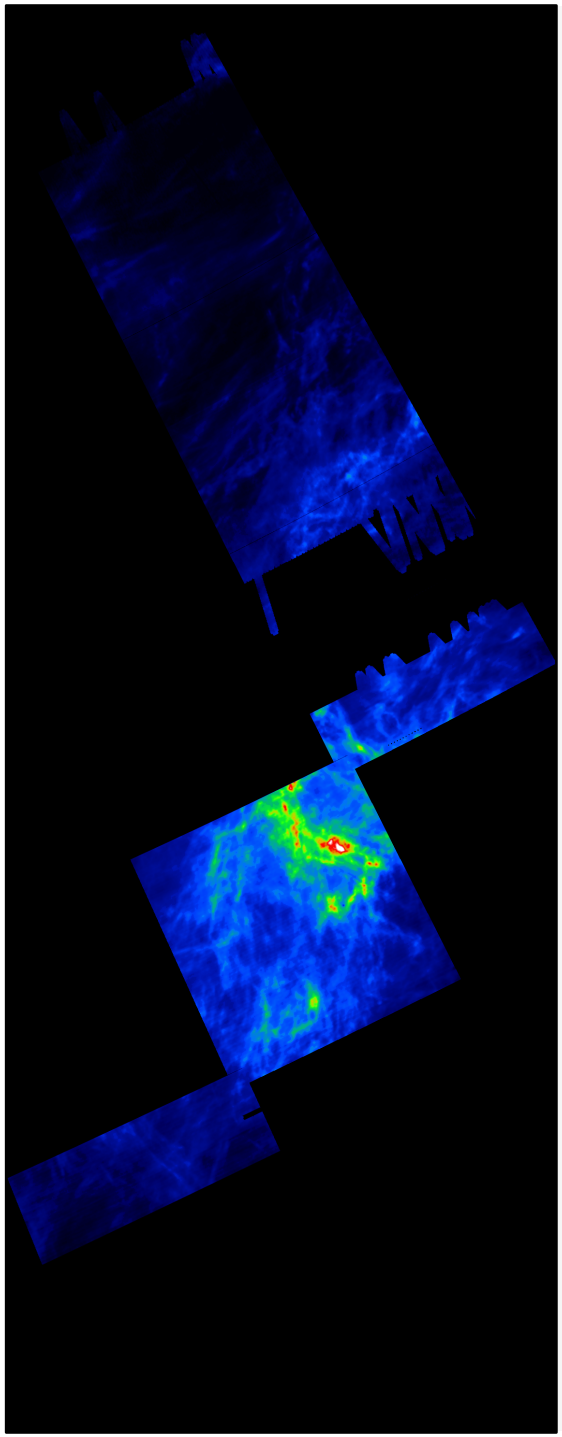

Restoring reproducibility: Making scientist software discoverable

Alice Allen
Astrophysics Source Code Library
ascl.net

Research software

Integrity of research depends on transparency and reproducibility

"… anything less than release of actual source code is an indefensible approach for any scientific results that depend on computation…"

Ince, Hatton, & Graham-Cumming, *The case for open computer programs*, Nature, v. 482, Feb. 23, 2012

ASCL
A brief history

Code entry, 1999

Astrophysics Source Code Library
Archive Page: CHIANTI

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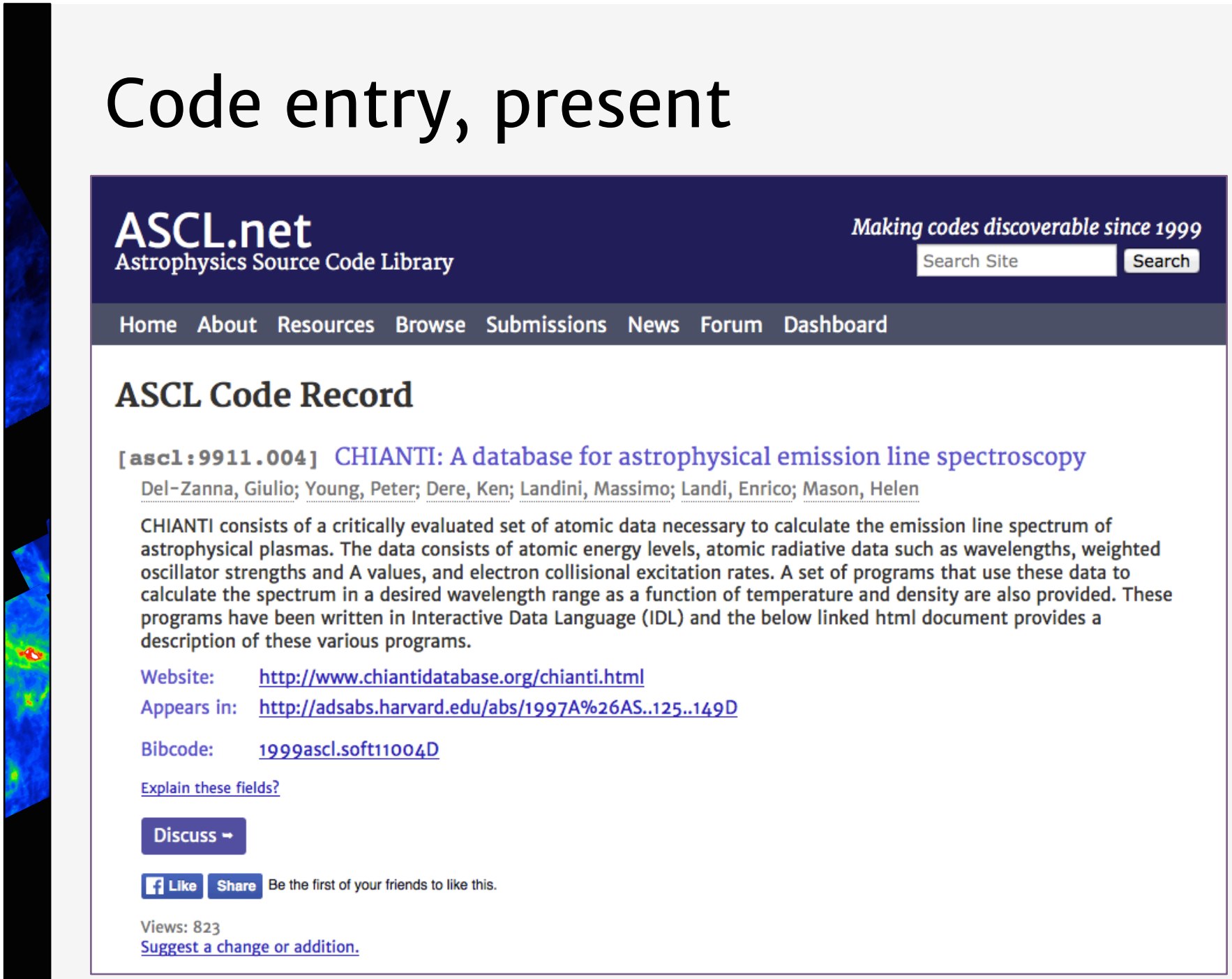
CHIANTI: A database for astrophysical emission line spectroscopy

The CHIANTI Consortium

Abstract: CHIANTI consists of a critically evaluated set of atomic data necessary to calculate the emission line spectrum of astrophysical plasmas. The data consists of atomic energy levels, atomic radiative data such as wavelengths, weighted oscillator strengths and A values, and electron collisional excitation rates. A set of programs that use these data to calculate the spectrum in a desired wavelength range as a function of temperature and density are also provided. These programs have been written in Interactive Data Language (IDL) and the below linked html document provides a description of these various programs.
Subject headings: astronomical data bases: miscellaneous, atomic data, atomic processes, stars: atmospheres, Sun: atmosphere, techniques: spectroscopic, ultraviolet: general

Latest Version: 1.0.3 (1999 April 2)
Archived: 1999 November 23
Papers: multiple, representative: Landi, E., Landini, M., Dere, K. P., Young, P. R., & Mason, H., 1999A&AS..135..339L
Languages: IDL
External Explanatory Pages: http://wwwsolar.nrl.navy.mil/chianti.html
Source Code: multiple, representative: CHIANTI_1.03_pro.tar.Z, CHIANTI_2.0_data.tar.Z

Code entry, present



Home page, 2003

Astrophysics Source Code Library : Archive

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ASCL.net Archive

New Editor-in-Chief wanted for ASCL.net.

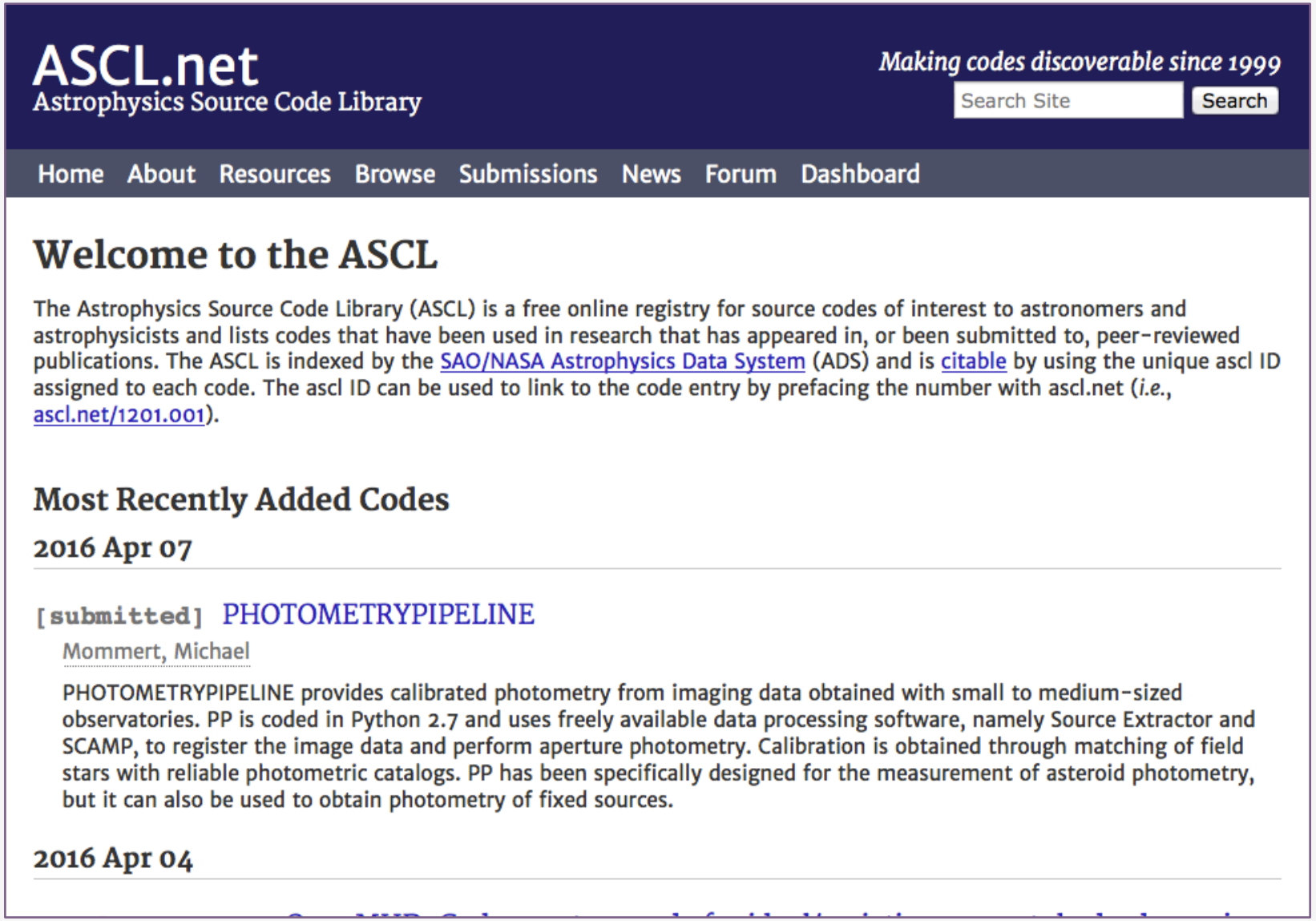
This archive is indexed by subject headings approved by the major journals in astronomy and astrophysics. A single code may be listed under multiple subject headings.

accretion disks

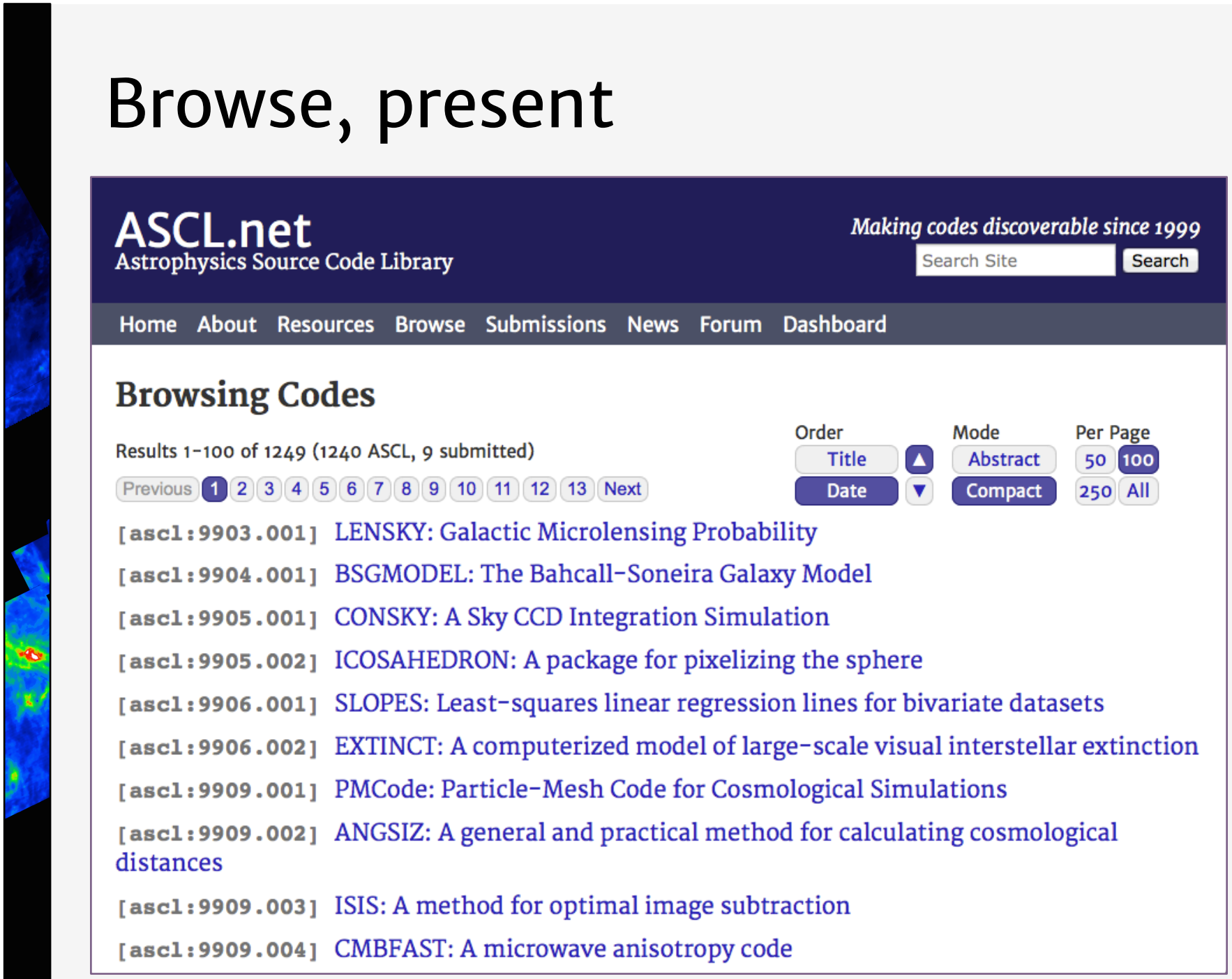
DUSTY: Radiation transport in a dusty environment
Ivezic, Z., Nenkova, M., & Elitzur, M.
http://ascl.net/dusty.html

XSTAR: A program for calculating conditions and spectra of photoionized gases
Kallman, T.
http://ascl.net/xstar.html

Home page, present



Browse, present



Looking around and back

- Why didn't this work initially?
- Who else has tried this?
- What other similar efforts exist?
- What can I learn from them?

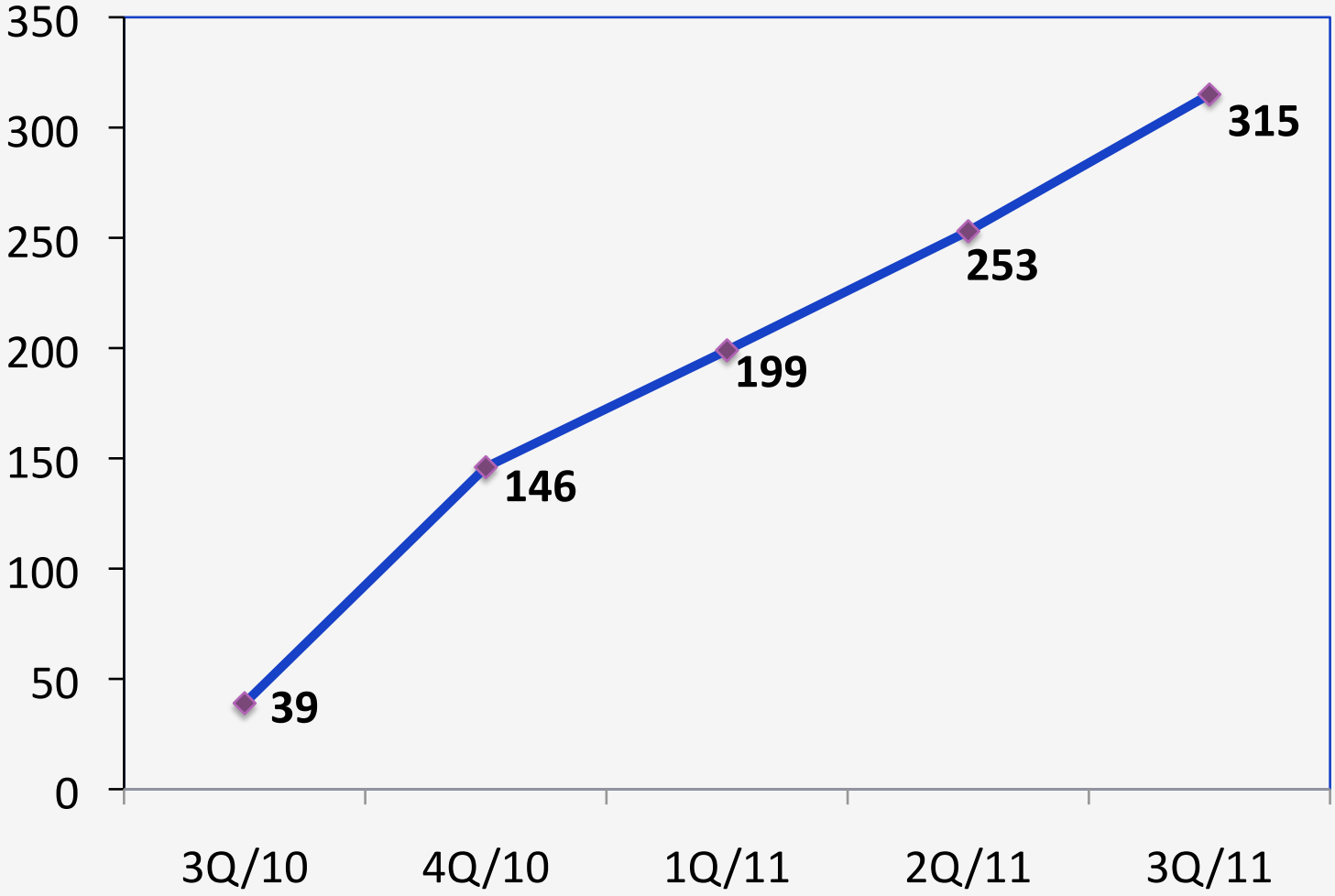
Lessons learned

- People don't want to deposit their codes/like to keep their codes nearby
  - Little incentive to register software
  - Don't want to go first
  - Don't want to have another site to update
- Funding cycle not long enough to get uptake by community
- Authors will not update metadata
- Limited marketing limited growth

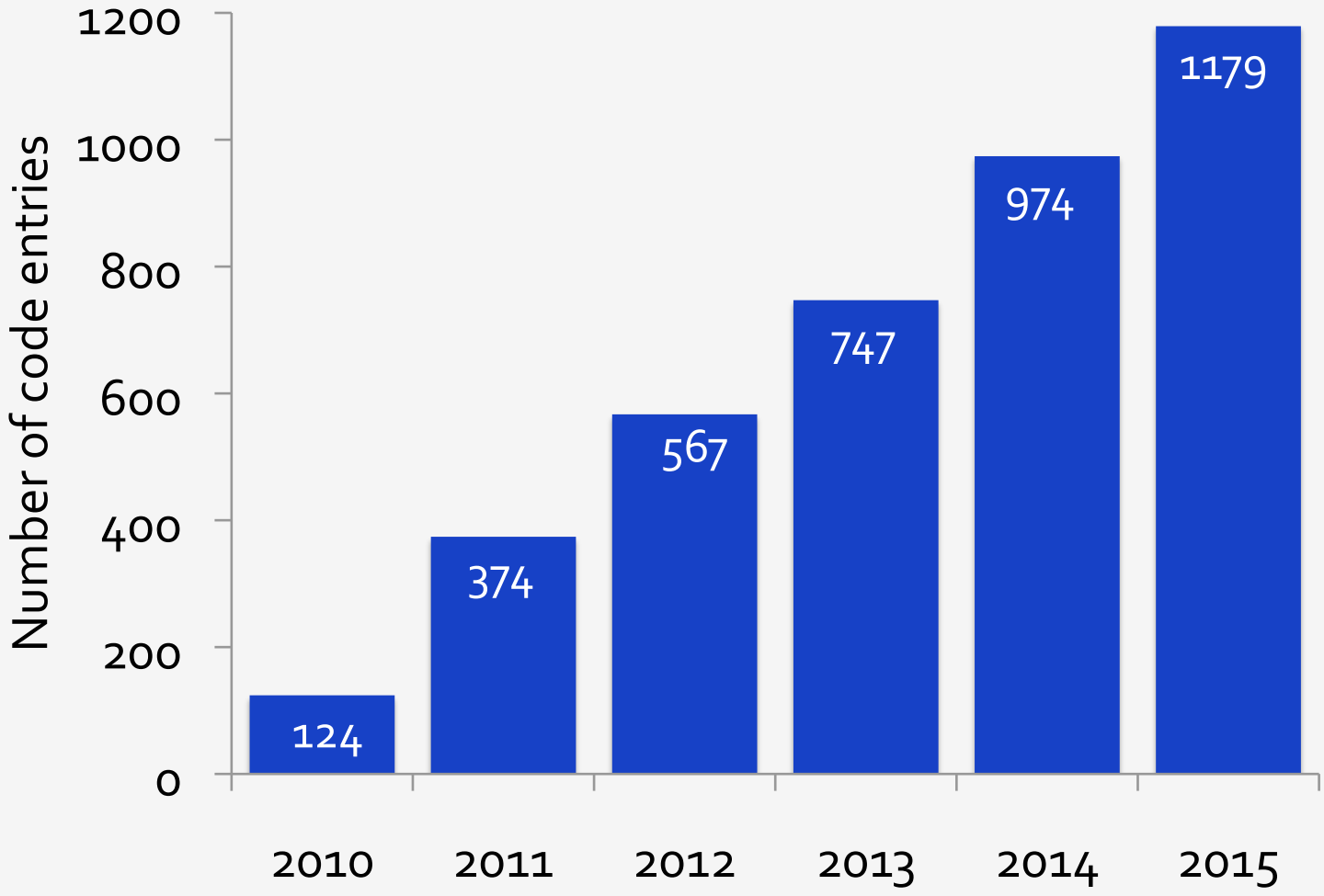
To bring about change…

- Build it
- Enlist/involve others
- Market, market, market
- Engage the community
  - Learn what barriers and incentives exist
  - Mitigate barriers and nurture incentives
- Be patient

Total code entries by quarter July, 2010 – September, 2011



Number of code entries at year end, 2010 - 2015



Advisory Committee

Get the word out

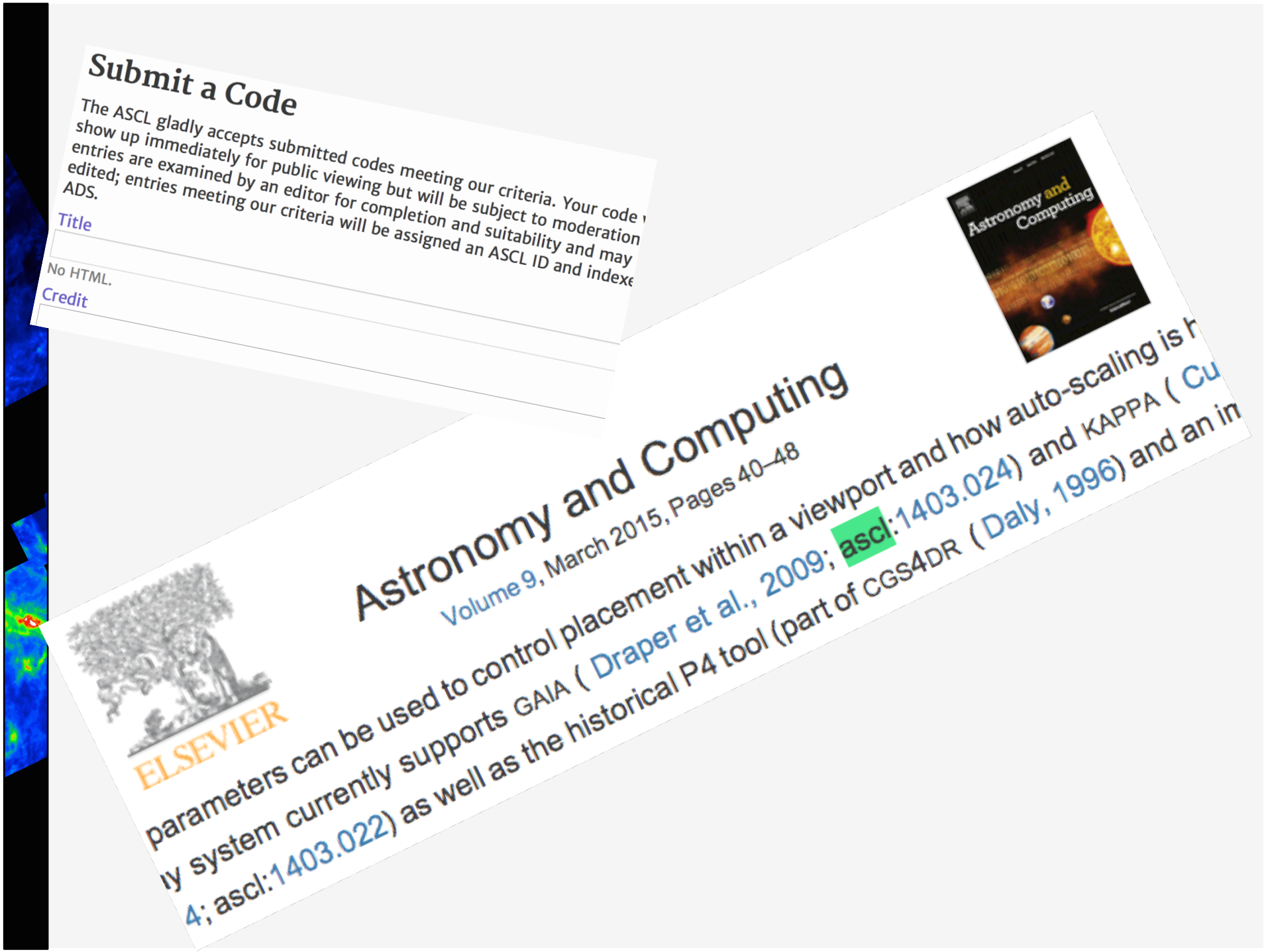
Community work

No one can assume that valuable innovations will pop up magically in the public domain if their inventors received no reward for their labor and capital.

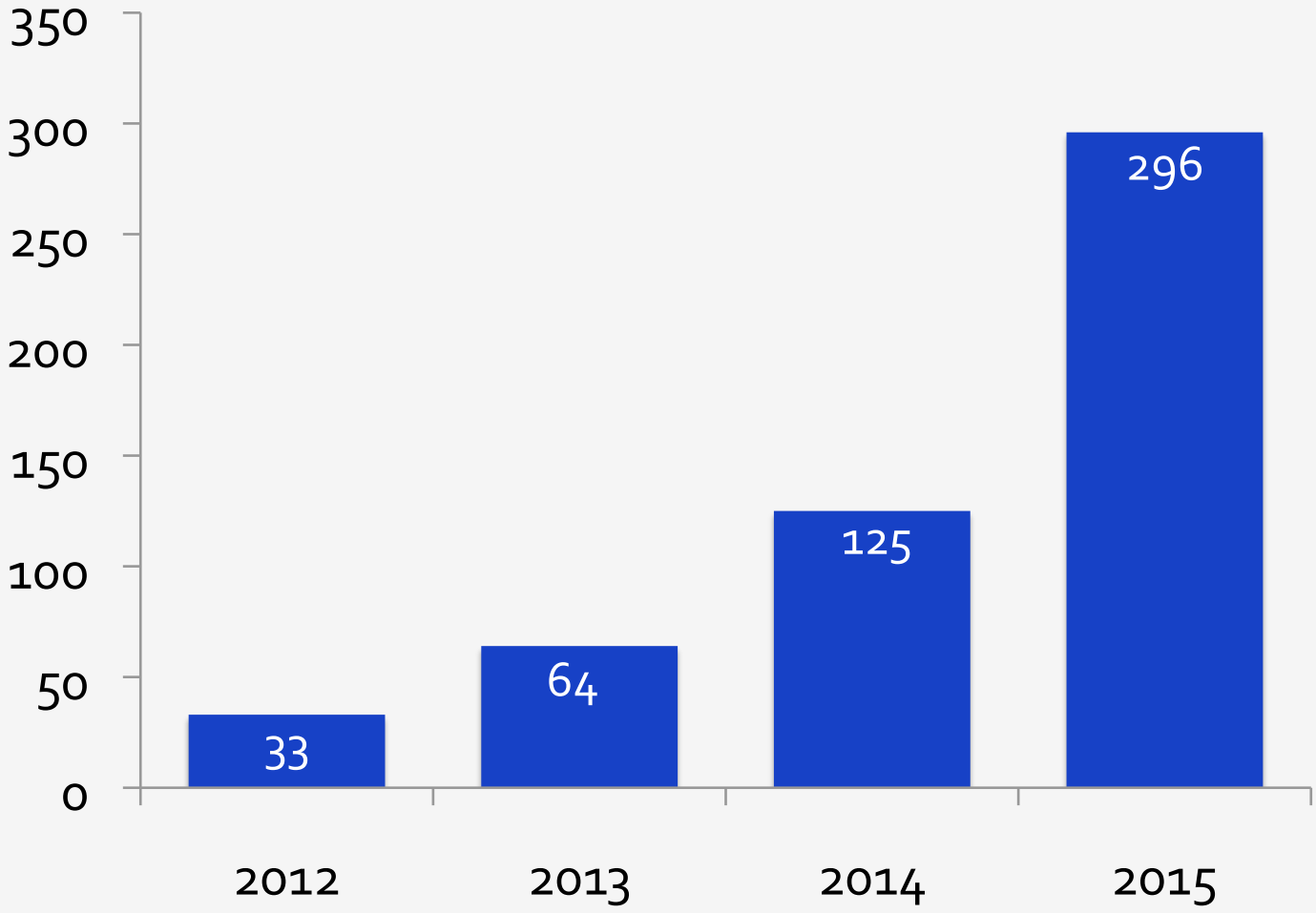
–Richard Epstein


francesco mistrulli 2010

Are we having any effect?


Submit a Code
The ASCL gladly accepts submitted codes meeting our criteria. Your code
show up immediately for public viewing but will be subject to moderation
entries are examined by an editor for completion and suitability and may
edited; entries meeting our criteria will be assigned an ASCL ID and indexe
ADS.
Title
No HTML.
Credit
Astronomy and Computing
Volume 9, March 2015, Pages 40–48
ELSEVIER
parameters can be used to control placement within a viewport and how auto-scaling is h
y system currently supports GAIA (Draper et al., 2009; ascl:1403.024) and KAPPA (Cu
4; ascl:1403.022) as well as the historical P4 tool (part of CGS4DR (Daly, 1996) and an in

Citations to ASCL entries by year



Things I didn't say but would have with more time...

We have automated some manual processes and will automate others as time/volunteer work/ideas/funding allow, but ASCL will always need human editors.

ASCL has had little funding in the past; $5K from AAS for outreach one year, and for this year, Heidelberg Institute for Theoretical Studies (HITS) has provided €6K in (unsolicited!) funding. (We're very grateful!) Consistent funding is on my to do list, and we are looking at perhaps gathering small amounts of funding annually ($500-$1000) from broad group of organizations.

ASCL is built using open source technologies: MySQL, CodeIgniter, phpbb, WordPress

Can be cloned; see offer here and an empty(ish) site here. I've had requests from physicists to create a physics source code library, and we are looking at other fields, including economics.

I get to meet the *best* people by working on this project! Thank you for being among them!

Template image credit and information:
This image is an average of the central 10 velocity planes of a mosaic of five data cubes released as part of the Galactic Arecibo L-band Feed Array HI (GALFA-HI) survey (Peek et al., 2011, Ap J Suppl, 194, 20; DOI 10.1088/0067-0049/194/2/20; ADS Bibcode 2011ApJS..194...20P). The mosaic was with computed version 4.0 of the Montage Image Mosaic Engine. Image courtesy John Good and Bruce Berriman, California Institute of Technology.