

Some personal thoughts on

The next Solar and Space Physics Decadal Survey

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In a nutshell...

- Every NASA proposal you write must relate your research to the priorities outlined in the decadal survey (DS).
- Every NSF proposal you write must address the scientific merit and broader impacts – powerful to articulate in terms of DS priorities.
- Many of the programs to which you submit proposals were created in response to DS recommendations.
- A lot of the data available to you were produced by missions or facilities that were either directly recommended or selected in response to DS priorities.

Decadal Surveys matter. A lot.

What came out of the last DS?

The recommendations of the last DS have shaped many of the programs at NASA and NSF as you know them

- **Diversify, Realize, Innovate, Venture, Educate**
 - A framework for organizing R&A programs
 - ~50 percent increase to competed research.
 - Examples:
 - NASA Helio CubeSat program
 - Maintain suborbital cadence
 - H-TIDeS technology development
 - Heliophysics Science Centers
 - NSF midscale project line
 - Mission Guest Investigator programs
- NASA Strategic Missions
 - IMAP under development, PI-led
 - GDC science & tech. definition team
 - DYNAMIC being implemented as MoO

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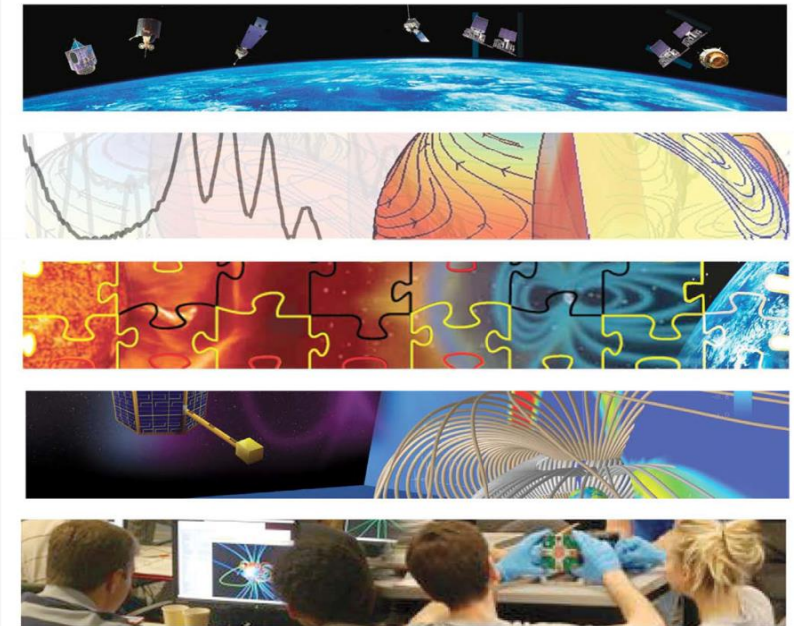


Figure credit: NASEM

What came out of the last DS?

Explorers - a crown-jewel at NASA

"...small to medium sized missions that are capable of being built, tested and launched in a short time interval compared to the large observatories." (GSFC Explorers website)

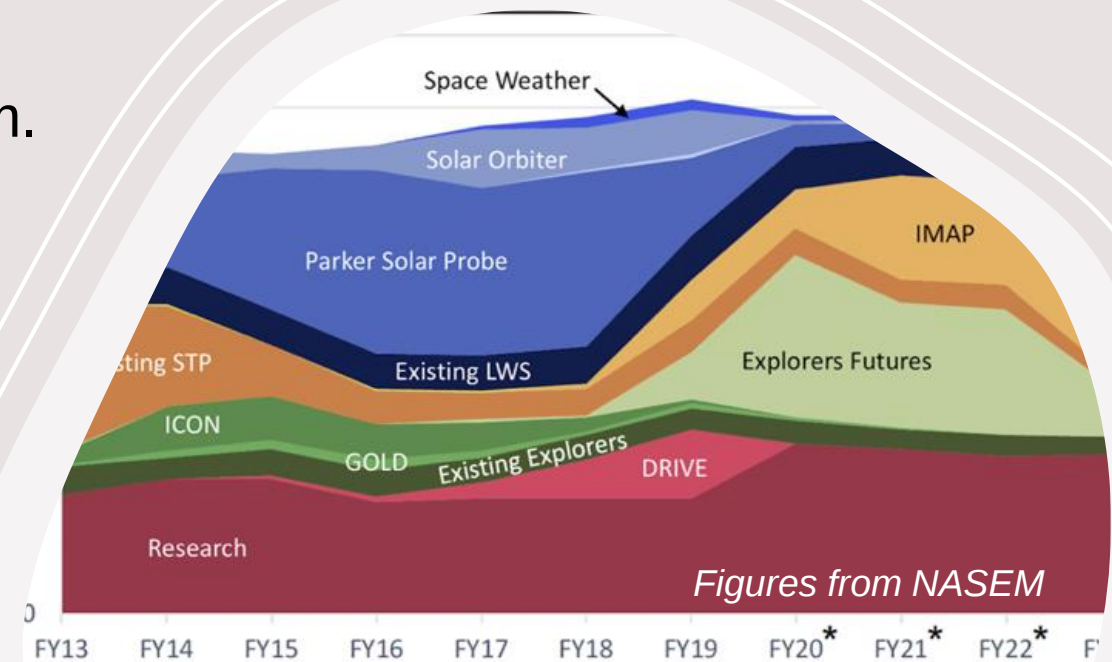
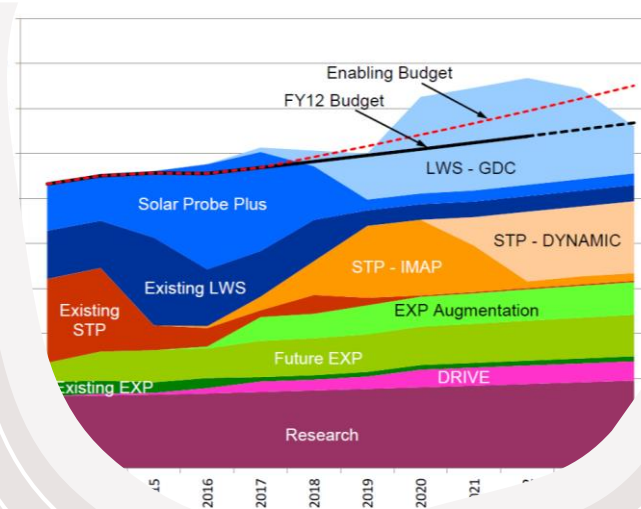
- At time of last DS (2013), ~5 years between Helio Explorers
- DS recommendation:
 - Increase cadence to 2-3 yrs, restore MDEX, more MoO's.
- Now:** four missions under development and a MDEX selection soon.



Figure credit: NASA

Lessons Learned from 2013 DS

- Some recommendations have unintended consequences
 - LWS vs. STP missions ended up being defined by cost cap as a result of “PI-led” recommendation
- We tried to be realistic and ended up being a bit conservative.
 - We prioritized the things that *could* be accomplished.
 - We didn’t emphasize enough the longer-term goals and how to make progress towards them.
- We have to prioritize because budgets are always limited and always uncertain.

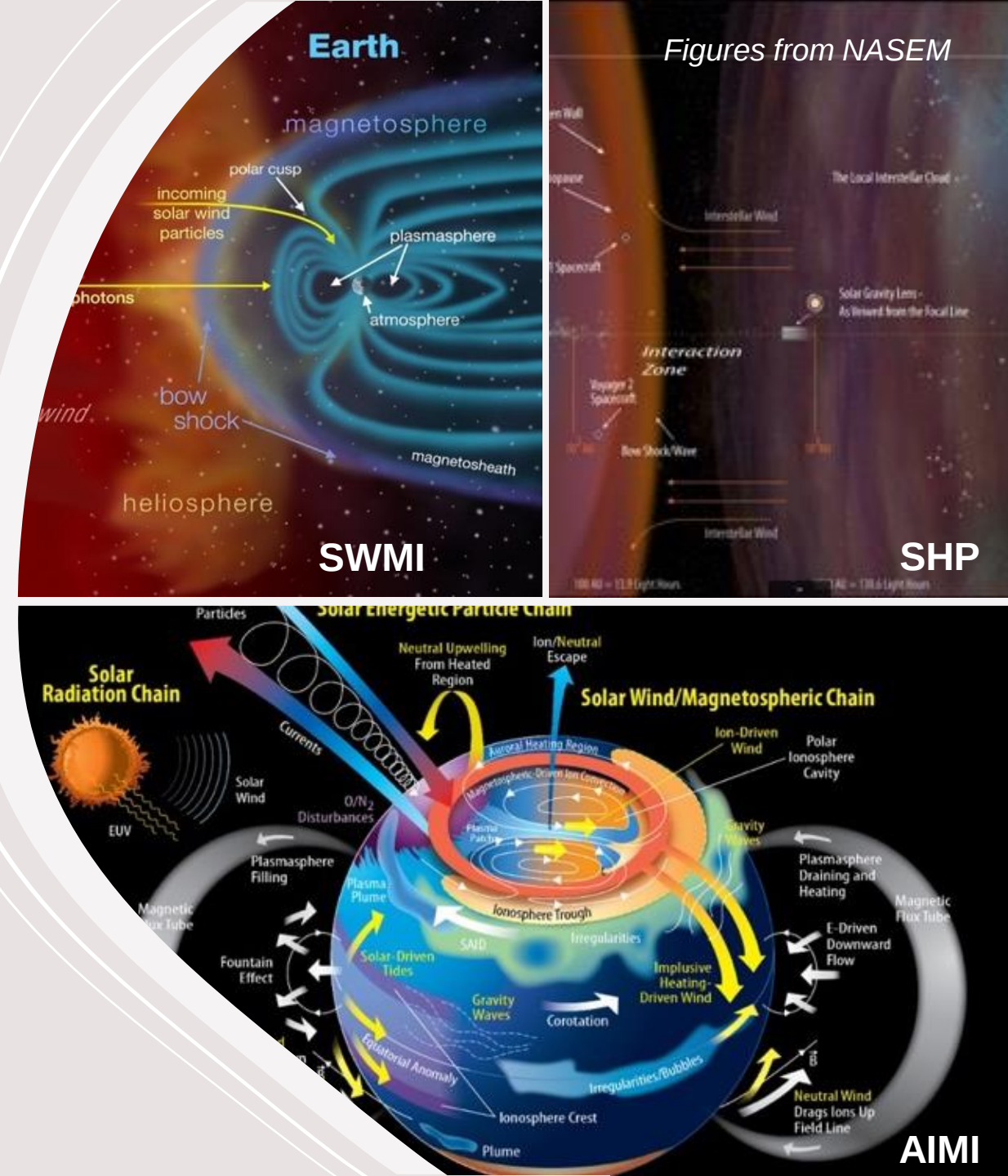


Preparing for the next Decadal Survey

- The midterm assessment outlined some considerations for the next DS:
 - Distinguish STP and LWS programs by their science goals;
 - Consider nominal and optimal budget projections to define decision rules;
 - Consider stretch-goal science objectives and recommendations to advance technologies towards them;
 - Importance of NASA, NSF, and NOAA participation in sponsoring DS and in writing a joint statement of task;
 - Expansion of Heliophysics System Observatory concept;
 - Integrated approach to space weather between agencies;
 - Cross-disciplinary research (exoplanets, astrospheres, etc.);
 - Ways to better support of early career and soft-money scientists;
 - Inclusion of emerging computer, data, and cloud technologies.
 - Community support for NSF Midscale facilities

How will our next DS be structured?

- Any study conducted by the NASEM is defined by the statement of task.
- In 2013, the DS committees consisted of:
 - Steering committee
 - AIMI, SWMI, SHP Panels
 - Crosscutting working groups
- The DS steering committee will decide on the report outline



What if I'm not on the committee?

- Being a member of any study takes a lot of time and involves a lot of writing.
- Early-career scientists should weigh carefully what they will give up versus what they will gain by participating in any community service.
 - Make sure it aligns with your career goals!
- There are many ways to get involved and provide input.
 - Many of you already participated in the Helio 2050 workshop!
 - Write a white paper.
 - Organize a group to write a white paper together.
 - Join an existing group to contribute to their white paper.
 - Participate in town halls.
 - Respond to requests by the DS committee:
 - Fun fact: the midterm assessment had a dedicated email account and solicited ideas and feedback from the community. We received very few inputs!

Will anyone read my white paper?

- Yes!

SWMI white paper
categorization for
2013 DS

System-Level SWM Physics

Expanding Understanding through
comparative magnetospheres

229	22	23	75
165	103	145	45

Global structure, dynamics,
forcing, and feedback

5	29	68	15	230	81	198
36		131	168	236	277	248

Sources and sinks of particles

Low-E	202	82	147			
High-E	62	71	40	78	69	123

Science that enables space
weather forecasting

160	239	96
	249	

Fundamental Physical Processes

- Reconnection 126 112
- Particle acceleration
- Turbulence 177
- Wave-particle interactions 16

Cross-scale coupling 117

140	26
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- Plasma entry during northward IMF
- Magnetospheric currents: where do they come from, where do they go?
- HFAs/RDs/etc. impact on SWM coupling
- Deep tail transport
- Extreme forcing events
- Magnetospheric regulation of dayside reconnection rate
- Causes of aurora
- Physics of the magnetosheath

Get Involved!

- There is a reason that Decadal Surveys exist.
 - Our community represents ~1000 minds, each with many ideas.
 - Innovation and progress are built from the ground up.
 - Community input enables Agencies to create productive programs and provide the right kinds of opportunities to advance our science.