NSF Division of Astronomical Sciences (AST) Report

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Outline

- Highlights, NSF and AST Budgets
- Astronomy and Astrophysics Advisory Committee
- Decadal Survey, Portfolio Review, and OIR System
- Astronomy and Astrophysics Research Grants (AAG)
- Job Opportunities in AST

Exoplanet Host Stars

- In GG Tau-A, ALMA detects clumps of gas between outer and inner disks of binary star system
- Inflow to replenish Jupiter-mass inner disk
- Speckle imaging of Kepler exoplanet hosts using WIYN and Gemini-N indicates that half of all exoplanet hosts are binary systems

- GG Tau-A: Dutrey et al., Nature in press
- Kepler exoplanet hosts: Howell et al., Ap. J., in press,

Highlights,NSF and AST Budgets

Highlights

- ALMA construction completed except for punchlist items
  - Spectacular science results already appearing
- 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

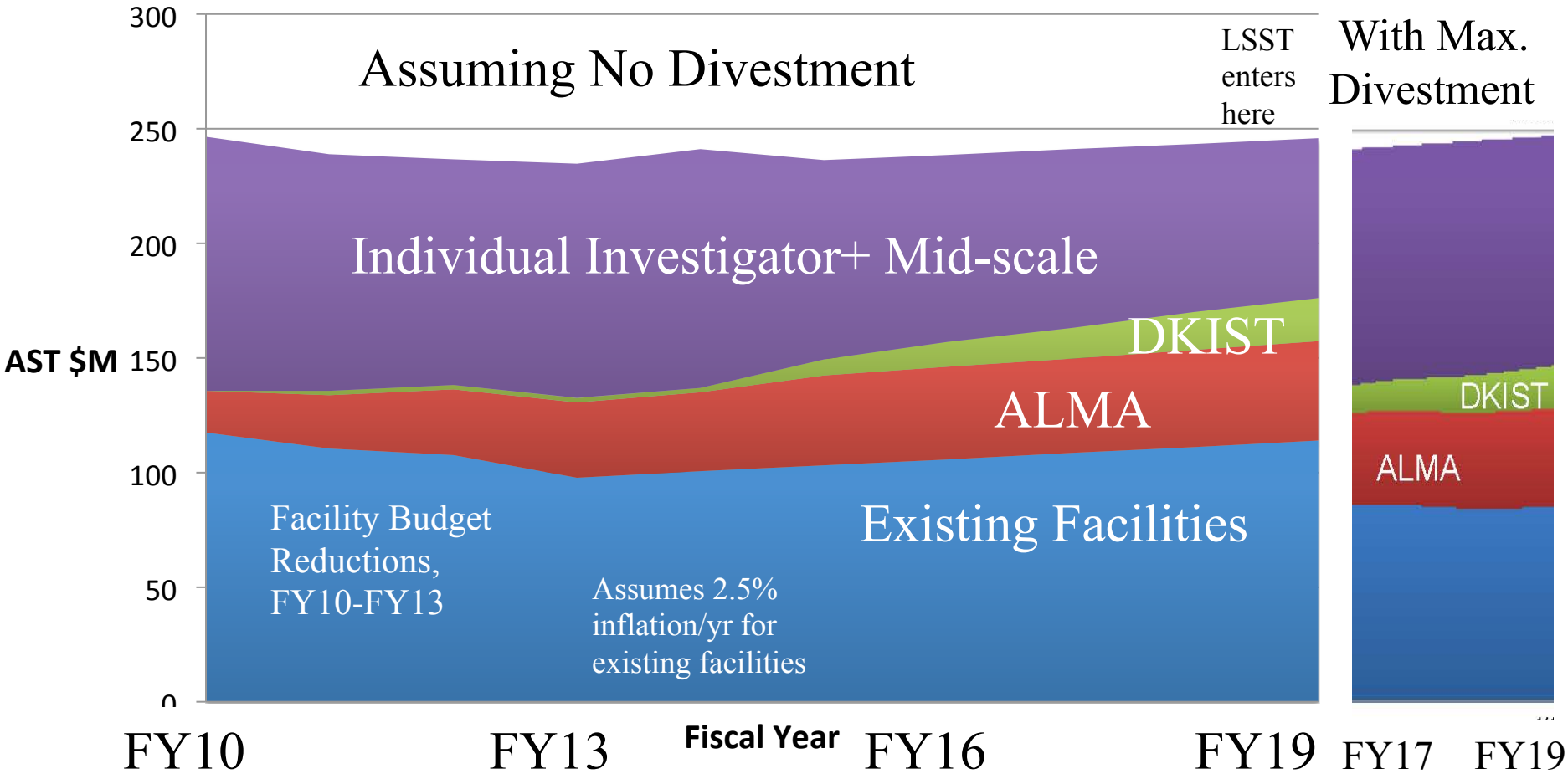
Not-So "High"lights

- 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%
- Ended University Radio Observatories and Telescope Systems Instrumentation Program as standalone activities, folded into MSIP
- "Open Access" time headed for reductions in both optical and radio regimes

Issues to Watch

- Merit Review oversight by Congress
- America Competes reauthorization
- Outcome of FY 2015 appropriations
  - More sequestration in the future (2016)?
- Facility divestment in the US and increasing activities in Chile
- Inspector General concerns about NSF construction projects

AST Portfolio Scenarios



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

Astronomy and Astrophysics Advisory Committee (AAAC)

AAAC "Principles for Access"

- Background
  - Apply principles to all large astrophysics projects and facilities funded by NSF AST, NASA Astrophysics, and DOE HEP
  - Apply principles to international collaborations, interagency collaborations, and collaborations with other public and private entities
  - Assess all proposed large astrophysics projects and facilities against these principles before deciding to undertake them
  - Discuss these principles with partners in current and future large astrophysics partnerships and facilities

- If agencies deviate significantly from these principles, reason for deviation should be publicly articulated

Six Recommended Principles

- Primary goal: produce best understanding of the universe
  - Balance opportunity for implementing consortium and funding partners with participation by wider community
- Global Coordination
  - Efficient and effective use of resources
- Open Data
  - Accessibility of data in a scientifically useful form; may include period of limited access
- Open Access
  - Merit-based process, with some preferred access for contributors
- Opportunity to Contribute
  - Openly advertised criteria for collaboration membership
- Reciprocity
  - Those desiring access to resources should offer similar access to their own resources

Decadal Survey, Portfolio Review, and OIR System

Decadal Survey (NWNH) Status

Funding circumstances are substantially below those assumed in NWNH.

With that as a boundary condition, on the NSF side --

- LSST construction approval in MREFC line was secured, with award made on August 1, 2014 (survey begins 2022)
- Mid-Scale Innovations Program (MSIP) proposals evaluated, and first awards have been made
- NSF and community participating in TMT Board, Science Advisory Committee, via planning award
- Only CTA and CCAT opportunities – MSIP
- "Small" recommendations: TCAN (Theoretical and Computational Astrophysics Network) started with NASA, no funds available for other recommended increases
- CAA O/IR System Study under way
- Portfolio review carried out in 2011-2012

MSIP and Open Access

- Two previous programs provided "open access"
  - TSIP (Telescope Systems Instrumentation Program) provided fixed number of nights per dollar, typically $3-4 million/yr in ~2010
  - URO (University Radio Observatories) provided 30-50% of observing time typically $6-10 million/yr in 2008-2014
  - TSIP and URO programs generally received 3-6 proposals, with funding rates of 25-50%
- MSIP subsumed these programs as a component of MSIP program, which also has open access to data as a goal
  - FY 2013 solicitation was for FY 2014/15 funds
  - Total AST MSIP budget started at ~$14 million/yr, hence with ~ $28 million available through first solicitation
    - Also attracted several million dollars in co-funding and made small out-year commitments, for total of ~$35 million
  - Expect similar FY 2015 solicitation for FY 2016/17 funds

MSIP First Results

- 38 pre-proposals, requesting $400 million (12 full proposals invited)
  - Between a quarter and half classified their proposals as “Open Access” (could specify multiple categories)
  - Observing time/access offered relative to funding (aka cost/ benefit) varied widely compared to either TSIP or URO standards
  - Most other proposals (and some with Open Access) involved instrumentation development
    - Community benefit criterion meant that panel had to weight the value per dollar of open access time against the value per dollar of, for example, student training in instrumentation
- MSIP Awards
  - Three full awards, so full-funding rate is below 10%
    - Two offer open data access
  - Seed funding or co-funding expected for 2-3 other awards

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 planned
  - 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 and data management, plus the people/training needs to support these areas
- Report expected in Spring 2015

Portfolio Review Status

- AST issued Dear Colleague Letter NSF 14-022 on December 20, 2013
  - Lays out future steps for all telescopes that were either recommended for divestment in the near term or for future consideration
  - NSF has begun engineering/environmental feasibility studies for a number of telescopes, while consideration of some others awaits specific external milestones
  - Expect next steps of environmental review to begin in FY 2015, as appropriate
- Congress continues to express interest in implementation

Facility Futures-1

- Kitt Peak 2.1m open availability ended in FY 2014
  - Proposals to take over 2.1m under evaluation
- Mayall 4m leaves NOAO base budget after FY 2015
  - Continued operation for special projects funded outside NOAO base
  - Expect some community access continuing during 2016-2018 transition to DOE DESI project
- NOAO share in WIYN 3.5m telescope
  - Joint NASA-NSF exoplanet program is under development
  - Includes development of Extreme Precision Radial Velocity Spectrograph under NASA solicitation

Facility Futures-2

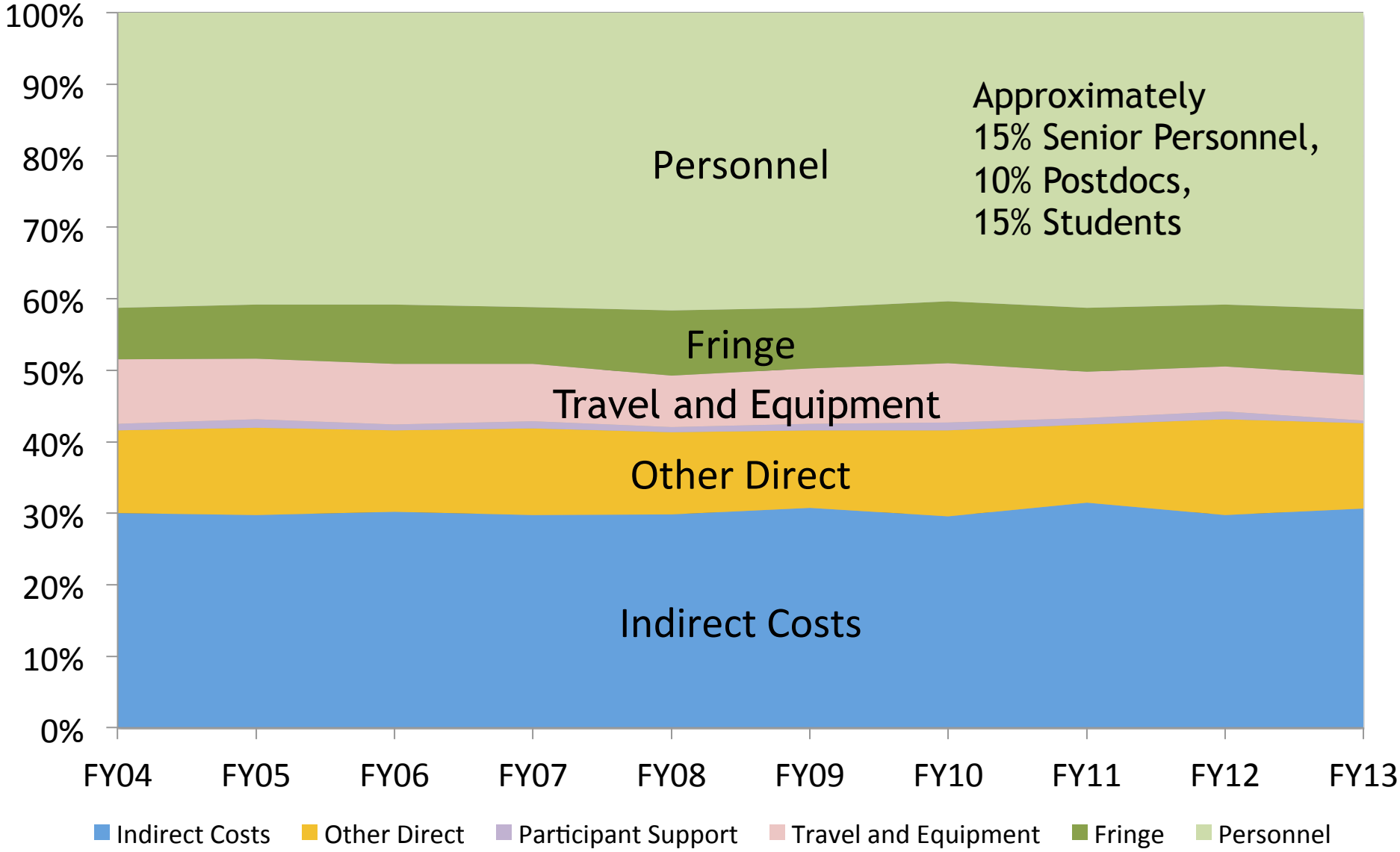
- GBT and VLBA removed from NRAO management competition
  - Engineering and environmental baseline review taking place for both
  - Similar to NOAO Kitt Peak, these are outside NRAO base budget in competition, with any operations to be funded separately
  - Partnerships under development
- DKIST will supplant open-access NSO observatories
  - Partnership discussions for GONG, Sac Peak, McMath-Pierce
- Arecibo undergoing baseline review similar to GBT
  - Will lead to decision about status post-2016

Astronomy and Astrophysics Research Grants (AAG)

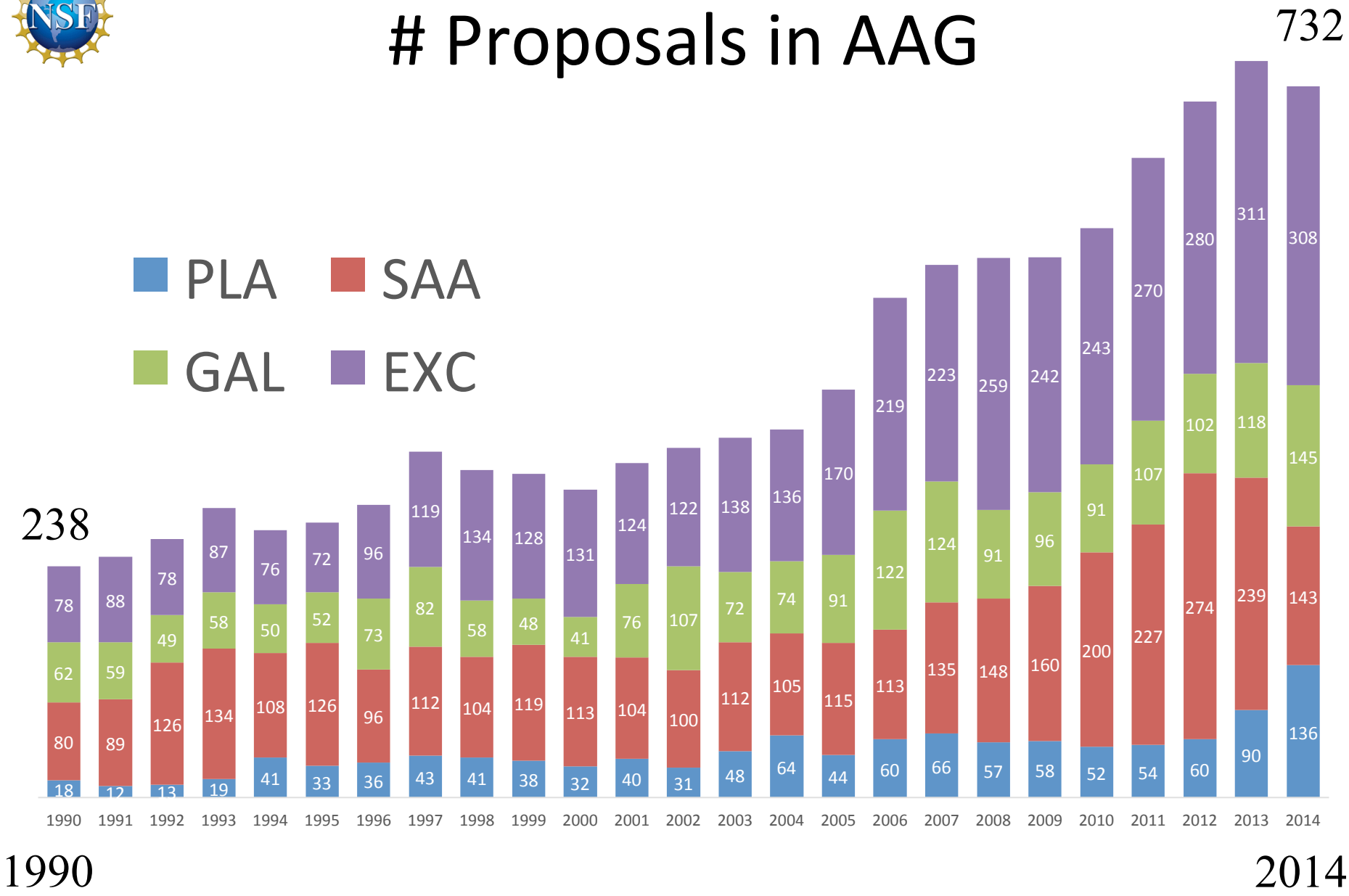
Grants Program Statistics

- Many questions are asked about various grants program statistics, impact of soft-money positions, money spent on students, multiple proposal submissions, gender balance, etc.
  - Data are important for assessing possible future approaches related to community health and demographics
  - AAAC recommended clarification and quantification of some of these issues, which also are of great interest to AAS
- Subsequent slides show some of our first looks at the data over last 10-25 years

AAG Global Budget Breakdown



Proposals in AAG



AAG Now and Future

- FY14 funding rate was 16%, because of some year-end funding offsets in other areas

- 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 needs to develop strategy for what to do when funding rates hit 12%, 10%, 8%

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 (VSEE) 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

Open and Upcoming AST Positions

- AST expects several openings for permanent positions over next few years
  - Emphasis on facility oversight in some cases
  - AST has five new federal program officers hired in last two years (three since August)
    - Grants Program: Glen Langston
    - Spectrum management: Mangala Sharma and Sandra Cruz-Pol
    - Facilities: Dave Boboltz and Ralph Gaume
- Current IPA rotator opening, with emphasis on planetary/exoplanetary or stellar astronomy
  - Opportunity to participate in defining joint NSF-NASA program in exoplanetary science