

DIVISION OF ASTRONOMICAL SCIENCES (AST)

\$244,550,000
+\$10,000,000 / 4.3%

AST Funding
(Dollars in Millions)

	FY 2011 Actual	FY 2012 Estimate	FY 2013 Request	Change Over FY 2012 Estimate	
				Amount	Percent
Total, AST	\$236.78	\$234.55	\$244.55	\$10.00	4.3%
Research	65.52	73.23	83.86	10.63	14.5%
<i>CAREER</i>	4.28	4.30	4.60	0.30	7.0%
Education	6.14	6.65	5.80	-0.85	-12.8%
Infrastructure	165.12	154.67	154.89	0.22	0.1%
<i>Adv. Technology Solar Tel. (ATST)</i>	2.00	2.00	2.00	-	-
<i>Arecibo Observatory</i>	6.19	5.50	5.00	-0.50	-9.1%
<i>Atacama Large Mm Array (ALMA)</i>	23.38	28.61	32.92	4.31	15.1%
<i>Gemini Observatory</i>	19.50	22.07	18.15	-3.92	-17.8%
<i>Nat'l Optical Astron. Obs. (NOAO)</i>	29.50	25.50	25.50	-	-
<i>Nat'l Radio Astron. Obs. (NRAO)</i>	44.27	43.14	41.00	-2.14	-5.0%
<i>Nat'l Solar Observatory (NSO)</i>	9.10	9.10	8.00	-1.10	-12.1%
<i>Pre-Construction Planning (Total)</i>	5.31	4.75	7.75	3.00	63.2%
<i>Giant Segmented Mirror Telescope (GSMT)</i>	-	0.25	0.25	-	-
<i>Large Synoptic Survey Telescope (LSST)</i>	5.31	4.50	7.50	3.00	66.7%
<i>Research Resources</i>	25.87	14.00	14.57	0.57	4.1%

Totals may not add due to rounding.

AST is the federal steward for ground-based astronomy in the U.S., working in partnership with private institutions to enhance overall observing capacity and capability. Funding covers research to understand the origins and characteristics of planets, stars, and galaxies, as well as the structure and origin of the Universe through awards to individual investigators, small groups, and national facilities. AST supports the development of advanced technologies and instrumentation, the planning and design of future facilities, and management of the electromagnetic spectrum for scientific use. AST funds operations and maintenance for several world-class national and international facilities, which provide access to a wide range of observational resources on a competitive basis and serve thousands of users each year. In 2010, the National Academy of Sciences released a decadal survey report recommending a comprehensive ground-based astronomy program for the coming decade. In anticipation of funding that is more constrained than assumed in that report, AST is carrying out a community-based review of its entire portfolio in order to maximize the delivery of the recommended science. It is expected that this review will be completed during FY 2012, and its output will be used to inform FY 2013 budget execution and future budget requests.

Approximately 57 percent of AST's budget is used to support current operations and future development of large multi-user astronomy facilities, while 33 percent supports individual investigator grants and 6 percent supports the development and operation of advanced instrumentation and experiments based on such instrumentation. In general, about 19 percent of the AST budget is available for new research grants, while the remainder funds long-term facilities and continuing awards for grants made in previous years.

FY 2013 Summary

All funding decreases/increases represent change over the FY 2012 Estimate.

Research

- Enhancing Access to the Radio Spectrum (EARS) increases +\$9.0 million, to a total of \$12.0 million. AST is the home of radio spectrum management for the entire NSF, and is where the EARS program was founded. The AST EARS investment will concentrate on the radio-frequency-interference mitigation, advanced receiver design, propagation studies, and other radio-astronomy-related foundations of radio spectrum access and hardware design, as well as key national and international regulatory and public policy foundations for radio spectrum management.
- Cyberinfrastructure Framework for the 21st Century (CIF21) increases by +\$1.48 million to \$3.18 million; this includes \$1.50 million to initiate the Theory and Computation Networks recommendation of the decadal survey, in collaboration with NASA.
- Other grants programs, including the Astronomy and Astrophysics Research Grants, remain approximately constant in the FY 2013 request. This stability is enabled by spending reductions in the AST facility infrastructure (see below), which have been made to support the AST commitment to maintaining the individual research that is critical to advancement in the field.

Education

- The reduction (-\$850,000 to \$5.80 million) reflects a cessation in contributions to funding of the ADVANCE program, in order to maintain the Research Experiences for Undergraduates (REU) and Astronomy and Astrophysics Postdoctoral Fellowship programs funded by AST.
- AST maintains its commitment to diversity through its Partnerships in Astronomy and Astrophysics Research and Education program, advancing the opportunities through institutions that historically serve under-represented minorities.

Infrastructure

AST oversees an array of infrastructure projects and programs. Reductions in facility funding reflect the maintenance of funding balance between facilities and individual research. Future trends for these facilities will depend critically on the results of the ongoing AST portfolio review, described above. For detailed information on individual AST facilities, please see the Facilities chapter.

- Gemini: FY 2013 support (-\$3.92 million to \$18.15 million) is primarily for observatory operations and maintenance, reflecting the international partner agreement, with a decreased contribution to the long-term instrumentation fund.
- ALMA: FY 2013 support (+\$4.31 million to a total of \$32.92 million) is consistent with a planned ramp-up of operations as this observatory comes on line and continues early science activities.
- Arecibo: Funding for the Arecibo radio telescope decreases (-\$500,000 to a total of \$5.0 million), with additional funding supplied from GEO/AGS and NASA. A collaboration led by SRI International took over Arecibo management in FY 2012 as the result of a management recompetition.
- NOAO: Funding in FY 2013 is the same as in FY 2012, pending the results of the ongoing AST portfolio review.
- NRAO: Funding in FY 2013 is reduced (-\$2.14 million to \$41.0 million) as part of the budget realignment plan to support ALMA operations.
- NSO: Funding (-\$1.10 million to \$8.0 million) assumes that closure of one or more current facilities begins in FY 2012 and is concluded in FY 2013, as planned for a long-term transition to the Advanced Technology Solar Telescope (ATST).
- ATST Operations: Funding is constant at \$2.0 million, to mitigate effects of construction in Hawaii.
- LSST: Design and development (D&D) funding increases (+\$3.0 million to \$7.50 million) in the

wake of the successful NSF Preliminary Design Review and coordinated DOE camera review, for this top-ranked ground-based project in the decadal survey. This support covers enhanced systems management, continued work on critical data management issues, and improved project management and quality assurance, which were recommended by the reviews, and other D&D that will reduce the risk before a potential construction start. NSF expects DOE to request continued D&D and preliminary camera fabrication and integration support.

- GSMT: Funding initiated (\$250,000) for a new solicitation for planning for a potential partnership solicitation.
- Research Resources: Funding growth (+\$570,000 to a total of \$14.57 million) reflects planned commitments to existing mid-scale experiment and instrumentation projects, together with a decrease (-\$500,000 to \$8.50 million) for the Advanced Technology and Instrumentation program.