

NASA Science Mission Directorate Astrophysics Division

National Aeronautics and
Space Administration



In the Science Mission Directorate (SMD), the Astrophysics Division (APD) studies the universe with the goal of seeking to understand the universe and our place in it.

In support of these goals APD seeks to discover how the universe works, explore how it began and is evolving, and search for life on planets around other stars.

<https://science.nasa.gov/astrophysics>



Astrophysics Pioneers

The Pioneers Program is a new program started in 2020 which is intended to do compelling astrophysics science at a lower cost cap than missions in the Explorers Program and larger.

Missions will include SmallSats, major Balloon payloads, (cis)-lunar payloads, and modest payloads attached to the International Space Station with a \$20M cost cap (excluding launch), typically 5 years development time.

Current Pioneers Missions

Four concepts chosen for further study in January 2021, and after passing a gate review all four were approved for development to flight and operations. Each of the original cohort of Pioneers missions have completed or on track to complete CDR in 2023.

- ASPERA
- Pandora
- PUEO
- StarBurst

Latest selection: TIGERISS!



Astrophysics CubeSats

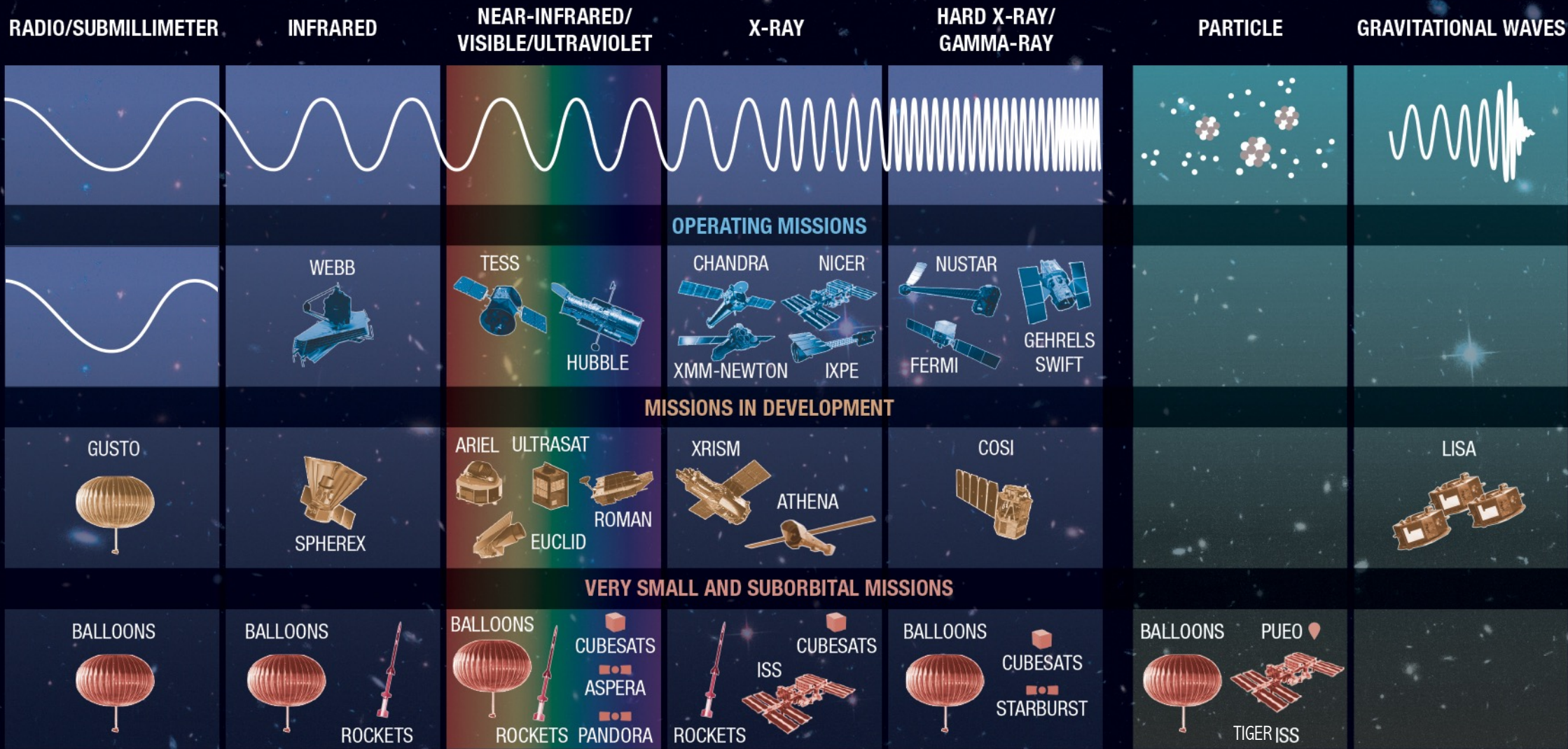
Astrophysics CubeSats are solicited annually via ROSES/APRA (D.3).

CubeSats are reviewed along with other sub-orbital proposals, including balloons, sounding rockets, and ISS attached payloads, less than 10 million and typically 5 years.

Current CubeSat Missions

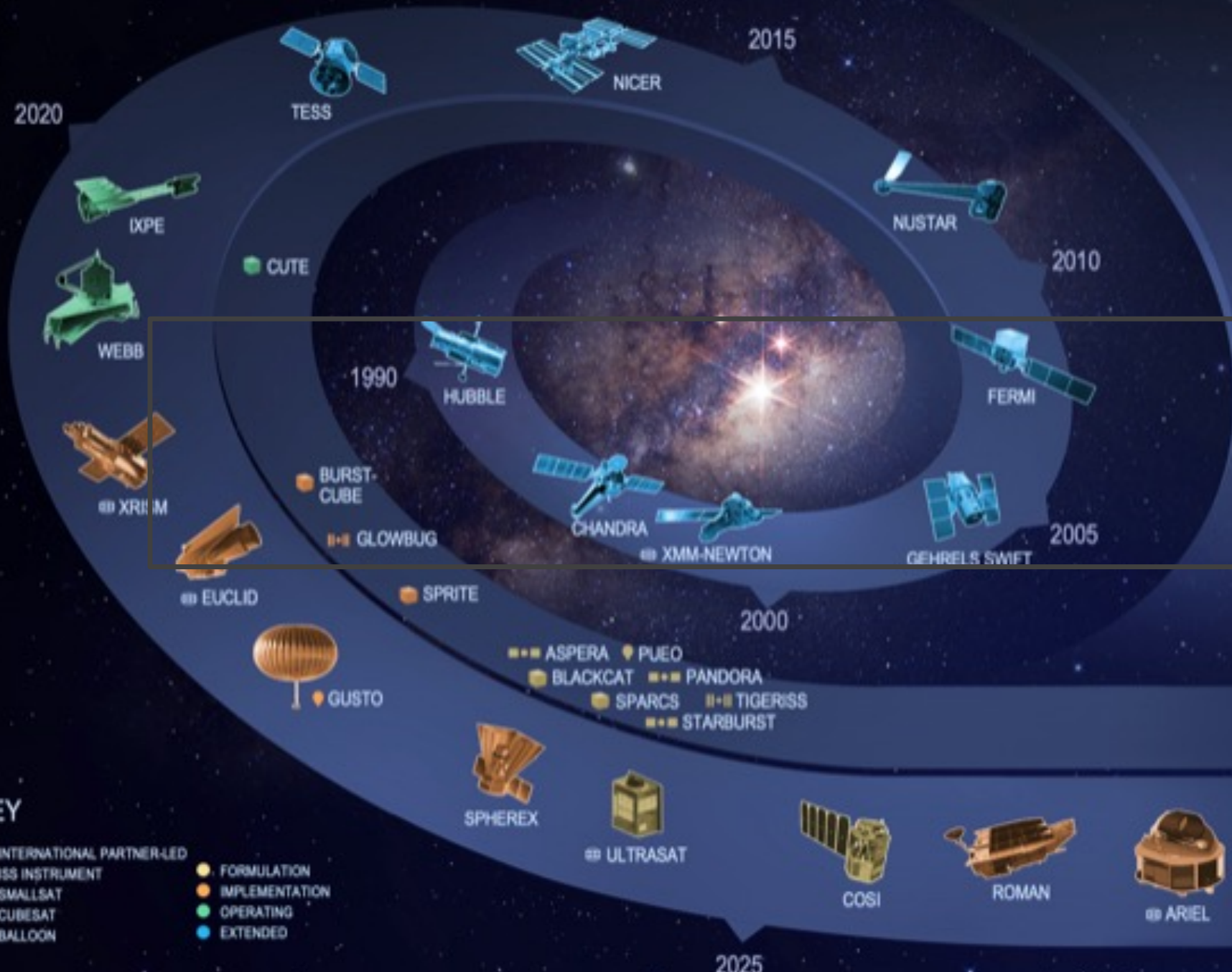
- **BurstCube** – in development
- **SPRITE** – in development
- **SPARCS** – In development
- **BlackCat** – in development
- **CANDELS** – in development
- **CUTE** – in operation

ELECTROMAGNETIC SPECTRUM





ASTROPHYSICS FLEET



PRE-FORMULATION

- PROBE ~2033
- LISA ~2037
- ATHENA TBD

COMPETED PHASE-A

- MO (LEAPY MOONBEAM)
- INDEX (LUVEX /STAR-X)

VERY SMALL MISSIONS

TRADITIONAL MISSIONS

KEY

- INTERNATIONAL PARTNER-LED
- ISS INSTRUMENT
- SMALLSAT
- CUBESAT
- BALLOON
- FORMULATION
- IMPLEMENTATION
- OPERATING
- EXTENDED



Future Plans

- CubeSats will not be solicited in ROSES 2023
- Nominally selections occur on an annual basis
- Selection goal is for one CubeSat per year and two Pioneers missions per year

Continue Dual Anonymous Peer Review for Pioneers

Looking forward to successful missions and valuable science (Pioneers website reference)

Point(s) of Contact

- Michael Garcia - Program Scientist and Officer
michael.r.garcia@nasa.gov
- Manuel Bautista – Deputy Program Scientist
manuel.bautista@nasa.gov
- Rachele Cocks – Program Executive
rachele.b.cocks@nasa.gov