

National Aeronautics and  
Space Administration



# EXPLORE SCIENCE

## How the Decadal Survey Impacts NASA

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# Overview

- Decadal survey, NASA's view
  - How does NASA use the decadal survey?
  - What does NASA want in the next decadal survey?
  - What makes a good recommendation?
- Decadal survey, NASA priorities
  - Science strategy
  - Science mission programs
  - State of the Profession

# How does NASA use the decadal survey?

- Single document that provides the scientific foundation for an Agency strategy
  - Priorities for science and projects
  - Capabilities that enable or enhance the projects' science return
  - Community that develops the capabilities, executes the projects
- Recognized by Agency stakeholders (e.g. OMB, Congress, int'l partners)
  - Referenced in questions, guidance, planning
- Used by NASA to inform Division planning, programmatic
  - Priorities with Agency leadership and Government stakeholders
  - Schedule and budget for programs and projects
  - Decision rules

# What does NASA want in the next decadal?

- Strategic science focus
  - What goals should be the focus in the next decade?
  - What specific investigations can be completed to make progress on those goals?
- Advance and expand the frontiers of the field
  - How can Heliophysics expertise enable and enhance Agency activities?
  - How do we grow our scientific footprint?
  - How do better align our science with Agency and National priorities?
- State of the profession, science/technical workforce

*More information later in presentation*

# What makes a good recommendation?

- Good recommendations...
  - *do* clearly identify the needs
  - *do* target the appropriate Agency
  - *do* provide discussion of potential options
  - *do not* prescribe specific implementation
- Background and context matter!
  - Agencies have their own program focuses
  - Agencies have their own mandates, requirements, and restrictions
- Not everything *can be* or *should be* a recommendation
  - Topics and actions must be in-scope for the decadal and the Agencies
  - Background information and identification of needed additional analysis can be more impactful!

# Science Strategy

- Priorities for the next decade, lay the foundation for future decades
  - What science investigations must be completed?
  - What are strategic knowledge gaps we need to fill?
  - What scientific/technological preparation is needed for future decades?
- Advance and expand the frontiers of the field
  - Where can Heliophysics expertise enable and enhance NASA activities?
  - What emerging fields need Heliophysics expertise for success?
  - How do we grow our scientific footprint?
- How do better align our science with Agency and National priorities?
  - Space weather science and the foundation for later operational activities
  - Space situation awareness, orbital debris

# Science Strategy, Frontiers

- Over the past decade, NASA has deepened and expanded its science and exploration activities
  - Human and robotic exploration (LEO, lunar, beyond)
  - Exoplanets, habitability, sun-star/heliosphere-astrosphere, interstellar space
- Heliophysics is a necessary component for NASA's success
  - How do we best participate?
  - How do we best develop those capabilities?
  - How do we retain agility to respond to the emerging topics of the next decade?

# Mission Programs

- Mid-term Assessment, NASA agree on restructuring STP and LWS programs
  - STP, LWS need to have...
    - based in science, not mission implementations
    - science objectives addressable by a range of mission sizes
    - flexibility for NASA implementation
  - NASA has developed a restructuring for STP and LWS programs
    - Discussed at CSSP (March 23, 2021)
    - Will publish documentation ahead of decadal survey
- Space Weather Science Applications (SWxSA) is a new program
  - Develops and manages NASA contribution to National space weather activities
  - Distinguished from LWS by focus on transition to operations, R2O2R loop

# Mission Programs, STP/LWS

- NASA has supported pre-decadal mission formulation
  - STP: Heliophysics Mission Concept Studies (ROSES-2021)
  - LWS: LWS Architecture Committee (APL organized, community-led)
- STP mission concept studies selected, pre-study reports will be published soon
  - Watch the community mailing lists!
- LWS Architecture Committee to be completed early next year
  - Planning community town halls ahead of report finalization
- Decadal survey expected to recommend range of mission sizes for STP/LWS
  - These studies show feasibility for major investments
  - No studies needed for smaller missions
  - Smaller missions can expand science impact, fill specific strategic needs

# Mission Programs, Space Weather

- Anticipated focus on smaller missions
  - Hosted payloads, contributions to non-HPD missions
  - SMEX, MIDEX
  - Possibility of larger missions, as appropriate and necessary
- Expect a component of technology and technique development/demonstration
  - Use for science before transition to operations

# State of the Profession

- NASA SMD Core Values, *Science 2020-2024: A Vision for Science Excellence*
  - **Teamwork**
    - Diverse teams, workforce personal and professional development, develop and inspire the next generation of science and engineering leaders
  - **Inclusion**
    - Inclusive environment, diversity of thought, sustained engagement
- Recent SMD/HPD workforce activities
  - Heliophysics Division Roundtables, early- and mid-career researchers
  - National Academies studies
    - *Foundation for Assessing the Health and Vitality of the NASA Science Mission Directorate's Research Communities*
    - *Increasing Diversity and Inclusion in the Leadership of Competed Space Missions*
  - Mentoring365, collaborative initiative with AGU, AAS, and ASGSR

# State of the Profession, Decadal

- Equally important aspect, hardest part of the decadal survey
  - The decadal may start an inquiry without giving us the conclusion
    - We want background information and framing of issues, challenges
    - We can acquire data and perform analyses that the decadal can not
- Accessibility, Inclusion
  - Reduce barriers for entry to, challenges for retention in research programs and missions
  - Encourage candidates from underrepresented and underserved communities
- Workforce development
  - Embrace that workforce development is not a pipeline, is a “braided river”
    - Eos, 21 April 2021, by R.L Batchelor et al.
  - Opportunities for personal and professional development



End

