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Galactic Globular Clusters Database: a progress report

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Abstract. The present status of Galactic Globular Clusters Database is briefly reviewed. The features implemented at the time writing are described, as well as plans for future improvements.

Key words. Galaxy: globular clusters – Astronomical data bases: Catalogs

1. Introduction

The Galactic Globular Clusters Database (briefly, *Gclusters*) [1] is focused on presenting, in an organized way, a comprehensive list of bibliography, parameters and data for each of the known globular cluster of the Milky Way (GGCs). The need for a rational and organic assembly of these data is well described in a famous paper (Harris 1996):

"The globular clusters in the Milky Way have proven throughout this century to be fundamental objects in an amazingly wide range of astrophysical studies... Year after year, it has proven important to have readily available up-to-date lists of parameters for these unique objects."

After more than ten years, these words appear even more true: the amount of available data on GGCs has increased at a steady rate, following closely the enhanced capability of the technical instrumentation. Not only we have new and more reliable parameters for a great part of the known clusters, but - thanks to modern surveys conducted in bands different from the visible one, such 2MASS Skrutskie et al. (2006) - several other objects keep going to increase our list of Milky Way clusters (e.g., Froebrich et al. 2007; Bonatto et al. 2007). However, such data are inevitably scattered among the various papers, so what is needed is a simple way to have the relevant informations on a given cluster in a single source.

The Harris' catalogue of GGCs [2] is surely an unique resource for the researchers, in what it provides an extensive list of parameters for all the GGCs known at the time of its last revision (Feb. 2003): such a compilation is accessible online and is composed by tables of parameters available in form of flat text files.

Initially built around the Harris' compilation, *Gclusters* is designed to allow a more flexible fruition of available data, so to make possible things such as ordering clusters according to the value of a given parameter, select objects whose parameters fall in a given interval, display related bibliography and colour

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[1] http://snipurl.com/gclusters

[2] http://snipurl.com/gclusters2

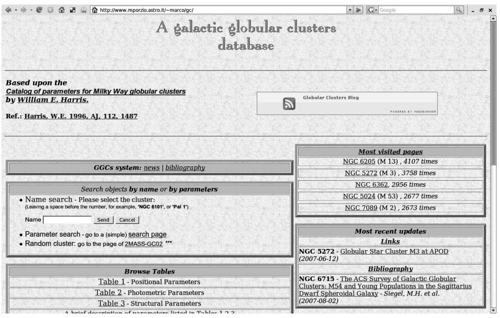

Fig. 1. The main page of the Gclusters

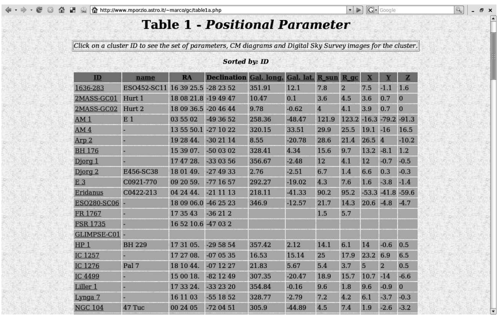

Fig. 2. Listing "positional parameters" of the clusters (Gclusters' Table 1)

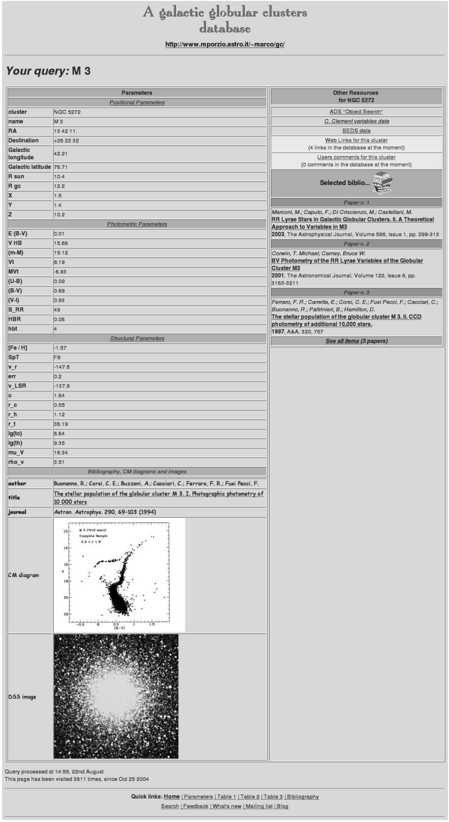

Fig. 3. The webpage for M3

magnitude diagrams, or even drop a note pertinent to that cluster, to be displayed in the website. Data are collected from a growing number of sources, such as NASA Astrophysics Data System (ADS), Clement's variable stars [3] pages, related websites, etc...

2. A quick tour on *Gclusters*

Documentation available for a given cluster is gathered in one page for the user's commodity. For example, typing "M 3" (one of the most popular cluster in the database, according to the access counts) in the search box, you obtain the output shown in Fig. 3

In this page, you can browse the whole list of parameters available for the cluster, together with a colour magnitude diagram and a Digital Sky Survey image. On the right columns, you can find links to other related resources available on the web, as well as a direct access to selected bibliography and NASA ADS search results.

The list of clusters are also conveniently divided into three tables that mimic the division made by Harris (see Fig.2 for a partial view of Table 1), plus one table of "essential" bibliography. Clusters in each of the three tables can also be sorted according to the value of one of the listed parameters.

It is also possible to obtain list of clusters whose parameters match some given criteria. Let's say that, in order to complete your (fundamental) paper, you need to know (quickly) what are the globular clusters that have metallicity greater than [Fe/H]=-1.6 and present a V magnitude of *Horizontal Branch* less than 15. Filling the *search page* with your data, you obtain a output a page with the list of the eight

[3] http://snipurl.com/gclusters3

clusters that match your requirements. A wide combination of searches are possible.

3. Technical info & statistics

This project is developed with Open Source software; specifically, it is a plane *"LAMP" application* [4] In particular, storing the parameters in form of tables of a *relational database* instead of plane text files, makes possible to use them in a much more flexible way: searches, ordered listings, and other queries on the data can be performed easily from the Gclusters website. Adding new data and putting them in relation with existing data is also a straightforward procedure.

For what concern the number of connections to the website, taking as example a period starting from May 15 and ending to June 15, Gclusters website collected a total of **3832 page views**, corresponding to **1171 different visitors** (source: *Google Analytics*). The day of maximum of page view is June 9, with a total of 493 visualized pages: as inspection of the logs revealed, it was the effect of having been linked from the NASA "Astronomical Picture Of the Day" (APOD), which on the same day presented a nice image of the globular cluster M3 [5]. The major number of visits for the quoted month came, in decreasing order, from United States, Italy, Canada, Brazil and United Kingdom.

4. Open to the scientific community

It is possible to collaborate to the project at a wide range of "levels", from pretty scientific tasks (such as insertion of new data and bibliographic items) to fairly technical ones (mainly HTML and PHP coding); anyway, even the availability to simply "test" new pages could be precious for the developments of new features! Note that the nature of the project make easy an Internet based collaboration: people interested are warmly invited to contact me by Email.

[4] http://snipurl.com/gclusters4
[5] http://snipurl.com/gclusters5

5. Future developments

Admittedly, several branches of the project are still under developments. Updated info on the status of the project can be found on the related blog [6]. A list of possible improvement includes: *(a)* insertion in the database of additional data compilations: for instance, dynamical data (e.g., Aguilar et al. 1988); *(b)* possibility to perform complex queries to select clusters that combine any range of given condition; possibility to refine searches; *(c)* availability of a wider collection of CM diagrams and of a more complete bibliography. *(d)* insertion of data (periods, magnitudes...) for variable stars (e.g., Castellani et al. 2003); *(e)* development of (hopefully) *smart* procedures for easy display and retrieval of relevant "row data" from main scientifical archive (e.g., ESO, HST...). Recently, a connection was established with people of the WEBDA Open Cluster Database [7], to explore the possibility of realizing a common environment for both the databases,

A dedication

Gclusters is dedicated to *Vittorio Castellani*, who passed away in May 2006.

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[6] http://globularclusters.wordpress.com
[7] http://www.univie.ac.at/webda/