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Xguiphot: A New Aperture Photometry Tool for IRAF

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Abstract. Xguiphot is a new GUI driven interactive aperture photometry tool being developed to run under the IRAF environment.

1. Introduction

Xguiphot as a new aperture photometry tool being developed to run under the IRAF environment. In interactive mode Xguiphot is a GUI driven IRAF task; in non-interactive mode it is a parameter driven IRAF task. The Xguiphot GUI is based on the same widget server technology, object manager library, and messaging facilities employed by the IRAF XGterm graphics terminal emulator and XImtool display server (Tody 1995). Xguiphot is an extension of an earlier prototype written to aid in the development and testing of the IRAF GUI facilities (Davis 1994).

2. Operating Modes

Xguiphot can be run interactively with a GUI interface, interactively without the GUI, or non-interactively. On task startup Xguiphot requests a list of images, a list of objects files, a list of output files, initial values for the algorithm parameters, and the name of the GUI definition file. In interactive mode Xguiphot downloads the GUI definition file to the widget server to create the GUI, initializes the panels and widgets, displays the first image, then waits for instructions from the user. If the GUI definition file is unspecified, Xguiphot activates the usual IRAF XGterm window and graphics cursor, displays the first image, and waits for input from the user. In non-interactive mode, Xguiphot can be driven by a user supplied object list or by an object list generated internally at runtime.

3. Task Features

Xguiphot image and object list management features include: interactive image and object list browsing, interactive object list creation using the image display and image cursor, automated object list creation using a built-in object detection algorithm, graphics overlay of objects lists, and interactive editing of objects lists.

Xguiphot provides four object measurement modes: interactive object measurement using the image display and image cursor, interactive selection of objects from an existing object list, automated measurement of an existing object

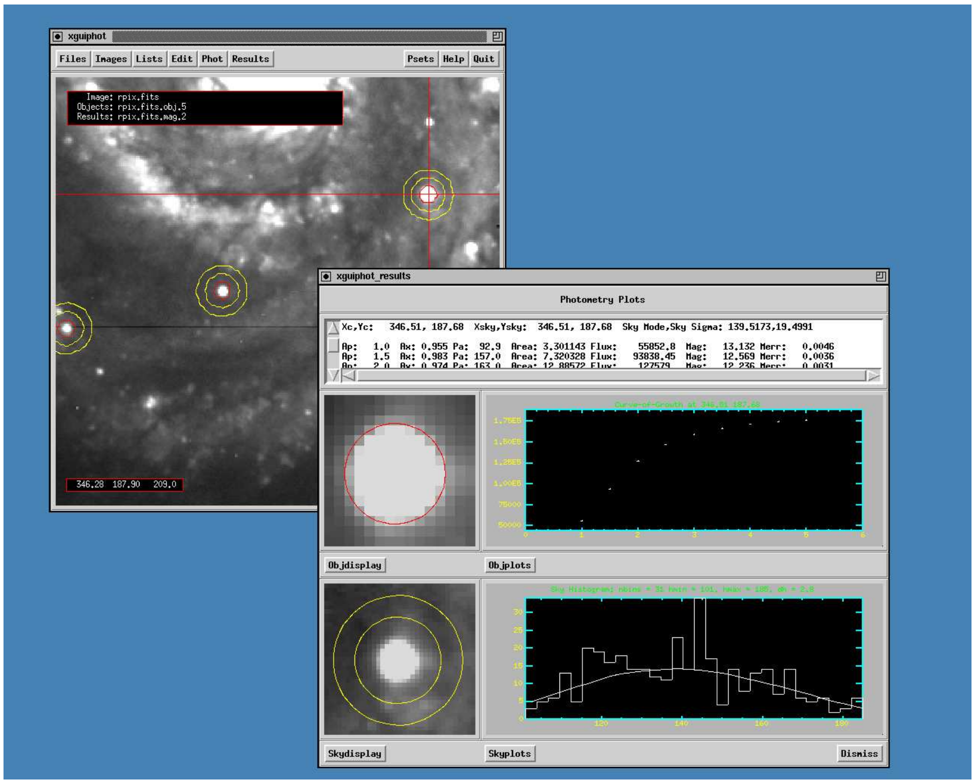

Figure 1. The Xguiphot command window showing the current image with the object and sky apertures for the measured objects superimposed on it. Detailed results for the last measured object, marked by the cursor in the image display window, are displayed in the graphical results panel.

list, and automated object detection and measurement. Quick-look output is written to the status line; full output is written to disk in a format compatible with other IRAF photometry software. Options are available for graphically displaying the individual object and sky regions and the object and sky photometry results as shown in Fig. 1.

The Xguiphot object and sky analysis algorithms support: multi-aperture fractional pixel photometry through circular, elliptical, rectangular, or polygonal object apertures, a concentric annular or offset circular, elliptical, rectangular, or polygonal sky aperture, and multi-aperture shape analysis using second order moment computations.

4. GUI Features

Xguiphot GUI support for browsing images includes an image selection panel, automatic image display, an image header display panel, cursor readout display, pan, zoom, and window functions, and built-in IRAF cursor mode functions. The image display window and associated panels are shown in Fig. 2.

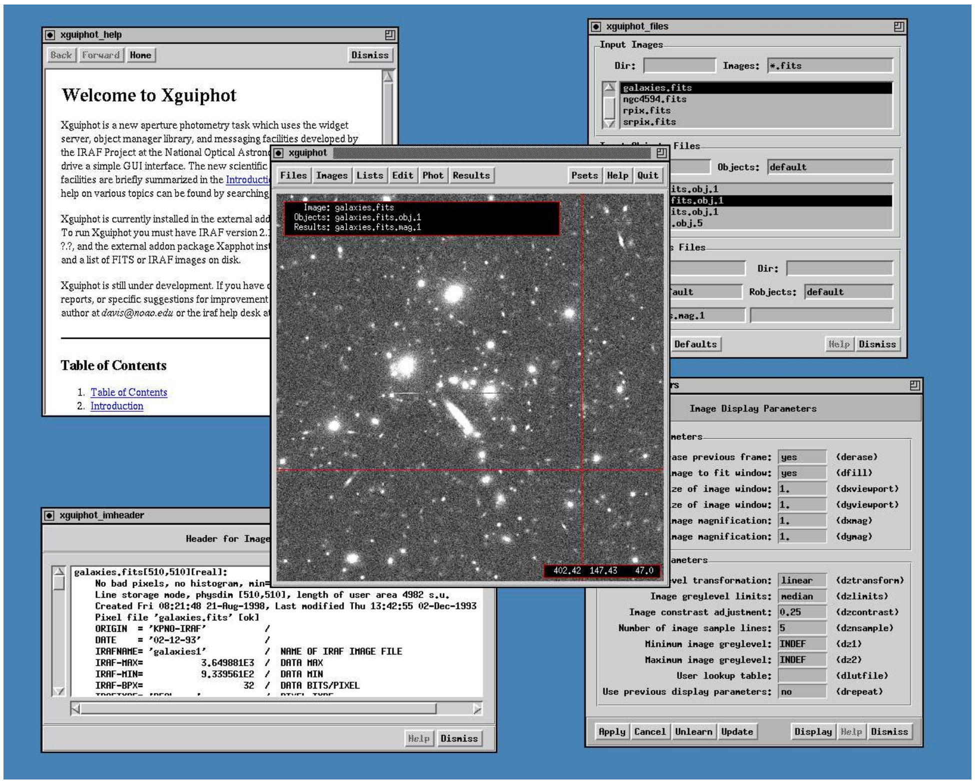

Figure 2. The Xguiphot command window containing the main menu buttons, the image display window, the image cursor, the file status box, and the coordinate readout box. Also shown are the on-line help, file selection, image header display, and display parameter set editing panels.

Xguiphot GUI features for object list creation and editing include an object file selection panel, an object list viewing and editing panel, and an object marker for tracking the current object. The object list viewing and editing panels are shown in Fig. 3.

Xguiphot GUI support for object measurement includes a photometry aperture marker for interactively defining object and sky regions, an image window status line display, and graphical and tabular results display panels. The image display window and graphics display panel are shown in Fig. 1. Keystroke accelerators are supplied for common measuring functions.

Parameter set editing panels are provided for all the Xguiphot parameter sets. Parameter sets can be viewed, edited, unlearned, or updated using a common interface. Individual parameters can also be edited using the usual IRAF colon command syntax. Figures 2 and 3 show sample parameter set editing panels. Xguiphot also has a built-in help facility which uses the standard HTML widget as shown in Fig. 2.

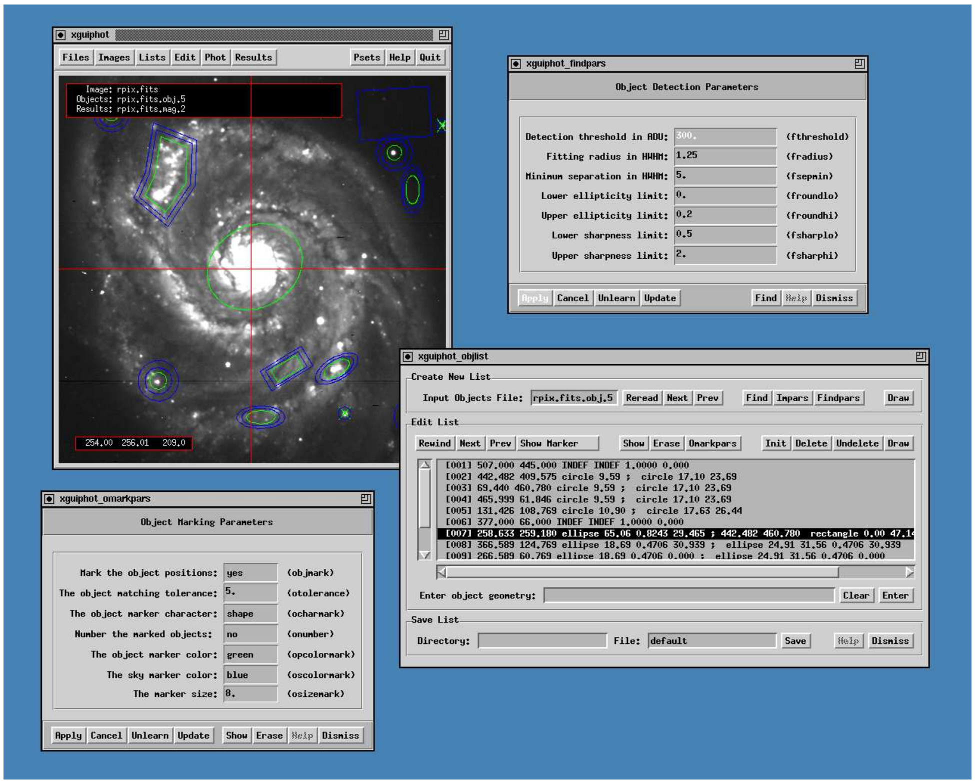

Figure 3. The Xguiphot command window showing the current image with the objects list superimposed on it. The image cursor marks the current object which is also highlighted in the object list viewing and editing panel. Also shown are the object detection and marking parameter set editing panels.

5. Current Status and Future Plans

Xguiphot adds new scientific analysis capabilities to IRAF and demonstrates that the current IRAF GUI facilities can be used for building complex science applications. Xguiphot should be ready for release in early 1999. Interested users should check the IRAF Web site at `http://iraf.noao.edu/` and the IRAF newsgroups for status updates.

References

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