NSF Expectations For The Decadal Survey on Planetary Science and Astrobiology

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Planetary Science at NSF

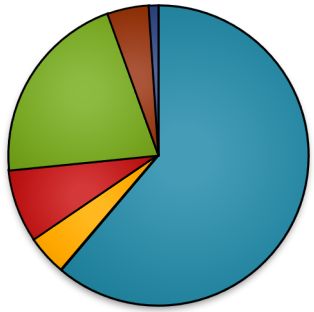
- Mathematical and Physical Sciences Directorate (MPS): Planetary Science research and facilities predominantly supported by the ***Division of Astronomical Sciences*** (AST).
  - AST overlaps NASA Astrophysics, Planetary Sciences, Heliophysics

- Geosciences Directorate (GEO): AST and planetary science borders on/overlaps some of the GEO programs, but these are in areas primarily "out of scope" for this review (e.g. space weather, Earth system science)

- Funding supports broad range of planetary science, including ground-based observations (often in support of NASA missions) at both NSF and private facilities, instrumentation, theory/modeling/simulations, and laboratory work.
- Telescope time awarded through separate, competitive TAC processes.

AST Division Programs

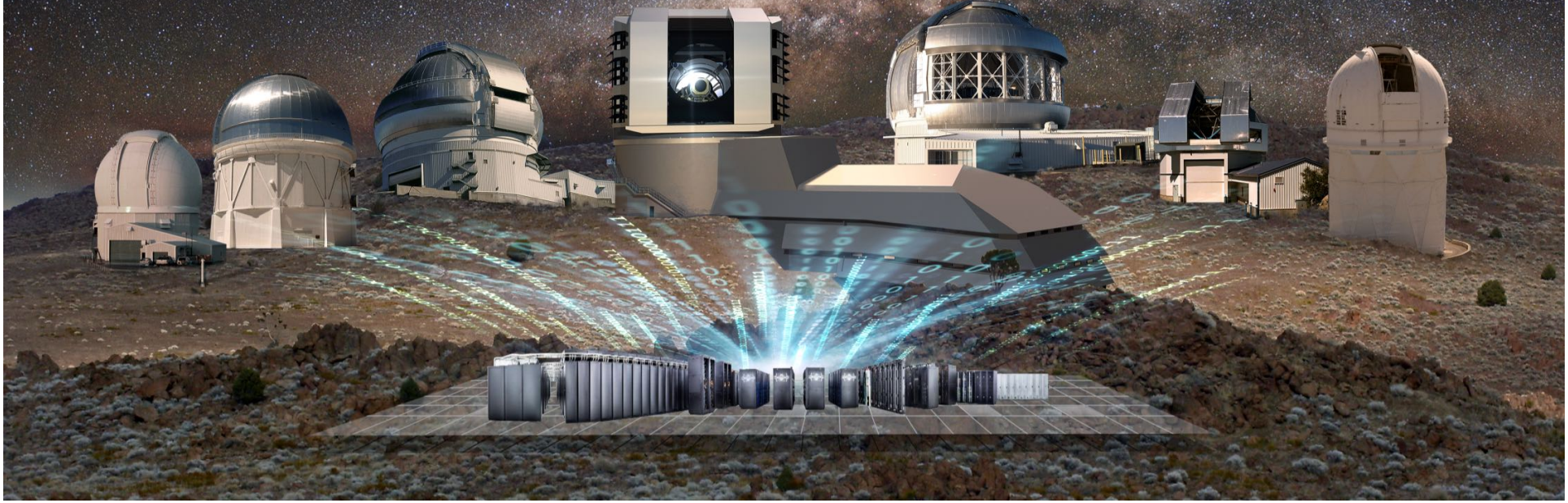
	Individual Investigators	Mid-scale	Facilities	MREFC
Research	AAG	MSIP	NRAO	
	CAREER*	MSRI*	ALMA	
	AAPF		GBO	
			Arecibo	
Technology/ Instrumentation	ATI		NSO	DKIST
	MRI*		NOIRLab	Rubin
			Gemini N & S	
			MidScale Obs	
Education and Special Programs	REU*			
	ESP			



Important Notes About NSF/AST Grants

- All proposals subject to a single “merit review” based on dual criteria: Intellectual Merit + Broader Societal Impact
- Success requires clear and convincing project description and *demonstrated astronomical context*
- Do not accept proposals that *predominantly* support NASA missions
- AST-wide programs with no funds earmarked for any particular subdiscipline or facility (and no “Guest Investigator” grants). This allows flexible response to changing priorities and diverse investment portfolios that best “promote the progress of science” in the long term.
- Amount and duration span a wide range. Supports research infrastructure, students, early-career scientists, etc.

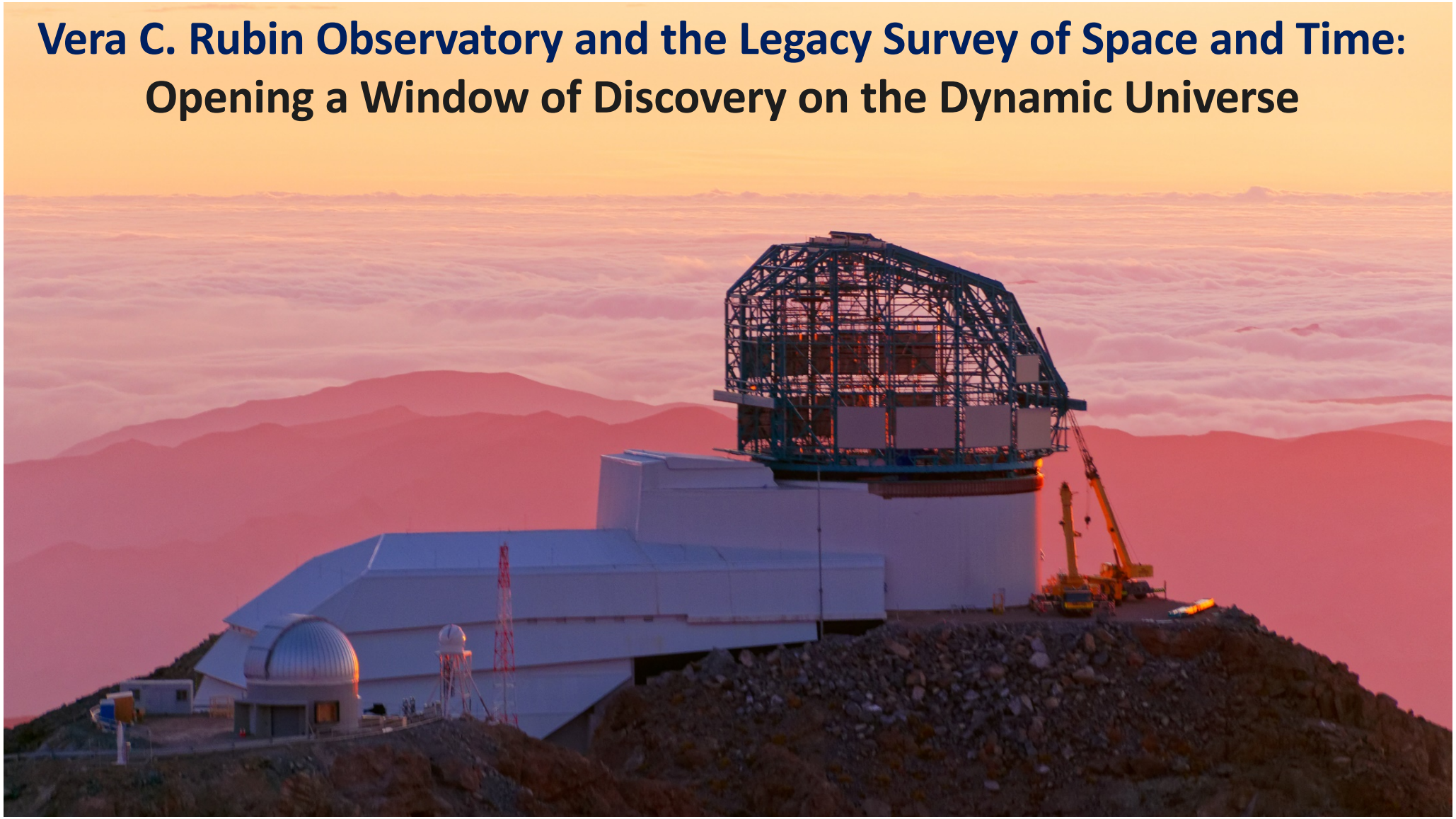
NSF's National Optical-Infrared Astronomy Research Laboratory – MidScale Observatories, Community Science and Data Center, International Gemini Observatory, and Rubin Observatory operations under a single organizational framework, managed by one awardee as a Federally Funded Research and Development Center.



National Radio
Astronomy Observatory

Daniel K. Inouye Solar Telescope

Vera C. Rubin Observatory and the Legacy Survey of Space and Time: Opening a Window of Discovery on the Dynamic Universe



Four Key Science Goals for LSST

Dark Matter, Dark Energy

- Weak Lensing
- Baryon acoustic oscillations
- Supernovae, Quasars

Cataloging the Solar System

- Potentially Hazardous Asteroids
- Near Earth Objects
- Object inventory of the Solar System

Milky Way Structure & Formation

- Structure and evolutionary history
- Spatial maps of stellar characteristics
- Reach well into the halo

Exploring the Transient sky

- Variable stars, Supernovae
- Fill in variability phase-space
- Discovery of new classes of transients

Future Facilities*?

*Awaiting ASTRO2020 recommendations

NOIRLab and NRAO engaged with scientific community in “development” activities

From the Statement of Task: Charge

- assess “how the current NSF portfolio of facilities and individual investigator grants address” the scientific priorities for planetary science
- assess “how well currently planned and new facilities under consideration in the ASTRO2020 survey could benefit the planetary science priorities”
- recommend “changes to NSF’s portfolio” that are “necessary to advance [planetary] science and to optimize the value of” facilities
- “encouraged to comment on NSF opportunities for expanding partnerships”

From the Statement of Task: Scope

- Out of Scope
  - Duplication/Reassessment of other Decadal Surveys, especially: Recommendations regarding construction of major new ground-based facilities
  - Investigations to detect exoplanets

- In Scope:
  - Role of current and contemplated ground-based facilities can play in advancing planetary science
  - Scientific issues related to exoplanets

NSF Expectations for Planetary Science and Astrobiology Decadal Survey

- The survey will be most effective if it is *inspirational* and based on *community consensus science priorities*.
- The survey should provide *clear priorities* and *actionable advice* to the agencies. Details of how to implement these may be left up to NSF.
- Recommendations/priorities also essential to strategic planning for NSF's observatories.
- We will be happy to provide additional information and briefings for the steering committee and panels.