

The Research Tools of the Virtual Astronomical Observatory

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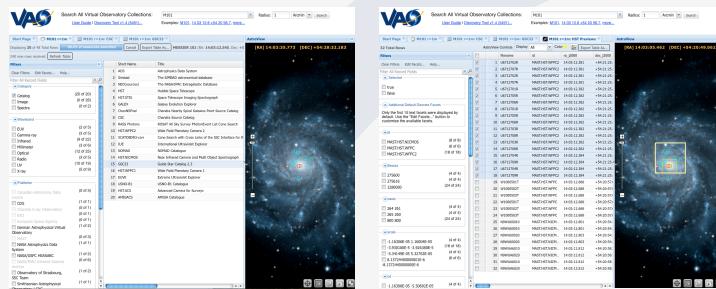
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VAO Research Tools

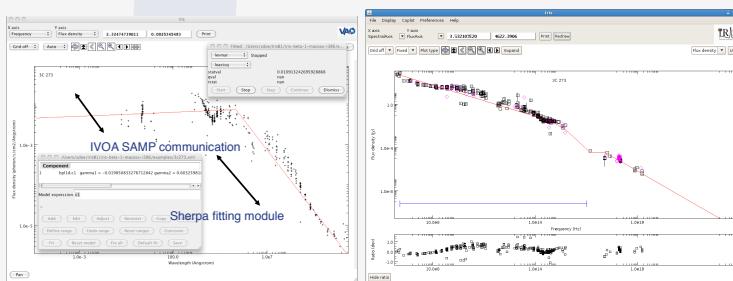
Astronomy is being transformed by the vast quantities of data, models, and simulations that are becoming available to astronomers at an ever-accelerating rate. The US Virtual Astronomical Observatory (VAO) has been funded to provide an operational facility that is a resource for discovery and access of data, and to provide science services that use these data. Over the past year the VAO has developed five science tools, which are illustrated here. VAO tools also work in concert with applications developed by VO projects worldwide through the Simple Applications Messaging Protocol (SAMP).

Data Discovery



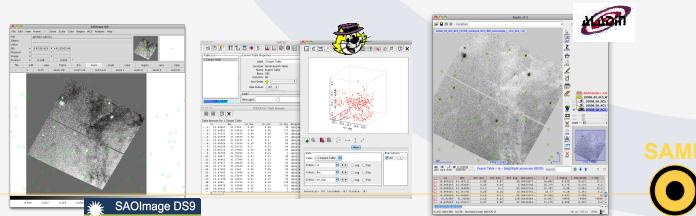
Finding sources of data on M101, with overlays of Chandra and GSC2.3 catalogs and image sky coverage "footprints".

SED Building and Analysis: Iris



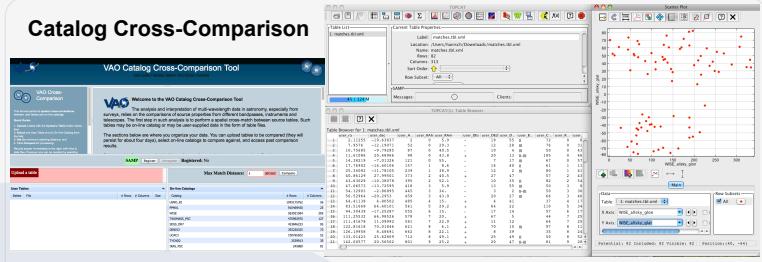
Spectrophotometric data is discovered and downloaded automatically.

STScI's Specview tool and SAO's Sherpa fitting software work together via SAMP connectivity. Many fitting functions, including user-defined functions and templates, are supported.



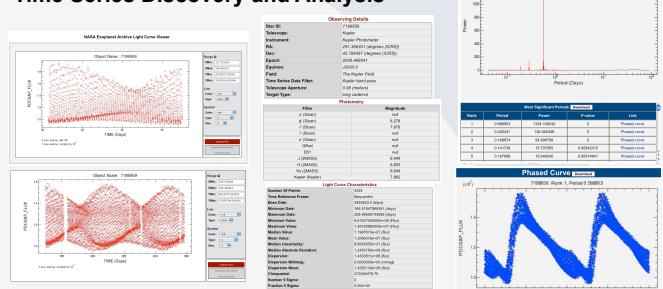
The Virtual Astronomical Observatory (VAO) is managed by the VAO, LLC, a non-profit company established as a partnership of the Associated Universities, Inc. and the Association of Universities for Research in Astronomy, Inc. The VAO is sponsored by the National Science Foundation and the National Aeronautics and Space Administration.

Catalog Cross-Comparison



Scales to billion-row+ catalogs. Cross-match candidates for frequently-used large catalogs will be pre-computed. WISE catalogs now available.

Time Series Discovery and Analysis



Data from Harvard Time Series Center, NASA Exoplanet Archive, and Catalina Real-Time Transient Survey, with dynamic period analysis.

VO IRAF Integration



Brings VO capabilities to ~5000 IRAF users;

~700 IRAF tasks VO-aware. Use IRAF in conjunction with SAMP-enabled applications.

A Virtual Astronomy "Ecosystem"

Virtual Observatory standards and protocols, with tools and applications built upon them, establish an environment for data discovery and analysis in which data and tool are all interoperable. VAO tools work in conjunction with VO-aware tools worldwide.

Demonstrations, tutorials, & more information at the VAO Exhibit (231-233)

www.usvao.org



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