

US Naval Observatory, Astronomical Applications Department

This report covers activity in the Nautical Almanac Office (NAO) and its parent organization, the Astronomical Applications Department.

(a) Publications. Publication of *The Astronomical Almanac* and *The Astronomical Almanac Online*, *The Nautical Almanac*, *The (U.S.) Air Almanac*, and *Astronomical Phenomena* continued as a joint activity between Her Majesty's Nautical Almanac Office of the United Kingdom and the NAO. *The Astronomical Almanac* for 2009, released in January 2008, fully implements the resolutions adopted by the IAU in 2006, both within the tabular data and explanatory text. *The Air Almanac* for 2009, released in June 2008, is now available exclusively as an electronic publication on CD-ROM. U.S. Naval Observatory Circular 179, *The IAU Resolutions on Astronomical Reference Systems, Time Scales, and Earth Rotation Models: Explanation and Implementation*, was published online and in print form in October 2005. Work was underway on a major revision of *The Explanatory Supplement to the Astronomical Almanac*, in collaboration with P.K. Seidelmann (Univ. of Virginia) and numerous contributors.

(b) Software. An update of the *Multiyear Interactive Computer Almanac*, MICA version 2.1, was completed and released in December 2006. The software is available in two editions for computers running Microsoft Windows and Apple Mac OS operating systems. A new version of the Naval Observatory Vector Astrometry Subroutines (NOVAS) that implements relevant IAU resolutions adopted in 1997 through 2006 was essentially completed. The software will be available in both Fortran and C editions. A major redesign of the Astronomical Applications Department Web site (<http://aa.usno.navy.mil/>), which included several new data services, was launched in September 2007. Usage of the Web site varied from about 0.5 to 1.3 million visits per month.

(c) Research. An active research program in positional and dynamical astronomy is underway within the department. Research topics included new methods of celestial navigation, determination of asteroid masses, and the theory of bodily tides.