NASA Astrophysics Decadal Survey Planning

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Astronomy and Astrophysics Advisory Committee
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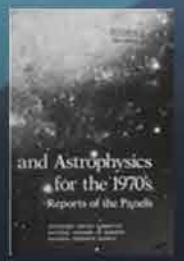
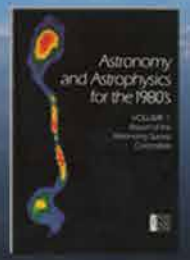
Astrophysics

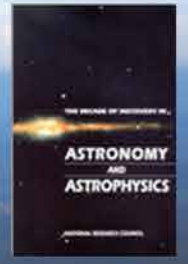
Decadal Survey Missions



1972 Decadal Survey *Hubble*



1982 Decadal Survey *Chandra*



1991 Decadal Survey *Spitzer*

2001 Decadal Survey *Webb*

2010 Decadal Survey *Roman*

2021 Decadal Survey

Strategy 1.1: Execute a balanced science program based on guidance from the National Academies, Administration priorities, and direction from Congress.

Decadal Survey Goal

NASA's highest aspiration for the 2020 Decadal Survey is that it be ambitious

- The important science questions require new and ambitious capabilities
- Ambitious missions prioritized by previous Decadal Surveys have always led to paradigm shifting discoveries about the universe

If you plan to a diminishing budget, you get a diminishing program

- Great visions inspire great budgets

Now is the time to be ambitious

Astro2020 Planning (past)

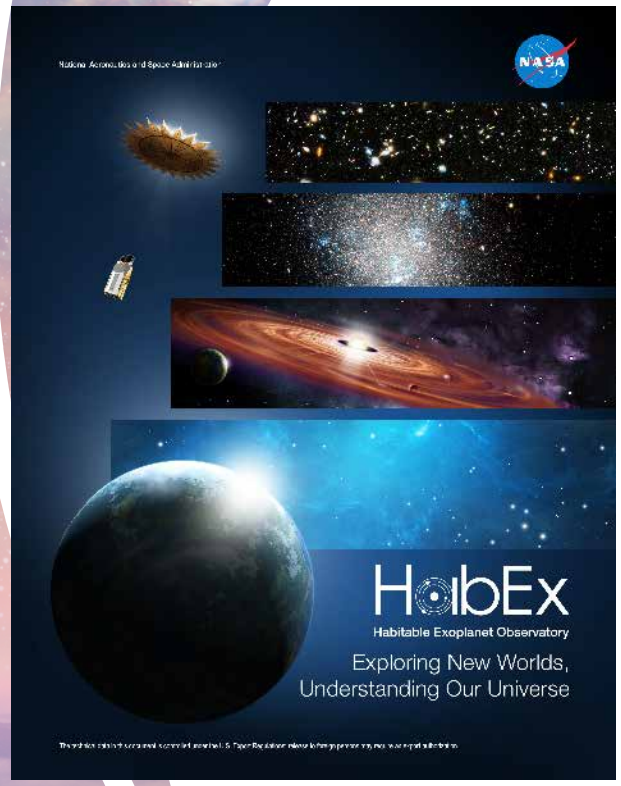
NASA has completed studies for large (Flagship) and medium (Probe) size mission concepts to inform the Astro2020 Decadal Survey Committee in an organized and coherent way

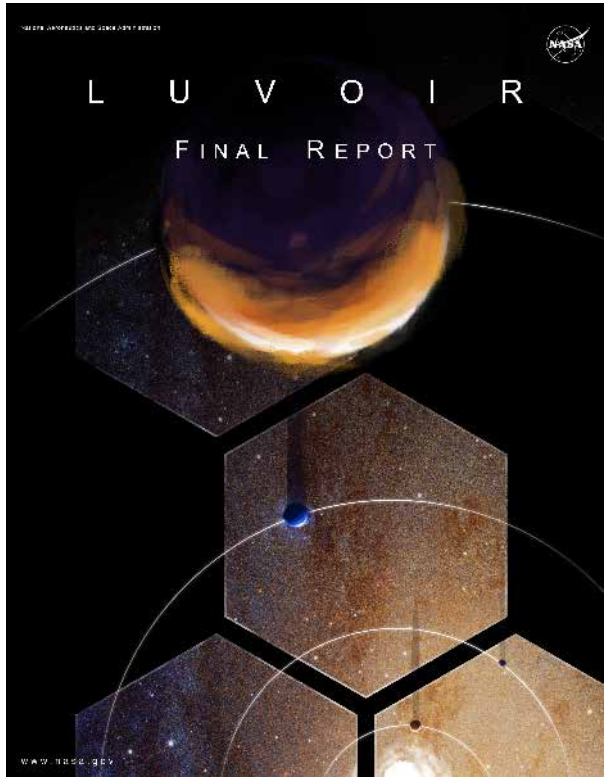
- Main purpose is to provide the Decadal Survey Committee with several well-defined mission concepts to facilitate their deliberations
- Mission concept studies assessed by HQ-tasked independent review teams; the non-public reports informed NASA's letter "endorsing" the mission concept studies
- Mission concept studies are available at https://science.nasa.gov/astrophysics/2020-decadal-survey-planning

Specifically, NASA has:

- Sponsored 4 community-based Science and Technology Definition Teams (STDTs) to partner with a NASA Center-based engineering team and study large (strategic) mission concept studies selected from the NASA Astrophysics 30-year Visionary Roadmap, a community-based report, and the 2010 Decadal Survey
- Supported 10 PI-led Study Teams for Probe-size mission concept studies, selected competitively
- Supported several other planning activities / studies / white papers including: Balloon Program Roadmap; Evolution of NASA Data Centers; SmallSats; In-Space Servicing/In-Space Assembly; System-Level Segmented Telescope Technology Program.
- Invested in next-generation technologies, including ultrastable telescope technology, starshades, coronagraphs, x-ray mirrors, detectors, etc.

Astro2020 Large Mission Studies





https://science.nasa.gov/astrophysics/2020-decadal-survey-planning

Strategy 2.2: Foster a culture that encourages collaboration in pursuit of common goals.

Astro2020 Status (present)

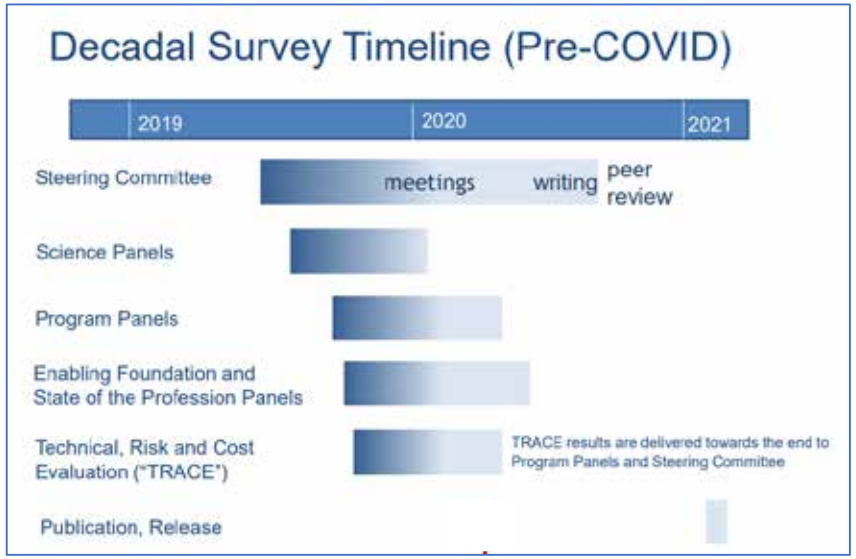
Panel work is mostly complete

- Science Panels have completed their work and reported to Steering Committee
- Program Panels have completed their work and reported to Steering Committee
- State of the Profession Panel is completing its work

Steering Committee had its final public meeting on August 25

- Agencies provided final updates to program and budget guidance provided in July 2019

Steering Committee co-chairs publicly announced Spring 2021 delivery date for Decadal Survey Report

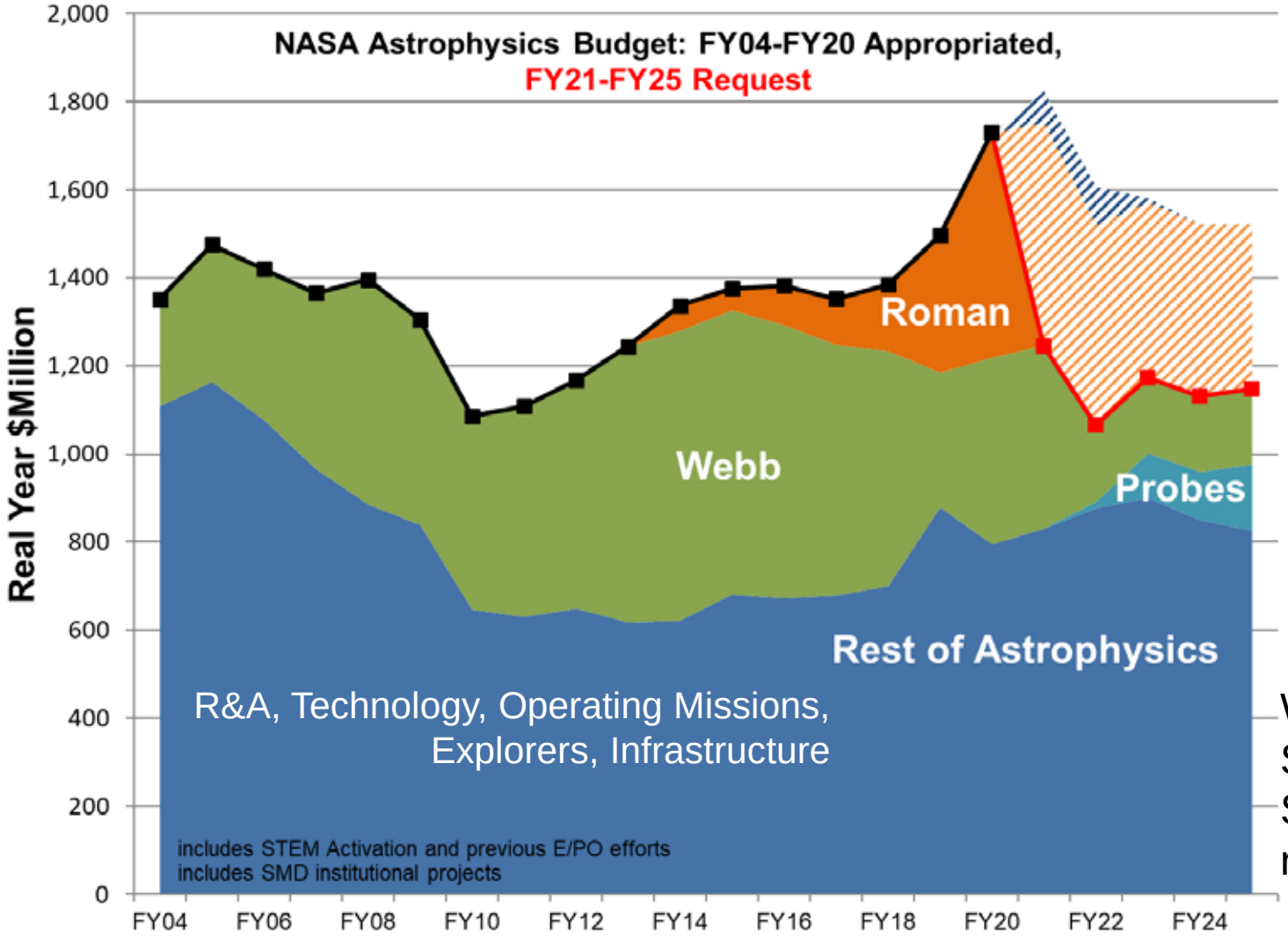


Astro2020 Implementation (future)

- NASA has been preparing to respond to both Probe and Flagship recommendations from Astro2020
  - Study team led by three Astrophysics Program Managers (HQ, GSFC, JPL) developing options for managing technology development and pre-formulation studies following Astro2020 report
  - Implementing such missions is not possible within the current budget planning guidelines
    - Astrophysics runout budget in the FY21 President's Budget Request averages $1,125M per year in FY22-24 (including Webb, excluding Roman)*
    - Continuing "Program of Record" (as presented to the Astro2020 Decadal Survey) is approximately $945M per year (including Webb, excluding Roman)*
  - Division conducting internal planning for possible non-mission recommendations
- Astrophysics has been holding a ~$50-100M annual wedge starting in FY23 to respond to Astro2020 recommendations
  - This wedge is labeled "Probes" in the sandchart previously shown
  - Could be used for technology maturation for the next flagship
  - Could be used to initiate formulation of a Probe, but the Probe mission cannot be completed within the current budget planning guidelines

* These numbers include approximately $85M/yr in non-Astrophysics SMD programs including Science Activation

Astrophysics Budget – FY21 Request



What if the Roman Space Telescope and SOFIA continue to receive appropriations?

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Carpe Posterum