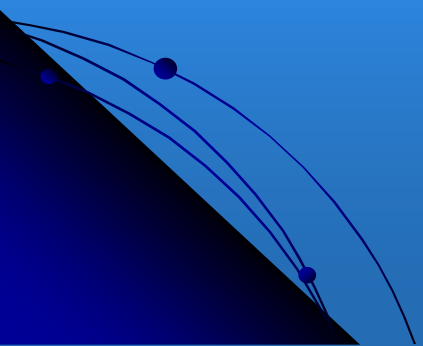




NSF
PERSPECTIVE
on
PLANETARY SCIENCES
DECADAL SURVEY

Nigel Sharp
Acting Deputy Division Director
Division of Astronomical Sciences





Scope

! Planetary Sciences !

- Solar System Phenomena, encompassing
 - Space exploration
 - Ground-based astronomy
 - Observational programs
 - Instrumentation
 - Facilities
 - Theory/modeling/simulations
 - Laboratory

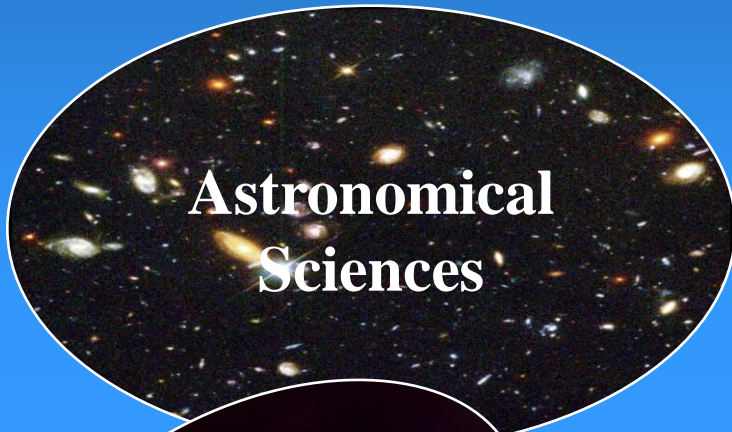


NSF supports all areas

- Space exploration – archived data
- Ground-based astronomy – national & international observatories
- Individual investigator awards
 - Observations
 - Instrumentation
 - Theory/modeling/simulations
 - Laboratory



Planetary Sciences at NSF



AGS





Planetary Sciences at NSF

Office of Polar Programs

- U.S. Antarctic Meteorite Program
 - NSF, NASA, Smithsonian Institution
 - NSF/OPP -- ~\$100,000 per year
- Individual Investigator Awards
 - geomorphology in the Dry Valleys
 - terrestrial analogs to ancient Mars



Planetary Sciences at NSF

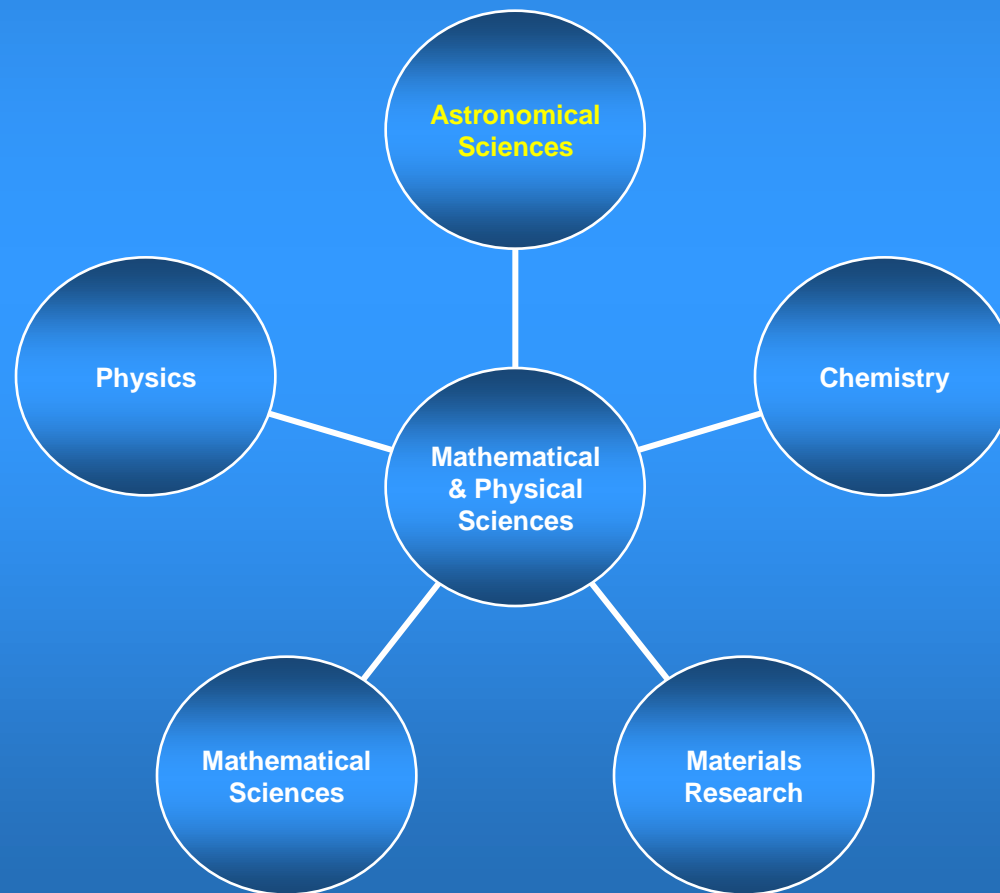
Directorate for Geosciences

- Atmospheric Sciences – ATM
- 10/09 – Atmospheric and Geospace Sciences – AGS
 - planetary magnetospheres
 - planetary atmospheres
 - Solar, heliospheric & interplanetary environment (SHINE)
 - Solar-terrestrial
- Earth Sciences -- EAR
 - meteorites
- Ocean Sciences -- OCE
 - ocean ice



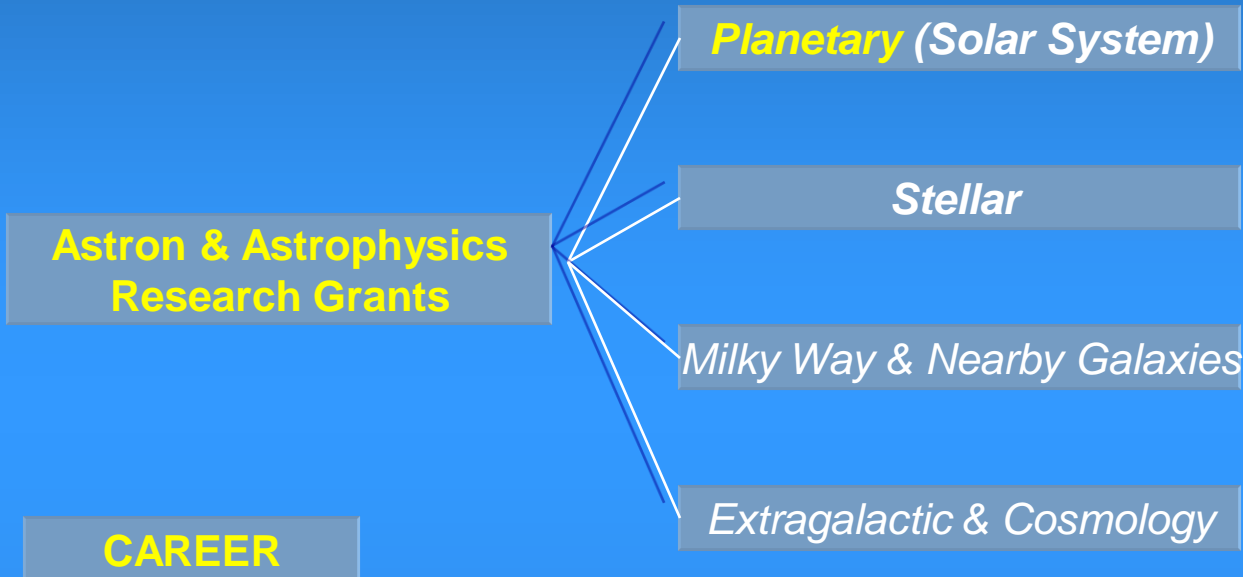
Planetary Sciences at NSF

DIRECTORATE FOR MATHEMATICAL & PHYSICAL SCIENCES





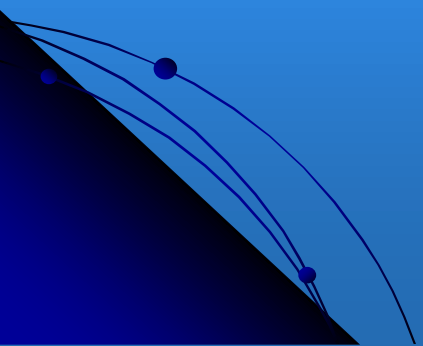
Planetary Sciences Funding Opportunities within Division of Astronomical Sciences (bold yellow font)



Astronomy & Astrophysics Postdoc Fellowships

Advanced Technologies & Instrumentation

Usage of NSF supported National Observatories





Division of Astronomical Sciences (AST) Astronomy & Astrophysics Research Grants (AAG)

AST

- **focus is on scientific merit / broader impact of a proposed project**
- **search for potentially transformative research**
- **no predetermined topic or technique or facility for preferential treatment**

Planetary Astronomy Theme

Individual investigator awards for theoretical, observational, and laboratory studies of the Solar System ---

- **Structure and Composition of Planetary Interiors, Surfaces, and Atmospheres**
 - **Planetary Satellites**
 - **Comets and Asteroids**
 - **Trans-Neptunian / Kuiper Belt Objects**
 - **Inter-Planetary Medium**
 - **Solar System Origins and Evolution**
-
- typical award: \$95,000 to \$125,000 per year for 3 years (08 mean \$108k)
 - can be more (or less!); can be for 5 years (very rarely longer)



National Observatory Facilities

National Astronomy & Ionosphere Center, Arecibo, Puerto Rico

- ◆ Astronomy:
 - ◆ 305m Radio/Radar Telescope
 - ◆ 1 MW S-band Planetary Radar
- ◆ Atmospheric Science:
 - ◆ 430 MHz incoherent scatter radar on Antenna
 - ◆ Numerous LIDARs, OIR Imagers
- ◆ Education / Outreach:
 - ◆ Arecibo Observatory Visitor and Education Facility

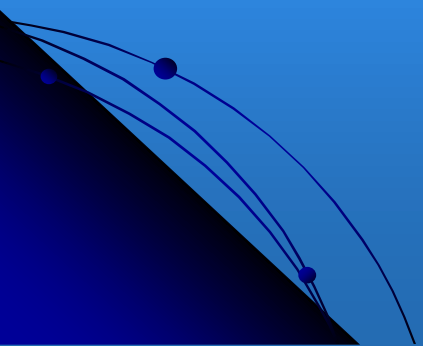




The Future

- **Potential Grants Programs Emphasis**
 - ? Comparative Planetology
 - AST & AGS [ATM] (& NASA?)
 - ? Laboratory

- **Facilities**
 - LSST

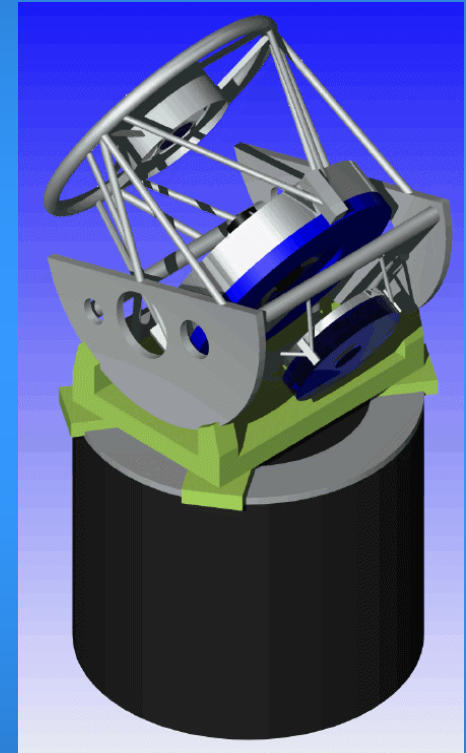




Large Synoptic Survey Telescope

--- LSST ---

- *Recommended by A&A Decade Survey; Connecting Quarks with Cosmos; Solar System Decade Survey; NEO Workshop*
- *Under consideration by ASTRO2010*
- *6.5 meter, wide field telescope*
- *Surveys entire sky in a week*
- *Design and development underway*





From the Statement of Task **B. National Science Foundation** **Recommendations**

- For NSF, the survey and report shall encompass all ground-based observational techniques, as well as analysis of data collected and relevant laboratory and theoretical investigations (including modeling and simulation). Thus, the study will assess the NSF-supported infrastructure of the field, including research and analysis support, the educational system, instrumentation and technology development, data distribution, analysis, and archiving, theory programs, and so on. The Committee shall also recommend any changes to this infrastructure that it deems necessary to advance the science and to capture the value of facilities in place.



CONCLUSIONS

- Decadal survey for **Planetary Sciences**
 - Space exploration
 - Ground-based astronomy
 - Observational programs
 - Instrumentation
 - Facilities
 - Theory/modeling/simulations
 - Laboratory
- Coordinate with Astronomy & Astrophysics Decadal Survey – ASTRO2010
- Given the Statement of Task expectations for NSF – what can we do to assist you?