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Annual Report, 2011
Working Group on Astronomical Software

Robert J. Hanisch, Chair
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With contributions from
Arnold Rots, SAO, Chair of WGAS FITS Committee
William Pence, HEASARC, Chair of IAU FITS Working Group
Alice Allen, Editor, Astrophysics Source Code Library

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The primary role of the AAS Working Group on Astronomical Software is to function as the body that serves the North American community in formulating, reviewing, and endorsing modifications to the FITS data format standard. The WGAS FITS Committee (WFC) serves as one of four regional FITS standards committees, operating under the IAU FITS Working Group. Arnold Rots (SAO/CXC) chairs the WFC.

Starting in the fall of 2011 the WGAS also got involved with the Astrophysics Source Code Library (ASCL) initiative (http://ascl.net). The Astrophysics Source Code Library (ASCL) is a free, on-line reference library for source codes of all sizes that are of interest to astrophysicists.

FITS Activities

There were no changes in membership this year. The committee has 16 voting members.

Two new conventions were submitted to the FITS registry: TPV and ZPX world coordinate systems. TPV extends the standard TAN (tangent plane) projection by adding a general polynomial distortion correction. ZPX extends the standard ZPN (zenithal polynomial) projection similarly. The ZPX convention is being used for wide-field imagers such as the NOAO Mosaic Camera and NEWFIRM.

R. Seaman (NOAO) published a number of the FITS conventions as contributions to arXiv in order to gain broader exposure.

The annual FITS BOF (Birds of a Feather) session was held at ADASS XXI in November 2011, in Paris.

The final paper needed to fully define world coordinate systems, on the representation of time coordinates (A. Rots, principal author), is nearing completion and will be presented to the IAU FITS Working Group at its meeting in August at the IAU General Assembly.

W. Pence (NASA GSFC/HEASRAC) will complete his term as chair of the IAU FITS WG in August. A heartfelt thank-you goes to Bill for his many years of service to the FITS community!
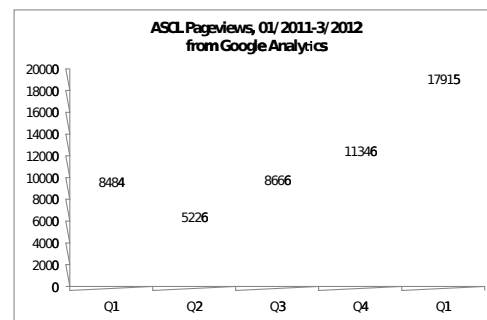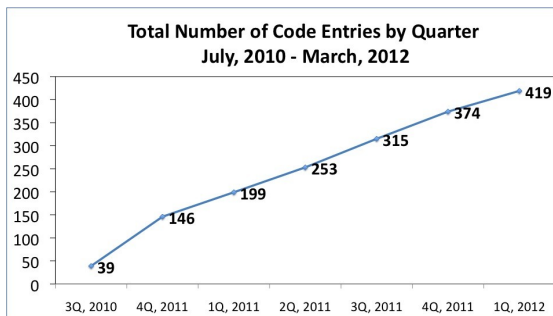
ASCL Activities

Since WGAS involvement in the Astrophysics Source Code Library is new this year, we begin by providing some background information.

The Astrophysics Source Code Library (ASCL) was founded in 1999 by Robert Nemiroff (Michigan Technological University) and John Wallin (Middle Tennessee State University), and is a free on-line registry for source codes of interest to astronomers and astrophysicists. All ASCL source codes have been used to generate results published in or submitted to a refereed journal. The library is housed on the discussion forum for Astronomy Picture of the Day (APOD) and can be accessed at http://ascl.net.

The ASCL has a comprehensive listing that covers a significant number of the astrophysics source codes used in peer-reviewed studies and continues to grow; it currently catalogs more than 430 codes. Its records are citable and are indexed by ADS.

Source codes are increasingly important for the advancement of science in general and astrophysics in particular. Papers are meant to detail the general logic behind new results and ideas but rarely make available the source codes that generated these results. ASCL seeks to fill this gap by making the code behind the interpretation discoverable for inspection and possible re-use.

In the past eighteen months—largely owing to a concerted voluntary effort of the ASCL editor and associate editor—the number of codes indexed in ASCL grew by 15-20 per month. An additional ~200 codes are known to the ASCL curators and are being added to the index as time allows. Use of the site also increased by a factor of more than three from spring of 2011 to spring of 2012.

In 2011 a formal Advisory Committee was established, with the following membership:

       Peter Teuben, University of Maryland, Chair
       Bruce Berriman, Infrared Processing and Analysis Center/Caltech
       Robert Hanisch, Space Telescope Science Institute/Virtual Astronomical

        Observatory
        Jessica Mink, Center for Astrophysics
        Robert Nemiroff, Michigan Technological University
        Lior Shamir, Lawrence Technological University
        John Wallin, Middle Tennessee State University

Alice Allen (Calverton, MD) and Kim DuPrie (Tokyo, Japan) serve as Editor and Associate Editor, respectively.

In January 2012 the WGAS approached Kevin Marvel, AAS Executive Officer, with a request for seed funding to help strengthen the ASCL initiative and improve awareness of ASCL in the astronomical research community. A three-tier development plan was described:

- *Near-term:* Our near-term goal is to provide immediate outreach and publicity to increase the code base and raise awareness with both code developers and users. The ASCL has reached a point in its growth that makes it a useful tool for developers and users, and increasing awareness and maintaining forward progress are essential.

- *Mid-term:* Our mid-term goals are to identify potential sources of funding, including a higher level of support from AAS as well as programs at NSF (AST, CISE, OCI) and NASA, develop proposals to present to these funding organizations, and to establish connections with publishers (ApJ and AJ, in particular) to encourage authors to deposit code associated with journal articles in the ASCL and to assure cross-linking of codes and journal articles.

- *Long-term:* With an annual funding of $40-60K, the ASCL would be a sustainable resource for the astrophysics community; these funds would cover systems administration support, development and documentation of curation procedures, ongoing curation efforts, routine collaboration with journals, and annual conference and advisory board travel to create and maintain contacts with the research community and help assure the growth and completeness of the library.

Kevin approved seed funding of $5,000 to support the near-term goal of increasing awareness and increasing the code base. These funds will be used primarily to provide an ASCL presence at two key events, the November 2012 Astronomical Data Analysis Software and Systems (ADASS) conference in Urbana, IL, and the January 2013 AAS meeting in Long Beach, CA.

Poster production and shipping (2 @ $65)	$130
Brochure printing and shipping (500 @ $0.34)	$170
ADASS registration (individual, demonstration table)	$1200
AAS registration	$450
Air transportation, DC/Urbana	$450
Air transportation, DC/Long Beach	$800

Accommodation and per diem, Urbana	$800
Accommodation and per diem, Long Beach	$1000
	$5000

Travel expenses support the ASCL Editor, Alice Allen, and partially support Advisory Committee Chair Peter Teuben. Other members of the ASCL Advisory Committee will participate in these conferences using alternate sources of funds. In addition, ASCL AC members will promote ASCL at scientific meetings and workshops throughout the year, but at no expense to the AAS. We would like the AAS to consider providing an exhibit space to ASCL, pro bono, so that we can maximize visibility with the community rather than being limited to a standard poster presentation for one day.