

Astronomical Data Archives & Catalogs

Habib Khosroshahi

What's in the data archives?

- Raw science frames
- Calibration files ?
- Not necessarily what you need, observing condition ...
- Pre-processed science frames
- Be VERY CAREFUL when trying to do measurements

Astronomy data archives

http://www.dmoz.org/Science/Astronomy/Data_Archives/

- [Centre de Données astronomiques de Strasbourg](#) [★] - (CDS) Astronomical databases, bibliography
- [NASA Extragalactic Database](#) [★] - (NED).
- [AAVSO International Database](#) - Over 10 million variable star estimates dating back over 100 years.
- [ADC: Astronomical Data Center](#) - NASA's ADC is a resource for astronomical data, catalogs, and *y*
- [The Aladin Sky Atlas](#) - Provides an interactive sky atlas allowing users to visualize digitized images, catalogs, personal user data files, and interactive access to related data from the Simbad database, and
- [Astronomical Data Archives Center](#) - Data from the National Astronomical Observatory of Japan. Its services, and journals.
- [Astronomy Data Archives](#) - Patrick Shephell's Astronomy Resources. Contains data archives, astron and links.
- [Astronomy Picture of the Day Archive](#) - Daily archive of interesting astronomy photos by NASA.
- [AstronomyNook](#) - Contains astronomy data, news, images, information, and downloads.
- [Byte-O-Matic NED Astronomical Information Archive](#) - Offers information services, and archiving o
- [Cambridge Astronomical Survey Unit](#) - Contains information on the PDS and APM microdensitometer archives, and processing center.
- [Canadian Astronomy Data Centre](#) - Contains digitized sky survey, IUE archive, star catalogs, and list
- [CASU Astronomical Data Centre](#) - Data center that is part of the Cambridge Astronomy Survey Unit ground based telescopes. Includes archives, and catalogs.
- [CATS Database](#) - Astrophysical CATALOG support System. Contains list of catalogs, table of major r
- [CFHT Archive](#) - The Canada-France-Hawaii Telescope Archive. Includes CFHT archives, images, l
- [DARTS](#) - A database to provide access for general researchers to observation data about solar, ultrap observation satellites of ISAS. Includes related resource links.
- [2dF Galaxy Redshift Survey \(2dFz\)](#) - An Anglo-Australian collaboration surveying 740 square degrees -

CDS



CDS online services

The 3 main services

CDS



SIMBAD



Simbad:
Astronomical
objects

The Simbad database
contains information for
more than 3,600,000
astronomical objects

<http://simbad.u-strasbg.fr>

SIMBAD

This screenshot shows the SIMBAD search results for the query 'MS'. A yellow box highlights the search input field with the text 'Specify a target'. Another yellow box points to the 'MS' search term. A red bracket on the right side of the results table groups the first few rows under the label 'Basic data'. A larger red bracket below it groups the entire table under the label 'All identifiers'.

This screenshot shows the SIMBAD search results for the query 'NGC 5904'. A yellow box highlights the search input field with the text 'You get...'. A red bracket on the left side of the results table groups the first few rows under the label 'Basic data'. A larger red bracket below it groups the entire table under the label 'All identifiers'. Below the table, a red arrow points to the text 'and !'. To the right, a larger window displays a detailed view of the object, including a grayscale image of a spiral galaxy (NGC 5904) and a sidebar with additional data and links.

You get

Links to images and field charts

Bibliographical references

Jump to one of them


Light charts

Bibliographical references

Measurements

NASA/IPAC EXTRAGALACTIC DATABASE

- Over 28.4 million objects and 14.8 million cross-IDs now in NED!
- Data for ~200,000 objects linked to 1440 new publications!
- Spectra and Images from the first release of SINGS
- Other Updates, Contents and Capabilities
- Features



OBJECTS	DATA	LITERATURE	TOOLS	INFO
By Name	Images By Object Name or By Region	References by Object Name	Coordinate Transformation & Extinction Calculator Velocity Calculator	FAQ Introduction
Near Name	Photometry & SEDs	References by Author Name	Constants Calculators Extinction-Law Calculators	Features Graphical Overview
Near Position	Spectra	Text Search	FTP	NED Source List
Advanced AB-Sky	Redshifts	Knowledgebase	X/Y offset to RA/DEC	Team
IAU Format	Positions	Distances	Batch Job Submission	Comment
By Refcode	Notes	Abstracts	Pick Up Batch Job Results	Web Links
	Diameters	Thesis Abstracts	Skyplot	Glossary & Lexicon

Database last updated: 31 Mar 2009

- 28.4 million objects
- 14.8 million references through object cross-IDs
- 140 thousand associations (including cross-IDs)
- 1.2 million spectra
- 740.3 million photometric measurements

Database last updated: 28 Mar 2009

- 4.2 million literature measurements
- 1.0 million objects linked to 1440 selected journal articles
- 0.3 million images, maps and external links
- 40 thousand notes
- 45 thousand abstracts
- 50 thousand spectra

If your research benefits from the use of NED, we would appreciate the following acknowledgement in your paper: This research has made use of the NASA/IPAC Extragalactic Database (NED) which is operated by the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration.



- Check if the measured flux / magnitude / velocity ... are within the radius you want or using the method you want!
- These measurements are probably done by someone like yourself. Do you trust?

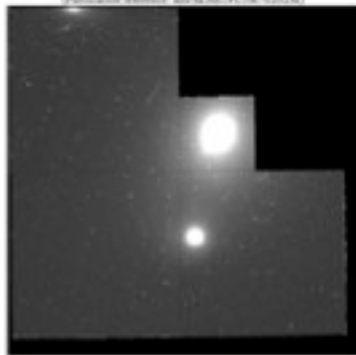
7	V (Johnson)	13.37	...	mag	5.42E+14	1.63E-02	...	Jy	Broad-band	20.0
8	V (Johnson)	12.79	...	mag	5.42E+14	2.79E-02	...	Jy	Broad-band	35.2
9	V (Johnson)	12.82	+/- 0.02	mag	5.42E+14	2.71E-02	+/- 5.04E-04	Jy	Broad-band	30.1
10	V (Johnson)	12.22	+/- 0.02	mag	5.42E+14	4.71E-02	+/- 8.76E-04	Jy	Broad-band	72.4
11	V (Johnson)	12.43	+/- 0.02	mag	5.42E+14	3.88E-02	+/- 7.22E-04	Jy	Broad-band	55.0
12	V (Johnson)	12.76	+/- 0.02	mag	5.42E+14	2.87E-02	+/- 5.33E-04	Jy	Broad-band	37.6
13	V (Johnson)	13.39	+/- 0.02	mag	5.42E+14	2.10E-02	+/- 3.89E-04	Jy	Broad-band	25.0
14	V (Johnson)	13.34	+/- 0.02	mag	5.42E+14	1.40E-02	+/- 2.60E-04	Jy	Broad-band	15.7

MAST

<http://archive.stsci.edu/>

Preview for U3M70202M

(Publication reference: [ads/58874/10M70202M](#))



Preview calibrations are uncertain so preview data should be used for diagnostic/quick-look purposes only.

[Preview in FITS format](#) [More preview format options](#)

Exposure Information

Target Name: NGC741

Observation Date: Jul 8 1997 8:28PM

Instrument: WFPC2

What is the Virtual Observatory... and what it is not...

A set of international standards to share complex data
A modular set of tools to work with distributed data
A simple environment to publish data to
An essential part of the research astronomer's toolkit
A catalyst for world-wide access to astronomical archives
A vehicle for education and public outreach



A replacement for building new telescopes and instruments
A centralized repository for data
A data quality enforcement organization



Astronomical Surveys

Why surveys?

- Produces statistical samples
- Economic and efficient
- Multi-purpose
- Uniform data and reduction
- Link to Virtual Observatory
- Service to community

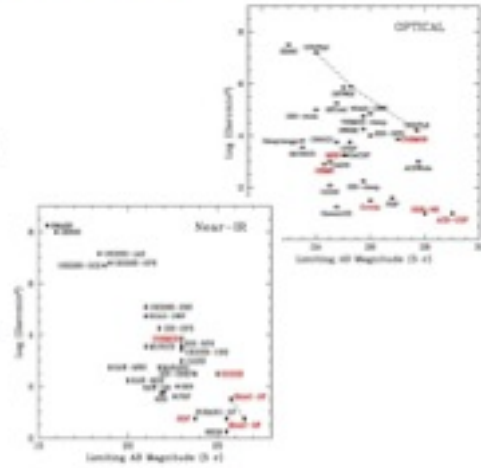
Optical surveys

Large area surveys

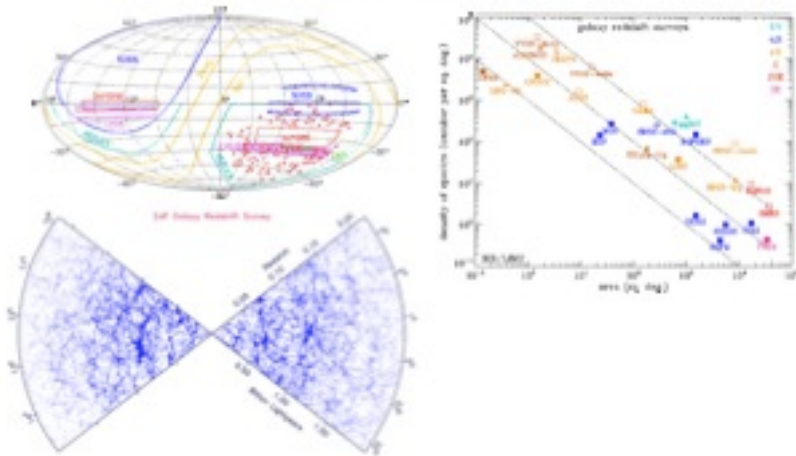
SDSS, 2MASS, UKIDSS (various),
UKDS, VISTA, PanSTARRS, EIS-WIDE,
2dFGRS, 6dF, CFHTLS, INTWFS,
NOAO-DWE, DENIS

Deep Surveys

COSMOS, GOODS, GEMS, HDE,
ACS-UDF, EIS-DEEP, MDS, KECK,
ISAAC-DF, EES, FDF



Galaxy redshift surveys



SDSS

<http://cas.sdss.org/1/Star/sets/quicklook/quicklook.asp>

SDSS

Summary

More Data

Search by

Notes

Printing Chart

Print

Help

Summary data for: SDSS J113458.47+022508.1

Position Data (How do I find it?)

Object ID	Right ascension (J2000)	Declination (J2000)
SDSS J113458.47+022508.1	173.74787788	2.419221916

Image Data
(What does it look like?)

Preview image (click to go to Navigator tool)



Object Type (Name): GALAXY

Magnitudes:

Filterband (ID)	Magnitude
Uband (U)	16.85 ± 0.03
Gband (G)	16.84 ± 0.01
Rband (R)	17.55 ± 0.01
IRband - 7500 Å (Z)	17.30 ± 0.01
IRband - 8500 Å (J)	17.74 ± 0.02

Spectrum Data
(What does its spectrum look like?)

Preview spectrum (click for a larger window)



Spectral Classification (SuperClass): ST14

Redshift (z): 0.01962 ± 0.00004

[Get spectrum in CSV](#)

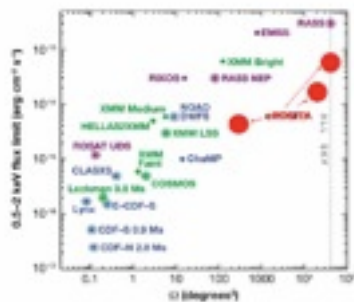
X-ray surveys

Large Area Surveys

ROSAT All Sky Survey, XMM-Bright, EMSS, eROSITA

Deep Surveys

XMM-LSX, CDF, COSMOS, Chandra ROSAT-UDS





Radio Surveys

NRAO VLA Sky Survey (NVSS) 1.4GHz

VLA Low-frequency Sky Survey (VLSS) -30 deg declination at 74 MHz with 80 arcsec resolution

The Westerbork Northern Sky Survey (WENSS) covering the 3.14 arc north of +30 deg declination at 326 MHz with 54 arcsec

The VLA high-resolution (5 arcsec FWHM) 1400 MHz survey covering the north Galactic cap. The FIRST survey (for Faint Images of the Radio Sky at Twenty-cm) yields very accurate (<1 arcsec rms) radio positions of faint (>1 mJy/beam) compact sources.

The Green Bank GB6 survey covering the 6.1-arc declination band between 0 deg and +75 deg at 4850 MHz with 3 arcmin resolution.

The corresponding 4850 MHz survey in the southern hemisphere is the Parkes-MIT-NRAO (PMN) survey made with the Parkes 64 m telescope.



Exercise I

- 1) How many galaxies are in the "New Galaxy Catalog" (NGC)?
- 2) Concentrate on Dec = -45 to -40.
- 3) Choose galaxies brighter than 13 mag in B-band and say which one of those don't have existing optical data (visible) from space.
- 4) Select the faintest galaxy. Estimate the local density around the galaxy and describe the system, i.e. part of a more massive system, galaxy cluster or super cluster. Is this galaxy isolated? If relevant, plot the velocity distribution of the galaxies in this system.
- 5) Study the multi-wavelength properties of this system. What observations and measurements are available. What can you say about the AGN activity, star formation history of the galaxy and IGM properties of this system? Use *dalí* or other tools to support your argument.
- 6) Describe the galaxy, color, morphology, etc. using SDSS images.
- 7) Obtain the 2 mass J-band data and obtain the isophotal shapes of the galaxies, obtain a smoothed model and a residual (limit the number to 3 galaxies).