



VIRTUAL ASTRONOMICAL OBSERVATORY

VO-IRAF Integration

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The VAO is operated by the VAO, LLC.



VO/IRAF Integration

Goals and Motivation

- Provide seamless integration of a familiar desktop system with remote data and services.
- Increase VO uptake by making VO capabilities available in familiar tools already used by many astronomers.
- Augment understanding of data from traditional observatories by providing easy access to related data.
- Allow powerful web-based tools to be easily used with desktop data.
- Serve as test bed system for future Desktop Integration efforts within VAO development.



VO/IRAF Integration

What it Provides:

- All tasks are able to access remote data referenced by a URL
 - static images resulting from a VO image query
 - catalog data returned by a dynamic VO query
 - VOspace access is planned
- All tasks are able to use the VOTable XML format where appropriate
 - transparent use of tabular data
- Enhanced @-file capabilities
- SAMP integration in the IRAF CL to allow interoperability with other VO tools (Topcat, Aladin, etc)
- New CL functions / tasks to access VO Registry and Data Services
 - All image and catalog services, some spectra
 - Advanced data access planned for Year 2
- Toolbox and science applications built on the above



VO/IRAF Integration

Highlights

- Tasks take object name, position *or* image name as input
- Resources may be specified as *user-defined* alias
 - Keyword-based search capability to
 - User-managed local registry table of preferred resources
- SAMP option on tasks where appropriate
- Output tables available in a variety of formats (csv, FITS, etc)
- System file cache backs URLs



VO/IRAF Tools

```

X voel
DATA QUERY/ACCESS TOOLS
  getcat - Query catalog data services in the VO
  getimg - Query image data services in the VO
  getspec - Query spectral data services in the VO (NYI)
  getlines - Query spectral line data services in the VO (NYI)
  vodata - General purpose query of VO data service

IMAGE UTILITIES
  dss - Display a DSS2 image of a named field
  imgcat - Create a catalog of detections in an image
  wcsinfo - Summarize the WCS information of an image
  dispname - Get the currently displayed image name

VO SERVICE TOOLS
  sesame - Resolve an object name to a position

SIMPLE CATALOG TOOLS
  nedoverlay - Overlay NED objects in the image display
  obslogoverlay - Overlay an observation catalog (HST, XMM, etc)
  radiooverlay - Overlay NVSS radio contours in the image display
  xrayoverlay - Overlay RASS3 X-Ray contours in the image display

REGISTRY TOOLS
  mkregdb - Create a local VO Registry database
  regdb - Manage/Query a local VO Registry database
  regmetalist - List the metadata fields of a Registry record

VOTABLE UTILITY TOOLS
  votcopy - Copy a VOTable to another format
  votget - Download data referenced in a VOTable
  votpos - Extract the main positional columns from a VOTable
  votsize - Get the size of a VOTable

TABLE UTILITIES
  colbyid - Identify VOTable column by ID attribute
  colbyucd - Identify VOTable column by UCD attribute
  colbyname - Identify VOTable column by NAME attribute
[q=quit,d=downhalf,f|sp=downfull,j|cr=downline,N=next]

```

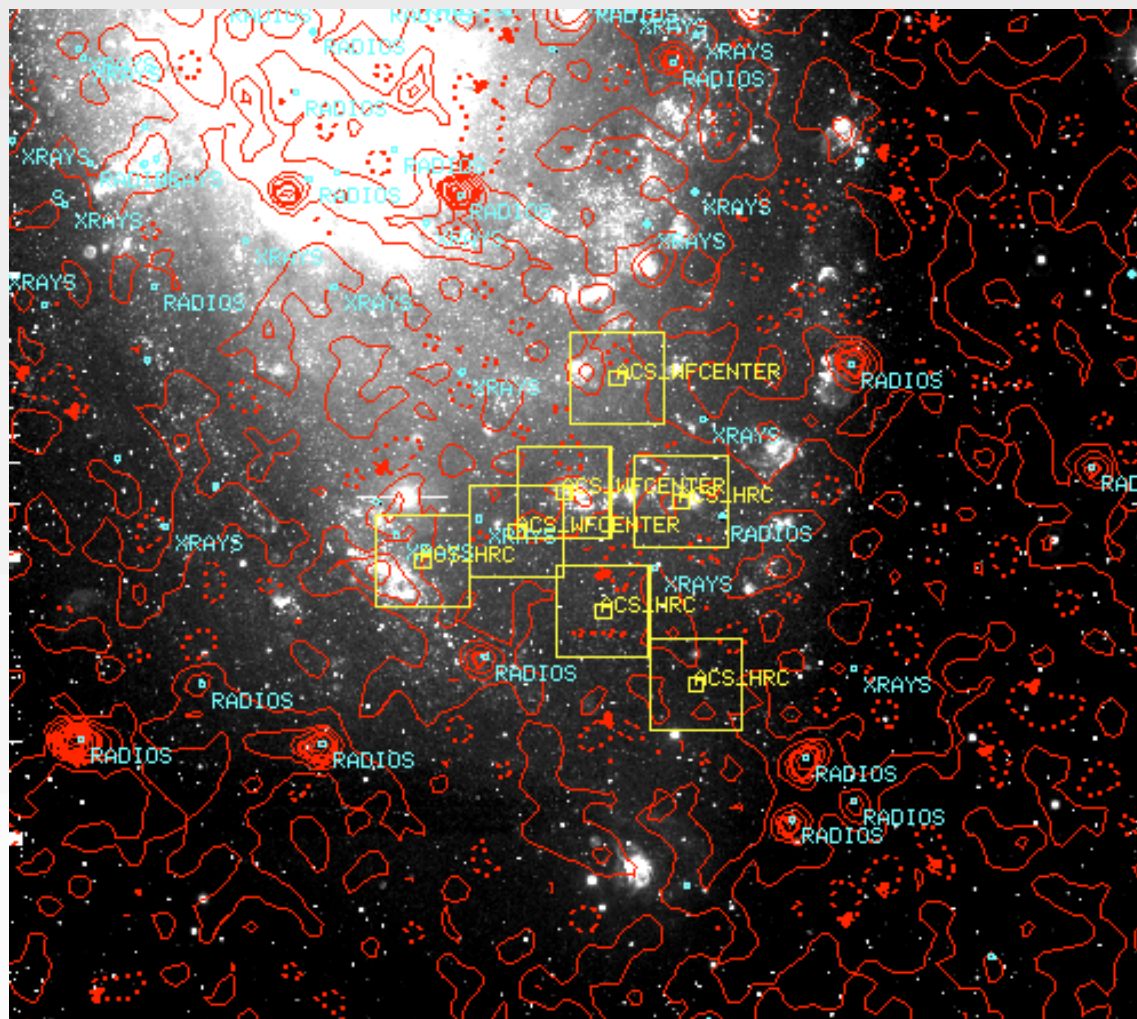
IRAF Integration: VO Package

NVSS Radio
Contours

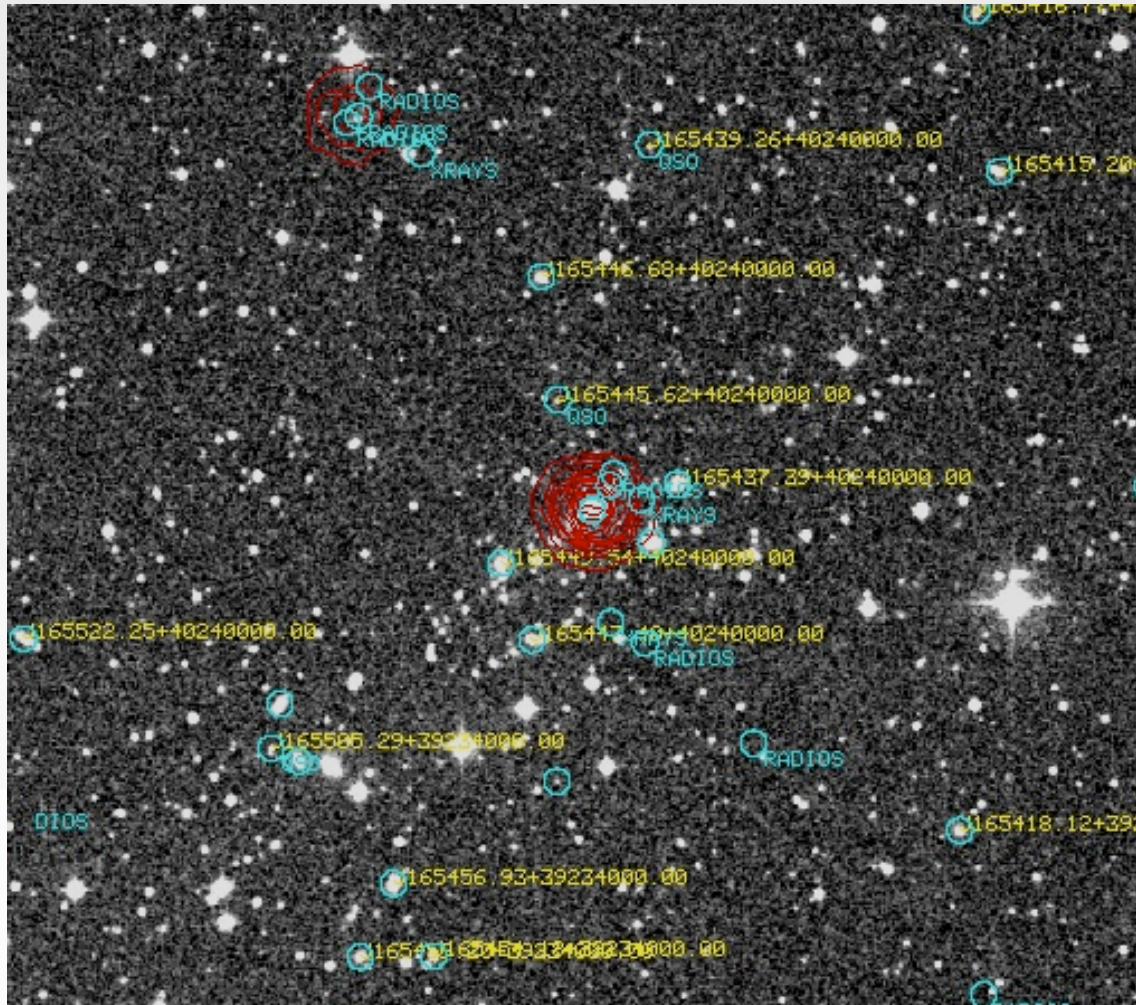
NED Catalog

NED Sources

HST Observations



IRAF Integration: VO Package



Query by Object
Name

Image from DSS
Overlays as before

Abell 2235

VO/IRAF Integration

DEMO



VOClient Roadmap

- (Non-IRAF) distribution of CLI Tools in development
 - Registry, data access, name resolver, etc
 - Utility/Convenience tasks (e.g. DSS), VOTable tools, etc
 - Tasks available as high-level API methods in multi-language binding
- C++ wrappers on API to provide OO interface for SWIG bindings
- *Pythonic* interface to VOA capabilities

- Extensions to support VOspace, SIAv2, Time Series, etc
- Replacement VOA Daemon to provide minimal functionality



VO/IRAF Links

IRAF v2.16 Downloads:

<ftp://iraf.noao.edu/iraf/v216/PCIX>

YouTube Introductions:

<http://www.youtube.com/user/usvaoTV>

Tucson VO-Day Presentations:

<ftp://iraf.noao.edu/pub/Tucson-VO-Day/>