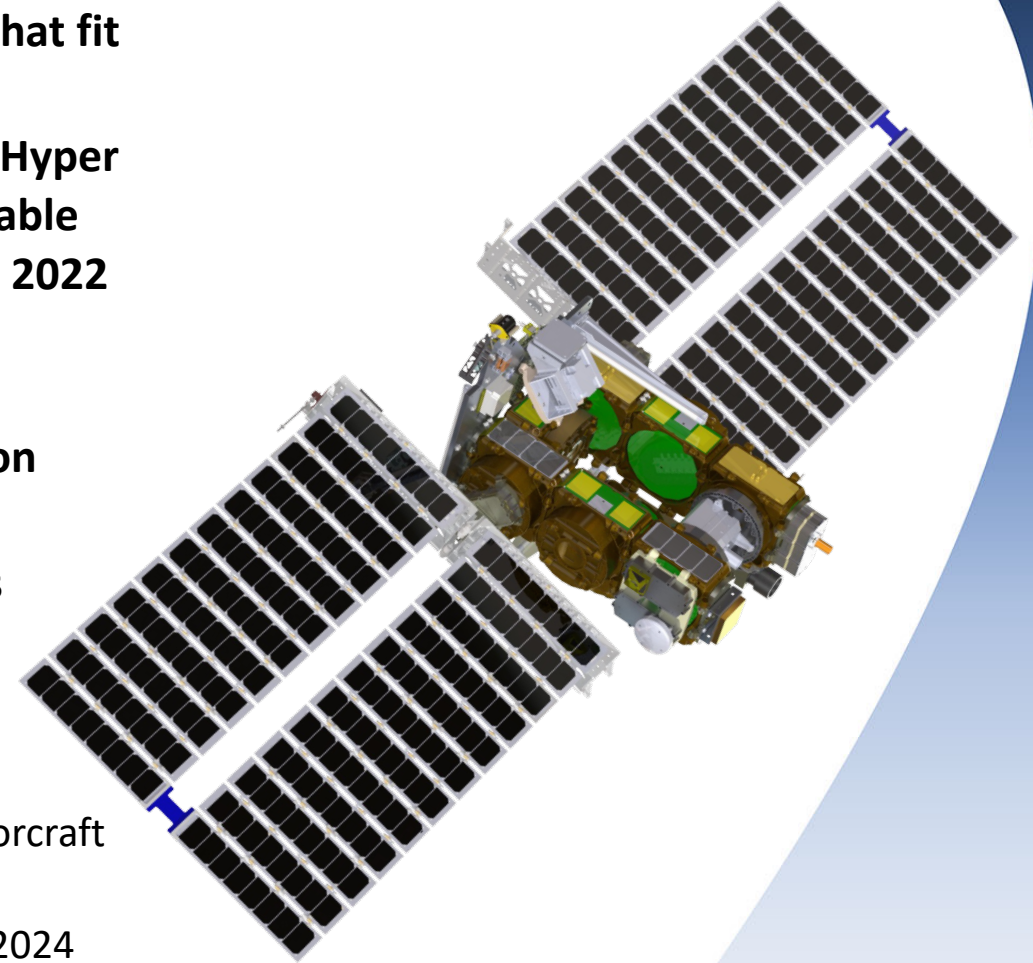




Athena Summary and Status



- Athena is the Goddess of Wisdom and Strategy, two qualities that fit perfectly with the aligned goals of this partnership.
- Athena/Epic is a technology demonstration of the NovaWurks Hyper Integrated Satlet (HISat) disaggregated small-satellite conformable bus platform for making remote sensing measurements. (Dec. 2022 Launch)
- Implementation is a multi-agency (NASA/DOD/NOAA), ‘all of government’ approach, to optimize investments across common goals and interests.
- Demonstration establishes a foundational component towards composable architecture for in-space assembly and persistent platforms
- **Technical Status**
 - Currently in Phase D, all hardware is at NovaWurks facility for sensorcraft I&T and delivery to launch providers
 - Tentatively selected by DOD Space Test Program for launch in Jan. 2024 with SpaceX



~ *Opportuna Sapienza* ~