Introductory Remarks: Explorer Program (SMEX/MO) Pre-proposal Conference

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Heliophysics

- 2007 NASA Science Plan

  – **Heliophysics**: Understand the Sun and its effects on Earth and the solar system.

  - How and why does the Sun vary?
  - How do the Earth and planetary systems respond?
  - What are the impacts on humanity?

  1. Understand the fundamental physical processes of the space environment from the Sun to Earth, to other planets, and beyond to the interstellar medium

  2. Understand how human society, technological systems, and the habitability of planets are affected by solar variability and planetary magnetic fields

  3. Develop the capability to predict the extreme and dynamic conditions in space in order to maximize the safety and productivity of human and robotic explorers

Astrophysics

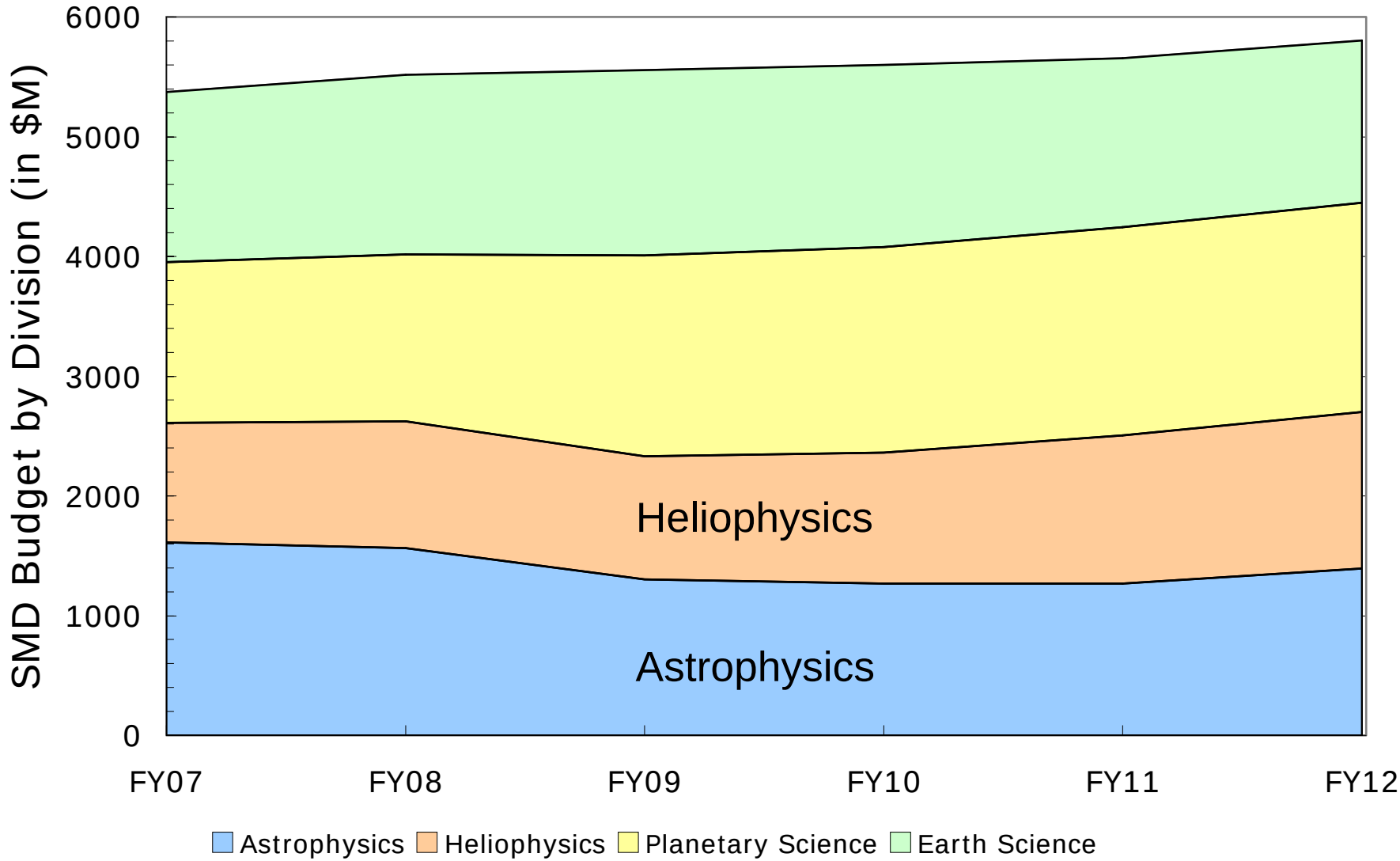
- 2007 NASA Science Plan
  - **Astrophysics**: Discover the origin, structure, evolution, and destiny of the universe, and search for Earth-like planets.
    - What are the origin, evolution, and fate of the universe?
    - How do planets, stars, galaxies, and cosmic structure come into being?
    - When and how did the elements of life and the universe arise?
    - Is there life elsewhere?

1. Understand the origin and destiny of the universe, phenom-ena near black holes, and the nature of gravity
2. Understand how the first stars and galaxies formed, and how they changed over time into the objects recognized in the present universe
3. Understand how individual stars form and how those processes ultimately affect the formation of planetary systems
4. Create a census of extrasolar planets and measuring their properties

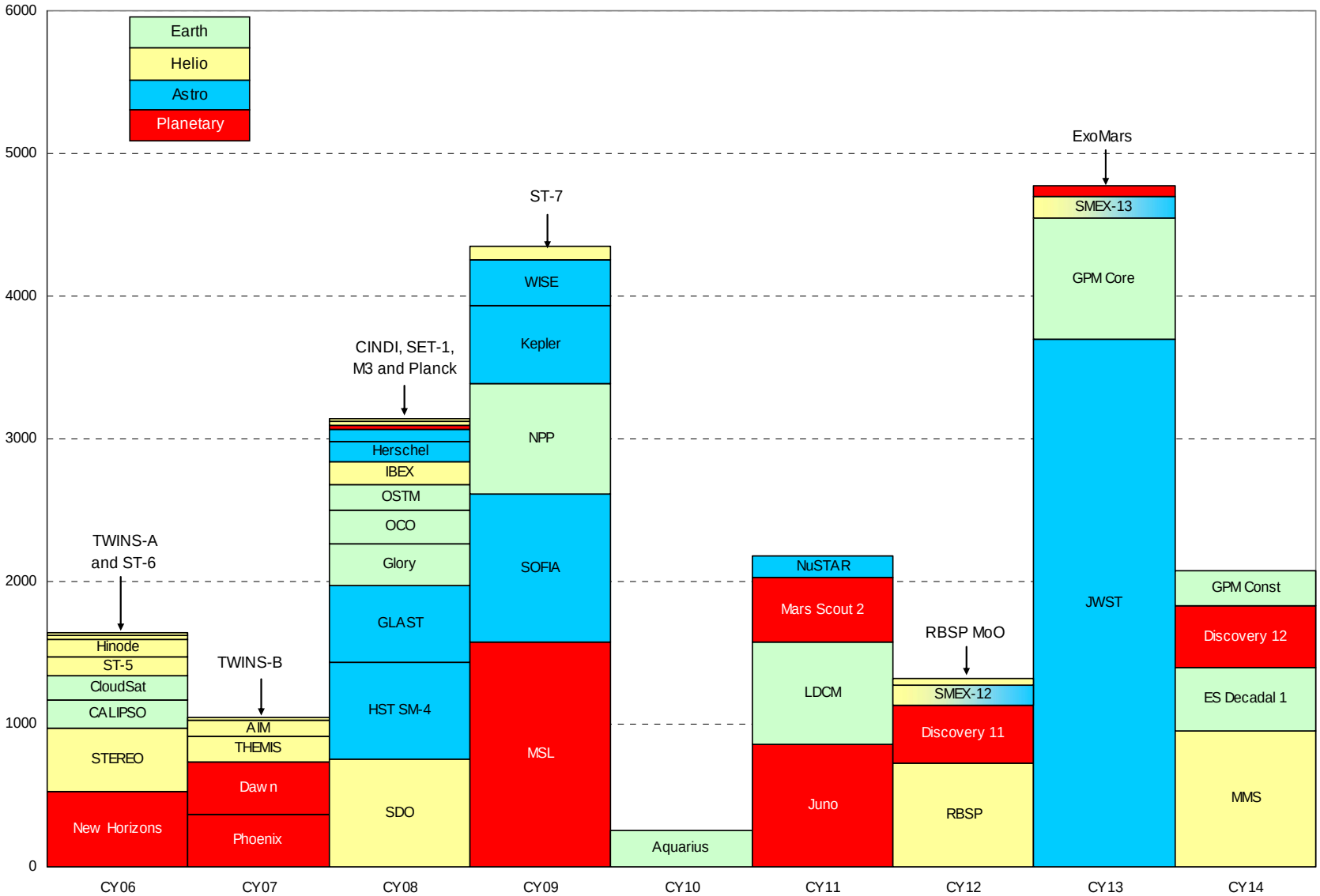
Heliophysics & Astrophysics Divisions

- Exciting new capabilities to launch within two years:
  - Helio: **TWINS-B, CINDI, IBEX, SDO, ST-7**
  - Astro: **GLAST, HST-SM4, Herschel/Planck, Kepler, SOFIA, WISE**
- New SMD focus on Strategic Investments in: Research and Analysis, Data Analysis, and Suborbital Opportunities.
  - Re-instatement of **NuSTAR** mission with August 2011 launch
  - Small Explorer (SMEX) & Missions of Opportunity AO (with focused Solar Orbiter opportunity)

FY2008 SMD Budget by Division ($M)



SMD Launches (Phase A-D, $M)

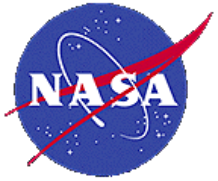


SMD Guiding Principles

- To advance the priorities of all four decadal surveys.
- To get more from our budgets through better management and investments in R&A.
- To help the Vision for Space Exploration succeed (e.g., fostering a lunar science community).

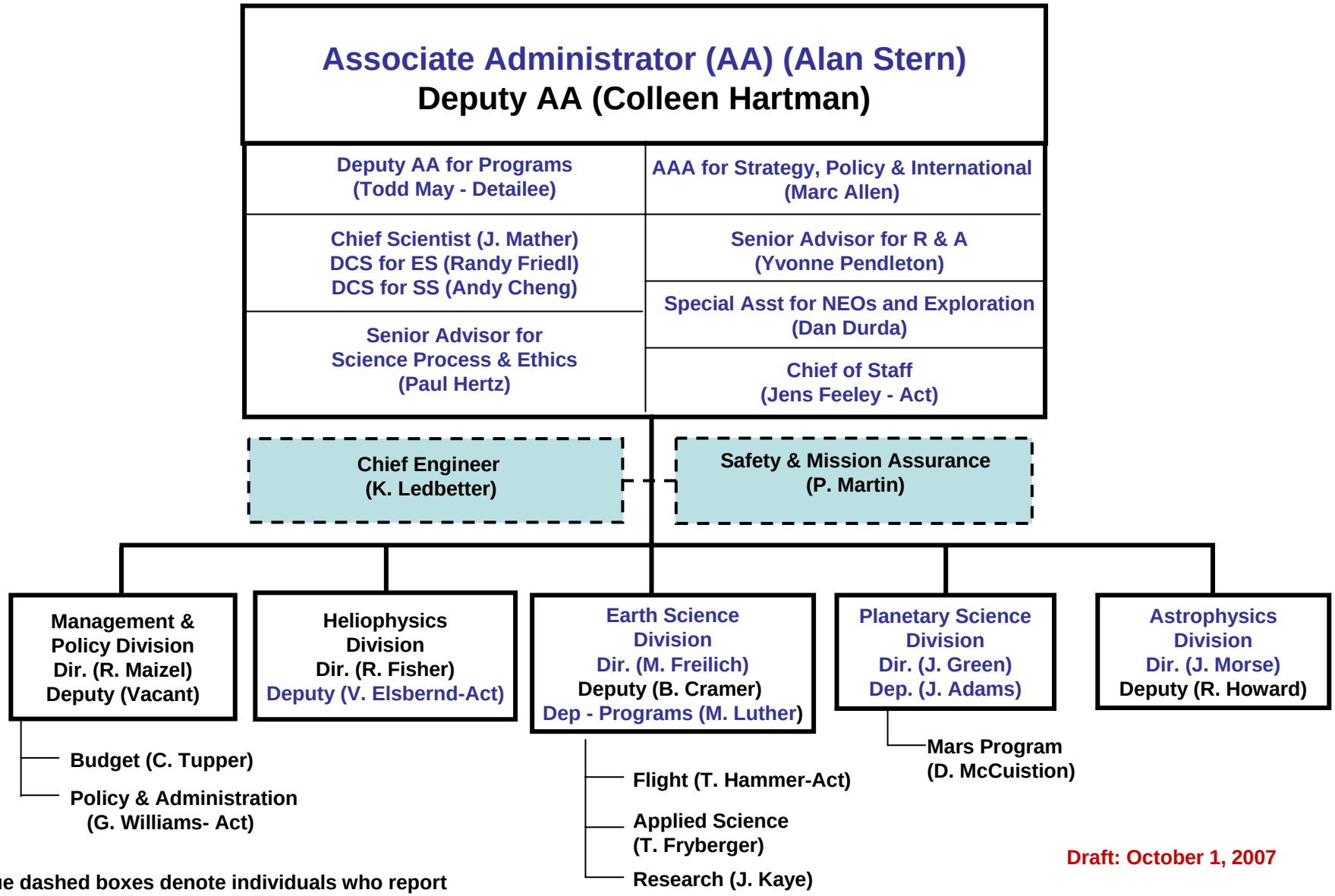
SMD Guiding Principles

- Mission cost control: Message to SMEX/MO proposers
  - It is **not** the most science that will win, but proposals with the most science in a credible cost and schedule package.
  - More headroom means more likelihood of proposal success.
  - It is imperative to fit the science and technical content within the budget and schedule guidelines. SMD would rather have 90% of the science with more headroom on schedule and cost than 100% of the science in a tight fit.



Backup

SMD Organization



Blue dashed boxes denote individuals who report to other organizations, but support SMD

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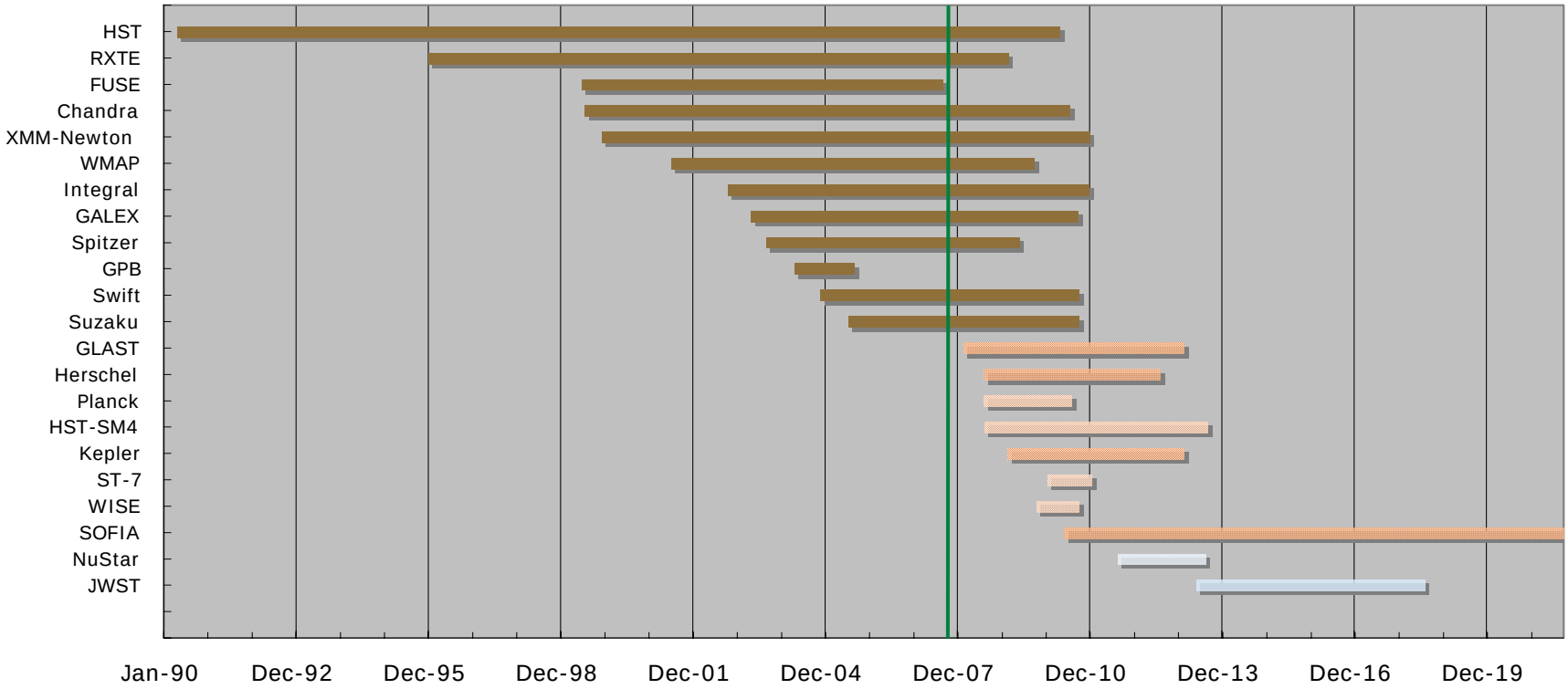
Astrophysics Timelines



Tan: mission in development, blue: mission in formulation

Astrophysics Directions

- Numerous recent community reports call for re-establishing balance among small, medium, and large missions in the Astrophysics program:
  - Astronomy & Astrophysics Advisory Committee 2007 Annual Report: *"The balance between small, medium and large programs in the NASA Astrophysics Division has been undermined. The AAAC recommends that the funding "wedge" in FY09/10 be used to add some funding for R&A and small missions, to rebalance the program."*
  - NRC 2007 NASA Astrophysics Program Assessment report: Recommendation #1: *"NASA should optimize the projected scientific return from its Astrophysics Program by ensuring a diversified portfolio of large and small missions that reflect the scientific priorities of the decadal review and by investing in the work required to bring science missions to their full potential: e.g., technology development, data analysis, data archiving, and theory."*