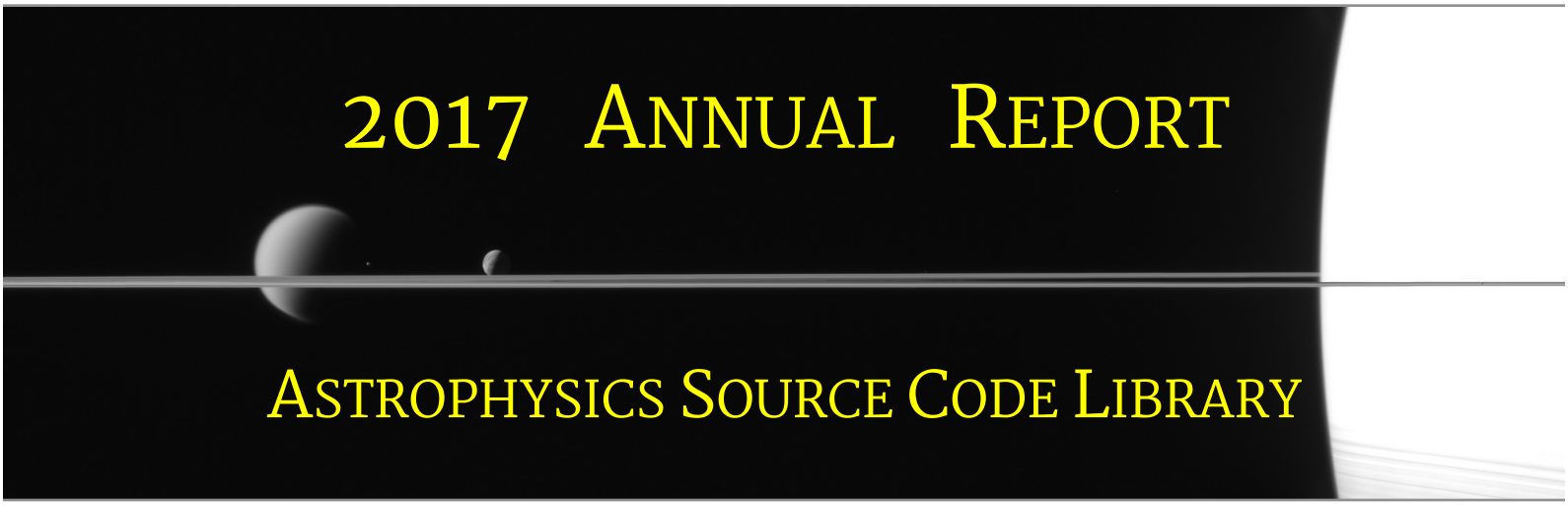
# 2017 Annual Report



## Astrophysics Source Code Library

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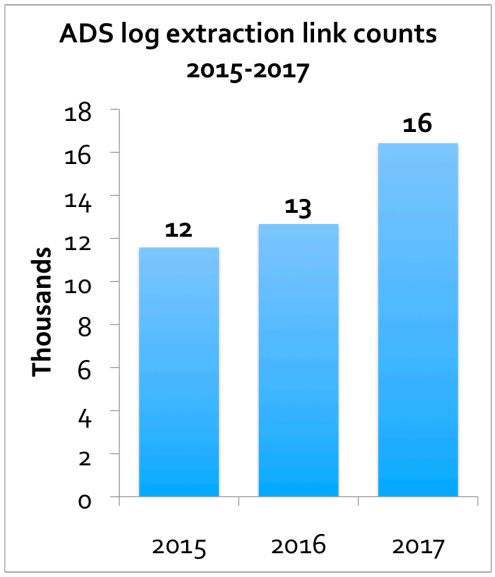
Written by Alice Allen, ASCL Editor; March 2018
The cover image is Moons on a Ring Plane by Judy Schmidt; used with permission.
Titan, Dione, and Epimetheus are easily visible in this 15 panel mosaic, imaged in January 2006. Instrument = ISS
https://www.flickr.com/photos/geckzilla/12847569093/

## Background

The Astrophysics Source Code Library (ASCL), founded in 1999 by Robert Nemiroff (Michigan Technological University) and John Wallin (Middle Tennessee State University), is a free online 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 ASCL website (http://ascl.net) is housed at Michigan Technological University; the site offers entries describing and linking to over 1600 source codes used in astronomy research, information about the resource itself and generally about research software, a news blog, and a discussion forum.

## 2017 Growth

The number of codes indexed in ASCL grew an average of 15.8 entries per month, down from the average growth of 18.4 codes per month over the 2014-2016 timeframe and the 19 codes per month average for 2016. 193 codes were added in 2017. At the end of December, the ASCL had 1600 code entries.




Code submissions have remained healthy; 70 of the 193 codes (36%) assigned IDs in 2017 were submitted, an increase of 23% over last year. Fifteen codes submitted did not meet the criteria for inclusion in the ASCL; it is likely a subset of these will eventually meet our criteria and be assigned ASCL IDs.

In July 2014, ADS started providing statistics for views of ASCL ADS records and clickthroughs from them to ASCL entries. These statistics indicate greater use of ASCL information over time from that resource; in the last half of 2016, ADS overtook APOD as the greatest source of referral traffic. In 2017, the number of views of ASCL entries grew 30% over 2016.

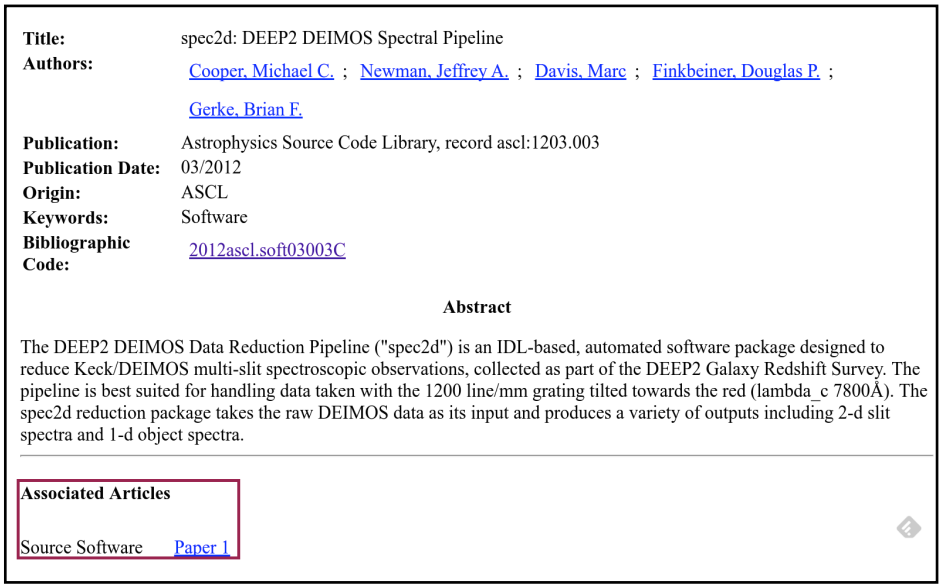
Citations to the ASCL have also increased, up 66% in 2017 over 2016. Citations are discussed more fully in the section "Impact on the community."

## New capabilities and features

Early in 2017, we realized there was a potential for losing new submissions to the ASCL should a problem develop in the hours between their submission and the daily backup of the ASCL. New submissions already generated an email to members of the ASCL team with some metadata for the submission, but did not include all of it. The auto-email system was made more robust by not only including all submitted metadata in the submissions-generated email, but also by capturing this information off-site in a secure location immediately upon submission of the entry.

We improved the cross-matching of software with articles in ADS by replacing links to articles in resources such as arXiv with links to ADS entries, which are used to create the cross-matching (example shown below), completing this work by the end of 2017. This increases the discoverability of codes by making it possible to find them from ADS entries for articles not only via the citations list, but also from the article's abstract page.

A public dashboard was moved into production in March 2016, and in August of that year, a dashboard for administrators was added to the site. In late 2016, we started adding information to a new field, *Preferred citation method*. As of November 2016, 130 entries included preferred citation information.



**Title:** spec2d: DEEP2 DEIMOS Spectral Pipeline
**Authors:** Cooper, Michael C. ; Newman, Jeffrey A. ; Davis, Marc ; Finkbeiner, Douglas P. ; Gerke, Brian F.
**Publication:** Astrophysics Source Code Library, record ascl:1203.003
**Publication Date:** 03/2012
**Origin:** ASCL
**Keywords:** Software
**Bibliographic Code:** 2012ascl.soft03003C

**Abstract**

The DEEP2 DEIMOS Data Reduction Pipeline ("spec2d") is an IDL-based, automated software package designed to reduce Keck/DEIMOS multi-slit spectroscopic observations, collected as part of the DEEP2 Galaxy Redshift Survey. The pipeline is best suited for handling data taken with the 1200 line/mm grating tilted towards the red (lambda_c 7800Å). The spec2d reduction package takes the raw DEIMOS data as its input and produces a variety of outputs including 2-d slit spectra and 1-d object spectra.

**Associated Articles**

Source Software Paper 1

Article-software cross-matching in ADS

In 2017, the ASCL participated in the first EWASS Hack Day; one project several people worked on was finding preferred citation information to entries where it was missing. This project resulted in the addition of this information to 52 entries edited at or shortly after EWASS, with more data added to the online file used to gather the information in the months after EWASS that has been or will be incorporated into ASCL entries as time permits.

## Research

ASCL Advisory Committee Chair Peter Teuben, developer P.W. Ryan, and Editor Alice Allen conducted a preliminary study on software availability and link persistence in astrophysics, which was submitted to and accepted by *The Astrophysics Journal Supplement* for a forthcoming (2018) special issue on data.

## Support and funding

Heidelberg Institute in Theoretical Studies (HITS) through Kai Polsterer provided €6,000 in funding at the end of 2016 for work in 2017; this support enabled the ASCL's presence at various conferences and participation in meetings on research software such as the European Week of Astronomy and Space Science (the European Astronomical Society's large annual meeting) in Prague, the ASCL's first appearance there. This funding also enabled the ASCL to invite non-astronomers with experience in research software in other disciplines to participate in an ASCL/Moore-Sloan Data Science Environment at NYU Special Session on "Perspectives in Research Software: Education, Funding, Reproducibility, Citation, and Impact" that was held at the January 2017 AAS meeting and cover travel expenses for them where necessary. The ASCL is deeply grateful for this support.

The AAS provided complimentary registrations for our non-astronomer participants in the January Special Session; the ASCL is thankful for this support, which ensured these outstanding speakers could present at the meeting.

Michigan Technological University (Houghton, MI) hosts the ASCL website and provides technical support, and the University of Maryland (College Park, MD) provides office space and other university services including library access; the ASCL assigns DOIs through an

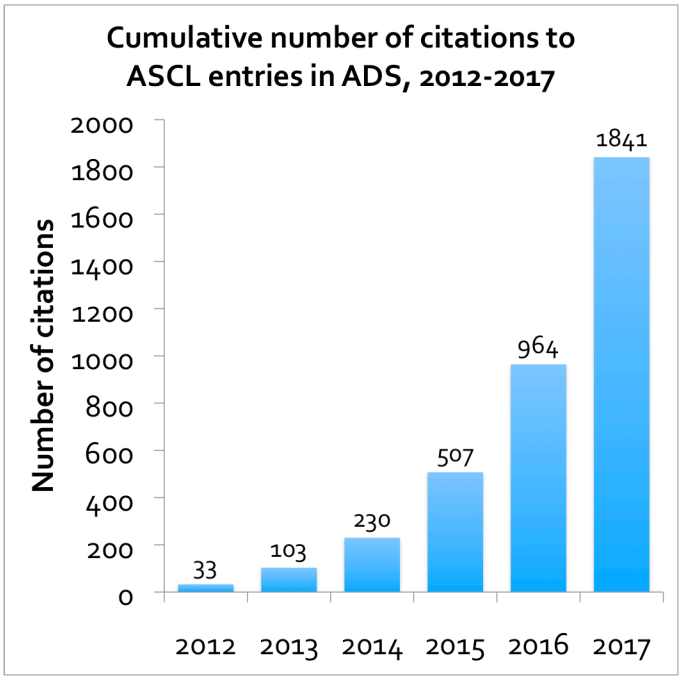
arrangement with the University of Maryland Libraries. The ASCL is very grateful for this valuable ongoing support.

At OpenCon 2016, a potential new collaboration with ContentMine and its founder Peter Murray-Rust was discussed, and a letter of interest for funding was sent to the Laura and John Arnold Foundation in December 2016. In February 2017, we learned that we would not be invited to submit a full proposal to the Arnold Foundation.

In May 2017, Peter Teuben and Alice Allen submitted a proposal for NASA funding under its ADAP solicitation, this to improve the visibility and discoverability of NASA software through the ASCL; in September 2017, we were notified that our proposal had been evaluated by the peer review panel as falling within the "selectable range" and that a funding decision would be made by late January 2018.

## Impact on the community

The ASCL uses various measures to try to determine its impact on and use by the community. Other than wanting software to be cited in a trackable way, the ASCL is agnostic on how codes are cited. That said, we use citation numbers as a metric to learn how and whether the ASCL is being used. Citations continue to increase at a faster rate than growth in the number of code entries. By the end of 2017, 442 ASCL entries collectively had 1841citations, meaning 27.8% of the 1590 codes indexed in ADS at that time having citations, up from 23.7% in December 2016.




Increasingly, authors submit their software to the ASCL; 85 code entries were submitted in 2017, with 70 of these accepted into the ASCL in 2017, which is 36% of the codes added. We take this as an indication that software authors see value in registering their codes with the ASCL. Interestingly, authors are not the only submitters of software to the ASCL; occasionally, a data editor or a user has submitted a code to enable citation of the software.

ASCL records continue to be indexed by the Web of Science's Data Citation Index quarterly, and as of this writing, shows that 699 code entries have been cited nearly 900 times. As the ASCL editor does not quite understand how the Data Citation Index tracks citations, she does not check citations in that resource very often and unfortunately does not have historical data for it.

## People

Alice Allen and Kimberly DuPrie (Space Telescope Science Institute) are Editor and Associate Editor, respectively. Judy Schmidt provides development and design work for the ASCL, and P.W. Ryan provides development work and support for citation and other statistics tracking.

The Advisory Committee members in 2017 were:

Peter Teuben, University of Maryland, *Chair*
Bruce Berriman, Infrared Processing and Analysis Center/Caltech
Jessica Mink, Center for Astrophysics
Robert Nemiroff, Michigan Technological University
Lior Shamir, Lawrence Technological University
Keith Shortridge, Knave and Varlet, AU
Mark Taylor, University of Bristol, UK
John Wallin, Middle Tennessee State University
Rein Warmels, European Southern Observatory, DE

## 2017 Highlights

| | |
|---|---|
| January | Collaborated with the Moore-Sloan Data Science Environment at NYU on a Special Session called Perspectives in *Research Software: Education, Funding, Reproducibility, Citation, and Impact* at the 229th AAS meeting (National Harbor, MD)<br>Presented the ASCL in a poster<br>http://ascl.net/wordpress/2017/01/05/ascl-poster-at-aas-229/ |
| May | Submitted proposal for NASA funding under ADAP solicitation |
| June | Held Special Session at EWASS 2017 in Prague, with Rein Warmels, Amruta Jaodand, Matteo Bachetti, and Abigail Stevens as co-organizers, called *Developments and Practices in Astronomy Research Software,* and organized a Hack Day (blog posts: overview, Special Session, ASCL Hack Day projects, In Conclusion 1, In Conclusion 2)<br>Gave a presentation on the ASCL in the first block of software sessions<br>Participated in EWASS Hack Day |
| September | Notified that our proposal for NASA funding fell within the "selectable range" and that a funding decision would be made by late January |
| October | Submitted research paper to ApJS<br>Poster presentation on the ASCL (blog post) given and a Birds of a Feather (BoF) session on software metadata held at ADASS in Santiago (slides, Google doc) |
| December | Finished replacing arxiv.org urls in the *Appears in* field for ADS urls<br>Preprint of ADASS poster and ADASS BoF appear on arXiv |

## 2017 Plans Revisited

- Create ASCL index in 2016 ADASS proceedings
  - Completed
- Present ASCL at at least two conferences
  - Completed; the ASCL was presented at AAS, EWASS, and ADASS
- Sustain reasonable growth in number of entries (190-210 additions)
  - 193 codes were added in 2017
- Implement a mirror site
  - Still outstanding; not completed
- Create real-time data backup for submissions and newly-published entries
  - Completed
- Complete outstanding plans from previous years
  - Add another two members to the Advisory Committee
    - Still outstanding; not completed

## 2018 Goals

- Create ASCL index in 2017 ADASS proceedings
- Make the administrator dashboard more robust; possible changes include the addition of stats for:
    - number of codes missing "Preferred citation" information
    - number of codes missing "Appears in" AND "Described in" information
- Present ASCL at at least two conferences
- Present ASCL at at least six institutions
- Sustain reasonable growth in number of entries (200-220 additions)
- Implement a mirror site
- Complete outstanding plans from previous years
    - Add two members to the Advisory Committee

## Press and bibliography

Software metadata: How much is enough?
Alice Allen *et al*, Astronomical Data Analysis Software and Systems XXVII, October 2017
Pre-print

The Astrophysics Source Code Library: What's new, what's coming
Alice Allen *et al*, Astronomical Data Analysis Software and Systems XXVII, October 2017
Pre-print | Poster

Top ten reasons to register your code with the Astrophysics Source Code Library
Alice Allen *et al*, American Astronomical Society, AAS Meeting #229, January 2017, #229, id.236.13
Poster

## AAS Poster, January 2017

## ADASS Poster, October 2017

# ASCL.net
# Astrophysics Source Code Library

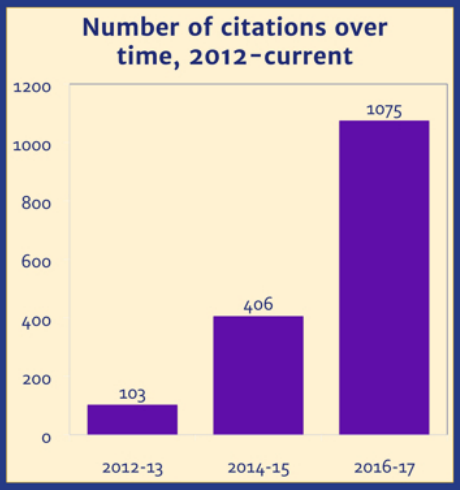
Making codes discoverable since 1999

ASCL is a free citable online resource for astrophysics research codes

- Over 1,500 entries
- Cited in over 60 journals
- Indexed by Web of Science and ADS
- In past 12 months:
  - Submissions by authors have increased by 40%
  - Citations have increased by 64%

**NEW!**

- Expansion of *preferred citation* information via EWASS Hack Day
- Improved cross-matching of research papers with software entries in ADS
- Real-time data backup for submissions and newly-published entries
- **Coming soon**: keywords and improved search capabilities




What would you like in the ASCL?
Your ideas here!

Alice Allen (ASCL), Bruce Berriman (Caltech/IPAC-NExScI), Kimberly DuPrie (STScI/ASCL), Jessica Mink (SAO), Robert Nemiroff (MTU), P. Wesley Ryan (ASCL), Judy Schmidt (ASCL), Lior Shamir (LTU), Keith Shortridge (AAO), Mark Taylor (UBristol), Peter Teuben (UMD), John Wallin (MTSU), Rein H. Warmels (ESO)
Supported by ***Heidelberg Institute for Theoretical Studies***, ***University of Maryland***, and ***Michigan Technological University***

### Preferred citation examples

These represent ways authors have specified their software should be cited. Not all methods listed in ASCL are trackable by ADS, however, and may not be compliant with Force11's recommended software citation standards.

**By ASCL ID**

[ascl:1305.002] **pynbody: N-Body/SPH analysis for python**
Pontzen, Andrew; Roškar, Rok; Stinson, Greg; Woods, Rory

Preferred citation method:
http://adsabs.harvard.edu/abs/2013ascl.soft05002P

**By article and ASCL ID**

[ascl:1205.004] **Turbospectrum: Code for spectral synthesis**
Plez, B.

Preferred citation method:
http://adsabs.harvard.edu/abs/1998A%26A...330.1109A
http://adsabs.harvard.edu/abs/2012ascl.soft05004P

[ascl:1508.001] **HMcode: Halo-model matter power spectrum computation**
Mead, Alexander

Preferred citation method:
http://adsabs.harvard.edu/abs/2015MNRAS.454.1958M and http://adsabs.harvard.edu/abs/2015ascl.soft08001M, and if updates by Mead used, also http://adsabs.harvard.edu/abs/2016MNRAS.459.1468M

**By Zenodo DOI**

[aascl:1601.009] **K2fov: Field of view software for NASA's K2 mission**
Mullally, Fergal; Barclay, Thomas; Barentsen, Geert

Preferred citation method:
http://dx.doi.org/10.5281/zenodo.44283

**Other methods**

[ascl:1206.013] **ImageJ: Image processing and analysis in Java**
Rasband, W. S.

Preferred citation method:
Please see citation information here: https://imagej.nih.gov/ij/docs/faqs.html#cite