National Science Foundation
AST Status

American Astronomical Society

Division for Planetary Sciences

Agencies Night

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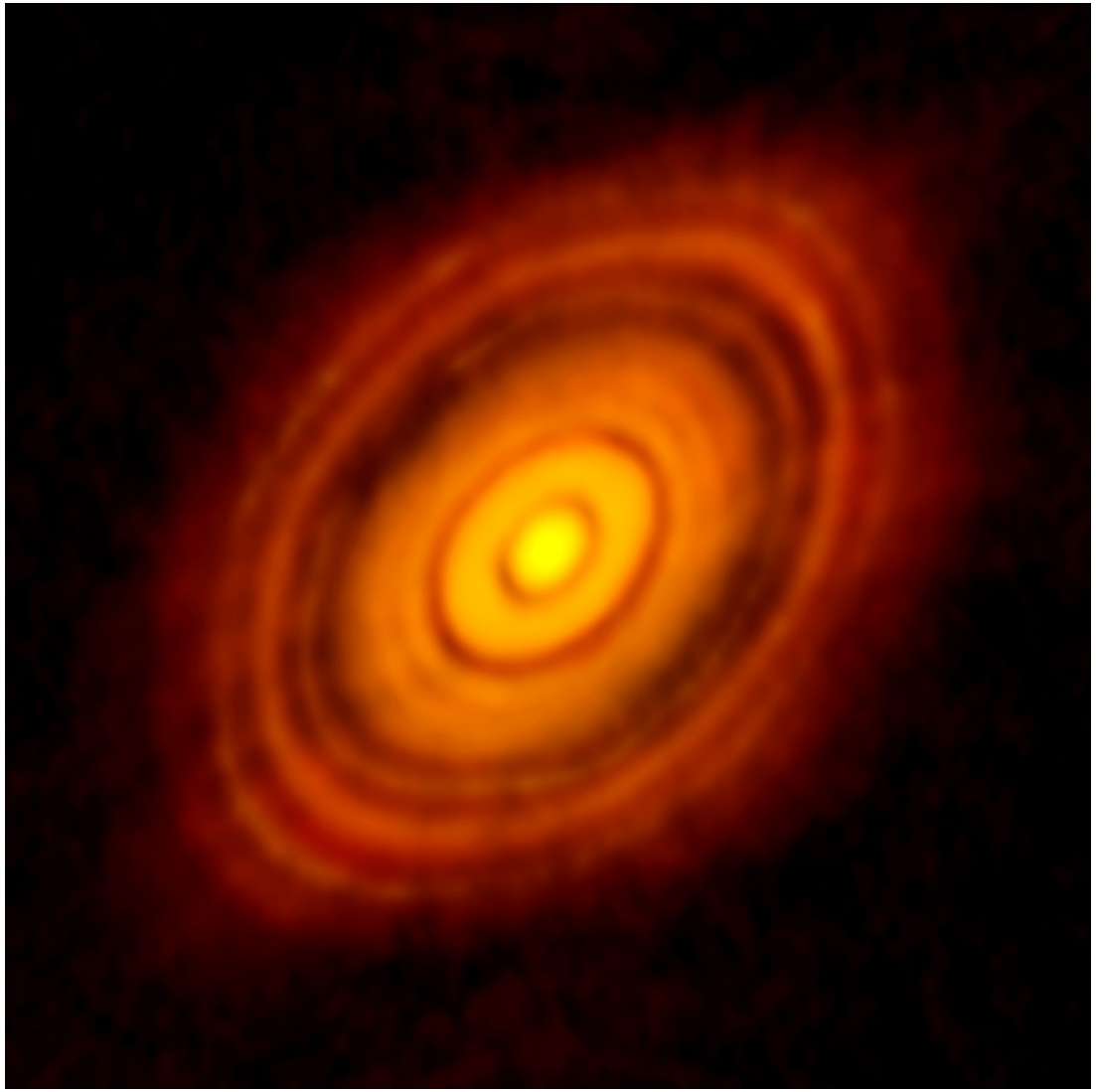
Outline

- Highlights, NSF and AST Budgets and overall program status
- O/IR System Study
- Reorganization of Planetary Astronomy Program
- NSF-NASA Joint Exoplanet Research Program
- Job Opportunities in AST

Highlights,NSF and AST Budgets, and overall program status

ALMA construction nearly completed



HL Tau:

- Astonishing detail in planet-forming disk ~235 AU in diameter around a young Sun-like star 450 ly away.
- Planet formation underway at <1 Myr
- Rings may have been created by planet-like bodies and/or resonances.
- λ=1.3 mm, 25-30 antennas, resolution = 35 mas, ~5 AU.

Extreme volcanism at Io

- Near-IR image of Io taken using adaptive optics at the Gemini N telescope on 29 August 2013.
- Extremely bright eruption on the upper right limb of the satellite.
- "Outburst" eruption is likely a highly energetic, high-volume lava fountain event.

de Kleer, de Pater, Davies, Ádámkovics, 2014, Icarus, 352-364.

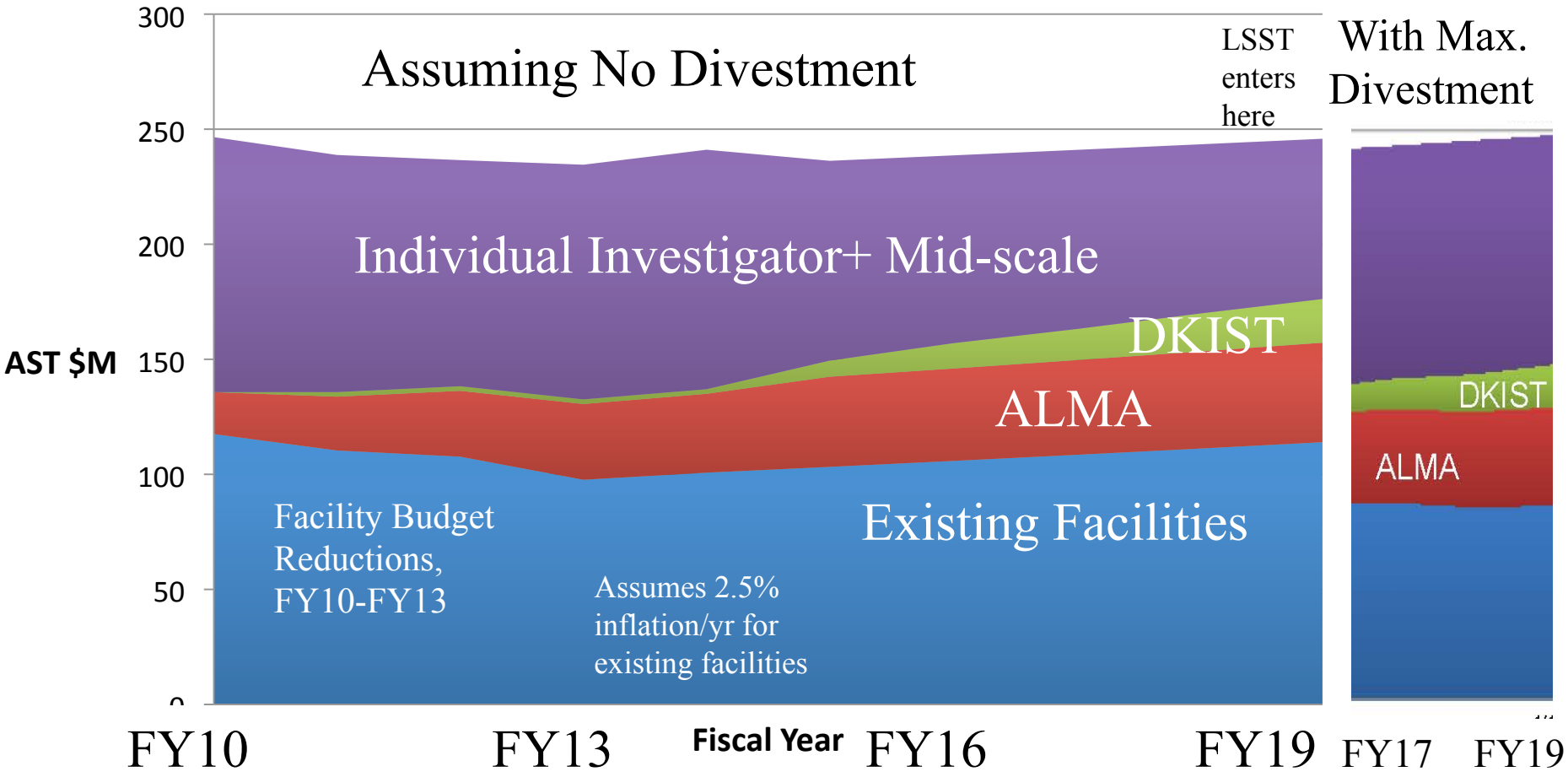
More Highlights

- Daniel K. Inouye Solar Telescope (DKIST) renamed, construction well on its way
- Construction award made for Large Synoptic Survey Telescope (LSST)
- Mid-Scale Innovations Program (MSIP) concluded its first round, with new awards
- Completed reorganization of grant discipline areas to group Planetary and Exoplanetary Astronomy

Not-So "High"lights

- AST Division budget remains stagnant
  - President's Budget Request of $236 million for FY 2015, compared to $246 million appropriated in FY 2010
- Astronomy and Astrophysics Research Grants (AAG) budget went from $49.4 million in FY 2010 to $43.7 million in FY 2014, with funding rate falling from 22% to 16%
- "Open Access" time headed for reductions in both optical and radio regimes

AST Portfolio Scenarios



AST budget assumption: FY15=Request, 1%/yr growth thereafter

AAG Now and Future

- Changes needed to achieve best review, reduce workload
  - Under consideration: reducing frequency of AAG calls, restricting numbers of proposals per investigator/institution
  - Strongly encouraging investigators to restrict themselves to 1 AAG proposal in FY 2015
  - AST working on strategy for what to do when funding rates hit 12%, 10%, 8%

NRC/CAA OIR System Study

- "A Strategy to Optimize the U.S. Optical and Infrared System in the Era of the Large Synoptic Survey Telescope (LSST)"
- Committee chaired by Debra Elmegreen, Vassar College.
- Three meetings
  - July 31/August 1; October 12-13; December 2-3
- Community input received and under discussion.
- October meeting had presentations from observatory directors, GMT, TMT, adaptive optics experts, ESO, etc.
- NSF has noted importance of recommendations in areas of instrumentation, data management, and human capital needs to support these and related areas.
- Report expected in Spring 2015.

Reorganization of Planetary Astronomy Program

- Exoplanet-related proposals are the fastest growing component submitted to AAG.
- Exoplanet proposals were previously reviewed in Stellar (SAA), Planetary (PLA) and Galactic Astronomy Programs – now all reviewed in Planetary Astronomy.

  2012: SAA = 35%, PLA = 9% of AAG projects reviewed

  2014: SAA = 21%, PLA = 18%
- The goal is to provide the most consistent review and to consolidate proposals under one program manager.

Planetary Astronomy AAG funding

- *Program description:*

  Studies of solar system and extrasolar planets; the detailed characterization, structure and composition of the surfaces, interiors, and atmospheres of planets and satellites; the nature of small bodies (asteroids, comets, and Kuiper-belt objects); the inter-planetary medium; and the origin, formation, and development of the Solar System and other planetary systems.

- *~110 active awards*
  - *55 solar system projects*
  - *65 exoplanet-related projects*

New Opportunity: NSF-NASA Joint Exoplanet Research Program

NSF supported exoplanet research since its inception

- Astronomy and Astrophysics Research Grants (AAG), Advanced Technologies & Instrumentation (ATI) and Major Research Instrumentation (MRI). Number of proposals increased significantly over last five years.
  - In 2014, ~15% of projects reviewed in AAG were XSP-related
  - **~50 active awards covering exoplanets (~$25 M)**
- NSF-funded facilities also play major roles in exoplanet research
  - Arecibo detected first extrasolar planets
  - ALMA playing a critical role in studying circumstellar disks
  - Gemini Observatory has imaged exoplanets with Near Infrared Coronagraphic Imager, and now has Gemini Planet Imager (GPI)
  - **New: WIYN telescope and NASA-NSF Exoplanet Research Partnership**

NASA/NSF Partnership for Exoplanet Research

- New Worlds, New Horizons; Visions & Voyages

  "*NASA and NSF should support an aggressive program of ground-based high-precision radial velocity surveys of nearby stars to identify potential candidates … for a future space imaging and spectroscopy mission.*" *Comparative planetology of the solar and extrasolar planets is a high priority, along with studying the formation and evolution of planetary systems.*
- NASA Motivation: Provide US astronomical community with open access to a world-class precision radial velocity **facility instrument** that will enable:
  - follow-up observations in support of current NASA missions (e.g. K2, TESS, JWST)
  - pathfinder observations to inform the design and operation of future NASA missions (e.g. WFIRST-AFTA, NWNH "*New Worlds Mission*")
- NSF primary objective is to implement a decadal study recommendation and provide an opportunity for an innovative community-based exoplanet research program.
- Partnership proposes to capitalize on NOAO share of the WIYN consortium to implement a joint exoplanet research program that ultimately will focus on extreme precision radial velocities of nearby stars.

NASA/NSF Partnership for Exoplanet Research

- The program, as currently envisioned, would be carried out in two stages:
  - Stage 1. FY2015 – FY2018
    - Manage an exoplanet-targeted Guest Observer program with existing instrumentation on WIYN using NOAO share (40%) of WIYN time.
    - NASA to release solicitation in early CY 2015 for a facility-class extreme precision radial velocity spectrometer (EPDS) for the WIYN telescope with the goal of commissioning in 2018.
  - Stage 2. FY2018 – TBD
    - Manage an exoplanet-targeted GO and guaranteed time program at WIYN with EPDS instrument and existing instrumentation on WIYN
    - Develop and maintain a data management system to serve EPDS data products.
    - Provide open community access to a cutting edge EPDS instrument for observations that support NASA missions.
- Anticipated timeline:
  - Early December 2014 – issue community announcement of plan for a NASA solicitation for the construction of an EPDS.
  - Early Jan. 2015 – release of EPDS solicitation as amendment to ROSES 2014 NRA
  - Guest Observer program begins with WIYN 2015B semester
  - April 2015 – EPDS proposal submission deadline
  - August 2015 – announcement of selection, initiation of project
  - FY2018 – commissioning of EPDS and beginning of operations

Job Opportunities in AST

Types of AST Positions

- Program Officer/Director
  - Permanent Federal Employee
    - Must be a U.S. citizen or seeking citizenship
  - Rotators
    - Intergovernmental Personnel Act (IPA)- remain an employee of home institution
      - 1 – 3 years (in rare cases, 4 years)
    - Visiting Scientist, Engineer, and Educator Program (VSEE)
      - 1 -2 years
      - Must be a U.S. Citizen or able to demonstrate seeking citizenship
  - Temporary Federal Employee (FedTemp)
  - Expert – usually short term, few months to 1 yr
  - AAAS Policy Fellow
  - Science Assistant – usually BA or MA level

Open and Upcoming AST Positions

- **Current IPA rotator opening, with emphasis on planetary/exoplanetary or stellar astronomy**
  - **Opportunity to participate in defining joint NSF-NASA program in exoplanetary science**

- AST expects several openings for permanent positions over next few years because of retirements
  - Emphasis on facility oversight in some cases