Division of Astronomical Sciences (AST)

Mission

The mission of the Division of Astronomical Sciences is to support forefront research in ground-based astronomy; to help ensure the scientific excellence of the U.S. astronomical community; to provide access to world-class research facilities through merit review; to support the development of new instrumentation and next-generation facilities; and to encourage broad understanding of and diverse participation in the astronomical sciences.

The Division supports research in all areas of astronomy and astrophysics and related multidisciplinary studies. Modes of support include single-investigator and collaborative awards, as well as funding for acquisition and development of astronomical instrumentation, technology development for future ground-based facilities, and educational projects that leverage the Division's research investments to build research and workforce capacity and to increase scientific literacy.

Astronomical Facilities

The Division invested 53% of its FY 2008 appropriation in the management and operation of ground-based astronomical facilities. Through the national observatories and international partnerships, the Division provides support for a system of multi-aperture, research-class telescopes as well as frontier facilities that enable transformational capabilities in both radio and optical/infrared astronomy. Technological advances in a number of key areas of telescope construction and design—including sophisticated adaptive optics technology to compensate for the blurring effects of the Earth's atmosphere at optical/infrared wavelengths and high-resolution aperture synthesis techniques of radio astronomy—allow these instruments to operate at the forefront of ground-based capabilities.

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A high-resolution image taken with the Gemini Observatory shows Jupiter's two giant red spots brushing past one another in the planet's southern hemisphere. The image was obtained in near-infrared light using adaptive optics that corrects, in real-time, for most of the distortions caused by turbulence in Earth's atmosphere. The result is a view from the ground that rivals images from space.

Credit: Gemini Observatory

Programs in Astronomical Sciences

Individual Investigator Programs
Astronomy and Astrophysics Research Grants (AAG)
Faculty Early Career Development Program (CAREER)
NSF Astronomy and Astrophysics Postdoctoral Fellowships (AAPF)
Partnerships in Astronomy and Astrophysics Research and Education (PAARE)
Research Experiences for Undergraduates (REU)
Research at Undergraduate Institutions (RUI)

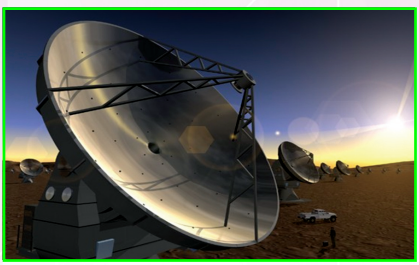
Astronomical Instrumentation Programs
Advanced Technologies and Instrumentation (ATI)
Major Research Instrumentation (MRI)
University Radio Observatories (UROs)

Large Facilities
Atacama Large Millimeter Array (ALMA)
Gemini Observatory
National Astronomy and Ionosphere Center (NAIC)
National Optical Astronomy Observatory (NOAO)
National Radio Astronomy Observatory (NRAO)
National Solar Observatory (NSO)

A Guide to Programs / Browse Funding Opportunities is available at http://www.nsf.gov/funding/browse_all_funding.jsp.

Electromagnetic Spectrum Management (ESM)

AST represents the interests of NSF and the scientific community in protecting access to portions of the electromagnetic spectrum that are needed for research purposes. The sensitivity of radio and optical telescopes can be compromised by electromagnetic interference from sources such as airborne and satellite radio transmissions and light pollution. ESM personnel protect these and other scientific resources by participating in the establishment of regulations, operating procedures and technical standards related to government, private sector and international uses of the spectrum.



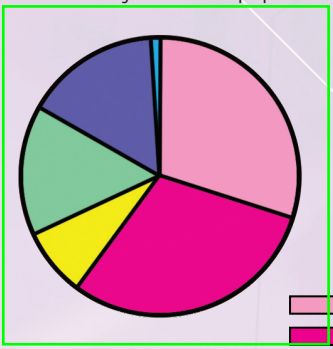
The Atacama Large Millimeter Array (ALMA) is an international collaboration to develop a world-class radio telescope composed of 66 antennas that will work together to study the universe from a high and dry site in the Chilean Andes. Once construction is completed, ALMA will function as the most capable imaging radio telescope ever built.

Credit: NRAO/AUI and ESO.

Division of Astronomical Sciences (AST)

Human Resources FY 2008

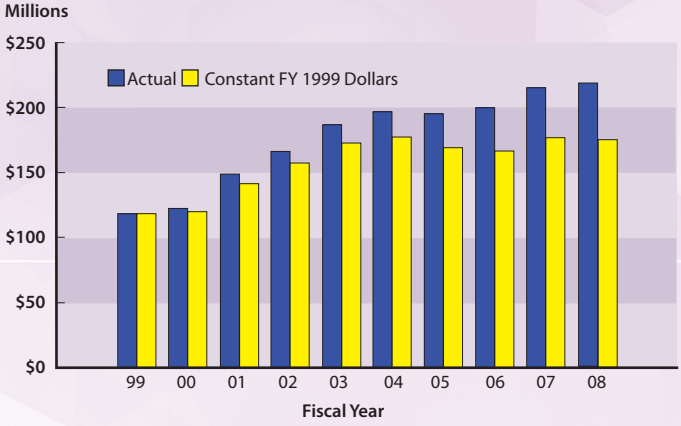
Pie chart showing total number of people involved in AST.



- Senior Researchers - 30%
- Other Professionals - 30%
- Post Doctorials - 8%
- Graduate Students - 15%
- Undergraduate Students - 16%
- K-12 Teachers - 1%

Totals may not add due to rounding.

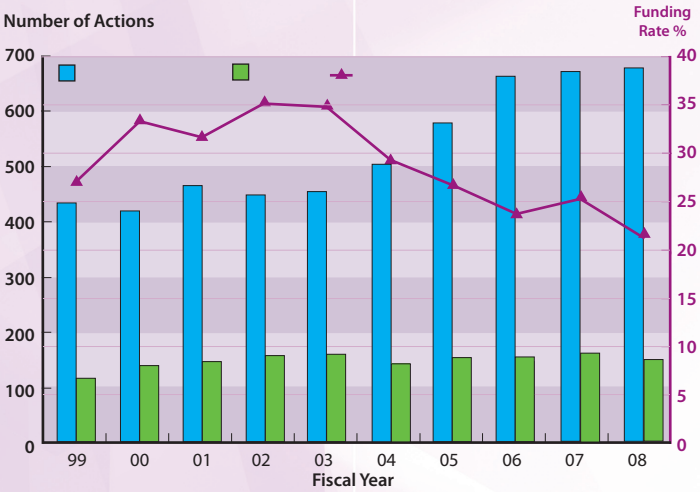
Budget in Actual and Constant FY 1999 Dollars



AST annual budgets in actual and constant FY 1999 dollars. Constant dollars show the purchasing power of the AST budget. Over this 10-year period, the constant dollar budget for AST has increased 48%.

Data provided from FY 1999 to 2009 NSF Budget Requests to Congress, http://www.nsf.gov/about/budget/.

Success Rates and Number of Actions



Graph shows number of proposals submitted versus awarded for Research Grants as defined by NSF and resultant success rates. Success rate is defined as the number of new or renewal proposals awarded funding divided by the total number of proposals received.

Note: the distribution of success rates reflects the average for the Astronomical Sciences Division and may not represent success rates in individual programs.

Modes of Support FY 2008