*Astronomical Data Analysis Software and Systems IV*
*ASP Conference Series, Vol. 77, 1995*
*R. A. Shaw, H. E. Payne, and J. J. E. Hayes, eds.*

# GUIDARES: Reading the Guide Star Catalog in Very Many Ways

O. Yu. Malkov, O. M. Smirnov

*Institute of Astronomy of the Russian Academy of Sciences, 48 Pyatnitskaya Str., Moscow 109017 Russia*

**Abstract.** We present some current and future variations of our Guide Star Catalog Data Retrieval Software (GUIDARES). Topics include the latest DOS version, a Unix/DOS C library, an IDL widgets version, and some future developments, such as an intelligent reclassifier, a Pocket GSC and a Pocket GUIDARES, and a WWW version which will supply finder charts through Mosaic.

## 1. GUIDARES, the Software of Many Faces

The GUIDARES software was born in 1991 (Malkov et al. 1992) as a PC-based tool for easy access to the Guide Star Catalog. Since then, the program has survived one major overhaul and a lot of minor tweaking (Malkov & Smirnov 1993, 1994a), and has even inspired a new project for automatic improvement of the original GSC material (Malkov & Smirnov 1995).

In its most current DOS form (version $2.\infty$), GUIDARES (also known as G2) is an interactive, GUI-style program that can retrieve GSC data for a specified area of the sky, and optionally produce a sky map in a celestial or Aitoff projection. GUIDARES supports four coordinate systems (equatorial, ecliptic, galactic, supergalactic) at any equinox, and automatically manages conversion between them and J2000.0 (the native GSC system); the user may specify rectangular or circular areas, set a magnitude range, and decide what to do with multiple-entry objects. The resulting data is written to an ASCII table; an optional SkyMap module produces plots, which is very useful for finder charts. This paper describes some recent evolution of the software in other directions.

## 2. GUIDARES as a C Library

In the past two years, it has become apparent that GUIDARES was needed not only as a stand-alone tool. Several applications arose (e.g., Malkov & Smirnov 1994b) where it was very useful for a program to be able to read the Guide Star Catalog easily, without the burden of sorting through its (very complicated) internal structure. For this reason, GUIDARES was recently recast into a library of several C functions (GUIDARES/Lib), versions of which now exist both under MS-DOS and Unix.

With GUIDARES/Lib, a C or FORTRAN program can sample the GSC without any burden on the programmer's part. One function call sets up the

CD-ROM drive, another selects the coordinate system, and a third retrieves data for any area. If the GSC disc needs to be changed, GUIDARES/Lib can report this event back to the program for it to handle.

## 3. GUIDARES for IDL

GUIDARES/IDL is an example application of GUIDARES/Lib. A short C program wraps around GUIDARES/Lib to handle communication (using the SPAWN procedure of IDL) between it and a few IDL routines. GUIDARES/IDL provides a way for an IDL program to read easily a sampling of any GSC area (as with the original DOS GUIDARES, the area may be specified in any coordinate system, etc.) into an array of structures. At ADASS IV, we demonstrated a GUIDARES interface based on IDL widgets.

## 4. Intelligent GUIDARES, Pocket GSC, and the WWW

The Guide Star Catalog is the biggest source of all-sky data to date. However, most of its data was produced by automatic classifiers, so it is prone to various errors and defects. The GSC Object Classifier (Malkov & Smirnov 1995) aims to extend GUIDARES with some sort of intelligence that would allow it to filter and improve GSC data automatically.

It it possible to compress the GSC significantly to a more reasonable size (for practical disk-space considerations) without any loss of data (see, e.g., Preite-Martinez & Ochsenbein 1993). If the GSC Object Classifier lives up to expectations, we will produce a compressed and re-classified GSC of our own. Finally, we will make a GUIDARES/WWW, which will provide access to this Pocket GSC through the World Wide Web. Using a WWW browser that supports query forms (such as NCSA Mosaic), it will be possible to submit a query to a version of GUIDARES running on our machine (using all of the features described above), and receive a sampling of the data as a FITS or plain ASCII table, or even a complete finder chart in PostScript, GIF, or JPEG format. This is but one of the possible applications of a GUIDARES for the WWW.

## 5. Conclusion

GUIDARES is an ongoing project and new ideas are constantly being born. Any comments, questions, or suggestions will be appreciated: please contact the the authors by e-mail at *omalkov@inasan.rssi.ru* or *oms@inasan.rssi.ru*. Some flavors of GUIDARES can probably be retrieved by anonymous ftp from *ftp.inasan.rssi.ru*, in the directory */pub/guidares*. As of 1994 October, GUIDARES for DOS, being the only product mature enough, was the sole application in */pub/guidares*. However, some additional platforms may be supported by the time this paper is published; interested parties are invited to browse our ftp area for updates.

**Acknowledgments.** This presentation was made possible by financial support from ST ScI. Many thanks to M. Pucillo of the Osservatorio di Trieste for inspiring a large portion of GUIDARES/Lib and GUIDARES/IDL.

**References**

Malkov, O. Yu., Kulkova, L. I., & Smirnov, O. M. 1992, in Astronomical Data Analysis Software and Systems I, ASP Conf. Ser., Vol. 25, eds. D. M. Worrall, C. Biemesderfer, & J. Barnes (San Francisco, ASP), p. 79

Malkov, O. Yu., & Smirnov, O. M. 1993, in Astronomical Data Analysis Software and Systems II, ASP Conf. Ser., Vol. 52, eds. R. J. Hanisch, R. J. V. Brissenden, & J. Barnes (San Francisco, ASP), p. 504

Malkov, O. Yu., & Smirnov, O. M. 1994a, in Astronomical Data Analysis Software and Systems III, ASP Conf. Ser., Vol. 61, eds. D. R. Crabtree, R. J. Hanisch, & J. Barnes (San Francisco, ASP), p. 183malkov1

Malkov, O. Yu., & Smirnov, O. M. 1994b, in Astronomical Data Analysis Software and Systems III, ASP Conf. Ser., Vol. 61, eds. D. R. Crabtree, R. J. Hanisch, & J. Barnes (San Francisco, ASP), p. 187malkov2

Malkov, O. Yu., & Smirnov, O. M. 1995, this volume, p. **??**

Preite-Martinez, A., Ochsenbein, F. 1993, in Handling and Archiving Data from Ground-Based Telescopes, ESO Conference Proceedings, eds. H. Albrecht & F. Pasian (Garching, ESO), p. 199