

**ASTRONOMICAL SCIENCES**

**\$250,010,000**

The FY 2009 Request for the Astronomical Sciences Division (AST) is \$250.01 million, an increase of \$32.15 million, or 14.8 percent, over the FY 2008 Estimate of \$217.86 million.

**Astronomical Sciences Funding**

(Dollars in Millions)

	FY 2007 Actual	FY 2008 Estimate	FY 2009 Request	Change over	
				FY 2008 Estimate Amount	Percent
<b>Astronomical Sciences</b>	<b>\$215.39</b>	<b>\$217.86</b>	<b>\$250.01</b>	<b>\$32.15</b>	<b>14.8%</b>
Major Components:					
Research and Education Grants	90.91	92.80	112.36	19.56	21.1%
Centers Programs	4.00	3.32	2.66	-0.66	-19.9%
Facilities	120.48	121.74	134.99	13.25	10.9%
Gemini Observatory	20.00	20.00	22.00	2.00	10.0%
National Astronomy and Ionosphere Center (NAIC)	10.46	10.45	9.60	-0.85	-8.1%
National Optical Astronomy Observatory (NOAO) <sup>1</sup>	39.28	38.55	41.83	3.28	8.5%
National Radio Astronomy Observatory (NRAO)	47.04	44.52	49.79	5.27	11.8%
Atacama large Milimeter Array (ALMA)	3.70	8.22	11.77	3.55	43.2%

Totals may not add due to rounding.

<sup>1</sup> Includes the National Solar Observatory and the Telescope System Instrumentation Program.

**About AST:**

AST is the federal steward for ground-based astronomy in the U.S. Research support covers a broad array of observational, theoretical, and laboratory research aimed at understanding the origins and characteristics of planets, the Sun, other stars, our galaxy, extragalactic objects, and the structure and origin of the Universe. Individual investigator awards and fellowship programs for young faculty, postdoctoral researchers, graduate students, and undergraduate students encourage researchers engaged in education and outreach and increase the participation of underrepresented minorities in science. AST provides the U.S. share of funding for the operation of the international Gemini Observatory and supports the operation of the National Astronomy facilities: NAIC; NOAO including the National Solar Observatory (NSO); and NRAO, including the U.S. share of the ALMA project. AST supports the development of advanced technologies and instrumentation and management of the electromagnetic spectrum for scientific use. In its quest to bring more powerful technology and a well-trained workforce to bear on the exploration of the universe, AST makes significant contributions to ACI.

The AST portfolio has two major modes of support: research and education grants and facilities.

- AST research and education grants range from awards to individual investigators to large collaborations carrying out extensive surveys or developing instrumentation.
- AST also supports major world-class facilities that provide access to a wide range of observational resources on a competitive basis.

Approximately 20 percent of the AST portfolio will be available for new research grants in FY 2009. The remainder of the funds will support continuing commitments on research grants from prior years, facilities (54 percent of the total), instrumentation, education and outreach, and centers. In FY 2007, AST received 670 research proposals and made 172 competitive awards for a success rate of 26 percent.

**AST Priorities for FY 2009:**

**Research Grants** are AST's highest priority in managing its portfolio. Emphasis will be on addressing scientific priorities articulated in the National Research Council's report "Astronomy and Astrophysics for the New Millennium" and the National Science and Technology Council report for the interagency "Physics of the Universe" activity, supporting work in cyberinfrastructure/ Cyber-Enabled Discovery and Innovation, including a national virtual observatory in partnership with NASA.

**Activities related to ACI and ACA** focus on using the strong connection to technology and instrumentation in the astronomical sciences to engage students and to promote workforce and career development. FY 2009 will see an increased emphasis in intermediate-scale instrumentation and development of university-based programs in instrumentation for students and faculty in collaboration with industry and national facilities (deferred in FY 2008 for lack of funds).

**Public-Private Partnerships** are a keystone of the division's strategy. In FY 2009, there will be continued investments in the **Telescope System Instrumentation Program (TSIP)** and **Giant Segmented Mirror Telescope (GSMT)** technology development, examples of such partnerships.

**Gemini Observatory and ALMA operations and instrumentation** are AST's highest priority in new research infrastructure. Ensuring optimum performance and future instrumentation of our premier and newest facilities enables forefront research by the community and their students in these international partnerships. Reallocation of funds within the facilities portfolio follows recommendations of the AST Senior Review, and optimizes the investment of scarce resources in highest priority capabilities.

**Changes from FY 2008:**

**Research and education grants** increase by \$19.56 million to \$112.36 million total. AST will continue to support a wide range of astrophysical investigations from the search for extra-solar planets to the origin of the universe. Development of tools for handling large data sets and implementation of the Virtual Astronomical Observatory in partnership with NASA are emphases in AST's approach to cyberinfrastructure/cyberscience. Education and outreach activities will receive continued emphasis. AST will continue support for technology development for the **Large-Aperture Synoptic Survey Telescope (LSST)**.

Support for the **Science and Technology Center for Adaptive Optics** totals \$2.66 million, a decrease of \$660,000 over the FY 2008 Estimate. This lower funding level is planned as the STC sunsets.

**Facilities** increase by \$13.25 million to \$134.99 million total. Base operations funding for all facilities continue implementation of the recommendations of the AST Senior Review. See the Facilities chapter for details. Changes include:

- An increase of \$2.0 million for **Gemini Observatory** will enable enhanced operational and visitor support and the funding of a new generation of advanced instrumentation.
- A decrease of \$850,000 for **NAIC** reflects the recommendation of the Senior Review.
- An increase of \$2.28 million for **NOAO/NSO** will enable infrastructure improvements, deferred in FY 2008, while design funding for the **Advanced Technology Solar Telescope** moves to the MREFC account. TSIP, administered through NOAO, increases by \$1.0 million to \$5.0 million, an increase originally planned for FY 2008. NRAO/ALMA funding totals \$61.56 million, an increase of \$8.82 million over FY 2008 Estimate, continuing the ramp up of ALMA operations.