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INTEGRATION OF THE HYPERLEDA DATABASE IN THE VIRTUAL OBSERVATORY

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Abstract. HyperLeda is an extragalactic database aimed to study the physics of the galaxies and of their distribution in the Nearby Universe. It contains original compilations of measurements published in the litterature and in the large surveys. They are used to produce a uniform and homogeneous catalogue with multi-wavelength information on galaxies. Beside offering an astronomer-friendly web interface, HyperLeda complies to the standards of the Virtual Observatory in order to be interoperable with other tools, in particular Aladin, and databases.

HyperLeda is available through 8 mirror interfaces and maintained automatically.

1 Motivation

Since several large datasets of unprecedented homogeneity, became available, the motivation for multi-mission, or multi-wavelength studies got a new impetus.

Actually, compiling various sources of information from the litterature and from surveys has been the basic recipe for producing the very successful reference catalogues of galaxies: RC1 (1964), RC2 (1976), RC3 (1991) by de Vaucouleurs and collaborators, and later the HyperLeda database. Although, the methods evolved constantly, the recent change is a complete revolution. Still, however, the scientific expertise for this multi-mission approach remains in the center.

In order to study the physics of galaxies (scaling relations) and their distribution in the Local Universe, surveys and catalogues must be combined to derive accurate description of the galaxies. For this purpose, HyperLeda will produce the RC4 containing in particular homogeneous estimates of distances, masses and classification (morphological, spectral and activity). The steps toward this goal are:
- Accessing the data:
The new tools, and in particular the Virtual Observatory, make the access to the data considerably easier and their description also improved. Therefore, the tasks of ingesting data in a database becomes lighter.
-Cross-identifying astronomical sources:
The first problem is to recognize the same objects throughout the whole collection of catalogues. This can be greatly automatized, but still require important scientific expertise, in particular when various wavelength domains are concerned.
- Homogenizing the data:
To build volume limited samples, data from various origin (surveys, missions, litterature) must be assembled. They come from various telescopes, various methods and cover different regions of the galaxies. These heterogeneous data must be rescaled to a common system, and all the measurements available for a given object has to be combined to produce the best indicators of the physical parameters. The strength and uniqueness of HyperLeda is to carefully homogenize the data collected from the literature and from large surveys over a large range of wavelengths.

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2 Using the VO

The Virtual Observatory already provides very valuable tools helping in all this process. First of all, the standardization of the format (VOTable) allows a uniform access to any tabular data, avoiding the need for ad'hoc procedure to read a particular catalogue.

The other important contribution of the Virtual Observatory is the description of the content of a table (using UCDs). The ingestion program of HyperLeda heavily rely on the UCDs generated from the field descriptions (using a webservice from CDS) to identify relevant data and associate them with the content of the database.

2.1 Implementation

The HyperLeda users interface is build using Pleinpot which integrates the Virtual Observatory standards and protocols. Therefore, the usage in the frame of the VO is straightforward. The outputs of HyperLeda, catalogues, spectra or images, are VO compatible and can be accessed from other services. For example, Aladin can be used to display a given selection in HyperLeda overlayed to an image, and possibly combine with other catalogues.

2.2 Capabilities of the user interface and the software

The web interface of HyperLeda is, **http://leda.univ-lyon1.fr**. It answers all the classical astronomical queries (see Vauglin et al. in this volume for a detailed description of the site). We invite you to visit it to realize by yourselves its larges capabilities.

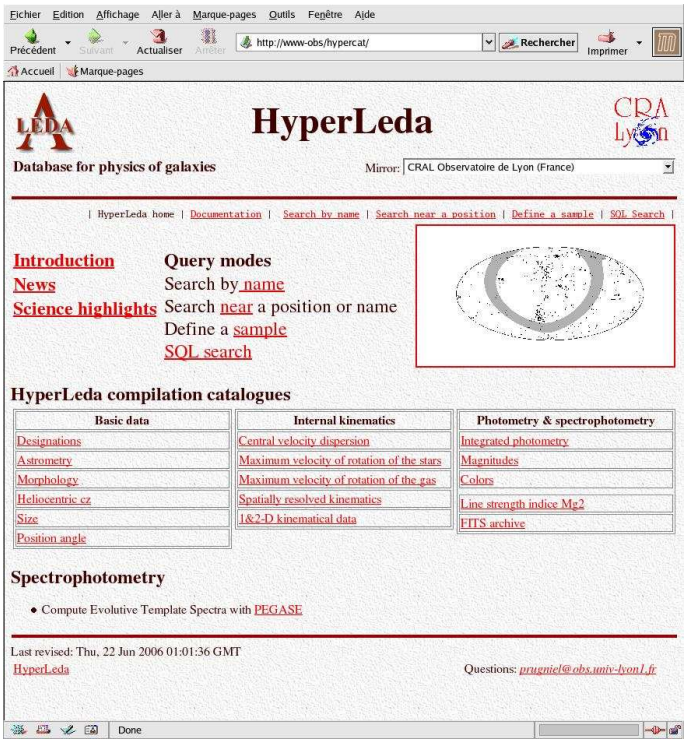

Fig. 1. HyperLeda home page

References

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