NSF AST Programs and Budget Update

AAAC Meeting

February 3, 2014

Jim Ulvestad, NSF MPS/AST
AST Strategy to 2020 and Beyond

Major Facilities

Mid-Scale Innovations

Divestment/Partnership

Individual Investigators

02/03/2014
Key AST Events Since Nov. 2013

- November: ALMA Cycle 2, ~1400 proposals received
- November: GPI first light on sky
- December 2-6: LSST Final Design Review held
- December 15: ATST renamed to Daniel K. Inouye Solar Telescope
- December 20: Released Portfolio Review Dear Colleague Letter, NSF 14-022
- January 6: Discussion of “Access Principles” at CAA Town Hall at AAS Meeting
- January 13: Earthquake off Puerto Rico, cable damage at Arecibo
- January 14: Invited 12 groups to submit full proposals to Mid-Scale Innovations Program
- January 18: Congress passed FY 2014 NSF appropriation
ALMA High-Impact Science Results

Dust formation in supernova 1987A
Indebetouw et al. 2014

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

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

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

02/03/2014
GPI First Light

- 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.

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)
The Telescope Formerly Known as ATST

- Telescope renamed the Daniel K. Inouye Solar Telescope (DKIST)
- Operational status scheduled for mid-2019

DKIST renaming ceremony, Dec. 15, 2013

DKIST Coude pier, Haleakala

Concrete formwork and rebar installation for the telescope pier walls, 03-Dec-2013.

Coude rotator construction in Rockport, IL
Portfolio Review NSF 14-022

- This DCL outlines the next step for every telescope that was subject of a divestment-related recommendation in PR report
- Primary focus is on moving toward a formal consideration of alternatives for each telescope
  - For some telescopes, consideration of alternatives is deferred until some triggering event occurs
  - For other telescopes, consideration of alternatives is beginning in 2014
- Consideration of alternatives is a formal process that must comply with National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), and Endangered Species Act (ESA)
  - Will include opportunities for public comment
Portfolio Review Budget Scenarios

- FY14 Req.
- FY13 – 5%
- Status Quo Facilities + URO:
  - No LSST or other new initiatives or upgrades
  - Includes ALMA and ATST operations ramps
Puerto Rico Earthquake, Jan. 13

- Magnitude 6.4, approximately 100 km from Arecibo (offshore)
- Damage to one of six cables (from one of three towers) supporting the Gregorian platform
- Arecibo telescope likely to be down until March
Decadal Survey (NWNH) Status

- LSST is in FY 2014 President’s request, Final Design Review held in December.
- MSIP is in FY 2014 President’s request, solicitation was released, pre-proposals evaluated, proposal invitations issued.
- 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.
LSST Recent Progress

• Primary-Tertiary Mirror on track to complete final polishing, summer 2014
• Secondary mirror contract in place: ITT/Exelis (design, option to build)
• Telescope Mount Assembly bids reviewed; vendor recommended; negotiation starting
• Summit Facility Construction bids due in early March
# LSST Review Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>August 2010</td>
<td>#1 large, ground-based project in NAS decadal survey</td>
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<tr>
<td>Aug/Sept 2011</td>
<td>NSF Preliminary Design Review</td>
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<tr>
<td>Nov 2011</td>
<td>DOE CD-1 camera review</td>
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<tr>
<td>Jan-March 2012</td>
<td>NSF MREFC Panel</td>
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<tr>
<td>May/June 2012</td>
<td>Cost Update and Joint Interface Reviews</td>
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<tr>
<td>July 2012</td>
<td>NSB advances LSST to Final Readiness stage</td>
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<tr>
<td>April 2013</td>
<td>MREFC start requested in President’s FY 2014 Budget</td>
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<tr>
<td>December 2013</td>
<td>NSF Final Design Review</td>
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<tr>
<td>March 2014</td>
<td>NSF MREFC Panel</td>
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<tr>
<td>May 2014</td>
<td>NSB hears action item for award approval</td>
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<tr>
<td>May 2014</td>
<td>DOE CD-3a review (long-lead procurements for camera)</td>
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<tr>
<td>July 2014</td>
<td>Potential MREFC award begins</td>
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<tr>
<td>2015</td>
<td>DOE CD-2 review (baseline cost for camera project)</td>
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*We are here*
Mid-Scale Innovations Program (MSIP)

- MSIP was #2 priority large program recommended by New Worlds, New Horizons decadal survey

- Solicitation NSF 13-567 allowed range of $4M to $40M
  - Estimated Number of Awards: 2 to 4

- 38 pre-proposals (8-page project description) received at deadline of September 16, 2013, in four categories
  - Mid-Scale Science Projects
  - Mid-Scale Facilities
  - Development Investments
  - Open Access Capabilities ($4 million minimum waived)

- 12 groups invited to submit full proposals
  - Full-proposal due date is March 12, 2014
# NSF Appropriation, FY 2014

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<td>NSF</td>
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<td>7373</td>
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<td>7626</td>
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<td>R&amp;RA</td>
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<td>5983</td>
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<td>6212</td>
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<td>1345</td>
<td>1249</td>
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<td>AST</td>
<td>235</td>
<td>245</td>
<td>233</td>
<td>244</td>
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FY 2014 AST Plan

- No AST budget available until FY 2014 Plan is submitted to Congress and approved, c. end of March

- MREFC
  - Requested $42.0 million for DKIST and $27.50 million for LSST
  - Congress cut MREFC line by $10.12 million, funding ongoing projects at request level, remainder for LSST
    - Permission given to request fund transfers
  - Senate report language incorporated by reference
    - Fund domestic NRAO at FY 2012 level
    - Require 60-day notice, including cost, to divest any operating facilities
FY14 Individual Investigator Programs

- AAG (general research grants)
  - Number of proposals approximately equal to FY 2013
  - Expect earlier award decisions than last year because of earlier appropriation
  - No current plan to change due dates or mechanisms
- CAREER: six awards in process
- AAPF: Made 10 initial offers
- REU sites: Six new awards completed
- ATI: Proposals in hand, under evaluation
## FY 2013 AST Budget: $232.52 M

<table>
<thead>
<tr>
<th>Program</th>
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<tr>
<td>NRAO</td>
<td>41.00</td>
<td>AAG</td>
<td>42.44</td>
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<tr>
<td>ALMA Ops</td>
<td>32.92</td>
<td>URO*</td>
<td>10.76</td>
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<td>NOAO</td>
<td>25.50</td>
<td>ATI</td>
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<tr>
<td>Gemini</td>
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<td>Mid-Scale</td>
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<tr>
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<td>EARS</td>
<td>6.00</td>
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<td>Arecibo</td>
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<td>CAREER</td>
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<td>DKIST mitigation</td>
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<td>AAPF</td>
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<td>LSST D&amp;D</td>
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<td>REU</td>
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<td>GSMT/TMT</td>
<td>0.25</td>
<td>Misc, expenses</td>
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*URO includes $4.46M of FY14 forward funding*
Proposals Reviewed in AAG

- PLA
- SAA
- GAL
- EXC

Years: 1990 to 2013

Number of Proposals: 758

2013: 90
2010: 58
2009: 54
2007: 57
2006: 66
2005: 60
2004: 44
2003: 64
2002: 100
2001: 107
2000: 113
1999: 115
1998: 112
1997: 104
1996: 119
1995: 112
1994: 104
1993: 108
1992: 134
1991: 126
1990: 18
## AAG Proposal Requests—FY12

<table>
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<tr>
<th>Item</th>
<th>Budget Percentage</th>
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<tr>
<td>Senior Personnel</td>
<td>17%</td>
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<tr>
<td>Grad Students</td>
<td>13%</td>
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<tr>
<td>Postdocs</td>
<td>8%</td>
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<tr>
<td>Undergrads</td>
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<tr>
<td>Fringe Benefits</td>
<td>9%</td>
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<tr>
<td>Travel</td>
<td>6%</td>
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<tr>
<td>Other Direct Costs (incl. tuition)</td>
<td>6%</td>
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<tr>
<td>Indirect Costs</td>
<td>31%</td>
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<tr>
<td>Misc (professionals, publications, equipment, etc.)</td>
<td>8%</td>
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Other Interagency Issues

- Dark Energy Survey in progress
- Dark Energy Spectroscopic Instrument (DESI)
  - Possible future path for Mayall Telescope on Kitt Peak
  - Depends on P5 report and DOE HEP funding outlook
- Virtual Astronomical Observatory
  - NASA will fund continuing infrastructure, NSF will fund new applications through its grants program
- Exoplanets/TESS
  - Preliminary discussions with NASA regarding ground telescope availability for radial velocity measurements
- Principles for Access to Projects, Data, and Facilities
  - Discussed by CAA at their AAS Town Hall meeting
  - NSF awaits some recommendation from AAAC
Backups Follow