

Searching for Journal Articles

Keeping up with the literature and being able to track down important references for your work are important skills worth developing. Luckily, astronomy is at the forefront in providing web services.

New research papers in many of the sciences are posted to an electronic archive and distribution server nearly every day. This pre-print server is called arXiv (<http://arxiv.org/>). In addition to web-accessible papers, automatic e-mails can be sent to your e-mail address listing the papers submitted each day. These days nearly every astronomer puts their papers on the astronomy list, called astro-ph <http://arxiv.org/archive/astro-ph>. These papers are a mixture of personal musings and unofficial responses to other papers (hard to assess the quality and difficult to cite, but sometimes interesting to read), conference proceedings (generally useful to indicate new results that hopefully will be published soon), papers submitted to official journals, and papers accepted by official journals. In 2008, 11,359 papers were either published directly to astro-ph or another arXiv category and cross-listed in astro-ph. That averages to about 30 papers every day.

For past articles, there is a digital library portal for researchers in astronomy and physics. The Smithsonian Astrophysical Observatory / NASA Astrophysics Data System (ADS, <http://www.adsabs.harvard.edu/>) contains bibliographic databases to millions of records. It is nearly complete after the mid-1990s, decently complete in the 20th century, and includes articles that date back to as early as 1057 A.D. These records often include abstracts, and links to online versions of the paper (some are scanned gifs, some are html, and some are pdfs). These days nearly all literature research in astronomy starts with a visit to http://adsabs.harvard.edu/abstract_service.html. In fact, the arXiv database can be queried through ADS, although sometimes it lags by a day or two.

Popular magazine articles do not always make it into arXiv or ADS. Also, sometimes you need a little more information to use arXiv and ADS better. In these cases, more general web searches are useful.

Both arXiv and ADS services have online help. Since one often has to figure out how to accomplish something from existing documentation, you are going to explore these services by yourself. If you get stuck, I will be happy to help you, but I encourage you to put in a good effort first.

Exercises

1. Find an article on arXiv that you think is strongly related to the presentation on black holes. What is it and why do you think it is related? You do not have to read the whole article.
2. Versions of Newton's and Einstein's seminal treatises on gravity are in ADS? What do you think is atypical about these papers? Are there electronic versions available?
3. You have heard that an astronomer named Sivakoff published a paper about a black hole in Centaurus A within the last few years. What is its title? When and where was it published? What is the main point of the paper? List three other papers referenced by this paper. Uniquely list any papers that reference this paper where Sivakoff is not an author.
4. John Wheeler coined the term black hole. The April 2009 issue of Physics Today commemorates some of his contributions to science, including a reprint of a 1971 article he co-wrote as an introduction to black holes. If you are on grounds or have set up your home computer to go through the University's library, you should be able to find an electronic version of the paper. Read it.