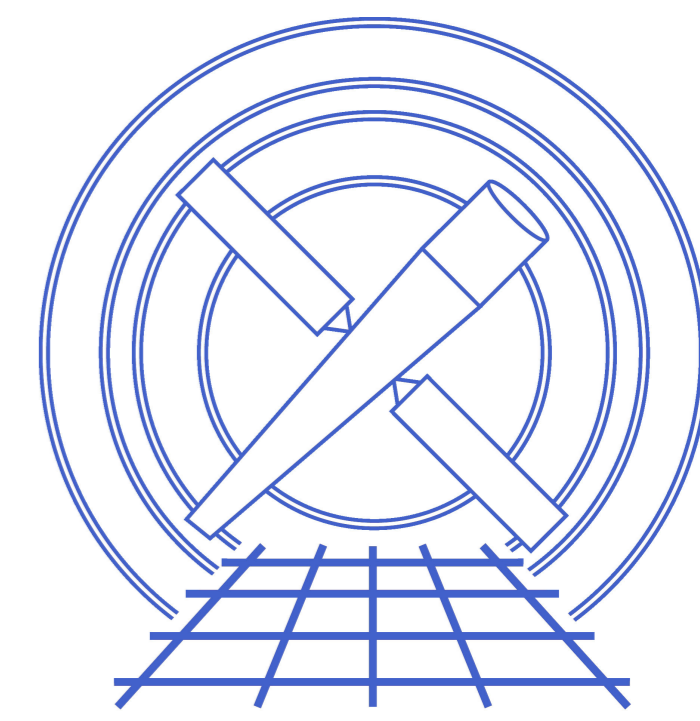# What's New in the Chandra Data Archive

S. Winkelman, A. Rots, M. McCollough, G. Becker, S. Thong

CXC/Smithsonian Astrophysical Observatory

swinkelman@cfa.harvard.edu

Science Impact of Chandra Data

The Chandra Data Archive (CDA) has been tracking publications that are based on Chandra observations in journals and on-line conference proceedings since early in the mission. In recent years the CDA has developed a number of metrics to provide a means for measuring the science impact of Chandra data. Figure 1 is a picture of how Chandra data, as it ages, have been published in the refereed literature. A summary of the scientific impact of Chandra data is summarized below. The conclusion is that publication history associated with the Chandra mission is healthy and vigorous and data from the entire life of the mission remain relevant.

Speed of Publication: The median time, T_P, to first publication of data in a refereed journal is 2.4 years.

Percentage of Data Published: 94% of Chandra data is published after $5T_P$.

Archival Usage:
- 78% of exposure time is published more than twice at $5T_P$.
- The amount of unique exposure time published annually, as a percentage of exposure time available in the archive is 42%

Journals: Chandra science results have been published in over 50 refereed journals with more than 90% of the papers being published in ApJ and ApJS (56.2%), A&A (17.2 %), MNRAS (14.2 %) and AJ (3.8%).

Citation of Results: In any given year, there are as many refereed journal articles that cite Chandra observations or results derived from them as there are that present Chandra science.
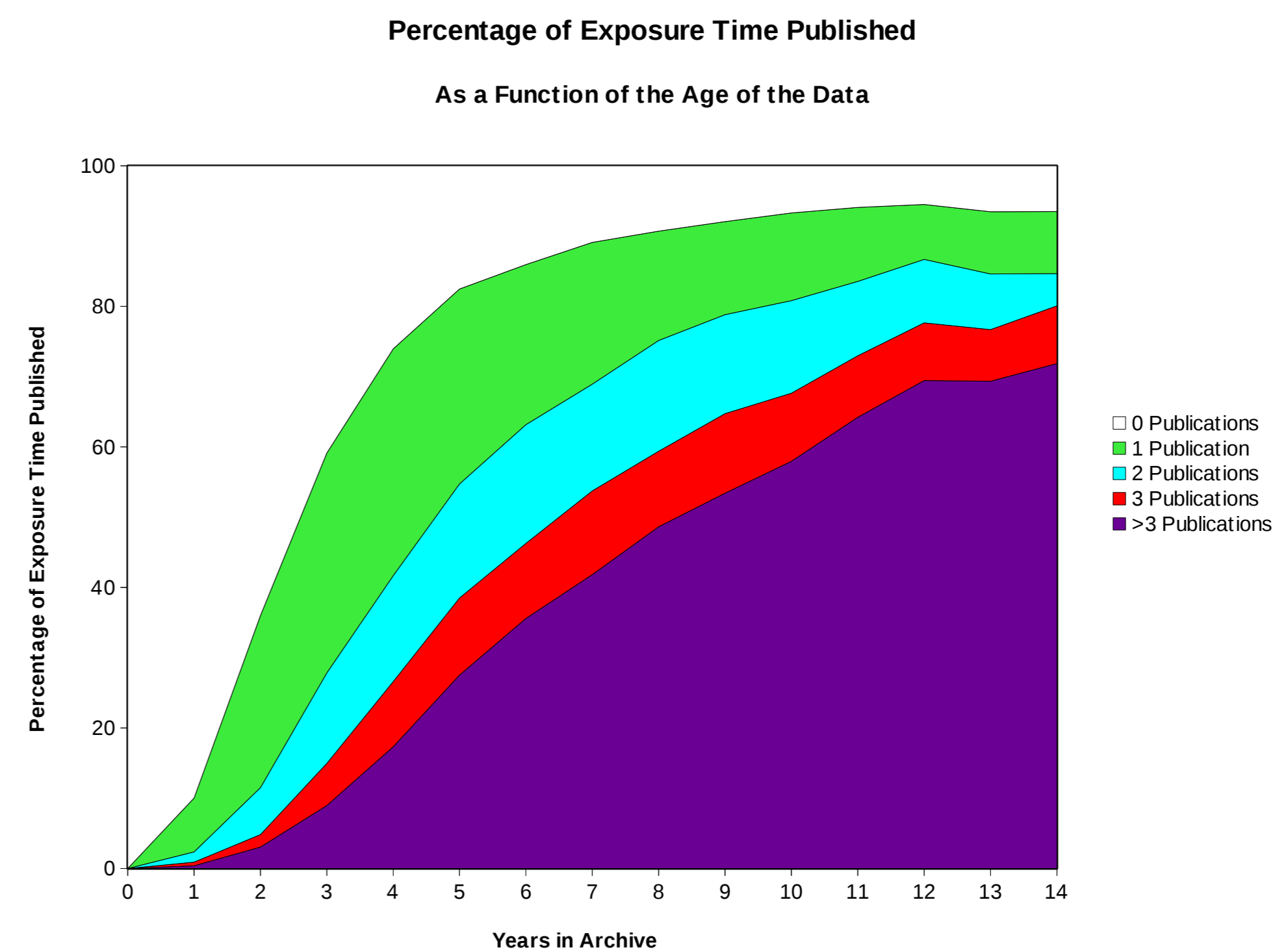

Figure 1: *Percentage of exposure time remaining unpublished, published once, twice, thrice, and more than three times, as a function of age of the data, in annual increments.*

New Research Tools

Finding papers connected to Chandra proposals

The proposal paper search tool shown in Figure 2 allows users to search for accepted proposals. Starting in Cycle 17, it will also provide a list of articles from the Chandra bibliography which have been flagged as presenting Chandra science as a result of the proposal and is associated with the PI team in some way. The list of articles may not be complete, so please email CDO with any additions that you feel should be made to the bibliography.
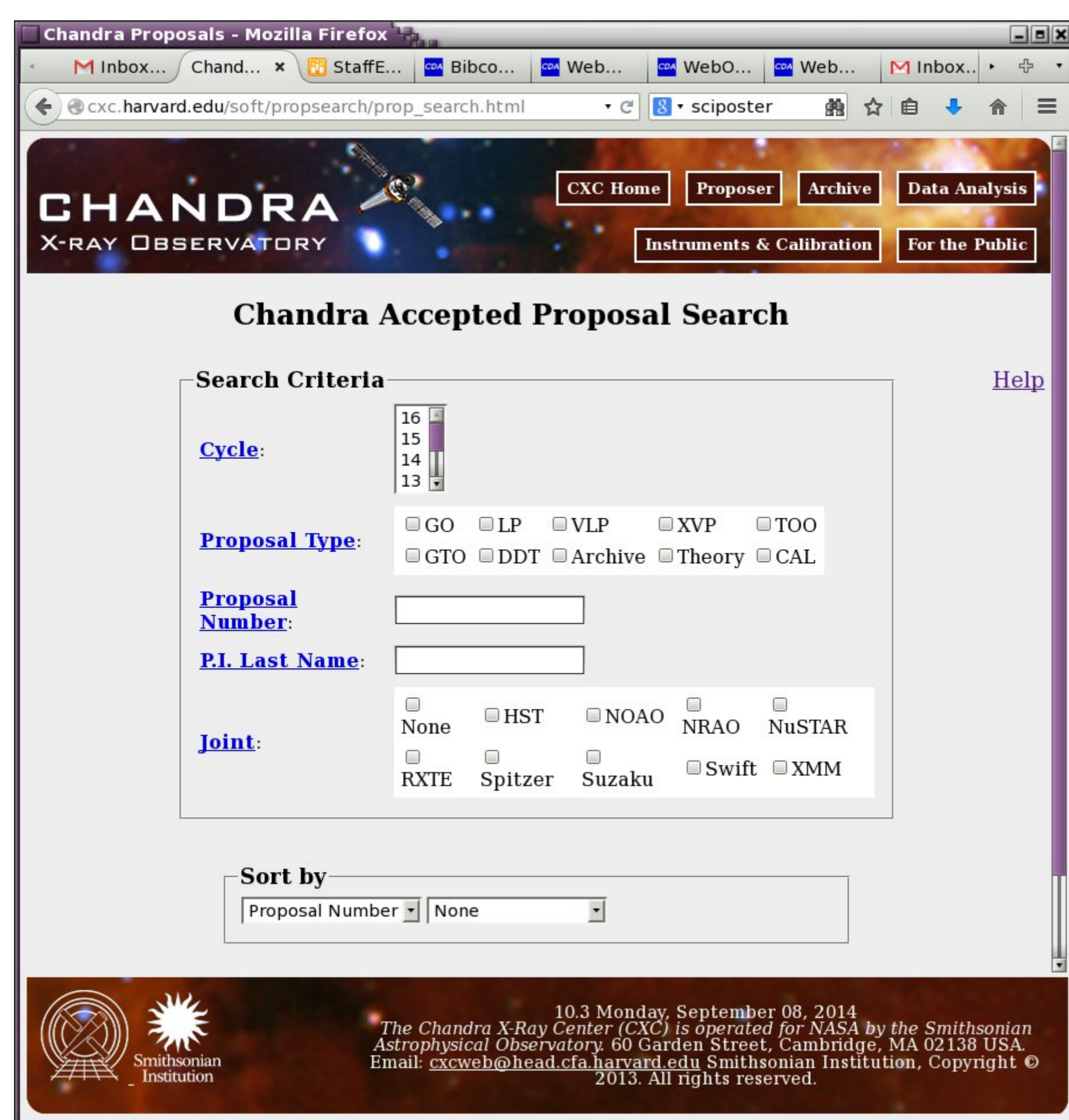

Figure 2: *Proposal Search Tool allows users to search for Chandra accepted proposals and to retrieve a list of Chandra science papers connected to the proposal from the PI team.*

Chandra proposal abstracts on ADS

For many years the CDA has been publishing to ADS the abstracts of accepted Chandra observing proposals. We now publish all accepted proposal abstracts including those for theory and archive proposals.

Retrieving Chandra data with CIAO Tools

The CIAO tools `find_chandra_obsid` and `download_chandra_obsid` will find and download data for a given Chandra Observation Id (ObsId) from the public archive. The tool has been upgraded to fetch data from mirrors of the CDA provided those mirrors are also ftp sites. See the CIAO documentation for full details.

Scrape FITS Headers for Data Acknowledgment

CIAO now provides a macro, `list_datasetid`, which will examine the headers of a set of files and provide a list of LaTeX dataset identifier macros to insert into your AAS manuscripts. The macro will scrape all FITS files in a directory and provide a list of unique dataset identifiers found in the files. See the CIAO documentation for full details.

Acknowledgments

We thank the ADS for providing opportunities to increase our outreach to the astronomical community. We also thank all past and present bibliography classifiers. Without their efforts there would be no bibliography. This work is supported by NASA contract NAS8-03060.

Future Plans

Creating Private Mirrors of the CDA

To aid users in maintaining private mirrors, we are developing recipes and tools to help users create and fully maintain customized archives using a minimum of CDA resources.

RSS feeds

The CDA will be publishing customized RSS 2.0 feeds to provide announcements related to sets of observations selected by location in the sky; objects; lists of observations; instrument configuration; and more.

FITS Dictionary

We are collecting the complete body of FITS keywords, as used in Chandra data products, into a dictionary database that provides easy access to their use and meaning. The dictionary interface (Figure 3) will allow users to:
- search the dictionary by keyword, including perform wildcard searches.
- browse the dictionary by specific filetype.
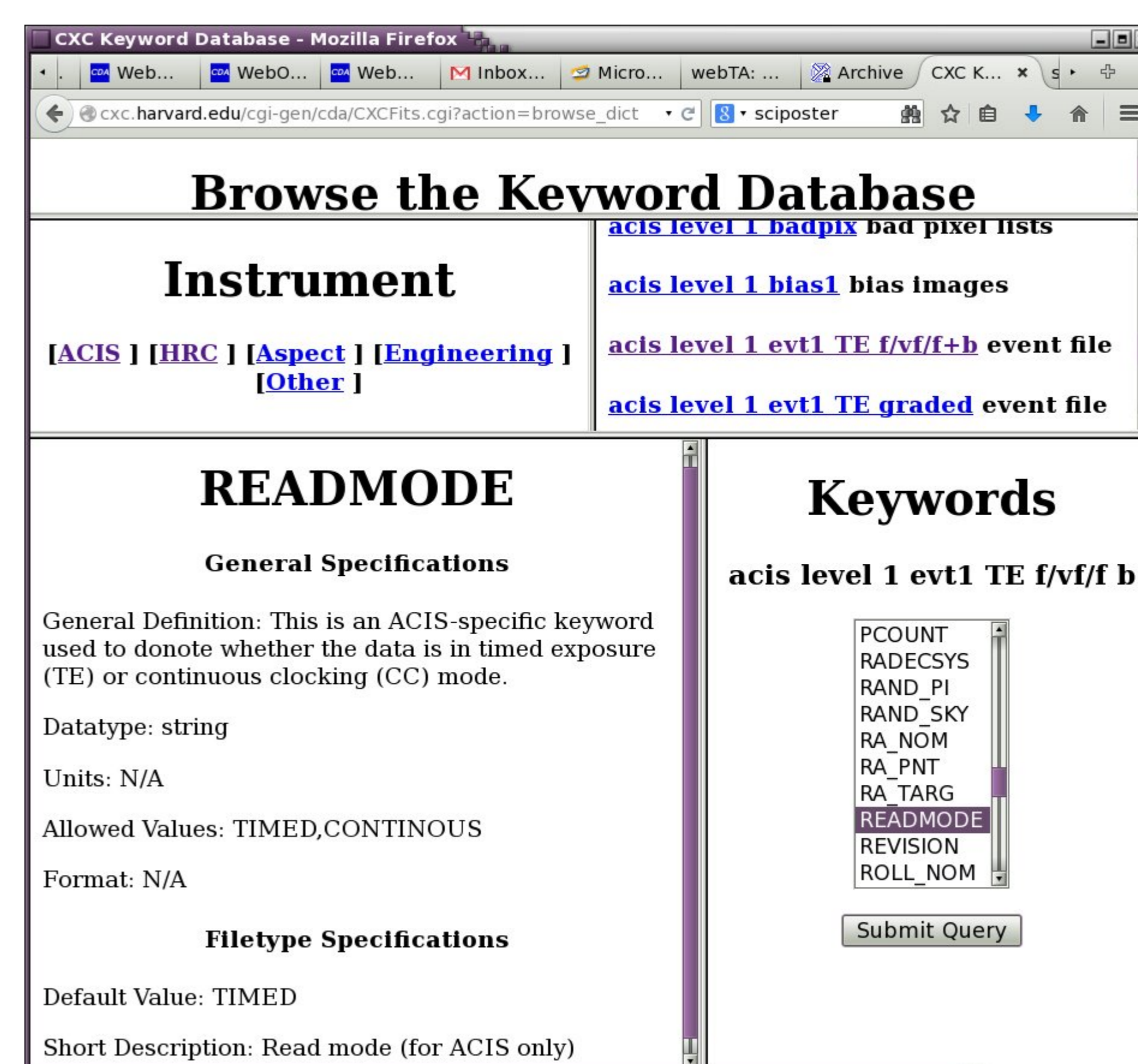- generate a schematic FITS header for a selected filetype.

Figure 3: *Prototype of the Chandra FITS dictionary.*

Overhaul Bibliography Search Interface

The Chandra Bibliography Search tool provides a seamless interface to search the literature and Chandra archive. In the last two years the CDA has extended the Chandra bibliography to include many more flags related to the content of papers. We will overhaul our bibliography search interface to include these new flags.

Taking advantage of facets on ADS

ADS 2.0 (http://labs.adsabs.harvard.edu/adsabs/) allows users to narrow their search results using facets on bibliographic records. The CDA provides ADS with a list of all articles contained in the Chandra bibliography, including articles on Chandra-related theory, software, calibration, instruments, etc. That link becomes a facet to articles in the list. We are working with ADS to supply additional lists of Chandra articles to ADS to provide hierarchical facets which we hope will aid in your searches for Chandra results. Some of the facets we are considering are:

Chandra/Instrument: contains articles that are related to software, calibration, instruments, and operation of the Chandra X-ray Observatory.

Chandra/Observation: contains articles that present analysis of Chandra data.

Chandra/Theory: contains articles that present theory related to and/or models of Chandra data.

Chandra/Multiwave: contains articles that present multi-wavelength/multi-observatory data analysis where Chandra data is a component of the data used.