

HSC Heliophysics Science Centers

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leading discussion

Decadal Survey DRIVE initiative

The survey committee recommends implementation of a new, integrated, multiagency initiative (DRIVE—Diversify, Realize, Integrate, Venture, Educate) that will develop more fully and employ more effectively the many experimental and theoretical assets at NASA, NSF, and other agencies.

- **Diversify** observing platforms with microsatellites and midscale ground-based assets.
- **Realize** scientific potential by sufficiently funding operations and data analysis.
- **Integrate** observing platforms and strengthen ties between agency disciplines.
- **Venture** forward with science centers and instrument and technology development.
- **Educate**, empower, and inspire the next generation of space researchers.

Visions for Heliophysics Science Centers

Decadal HSC

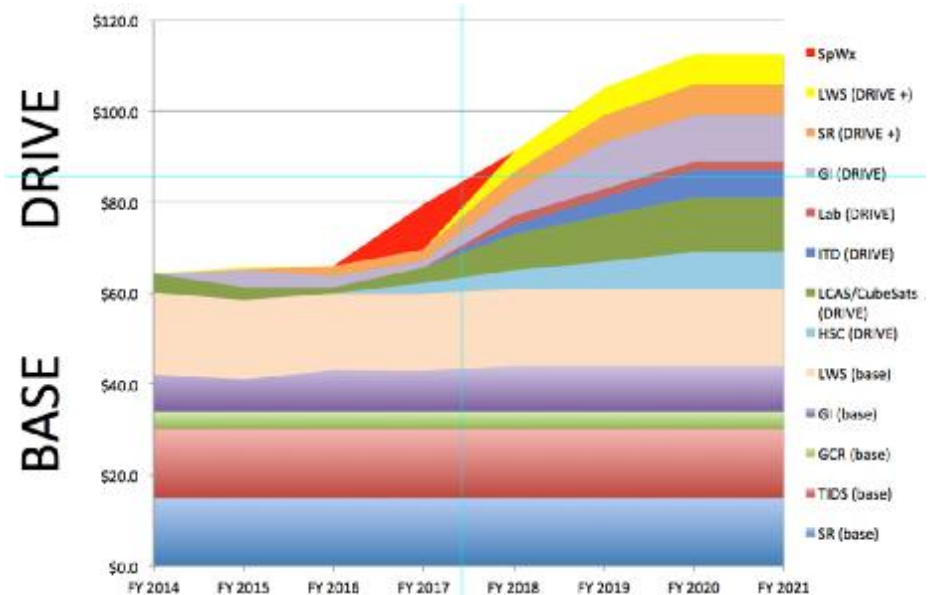
- Intended to be jointly funded by NSF and NASA as “Venture” part of DRIVE initiative.

Decadal Survey Recommendation: NASA and NSF together should create heliophysics science centers to tackle the key science problems of solar and space physics that require multidisciplinary teams of theorists, observers, modelers, and computer scientists, with annual funding in the range of \$1 million to \$3 million for each center for 6 years, requiring NASA funds ramping to \$8 million per year (plus increases for inflation).

from Decadal Survey (NSF section) : The periodic competition for heliophysics science centers (HSCs) ... will focus attention on the field in a way that is not possible with the present programmatic mix. ... The NSF Physics Frontier Centers are successful examples that have become highly competitive in the university community and might serve as models for the HSCs. They also have great potential for attracting faculty and students via their focus on exciting and challenging science.

NASA HSC

- NASA 2014 Heliophysics roadmap stated that HSC's would be managed under the Grand Challenges element.
- NASA 2016 ROSES element includes Heliophysics Grand Challenges Research
 - Science Centers
 - Theory & Modeling



Possible Models for Heliophysics Science Centers

NSF Centers

- Directorate for Mathematical & Physical Sciences: Physics Frontiers Centers (PFCs)

Science & Technology Center:

- Biophotonics Science and Technology

Theoretical Institutes:

- Institute Theoretical Atomic Molecular Physics
- The Aspen Center for Physics
- The Santa Fe Institute

- Office of Integrative Activities: Science and Technology Centers (STCs)

supports innovative, potentially transformative, complex research and education projects that require large-scale, long-term awards. STCs conduct world-class research through partnerships among academic institutions, national laboratories, industrial organizations, other public/private entities, and via international collaborations. They provide a means to undertake significant investigations at the interfaces of disciplines and/or fresh approaches within disciplines.

- Center for Integrated Space Weather Modeling (CISM) at Boston University

NASA - NSF Collaborations

- Living With a Star Strategic Capabilities

Development of first-principles-based models for the coupled Sun-Earth and Sun-Solar System. Such models can act as tools for science investigations, as prototypes and test beds for prediction and specification capabilities, as frameworks for linking disparate data sets at vantage points throughout the System.

- Community Coordinated Modeling Center

The CCMC is a multi-agency partnership to enable, support and perform the research and development for next-generation space science and space weather models.

- Heliophysics Science Centers (HSCs)

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Status of NASA ROSES 2016 Grand Challenge Research Science Centers Element

- Formulating announcement
- Expected release Summer 2016
- Due date at least 90 days after

- Seeking Community Input

Discussion

- Science Center Topics – OPEN
- Multiple Institutions vs Single institution (virtual vs co-located)
- Funding Level / duration
- Implementation ideas
 - Following NSF Science & Technology Centers Model
 - 2-step process:
 1. form science definition teams (*Phase A*)
 2. down select
 - Other