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CDS Services; recent Developments

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Abstract. The services presented by the Centre de données astronomiques de Strasbourg (CDS) are demonstrated: Simbad, the reference database for nomenclature and bibliography of astronomical objects, the VizieR catalogue browser, the Aladin image server, the CDS bibliographical services and the Dictionary of Nomenclature.

Recent developments include links from Simbad and VizieR to images of the sky (Aladin), links to external data archive and services (IUE, HEASARC, NED), a new implementation of the resource discovery service AstroGlu. A tool to query and check the service profiles, and a XML formatting for data exchange will also be shown.

1. Introduction

The Centre de Données astronomiques de Strasbourg (CDS) has been providing database services to the the astronomical community for more than 25 years (`http://cdsweb.u-strasbg.fr`).

Several databases and services are developped and maintained at CDS:

- **Simbad** is the reference database for astronomical objects (Wenger et al. 2000) – `http://simbad.u-strasbg.fr/`
- **VizieR** is the catalogue database (Ochsenbein et al. 2000a) `http://vizier.u-strasbg.fr/`
- **Aladin** gives access to images of the sky from several origins (Bonnarel et al. 2000) – `http://aladin.u-strasbg.fr/`

All these services are accessible through the CDS web interface, together with documentation, the Nomenclature Dictionary, Yellow Page services, bibliographic data, etc.

Another common characteristic of all these services is their interconnectivity, with the other CDS services, and also with remote services, weaving a web which allows, in a few mouse clicks, to navigate from the pixels of a galaxy to its bibliography and the corresponding full text or to its IUE spectra.

These different databases and the navigation possibilities among them are shown in action in the demos.

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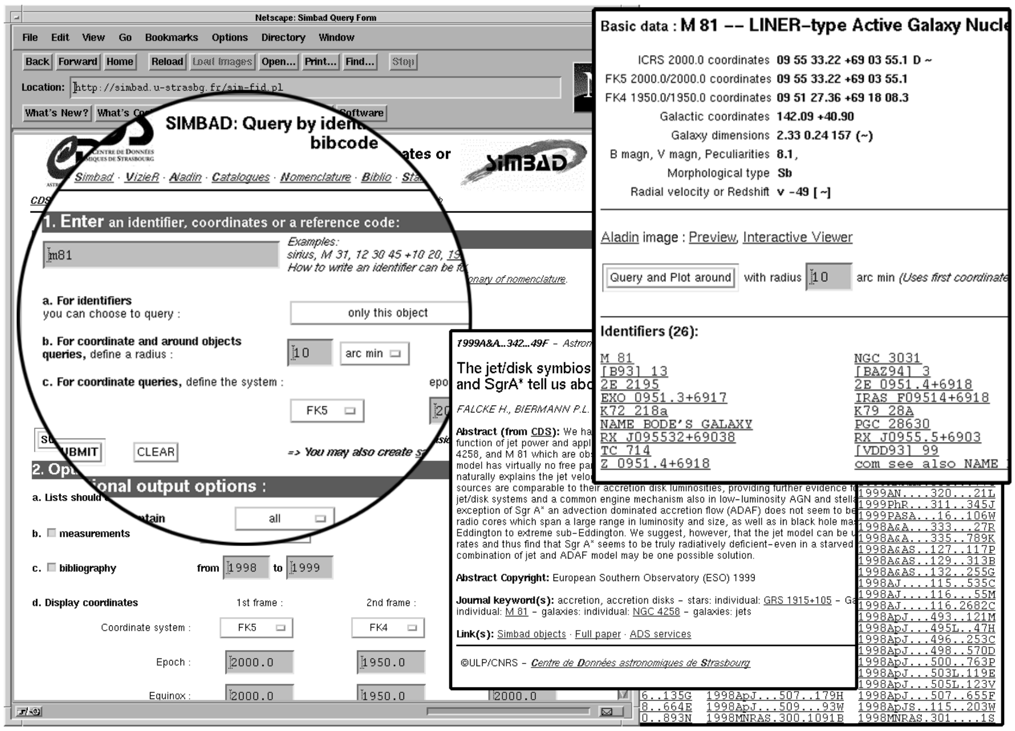

Figure 1. Simbad object database.

2. Navigation from Simbad

The Simbad database gathers data for more than 2,500,000 astronomical objects. It can be queried by identifiers, coordinates or different criteria based on the basic data (Figure 1).

For instance a query by coordinates brings up a page containing the list of corresponding objects. This set of objects can be plotted, and each object can be queried by itself, displaying all its data:

- The basic data, where a button can again bring the neighborhood of this particular object,
- Tll known identifiers, which are displayed as a link to the dictionary of nomenclature, giving all information about a particular catalogue,
- Selected measurements. For IUE, Simbad offers a link to the spectra provided by the INES database at Vilspa (`http://ines.vilspa.esa.es/`),
- Access to external archives when relevant: currently, objects observed in high energy wavelengths are linked to the HEASARC databases (`http://heasarc.gsfc.nasa.gov/`),
- Bibliographical references: bibcodes, abstracts from CDS or ADS and direct links to the ADS facilities and the full papers at the editor's site, or at ADS (`http://ads.harvard.edu/`).

By a simple click, the user can also access an image of the current object, either through the Aladin previewer, or through the much more powerful Aladin Java Applet (see below).

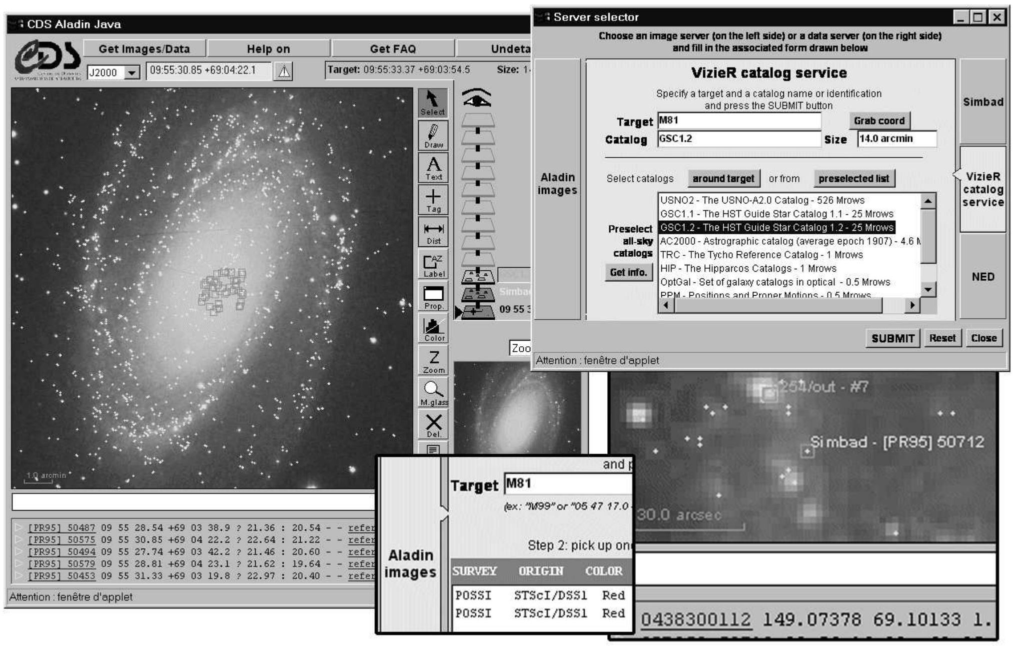

Figure 2. Aladin image database.

3. Navigation from Aladin

The Aladin Java Applet is primarily an image displayer (Figure 2). Most of these images come from the Aladin server itself. It has also access to different catalogue sources, namely SIMBAD, NED (`http://ned.ipac.caltech.edu`) and especially VizieR with about 1300 catalogues with coordinates, including very large reference catalogues such as the USNO A2.0. Objects from these catalogues can be overlayed on the images for identification purposes, also across wavelengths. Several other tools allow to compute angular distances, to draw an outline of extended objects, which will automatically be redrawn with the right scale and rotation on another image, to add the user's own labels, and so on.

From the objects overlayed on an image, it is possible to access the original data in the catalogue or the database and observation logs may allow the loading of archive images, or access to the remote data archive.

The Aladin Java application will also be distributed as a standalone application, allowing the possibility of using the user's own images, provided their FITS header contains the World Coordinates System (WCS) entries, and of overlaying the user's own catalogue data on images provided they are TSV (Tab Separated Value) formatted.

4. Navigation from VizieR

The VizieR database allows to query any of its 2400 catalogues and to select objects according to criteria set on any field of the catalogue (Figure 3).

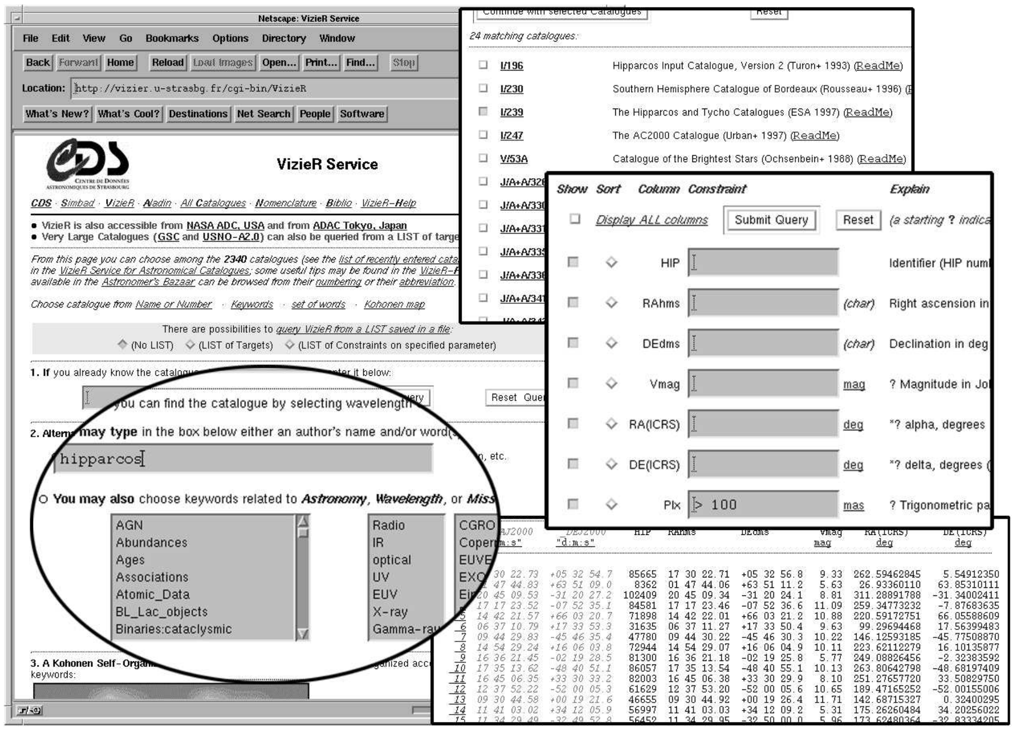

Figure 3. VizieR catalogue database.

The first step consists in finding the right catalogue among all the available catalogues. Criteria like the catalogue number, author name, keyword, selection of wavelength or mission are available, or a selection facility based on a Kohonen map (Poinçot et al. 1998).

Once one or several catalogues are selected, VizieR displays a form allowing to set criteria on any common field in these catalogues. The final result is a set of rows extracted from the catalogues.

Several links to Simbad objects or remote archive (IUE, FIRST/VLA: `http://sundog.stsci.edu/`) already exist. The description of every catalogue contains also many links, mainly to the basic papers describing the catalogue or other related catalogues, but also to external databases when relevant.

VizieR output comes in HTML or in TSV format with standardized description in well-formed XML.

References

Wenger, M., et al. 2000, A&AS, to be published

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Poinçot, P., et al. 1998, A&AS, 130, 183