What is NED?

NED is the world's largest database of cross-correlated multiwavelength data for extragalactic objects. NED provides a portal into a systematic fusion of information integrated from hundreds of large sky surveys and tens of thousands of research publications. The contents and services span the entire observed spectrum from gamma rays through radio frequencies. As new observations are published, they are cross-identified or statistically associated with previous data and fused in a unified database to simplify queries and retrieval. Seamless connectivity to relevant data in NASA's astrophysics mission archives (IRSA, HEASARC, MAST), ADS, and other data centers around the world are also provided based on cross-identifications in NED.

Objects can be queried *By Name, Near Name or Near Position* (cone search), *By Reference*, and *By Author. By Parameter (Advanced All-Sky)* queries utilize joint constraints on *Redshift, Sky Area, Object Types, Survey Names, or Flux Density (Magnitude)* to construct galaxy samples. The *LEVEL5 Knowledgebase* provides review articles in extragalactic astrophysics and cosmology with object names and graphical content within the articles linked directly to relevant database queries. Queries may be submitted via Web browser, email batch forms, and remote computer programs or scripts.

Holdings as of January 2009

- *163 million objects*
- *170 million multi-wavelength Cross-IDs*
- *188 thousand object Associations*
- *1.4 million Redshifts*
- *1.7 billion Photometric measurements*
- *609 million detailed Diameter measurements*
- *5.0 million objects linked to 68 thousand journal articles*
- *2.3 million Images, maps and external links*
- *54 thousand Spectra*
- *65 thousand object Notes*
- *45 thousand journal article Abstracts with links to related objects*

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Image Credits

AM 1633-682 (this panel): NASA, ESA, and A. Evans (U.Virginia, Charlottesville/NRAO/Stony Brook University)

Sombrero Galaxy (left panel): NASA/JPL-Caltech/R. Kennicutt (University of Arizona) and the SINGS team

MACS J0025.4-1222 (front panel): X-ray (NASA/CXC/Stanford/S.Allen); Optical/Lensing(NASA/STScI/UC Santa Barbara/M.Bradac)

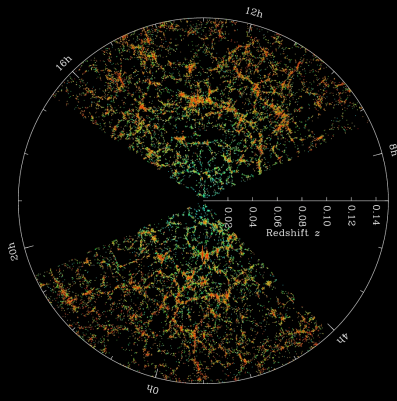
NASA/IPAC Extragalactic Database

January 2009

What's New with NED?

NED Grows From 10 Million to Over 163 Million Objects

As our infrastructure and data management processes continue to evolve, NED is scaling up to handle modern sky surveys containing hundreds of millions of objects. The first extremely large data set to be integrated into NED involves 154 million objects from the Sloan Digital Sky Survey (SDSS) Data Release 6 (DR6) photometric catalog. These are a subset of the 217 million objects in DR6 selected using "Clean sample" filters recommended by the SDSS project; this includes objects with status Primary and excludes Family objects (de-blended by the pipeline into fainter Primary components) and also excludes repeated Secondary observations. Whenever possible, SDSS objects have been cross-matched to objects in the previous version of NED (which had ~10 million objects total, including ~4 million objects within the SDSS footprint) using our standard position- and data-matching procedures.



Slices through a 3-D map of the distribution of galaxies in the SDSS. Credit: M. Blanton & the SDSS

With over 1.7 billion detailed photometric measurements (PSF, Model and CModel magnitudes for in five bands for galaxies), and hundreds of millions of diameter and position measurements (as well as crucial flags from the pipeline processing), SDSS has expanded NED's tabular database volume by a factor of ~200.

The new SDSS information in NED includes:

- The establishment of multiwavelength cross-identifications with previous observations from tens of thousands of catalogs and journal papers. These initial Cross-IDs and Associations between SDSS objects and other objects in NED will be refined in future updates.
- Basic Data, including representative g-band magnitudes, positions, and classifications
- Position measurements in the r band
- Size measurements in the r band using 4 methods: Isophotal, Petrosian, de Vaucouleurs, and Exponential
- Photometric measurements in all 5 bands [ugriz], each with 3 methods (PSF, Model, CModel) for extended objects and with one method (PSF) for point sources have been folded into NED's SEDs
- Links to SDSS SkyServer for detailed pipeline processing flags, spectra and images for each object.

User Interface Enhancements

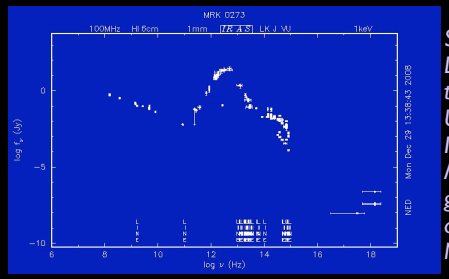
- Object searches now include the ability to change the cosmological parameters used to calculate Hubble distances and other Derived Quantities, including a short-cut to select high precision parameters from the recent Five-Year WMAP results (i.e., H_0 = 70.5 +/- 1.3 km s^{-1} Mpc^{-1}; Hinshaw et al. 2009, ApJS, in press;

  http://arxiv.org/abs/0803.0732).
- Result tables returned by object searches now include magnitudes and filter codes, where appropriate.
- The Advanced All-Sky (By Parameters) search includes Spitzer IRAC and MIPS, SDSS, and GALEX filters among the photometric constraints.
- For further details and updates, please visit

  http://nedwww.ipac.caltech.edu/help/whats_new.html

Coming Attractions

The January 2009 NED release includes DR6 objects that have either no counterparts among objects previously in NED, or generally reliable cross-identifications with objects previously in NED based on observations across the EM spectrum. However, hundreds of thousands of SDSS objects have been determined by our cross-comparison software to be possible matches with other objects in NED. In addition, there are many cases in which multiple SDSS objects are associated with observations with lower resolution (e.g., radio, UV, or X-ray surveys). Such one-to-one and one-to-many relationships are being folded into NED as Associations.



Spectral Energy Distribution of the Ultraluminous Infrared Galaxy Mrk 273 generated dynamically by NED.

The Master List of Galaxy Distances (NED-D) is currently available exclusively through LEVEL 5: A Knowledgebase for Extragalactic Astronomy and Cosmology (http://nedwww.ipac.caltech.edu/level5/NED1D) as tabular lists. Work is underway to incorporate these data into NED directly such that galaxy distances measured from methods other than redshift (Hubble flow), when available, will be displayed in the database query reports.

Morphological and spectroscopic *Classifications* for galaxies, along with other observed and derived galaxy *Attributes*, are being input into the database with references and metadata such as the observed bandpass and region of interest. Updates to the database and user interface throughout 2009 will provide fully qualified *Classifications* in object query reports, and enable the construction of galaxy samples based on *Attribute* filters such as nuclear spectral types and morphological classes.

Data from the current literature and new sky survey catalogs are being incorporated on an ongoing basis.