NSF AST Town Hall

June 3, 2014

NSF Attendees:

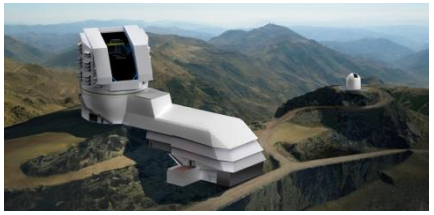
Jim Ulvestad, (Pat Knezek), Dan Evans, Joan Schmelz

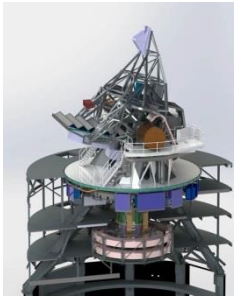
Outline

- Science and Facility Highlights
- NSF and AST Budgets
- AAAC Report, 2014
- Decadal Survey and Portfolio Review Status
- Astronomy and Astrophysics Research Grants (AAG)
- Job Opportunities

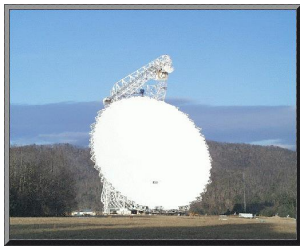
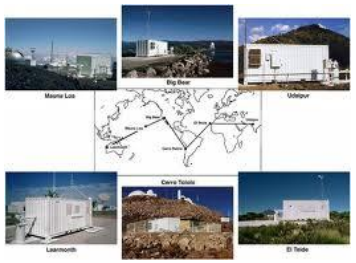
AST Strategy to 2020 and Beyond

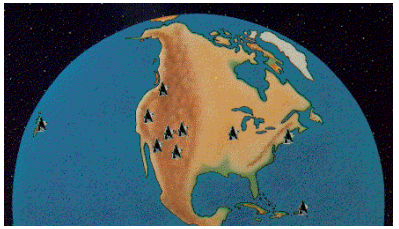
Major Facilities

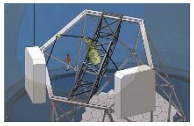
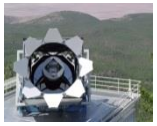
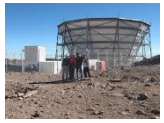


Divestment/ Partnership

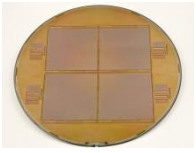




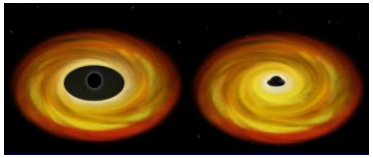
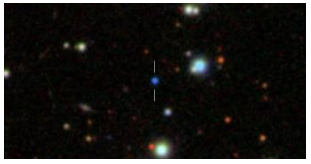
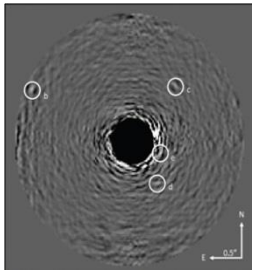


Mid-Scale Innovations

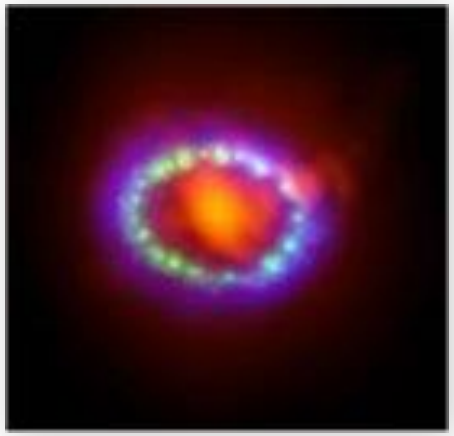





Individual Investigators

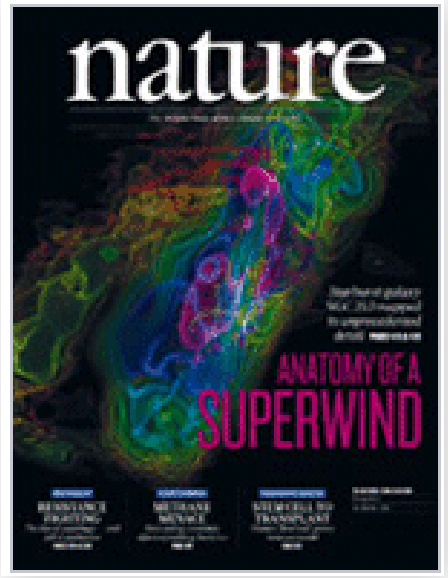


ALMA High-Impact Science Results



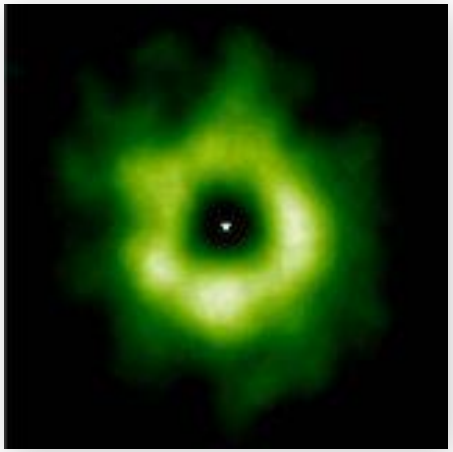
Dust formation in supernova 1987A
Indebetouw et al. 2014



Galaxy superwind
Bollato et al. 2013, and a Nature "Image of the Year"

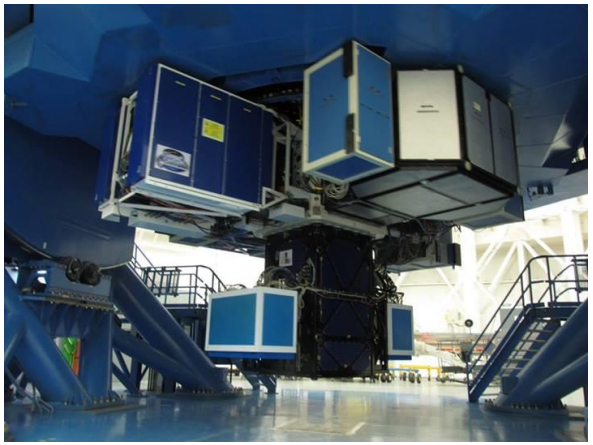
The coldest place in the known universe (~1K)
Sahai et al. 2013

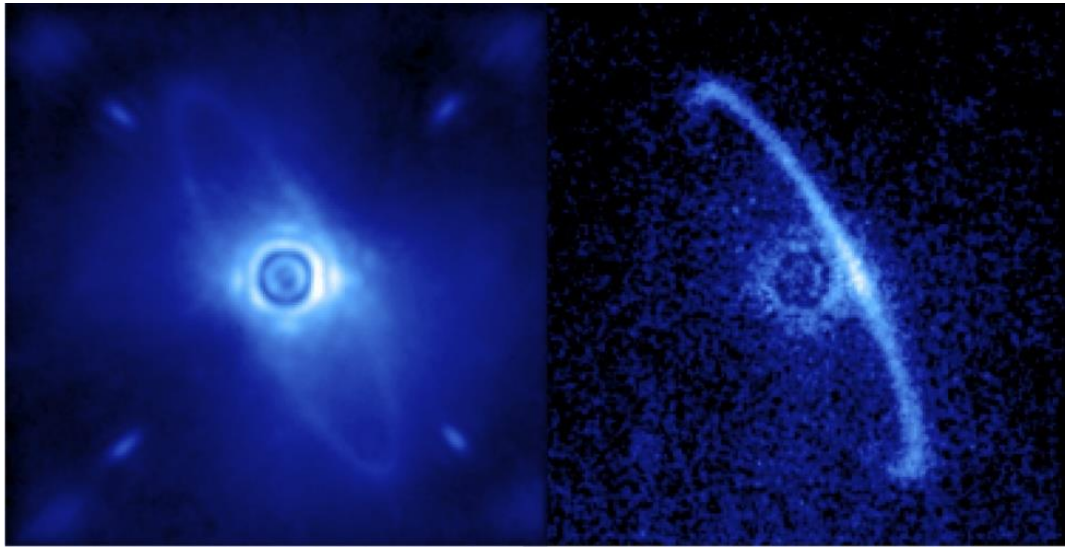
Imaging the "snow line" in an infant solar system
Qi et al. 2013



Gemini Planet Imager (GPI)

- GPI passed commissioning tests at Gemini-South
  - Able to detect and characterize giant planets at $<10^{-6}$ brightness of parent star
  - Campaign to image ~600 exoplanets orbiting nearby stars begins later this year.
  - Shared-risk observing, 2014 Semester 2





First light with the Gemini Planet Imager: Dust ring 2x orbit of Neptune around HR 4796A (220 LY distance). Left image: total light; Right image: polarized light. Starlight is blocked.
(2014 AURA/Gemini)

Daniel K. Inouye Solar Telescope (DKIST)

DKIST enclosure, Bilbao, Spain

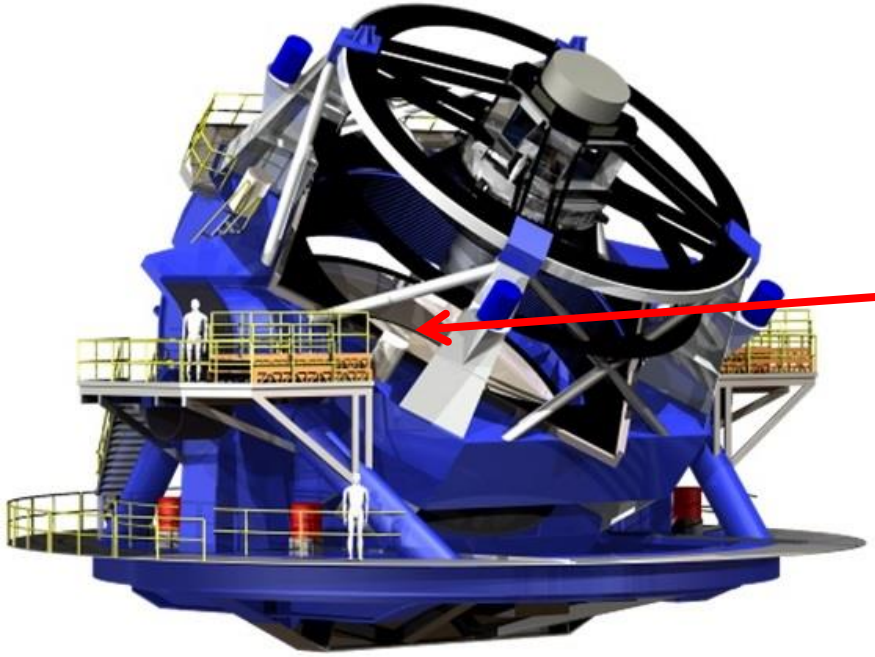
- Renamed from Advanced Technology Solar Telescope (ATST) in December 2013
- Operational status scheduled for mid-2019
- Ramp up to operations starts in FY 2015 budget request

Coudé rotator construction in Rockford, IL

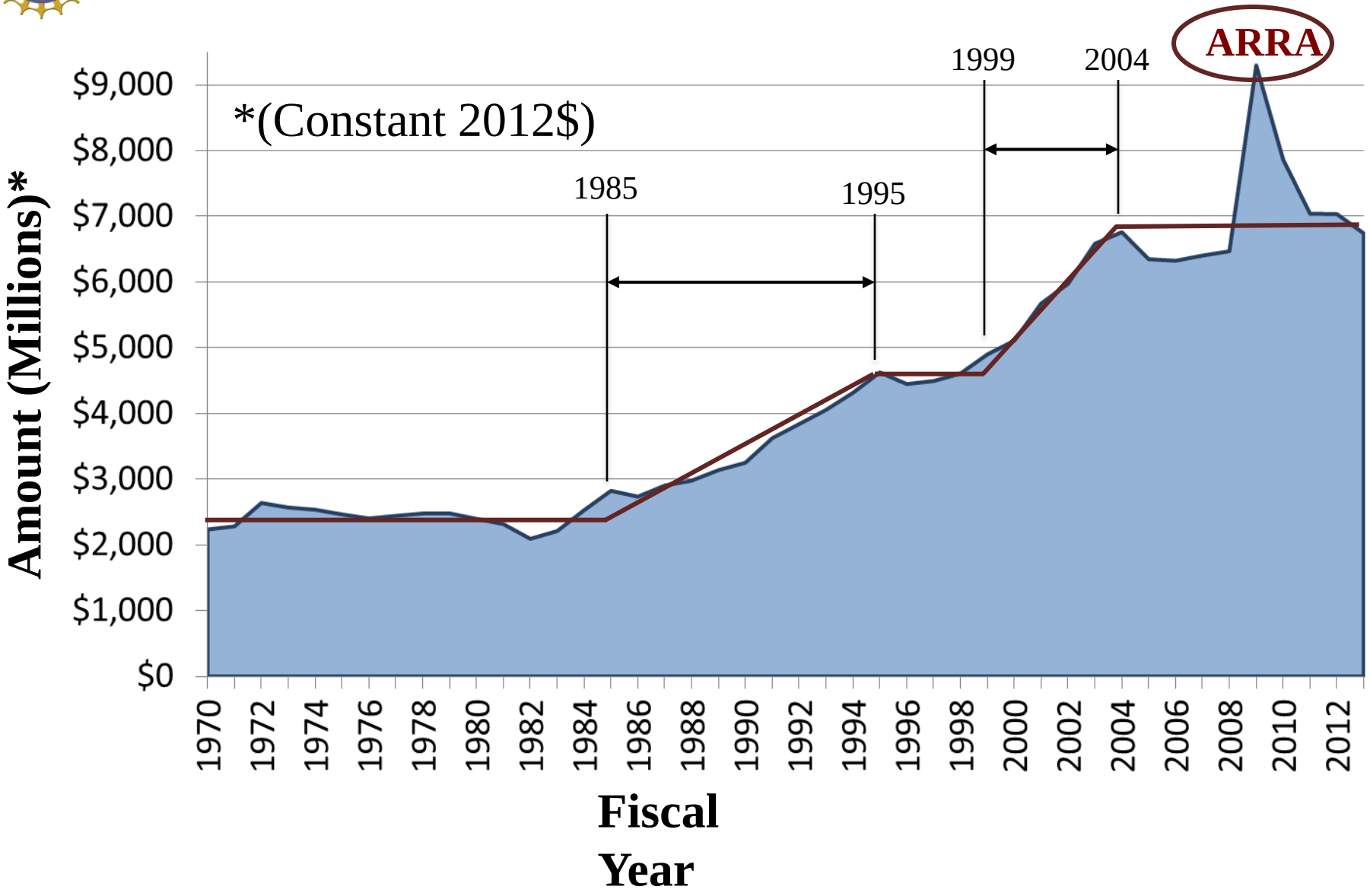
DKIST telescope pier, Haleakala

LSST Recent Progress

- Primary-Tertiary Mirror on track to complete final polishing by mid-2014
- Secondary mirror M2 contract in place: ITT/Exelis (design, option to build)
- M2 Hexapod & Camera Rotator contract in place: Moog/CSA (same approach)
- Telescope Mount Assembly: vendor chosen, contract in negotiation
- Summit Facility Construction: bids received, review under way
- Contracts phased, “design with option to build”: design is Phase I



NSF Funding History



NSF Appropriations, FY 2010-15

Budget, In $M	FY10 Actual	FY11 Actual	FY12 Actual	FY13 Actual	FY14 Plan	FY15 Req.
NSF	6972	6913	7033	6902	7172	7255
R&RA	5615	5608	5689	5559	5809	5808
MREFC	166	125	197	196	200	201
MPS	1368	1312	1309	1249	1300	1296
AST	246	237	235	233	239	236

MREFC, In $M	FY10 Actual	FY11 Actual	FY12 Actual	FY13 Actual	FY14 Plan	FY15 Req.
ALMA	42.76	13.92	2.50	0.51	0	0
DKIST	20.00	5.00	10.00	25.00	36.88	25.12
LSST	0	0	0	0	27.50	79.64

DKIST also received $146.00 million ARRA funding in FY 2010

Astronomy and Astrophysics Advisory Committee (AAAC)

What is the AAAC?

- Advisory Committee chartered by Congress in 2002
  - Advises NSF, NASA, and DOE on interagency astrophysics activities
  - Advises on activities related to NRC decadal surveys
  - Transmits annual report to Congress by March 15 of each year
- 13 members: selected by NSF (4), NASA (4), DOE (3), and OSTP (2)
- Meets four times per year (typically two in person, two by telecon)
  - Next meeting is June 10 telecon

AAAC 2013-2014 Annual Report

- Recommendations to NSF
  - Use newly drafted "Principles for Access to Large Astrophysics Projects and Facilities" in negotiating future agreements (also NASA, DOE)
  - Should budget situation improve, make more aggressive progress on decadal survey priorities (also NASA, DOE)
  - Pursue divestments in most expedient possible manner to enable decadal survey progress
  - Where possible, leverage divested facilities for community access
  - AAAC and agencies work together to clarify and quantify questions related to individual investigator grants and mid-scale programs (also NASA, DOE)
- Recommendations to Congress and Executive Branch
  - Recognize importance of basic research and prevent funding decline
  - Stabilize funding environment

Intent of AAAC Principles

- 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 and Portfolio Review

Decadal Survey (NWNH) Status

- LSST construction under NSF budget expected to begin in July
- Mid-Scale Innovations Program (MSIP) proposals under final evaluation
- NSF and community participating in TMT Board, Science Advisory Committee, via planning award

- Only Cerenkov Telescope Array (CTA) opportunity - MSIP
- Only CCAT opportunity - MSIP

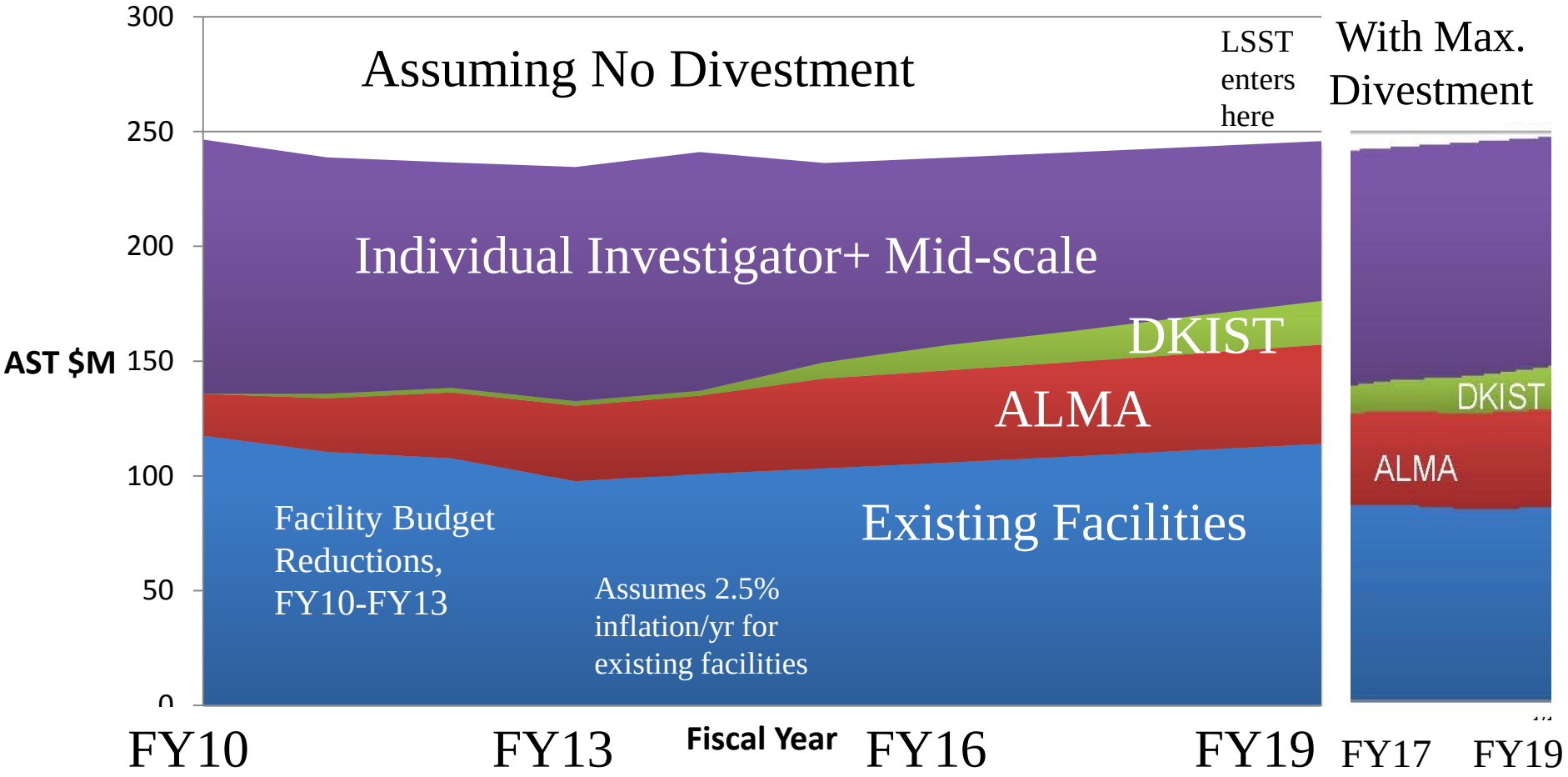
- "Small" recommendations: TCAN (Theoretical and Computational Astrophysics Network) started with NASA, no funds available for other recommended increases
- CAA O/IR System Study under way (see Town Hall tomorrow)

NSF Goals of CAA-chartered O/IR Study

- Goal 1: Position the observational, instrumentation, data management, and support capabilities in U.S. O/IR astronomy to best address the science frontiers and science goals as identified in the decadal surveys *"New Worlds, New Horizons in Astronomy and Astrophysics"* and *"Vision and Voyages for Planetary Sciences in the Decade 2013-2022"* in the era of LSST as the primary new federal asset in the O/IR portfolio.

- Goal 2: Achieve the best science return from the NSF investment in night-time O/IR astronomy, including, but not limited to, the role of the O/IR system in delivering LSST-related science.

AST Portfolio Scenarios



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

Portfolio Review Status

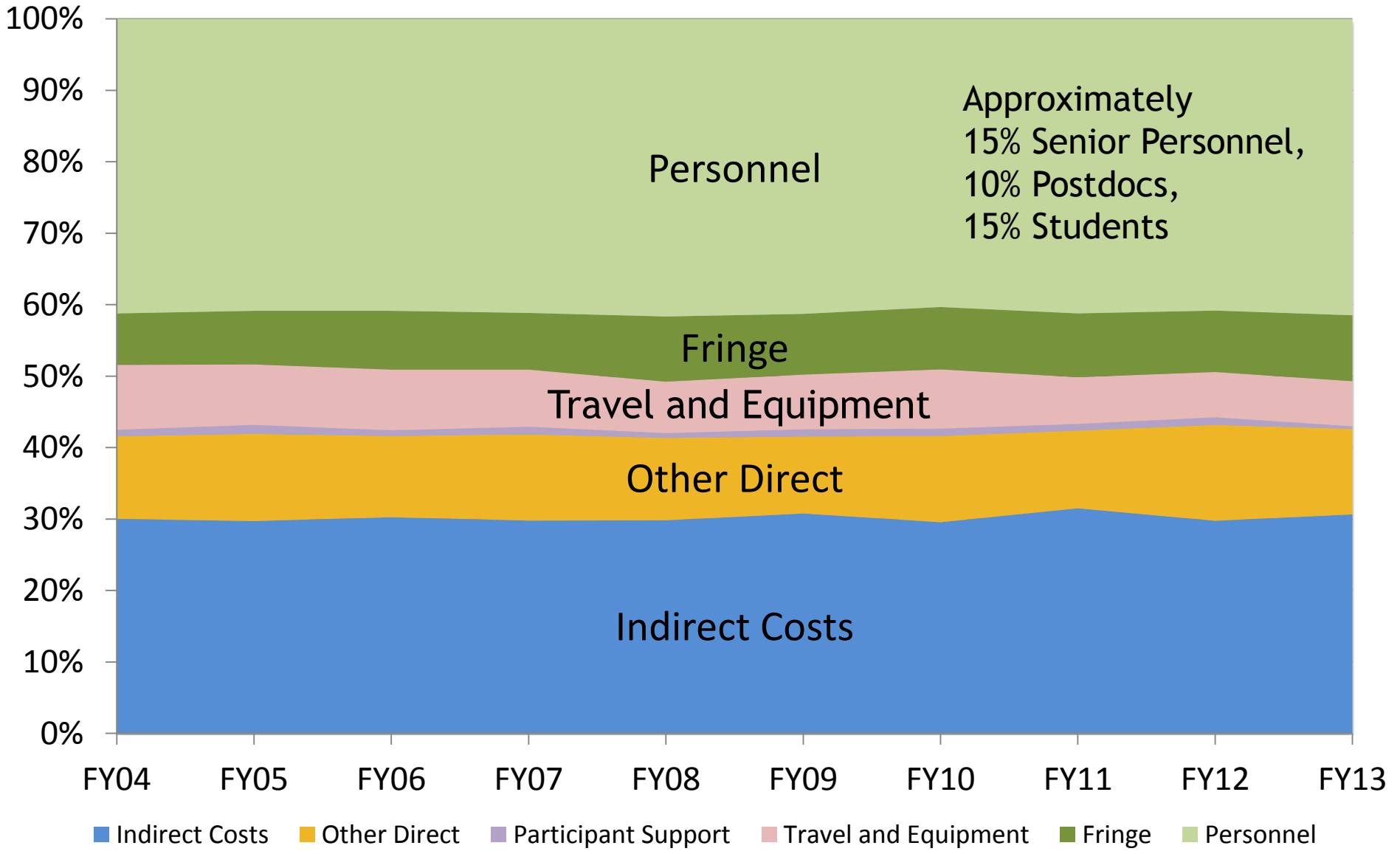
- AST issued Dear Colleague Letter NSF 14-022 on December 20, 2013
  - Lays out future steps for all telescopes that were either recommended for divestment in the near term or for future consideration
  - NSF will begin environmental review of alternatives for a number of telescopes, while consideration of some others awaits specific external milestones
  - Expect outcome and preferred alternatives in FY 2015
- Congress continues to express interest in implementation

Astronomy and Astrophysics Research Grants (AAG)

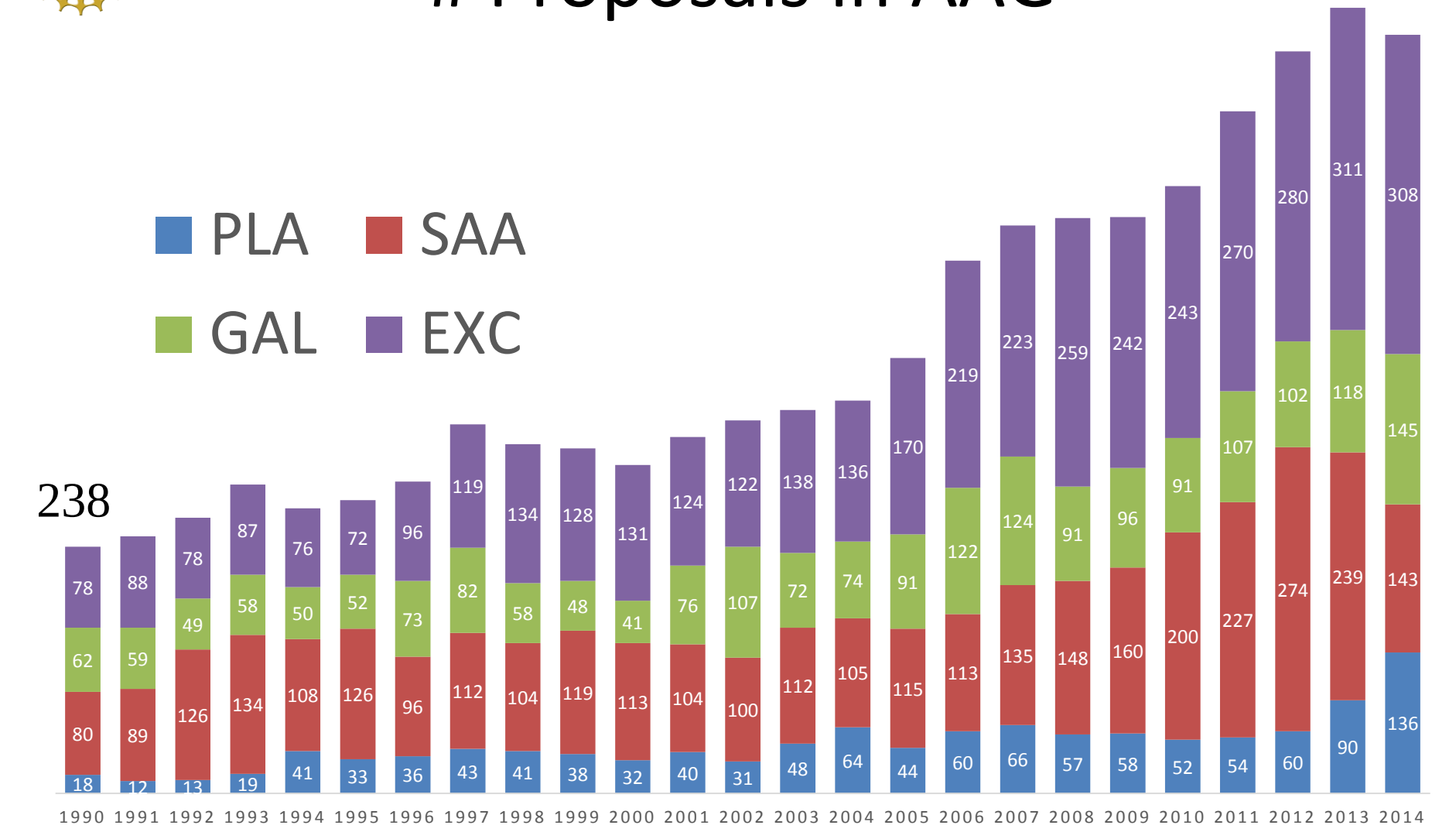
Grants Program Statistics

- 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

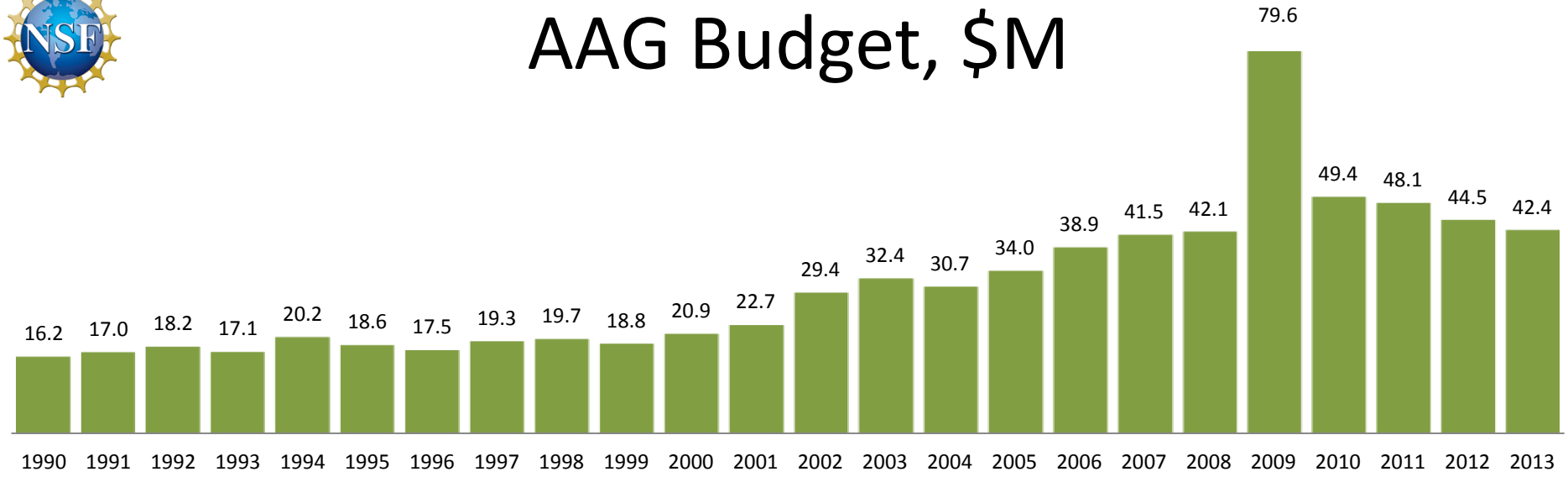
AAG Global Budget Breakdown



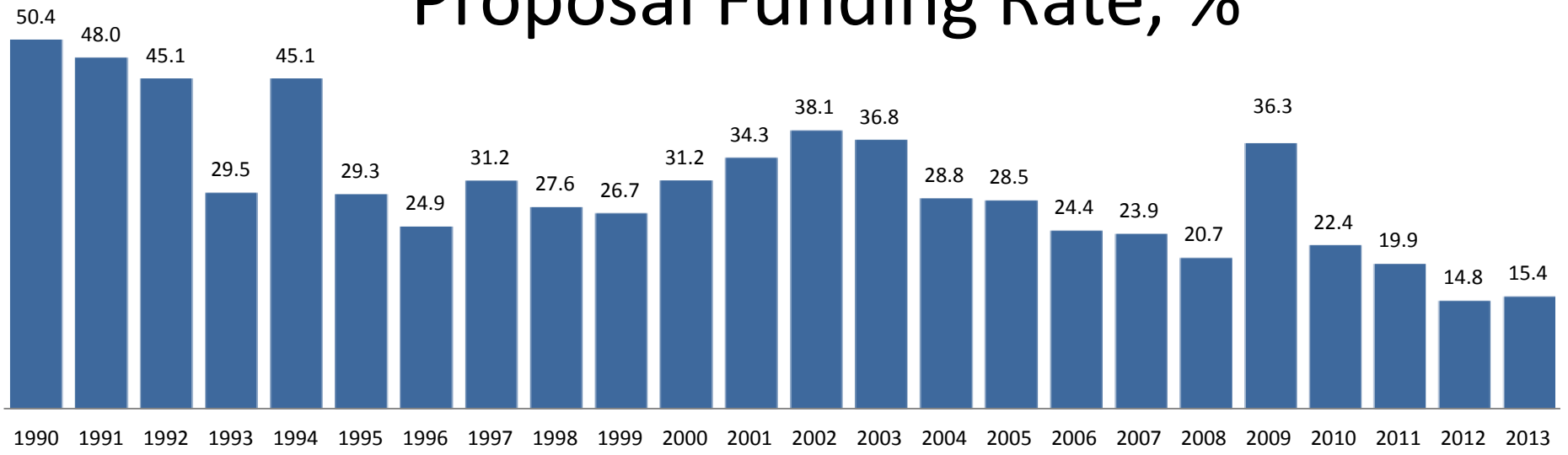
Proposals in AAG



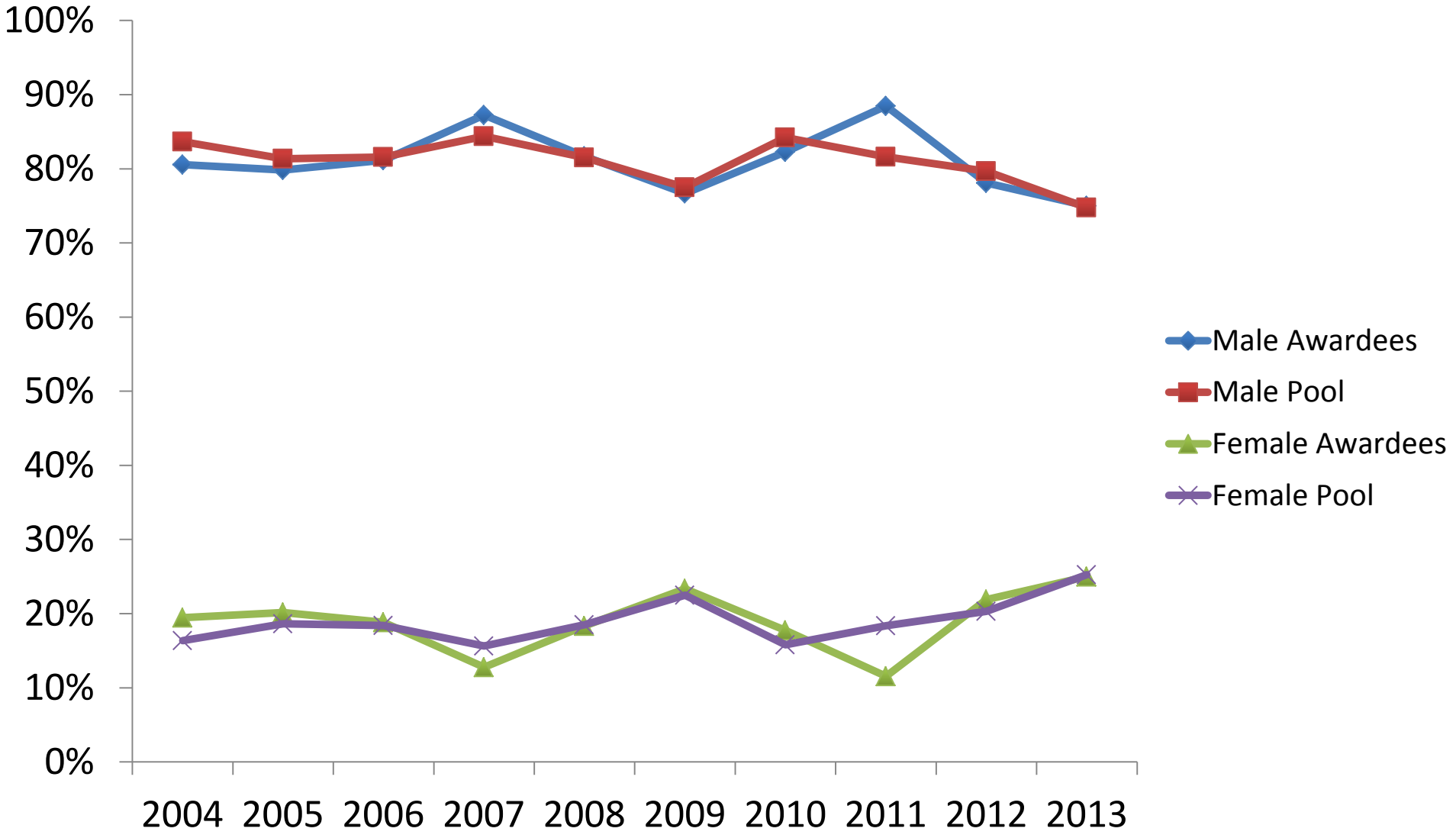
AAG Budget, $M



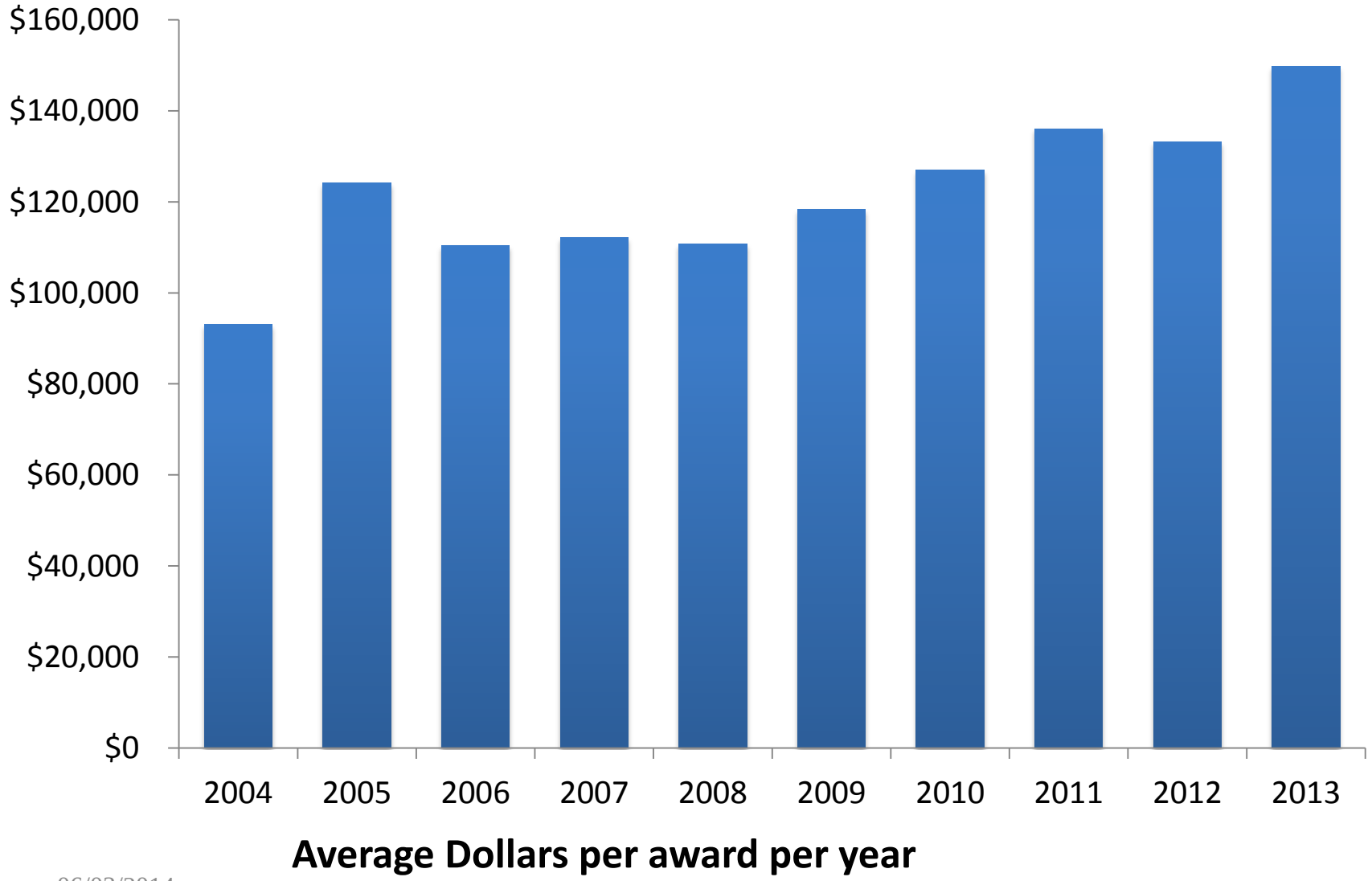
Proposal Funding Rate, %



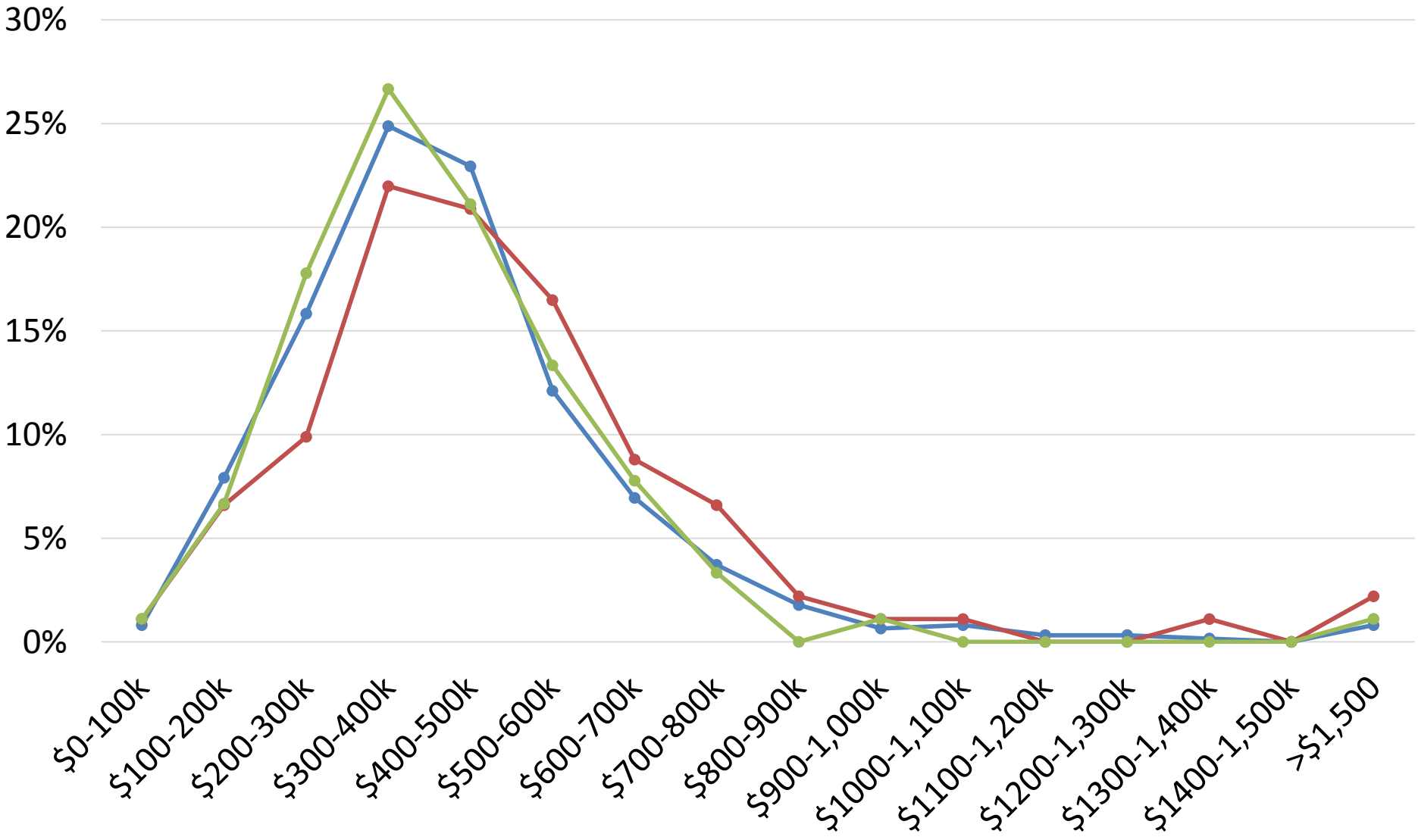
Submissions and Awards by Gender



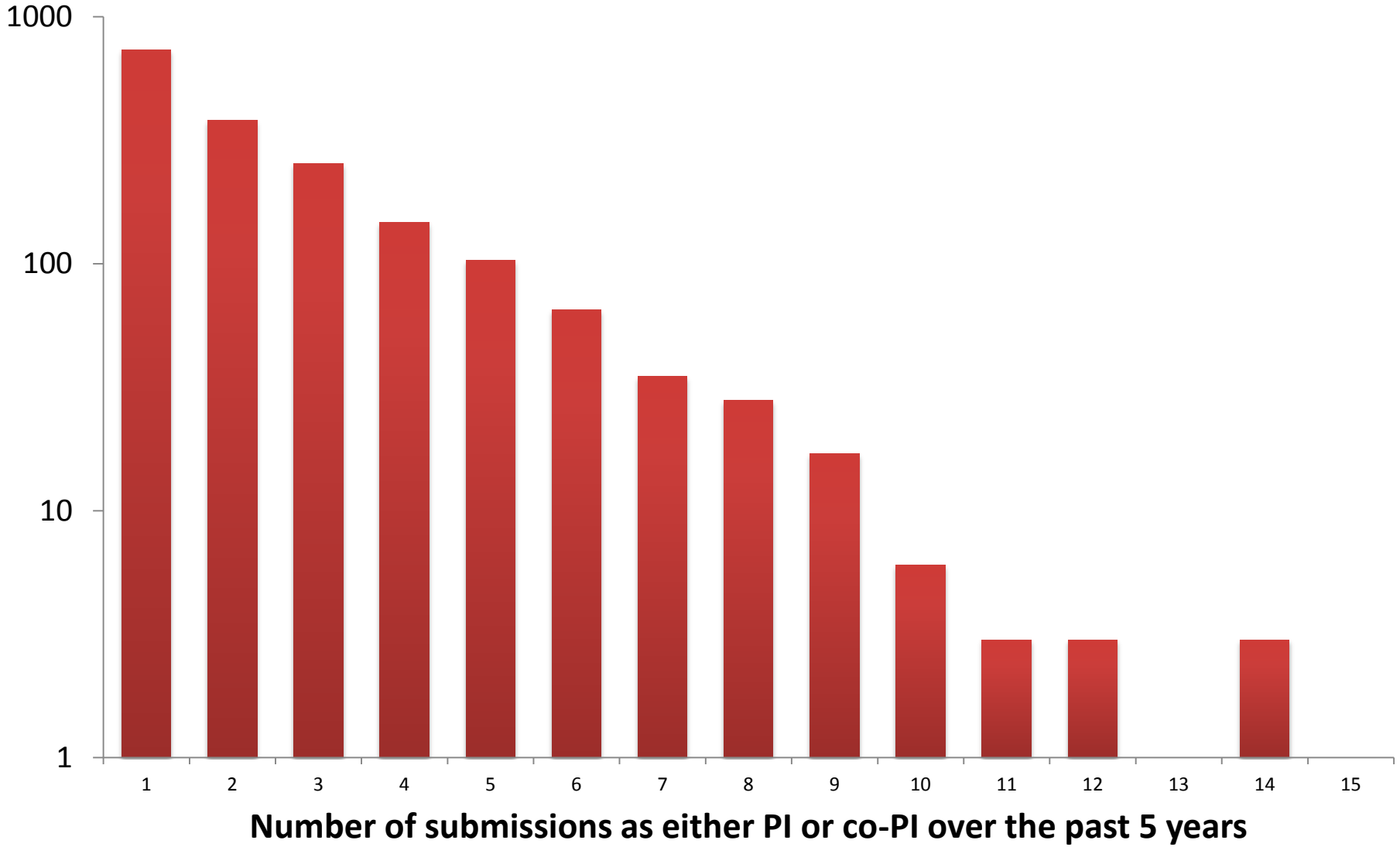
Increasing Proposal Cost



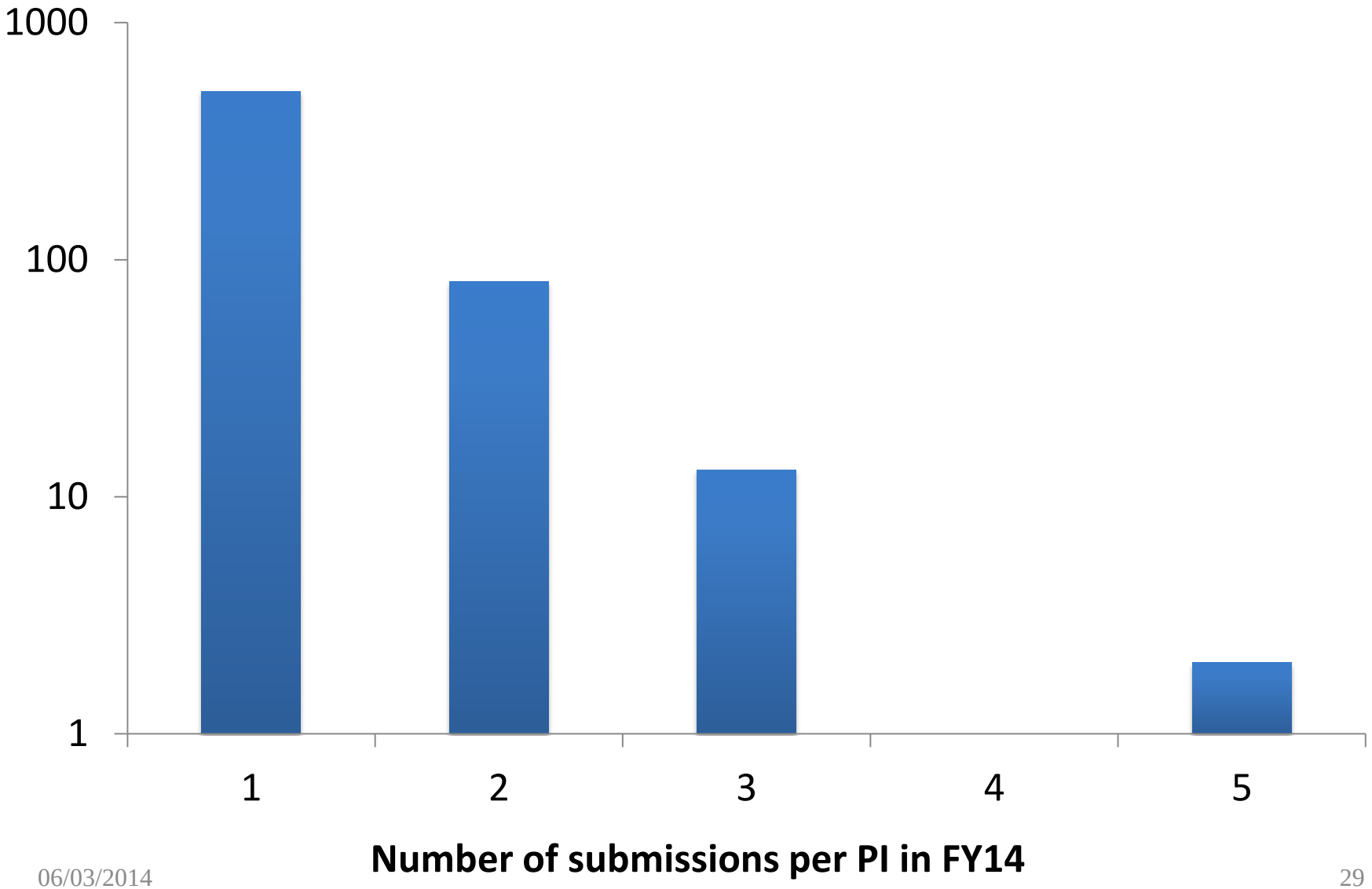
FY13 Project Cost



Multiple Submissions in 5 Yr



Multiple Submissions in FY14



AAG Now and Future

- FY13: 112/758 proposals = 15% funding rate
  - Desire >20% funding rate for best merit review
  - Reviewer load is quite high

- Number of FY14 proposals decreased ~3.5%, and AAG budget will likely decrease by similar amount

- 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

Job Opportunities at the National Science Foundation

Types of Positions

- Program Officer/Director
  - Permanent Federal Employee
    - Must be a U.S. citizen or able to demonstrate seeking citizenship
  - Rotators
    - Intergovernmental Personnel Act (IPA)- remain an employee of home institution
      - 1 – 3 years (in rare cases, 4 years)
      - Must have a job to go back to!
    - 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)

Types of Positions

- Expert – usually short term, a few months – 1 year
- AAAS Fellows
  - Can target specific area, such as public policy
  - Can be more general

- Current AST opportunity – Program Officer/Director(s)
  - All areas of astronomical expertise considered; background in the oversight, management, and operation of large scientific facilities are especially encouraged.
  - Also 1-2 rotator positions becoming available in next year

Backups

Normalized AAG Fiscal Year Budget Breakdown