



# EURO-VO Facility Centre Report (continued)

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**EURO-VO SAC Meeting, December 11-12 2008**



## Research Initiative Project: Multi-wavelength Study of Spitzer sources

- Aims
  - Conduct a multi-wavelength study of Spitzer sources (28 objects) with VOSpec and VOSED.
  - Cross-correlate various catalogues to obtain more sources with similar properties.
  - Compare results to known optical classifications and establish a link between optical and IR classifications.

“An overall analysis of all available multi-wavelength data for these sources is necessary to investigate them in detail and understand their physical nature.”
- Ranked 3rd by SAC
  - 2.71
  - 0.49
  - 2.00
  - 3.50

- Feasibility study results:
  - Search for spectra available in the VO:
    - No Spitzer spectra currently available in the VO, only ISO in the IR.
    - Only 3 of the 28 objects have spectra available.
  - PI also interested in the shape of the SED therefore search for SDSS and 2MASS information:
    - Only 12 sources with spectra and/or catalogue data.
      - 1 object: IUE+SDSS+2MASS+ISO+Spitzer
      - 1 object: SDSS+2MASS+ISO+Spitzer
      - 1 object: 2MASS+ISO+Spitzer
      - 3 objects: SDSS+2MASS+Spitzer
      - 2 objects: 2MASS+Spitzer
      - 4 objects: SDSS+Spitzer

## Feedback from the PI after the feasibility study:

- Want to now focus on Markarian galaxies:
  - “.. the initial purpose was to start with the 28 sources and then extend the same methods to the sample of 1469 Markarian galaxies..... the best would be to focus on Markarian galaxies at once.”
- Catalogues to be cross-matched:
  - SDSS, 2MASS, X-ray (ROSAT BSC and FSC), UV (GALEX), and radio (NVSS, FIRST).
- No longer want to use theoretical models:
  - “First we try to group objects in several types by the shape of their SEDs to see how they differ depending on their other properties, like activity types, morphology, etc.”



## Research Initiative Project: Multi-wavelength Study of Spitzer sources

- Production of a paper:
  - “If we emphasise the necessity of publication within one year, then the second aim (Markarian galaxies) is of course much better, both for larger number of available data and because a MW atlas of Markarian galaxies would be important for publication.
- Resources:
  - PI proposes that 2 young researchers come to Madrid and learn how to use the VO Tools to build MW spectra and SEDs.
  - PI asked Vassilis Charmandaris to join the team (extragalactic and ISO expert). From discussion with EH:
    - Only 5 extragalactic objects with full scan by ISO in the whole sky.
    - Many objects with lines observed.
    - Very few objects with ISOCAM

- Where the project now stands
  - No longer the same project as was initially reviewed by the SAC.
  - Optical and near-IR data for all Markarian galaxies already published in Petrosian et. al. (2007) “Markarian Galaxies. I. The Optical Database and Atlas”.  
<http://adsabs.harvard.edu/abs/2008ApJS..177..645P>  
Includes SDSS, 2MASS and DENIS data.
- Questions:
  - Do we have confidence that the PI (and/or his team) will produce a paper next year?
  - Do we continue with this Research Initiative?



# **Multi-wavelength Astronomy and the VO Workshop, ESAC, 1-3 Dec 2008**

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## Multi-wavelength Astronomy and the VO Workshop, ESAC, 1-3 Dec 2008

- Goals:
  - Identify needs and challenges multi-wavelength astronomy will be facing in the coming years.
  - Identify how the VO can meet them.
  - Bring together experts in multi-wavelength galactic and extragalactic astronomy and scientists and engineers actively involved in the international VO initiative.
  - Overall rationale: scientific needs to drive the technological development.
- Topics:
  - Multi-wavelength Astronomy
  - Multi-wavelength Astronomy VO Tools and Standards
  - Surveys
  - Putting it all together - recent science using the VO.



## Multi-wavelength Astronomy and the VO Workshop, ESAC, 1-3 Dec 2008

- ~85 participants
- 28 Oral talks (13 invited)
- 12 posters
- 4 round table discussions
- SAC involvement:
  - 2 SAC members in the Science & Technical Organising Committee.
  - Only 1 SAC member attended the Workshop.
- Initial outcome:
  - Proceedings deadline given for 15<sup>th</sup> January 2009 (aim to publish proceedings faster than the spectroscopy workshop).
  - General feedback: still collecting feedback. I received good feedback from the younger participants!

### Round Tables: Community needs & feedback:

- Main message from multi-wavelength astronomers: more data is needed in the VO (science-ready and raw). Still very few “science-ready data in the VO, and even less raw data (needed, e.g., for large [re-]processing/archival projects).
- Meta-data: Access so far to VO data is only “simple”; relevant meta-data is not always searchable, e.g.  $t_{\text{exp}}$  for spectral tools, observing date (mostly *VO problem*, but meta-data need to be there).
- Meta-data quality: VO should check that relevant information is provided and *make an effort* to check that it is correct. Error bars must be included, more data wanted. Suggestion to encourage service providers to include as much meta-data as possible.
- Standards: Table Access Protocol: very important (should be done soon).
  - Standard for filter/response curve + zero point: magnitude to flux conversion => vital for SED building!



## Multi-wavelength Astronomy and the VO Workshop, ESAC, 1-3 Dec 2008

### Round Tables: Community needs & feedback, cont:

- Data coverage: was this position ever observed and, if so, is there an  $X\text{-}\sigma$  detection or not?
  - catalogue available: easy
  - reduced data available: difficult (on-the-fly SExtractor?)
  - raw data: extremely hard [impossible?] (on-the-fly reduction first!)
- Want VO tools to work on multi-objects, e.g. VO searches for lists of sources, massive scaling: scripting for, e.g. cutout services or access to thousands of spectra at the same time.
- “Quick” check on **all** available data (raw data access!)
- SED “on-the-fly” from spectra and catalogues (at least!)



## Multi-wavelength Astronomy and the VO Workshop, ESAC, 1-3 Dec 2008

### Round Tables: Community needs & feedback, cont:

- VO tools: too many/too complicated.
- Want more information on available VO tools (and more astronomy oriented, less technical details).
- The community would like the IVOA (web pages) to have a more astronomer friendly face to it.
- Top level “VO portal”.
- Survey astronomy:
  - Medium/large surveys (e.g. COSMOS) have less pressing “standard” VO needs, as all their data are local; moreover, no VO tool will ever be able to compete with their own tools.
  - VO tools “nice to have” to maximize exploitation: e.g. to allow easy match between imaging and spectral data.



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### Round Tables: Community needs & feedback, cont:

- Example use cases are very useful (particularly for first time users).
- Promotion of the VO: Suggest we focus on younger researchers, post-docs and PhDs.
- Main reasons for the community not writing lots of VO-based papers:
  - Lack of publicly available data \*\*\*
  - Unawareness of the community about the VO \*\*
  - VO tools still not adequate or user friendly \*\*
  - Lack of metadata \*\*
  - Lack of theoretical models \*
  - Too slow for large data volume \*