

Committee on Solar and Space Physics Challenges and Opportunities

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Heliophysics New Initiatives (Nicky Fox)

1) Whole Heliosphere (and Planetary Interactions)

- Campaign to characterize the 3D, interconnected, Sun-Earth/Planet-Heliosphere system
- Benchmark for integrated knowledge and assessment of system knowledge gaps
- PSP, STEREO-A, DKIST, Juno, MMS, Van Allen Probes, ICON, GOLD, Maven, Juno, Voyager... – unprecedented opportunity for observations that span the solar system
- Possibly three intervals: July 2019 (Solar eclipse; PSP en route); September 2019 (PSP perihelion); December 2019 (PSP Venus fly-by)
- Also three phases of campaign: Planning, data-collecting, data-mining/analysis

Heliophysics New Initiatives (Nicky Fox)

2) Heliophysics "Pantry"

- Suite of instruments "on the shelf" ready to take advantage of any ride opportunity
- CSSP could help with short report or mini-workshop addressing specific issues:
 - What is "shelf life" of instruments?
 - Should there be published standards?
 - How is workforce/expertise maintained while instrument on shelf?
 - What types of instrument would be best for this program?
 - Constellation (more always better)
 - Always-needed (benefits arise from new vantages)
 - High-risk high-reward? Cross-cutting?

Discussion with HPAC chair (Mike Liemohn)

Are we doing enough to fund high-risk high-reward research?

- CSSP comments and questions
 - How do you normalize risk and reward? Reward in particular hard to quantify
 - low-risk (?)some reward will always beat high-risk (?)some reward
 - Evaluate reward in a "risk-blind" manner first?
 - Have specific risk-friendly program line where you can get kicked out both for low-reward and low-risk?
- Look at proposals 20 years ago – where did the paradigm shifts come from?

Mid-term and next decadal

What can CSSP do to help?

- Comment on status of last DS recommendations, also new technology, emergent opportunities/development e.g. Space Wx
- Help identify steps that are needed to help prepare for next decadal – e.g., workforce capabilities/demographics/diversity?
 - Heard an interesting presentation from Fran Bagenal
 - Recommends AIP survey in advance of next DS – how has field changed since last DS?
- Cross-committee session at spring meeting? Coordination of AIP surveys? Bystander training...

Mini-workshop on constellations

Heard from NASA (Charles Norton), NSF (Irfan Azeem), Google (Jonny Dyer), Iridium (Scott Teplitz)

Reflections:

- Large constellations: need for tech development in high-quality sensors, methods of manufacturing
- Important to improve communication between scientific and commercial communities
 - Industry-government-university round table (Space Wx in future?)
 - Needs to be benefits in both directions

Final thoughts

- The committee is happy with the way things have been going/are going for Heliophysics at NASA HQ – in particular with regards to leadership, inter-agency relationships
- Times are still tough with proposal rates <20%
but, encouraging new opportunities including early-career grants, DRIVE centers and a variety of mission solicitations
- With the new "stability", it's time to plan for a vital and vibrant future!