Telescope Bibliometrics 101

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ESO Library
esolib@eso.org

STScI Library
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Overview

• Bibliometric Studies
  ‣ What are they?
  ‣ Who is interested?

• Linking Publications and Data
  ‣ Access how and where?

• Telescope Bibliographies
  ‣ Who compiles them? How?
  ‣ Current tools, methodologies, features
  ‣ What’s next?

FPCA-II, Cambridge, MA, April 2010
Bibliometric studies

- Metrics to measure productivity and impact through publications and citations
- Long history (1960ies: Science Citation Index)
- Large number of articles on this topic
## Typical measures

| Measure                                      | Good                          | Bad                          |
|----------------------------------------------|-------------------------------|------------------------------|
| # Publications                              | productivity                  | no impact                    |
| # Citations                                 | impact                        | can be inflated              |
| Mean / median cites per paper               | allows comparison of different ages | rewards low productivity |
| ‘High-Impact Papers’                        | shows trends                  | favors ‘hot topics’           |
| $h$-index                                   | productivity + impact         | determined by years of operation |
## Typical measures

|                | Good                     | Bad                                      |
|----------------|--------------------------|------------------------------------------|
| # Publications | productivity             | no impact                                |
| # Citations    | impact                   | can be inflated                          |
| Mean / Median  |                          |                                          |
| Cites / Paper  |                          |                                          |
| H-index        | productivity + impact    | determined by years of operation         |

*Handle with care!*
Who is interested?

Scientists, management, governing bodies, funding agencies who want to...

- Evaluate performance of telescopes and instruments
- Measure scientific output from observing programs
- Define guidelines for future facilities
- Compare in-house facilities with other observatories and telescopes
- Interconnect resources (Virtual Observatory)

Maximum return of science benefits from observing proposals
Linking publications and data (1)

Access through observatories’ web sites

http://www.eso.org/libraries/publicationlists.html
Example: Chandra
Welcome to the HST Bibliography!
Here you may search the collection of refereed papers that use HST data.

| Field                  | Description                                                                 |
|------------------------|-----------------------------------------------------------------------------|
| Author(s)              | e.g. Smith, J or Smith) To search for more than one author, separate names with ; (e.g. Smith, J; Jones, J) will find Smith, J OR Jones, J |
| First Author only      |                                                                             |
| Title                  | galaxy - Finds titles containing galaxy                                     |
|                        | galaxy, cluster - Finds titles with either galaxy OR cluster                |
|                        | galaxy, +cluster - Finds titles with both galaxy AND cluster                |
|                        | galaxy, -cluster - Finds titles with galaxy but NOT cluster                 |
| Publication Year(s)    | e.g. 2006 or 2006..2007                                                     |
| ADS Journal            | e.g. ApJ (See table)                                                        |
| Abbreviation           |                                                                             |
| HST programs           | c.g. 7387, 8216                                                             |
| Science or Instrument  | Both Science and Instrument papers are selected by default                 |
| paper                  |                                                                             |
| Referred or Not        |                                                                             |
| Refereed               |                                                                             |
| Referred papers Only   |                                                                             |
| Unrefereed Only        |                                                                             |
| GO                     |                                                                             |
| AR                     |                                                                             |
| Part GO; Part AR       |                                                                             |
| Paper type unassigned  |                                                                             |

Example: HST

[Image of HST]
Example: ESO

ESO Telescope Bibliography
Query Form

Description
The Telescope Bibliography is maintained by the ESO library. It contains refereed publications directly using ESO data. For more detailed information, please contact esolib@eso.org.

The checkboxes in front of the parameters define whether or not they will be displayed on the query result page. For more detailed information on how to use this interface, follow the hyperlinked search option labels.

Observation Information

+ Select matching Site--Telescope--Instrument or choose Any

- Site / Archive: Any
  - Pre-2002 La Silla archive papers cannot be combined with specific instruments

- Telescope(s): Any
  - Paranal telescopes from 1999 onwards
  - La Silla telescopes from 1996 onwards

**Instrument(s):** Paranal -- VLT -- SINFONI
  - Paranal instruments from 1999 onwards
  - La Silla instruments from 2000 onwards

- Program ID(s): Any
  - Paranal Program IDs from 1999 onwards
  - La Silla Program IDs from 2000 onwards
Example: ESO

ESO Telescope Bibliography
Query Results

More help on display options.

Define new query

| Paper ID | Author(s) | Title | Journal | Vol. | Pages | Publ | Abstract | BibCode | Instrument(s) |
|----------|-----------|-------|---------|------|-------|------|----------|---------|---------------|
| 38798    | Abaronian, F.; Akhperjanian, A. G.; Barres de Almeida, U. et al. | HESS observations and VLT spectroscopy of PG 1553+113 | A&A | 477 | 481-489 | 2008 | ADS | 2008A&A...477..481A SINFONI | 275.B-5036 |
| 41929    | Alvarez-Candal, A.; Barucci, M. A.; Merlin, F. et al. | The trans-Neptunian object (42355) Typhon: composition and dynamical evolution | A&A | 511 | 35- | 2010 | ADS | 2010A&A...511A..35A FORS2, ISAAC, SINFONI | 178.C-0036 |
Example: ESO

### ESO Observing Programmes

**Define new query**

| Allocation                  | Period | Mode  | Prog ID   | Nights | Programme | Instrument | PI/CoI                                          | Raw Products |
|-----------------------------|--------|-------|-----------|--------|-----------|-----------|------------------------------------------------|--------------|
| 276.B-5036(A), Service Mode, VLT-Yepun | 77     | Service | 276.B-5036(A) | 0 hrs  | DDT       | SINFONI   | Boisson/ Benbow/ Costamante/ Dubus/ Giebels/ McComb/ Pita/ Punch/ Puehlhofer/ Sol/ Wagner/ Ward | FileList     |
| 276.B-5036(A), Service Mode, VLT-Yepun | 76     | Service | 276.B-5036(A) | 5 hrs  | DDT       | SINFONI   | Boisson/ Benbow/ Costamante/ Dubus/ Giebels/ McComb/ Pita/ Punch/ Puehlhofer/ Sol/ Wagner/ Ward | FileList     |

A total of 2 were found matching the provided criteria

**Access to proposal information**
Example: ESO

## ESO Observing Programmes

### 276.B-5036(A), Service Mode, VLT-Yepun

| Period | 77 | Mode | Service |
|--------|----|------|---------|
| Telescope | VLT-Yepun | | |
| Nights  | 0 hrs | | |
| Programme Type | DDT | | |
| Instrument | SINFONI | | |
| PI/CoI | Boisson/ Benbow/ Costamante/ Dubus/ Giebels/ McComb/ Pita/ Punch/ Puehlhefer/ Sol/ Wagner/ Ward | | |
| Remarks | | comment: carry-over DDT | |
| Title | Redshift of the high-frequency peaked TeV gamma-ray emitting blazar 1ES1553+113 | | |
| Abstract | Abstract of proposal | | |

**Raw Products** | FileList
---|---
**Publications** | PublicationList

Request data

Other papers based on same program
Linking publications and data (2)

At the ADS / Filters section

Select References In:
- All Groups
- At least one of the following groups (OR):
- All of the following groups (AND):
  - ARI
  - ESO/Lib
  - HST
  - Leiden
  - ROSAT
  - Subaru
  - CfA
  - ESO/Telescopes
  - ISO
  - LPI
  - SDO
  - USNO
  - CFHT
  - GBT
  - IUE
  - NCSA/ADIL
  - SMA
  - VSGC
  - Chandra
  - Gemini
  - Keck
  - NRAO
  - Spitzer
  - XMM

FPCA-II, Cambridge, MA, April 2010
## Query Results from the ADS Database

Selected and retrieved 62 abstracts.

| # | Bibcode Authors          | Score | Date     | List of Links | Access Control Help |
|---|--------------------------|-------|----------|---------------|--------------------|
| 1 | `2007AJ....134.2118F` Ferrero, P.; Sanchez, S. F.; Kann, D. A.; Klose, S.; Greiner, J.; Gorosabel, J.; Hartmann, D. H.; Henden, A. A.; Möller, P.; Palazzi, E.; and 11 coauthors | 1.000 | 12/2007 | A E F X D R C S U | Constraints on an Optical Afterglow and on Supernova Light Following the Short Burst GRB 070311 |
| 2 | `2007A&A...474..793G` Guidorzi, C.; Vergani, S. D.; Sazonov, S.; Covino, S.; Malesani, D.; Molokov, S.; Palazzi, E.; Romano, P.; Campana, S.; Chincarini, G.; and 23 coauthors | 1.000 | 11/2007 | A E F X D R C S Q U | GRB 070311: a direct link between the prompt emission and the afterglow |
| 3 | `2007A&A...469..503D` Dolcini, A.; Farinelli, F.; Ciprini, S.; Tibaldo, G.; Bongiorno, S.; Frail, G. | 1.000 | 07/2007 | A E F X D R C S Q U | REM near-IR and optical multiband observations of PKS 2155-304 in 2005 |
Prerequisites for telescope bibliographies

- Access to literature
- Semi-automated search tool
- Policy / selection criteria

Data archive

Tags / keywords / programs

Database

Programs

Tags
Prerequisites for telescope bibliographies

And staff!
Who compiles telescope bibliographies?

- 2010 Survey by J. Lagerstrom, STScI Library

Respondents:
CFHT, Chandra, FUSE/Galex/IUE, ESO, Gemini, HST, ING, Keck, NOAO, NRAO, SDSS, Spitzer, Subaru, XMM Newton

- Who does it? How many people are involved?
Which sources?

- 30+ journals listed, only 4 in common

- Print journals
- E-journals (pdfs)
- Journals’ web sites
- ADS abstracts
- Self-reporting

\{ Access to entire text of papers (incl. footnotes, figures, captions etc.) \}

\rightarrow Entire article?
\rightarrow Only title, abstract, selected footnotes
\rightarrow Rely on PIs / authors
Search strategies

• Observatory, telescope, instrument names
• Science programs, surveys, archive names
• Geographic locations
• Concepts

Challenges:

› papers: missing references to obs identifiers
› publisher restrictions for downloading papers
› central full-text search feature at ADS?
Tools of the trade

Full-text search tool (FUSE)

Users: ESO, STScI, Gemini, Subaru, Carnegie Obs. coming soon: IUCAA
Tools of the trade

ESO Telescope Bibliography (telbib)
Tools of the trade

ESO Telescope Bibliography (telbib)

Search telbib

| #  | BibCode          | Author      | Title                                               | Year | Citations |
|----|------------------|-------------|-----------------------------------------------------|------|-----------|
| 1  | 2010ApJ...709..512R | Retorra, Alessandro | Formation Epochs, Star Forming Regions, and Long Period - Short Period Cycle | 2010 | 15        |
| 2  | 2010ApJ...711..731J | Janczak, Julia | Sub-Saturn Planet MOA-20074085 ... | 2010 | 14        |
| 3  | 2010ApJ...708..505K | Kovac, K. | The Density Field of the Local Group ... | 2010 | 12        |
| 4  | 2010ApJ...709..97L | Leauthaud, Alexie | A Weak Lensing Study of X-ray ... | 2010 | 8         |
| 5  | 2010ApJ...708..137M | Merloni, A. | On the Cosmic Evolution of ... | 2010 | 7         |
| 6  | 2010A&A...512A..418 | Bensby, T. | Chemical evolution of the galactic disc ... | 2010 | 6         |
| 7  | 2010A&A...509A..40I | Iovino, A. | The zCOSMOS redshift survey ... | 2010 | 5         |
| 8  | 2010A&A...509A..42V | Vergani, D. | K+a galaxies in the zCOSMOS ... | 2010 | 5         |
| 9  | 2010MNRAS.401.1657L | Lemoine-Busserolle, M. | 2D kinematics and physics ... | 2010 | 4         |
| 10 | 2010A&A...509A..20R | Rycke, N. | Chemical abundances of 11 ... | 2010 | 4         |
| 11 | 2010MNRAS.424S1165 | Ivison, R. J. | BLAST: the far-infrared ... | 2010 | 4         |
| 12 | 2010ApJ...710.1641S | Sumi, T. | A Cold Neutrine-Mass Planet ... | 2010 | 3         |
| 13 | 2010A&A...510A..108P | Patat, F. | VLT spectro polarimetry ... | 2010 | 3         |
| 14 | 2010A&A...509A..111M | Martayan, C. | A slitless spectroscopic ... | 2010 | 2         |
| 15 | 2010A&A...510A..72F | Fedele, D. | Timescale of mass accretion ... | 2010 | 2         |
| 16 | 2010MNRAS.402.724P | Prieto, M. A. | The spectral energy dist ... | 2010 | 1         |
| 17 | 2010A&A...510A..31P | Presotto, V. | SCG0016-4854: a young and ... | 2010 | 1         |
| 18 | 2010A&A...510A..15S | Smoljanic, R. | Berdillium abundances ... | 2010 | 1         |

Users: ESO, NRAO
Statistics / reports

- Basic ESO Statistics
  http://www.eso.org/libraries/
  - Publication + citation statistics
  - ESO and other observatories
  - ESO Top 20
  - Instruments’ pub stats
  - Further reading

- regularly updated
- other reports on demand

FPCA-II, Cambridge, MA, April 2010
What’s next?

• Citations are problematic
  ▸ Incompleteness: listings often incomplete
  ▸ Incorrectness: incorrect citing, multiple journal abbreviations
  ▸ Citing behavior: cite well-known authors, friends citing friends
  ▸ Multi-author papers: self-cites (introduce normalized citation counts?)

• Tracing usage and popularity
  ▸ Reads (ADS)
  ▸ Downloads (arXiv, Citebase)
  ▸ Forum discussions (e.g., CosmoCoffee)
Citations vs. Reads

Title: The morphological identification of the rapidly evolving population of faint galaxies
Authors: Glazebrook, Karl; Ellis, Richard; Santiago, Basilio; Griffiths, Richard
Affiliation: AA(Institute of Astronomy, Madingley Road, Cambridge CB3 0HA, UK ), AB(Institute of Astronomy, Madingley Road, Cambridge CB3 0HA, UK ), AC(Institute of Astronomy, Madingley Road, Cambridge CB3 0HA, UK ), AD(Department of Physics, 3400 North Charles St, Baltimore, MD 21218, USA )
Publication: Monthly Notices of the Royal Astronomical Society, Volume 275, Issue 2, pp. L19-L22.
Publication Date: 07/1995
Origin: MNRAS; KNUDSEN
MNRAS Keywords: SURVEYS, GALAXIES: EVOLUTION, GALAXIES: STRUCTURE, GALAXIES: FORC
Abstract Copyright: (c) 1995 The Royal Astronomical Society
Bibliographic Code: 1995MNRAS.275L..19G

Abstract
The excess numbers of blue galaxies at faint magnitudes are a long-standing cosmological puzzle. We present new morphology from the first deep fields of the Cycle 4 Hubble Space Telescope Medium Deep Survey project. From spiral and irregular/peculiar galaxies to I=22. We find two principal results. First, the elliptical and spiral galaxy co
Citations vs. Reads

Citations history for 1995MNRAS.275L..19G from the ADS Databases

The Citation database in the ADS is NOT complete. Please keep this in mind when using the ADS Citation lists.

Citations/Publication Year for 1995MNRAS.275L..19G

- Unrefereed
- Refereed

Total citations: 174
Total refereed: 154
Citations vs. Reads

Reads history for 1995MNRAS.275L..19G from the ADS Databases

ADS Reads/Year for 1995MNRAS.275L..19G

Total reads: 435
Downloads from Citebase.org

Citebase is currently only an experimental demonstration. Users are cautioned not to use.

The Mass-Metallicity Relation at z ~ 2

Erb, Dawn K.; Shapley, Alice E.; Pettini, Max et al (2006-02-21) oai:arXiv.org:astro-ph/0602473
We use a sample of 87 rest-frame UV-selected star-forming galaxies with mean spectroscopic redshift z = 2.26 to study the correlation between metallicity and stellar mass at high redshift. Using stellar masses determined from SED fitting to 0.3-8 micron photometry, we divide the sample into six bins in ...

Velocity-Metallicity Correlation for high-z DLA Galaxies: Evidence for a Mass-Metallicity Relation?

Leduc, C.; Petitjean, P.; Fynbo, J. P. U. et al (2006-06-08) In ASTRON.ASTROPHYS. 457 71 (2006)
We used our database of VLT-UVES quasar spectra to build up a sample of 70 Damped Lyman-alpha (DLA) or strong sub-DLA systems with total neutral hydrogen column densities of log N(HI)/cm^2 ~ 20 and redshifts in the range...
## Discussions at CosmoCoffee.info

### arXiv papers

Users browsing this forum: None

| Topics | Posts | Views | Last Post |
|--------|-------|-------|-----------|
| Sticky: Posting guidelines | 0 | 3515 | September 24 2004 |
| [1003.1073] The origin of the WMAP quadrupole | 23 | 1952 | April 07 2010 |
| [1004.0221] High resolution spectroscopy of the three dimensional cosmic web with close QSO groups | 0 | 66 | April 06 2010 |
| [1003.4531] Manifestiy Covariant Gauge-invariant Cosmological Perturbation Theory | 3 | 307 | April 01 2010 |
| [1003.3999] Cosmological parameters from large scale structure - geometric versus shape information | 4 | 196 | April 01 2010 |
| [1001.0785] On the Origin of Gravity and the Laws of Newton | 2 | 306 | March 30 2010 |
| [1003.4282] Modelling redshift space distortions in hierarchical cosmologies | 1 | 188 | March 26 2010 |
| [1003.3451] Primordial Non-Gaussianity and the NRAO VLA Sky Survey | 5 | 428 | March 25 2010 |
| [1002.3966] Why all these prejudices against a constant? | 5 | 826 | March 16 2010 |
| [1003.8979] The Data Big Bang and the Expanding Digital Universe: High-Dimensional, Complex and Massive Data Sets in an Inflationary Epoch | 0 | 157 | March 16 2010 |
| [0907.2731] Improved CMB Map from WMAP Data | 2 | 1749 | March 16 2010 |
The origin of the WMAP quadrupole

Authors: Hao Liu, Ti-Pei Li

Abstract: The cosmic microwave background (CMB) temperature maps from the Wilkinson Microwave Anisotropy Probe (WMAP) are of great importance for cosmology. After finding significant systematic in official WMAP maps, we had developed our own map-making software independently of the WMAP team. The new maps produced from the WMAP raw data and our software are notably different to the official ones, and the power spectrum as well as the best-fit cosmological parameters are significantly different too. By revealing the inconsistency between the WMAP raw data and their official map, we pointed out that there must exist an unexpected problem in the WMAP map-making routine. Here we state that the trouble comes from the inaccuracy of antenna pointing direction caused by improper offset of the quaternion interpolation in the WMAP routine. The CMB quadrupole in the WMAP release can be generated from a differential dipole field which is completely determined by the spacecraft velocity and the antenna directions without using any CMB signal. After correcting the WMAP team's error, the CMB quadrupole component disappears. Therefore, the released WMAP CMB quadrupole is almost completely artificial and the real quadrupole of the CMB anisotropy should be near zero. Our finding is important for understanding the early universe.

Discussions at CosmoCoffee.info

[1003.1073] The origin of the WMAP quadrupole

Douglas Applegate

Posted: March 07 2010

These authors have been quite busy reprocessing the WMAP data. I noticed that some of their last papers have also been posted on Cosmo Coffee for comment.

In this paper, the authors hit on a small, but they say crucial, difference between the official analysis and their analysis. Basically, the telescope pointing is off by half a pixel (interesting amount), and thus the quadrupole is mis-measured.

Putting aside the hard question of correctness, is it plausible that an incorrect model for the telescope pointing would result in a mis-measured quadrupole?

Boud Roukema

Posted: March 09 2010

Bennett et al 2003 arXiv:astro-ph/0302207 give 3.3mK for the dipole.

\[
\sin(\theta) \times 3.3\text{mK} = 0.002 + 3.3\text{mK} = 6.7\mu K
\]
Ongoing projects

• Further metadata from the ADS:
  ‣ Subject terms / keywords
  ‣ Full info re. citations (to eliminate self-cites)
  ‣ All available links (DOI, ePrintID etc.)
  ‣ Author gender (in collaboration with AuthorID projects?)

• Additional internal links:
  ‣ Authors’ acknowledgments of observing time
  ‣ Fully link telbib records and ESO Press Releases
  ‣ Gather information on publication delay
Thank you