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TeVCat: An online catalog for Very High Energy Gamma-Ray Astronomy

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Abstract: An overview of TeVCat, a new, online, interactive catalog for very-high-energy (VHE; $E >\sim 50$ GeV) gamma-ray astronomy is presented. As VHE astronomy continues to grow, the usefulness of a one-stop clearing house for information on new sources is increasingly evident. TeVCat is intended to be such a resource. With sky maps, scientific information, visibility plotters and linked references, it will help the wider gamma-ray community stay up-to-date and informed on this exciting and rapidly developing field.

Introduction

With the advent of third generation imaging atmospheric Cherenkov telescope systems [1], [2], [3] & [4] and the development of water Cherenkov instruments [5], recent years have seen rapid growth in the catalog of claimed very-high-energy (VHE; $E >\sim 50\,\mathrm{GeV}$) detections (Figure 1). As the field of VHE astronomy has grown, so too has interest in it from the wider astronomical community. This growth is set to continue as VHE instruments explore the sky with ever increasing sensitivity.

For all of these reasons, it is clear that an interactive source catalog for the TeV sky is warranted. TeVCat was established to aid both the VHE and larger astronomical communities in finding and maintaining up-to-date information on the TeV sky. More details will be forthcoming at the conference. Here we simply outline some of the main TeVCat features.

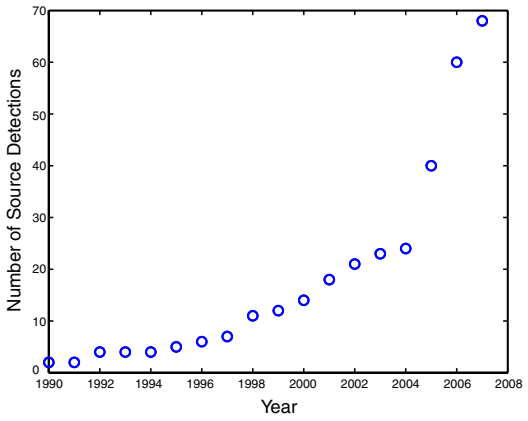

Figure 1: The number of sources claimed to as VHE emitters from 1990 to the present.

TeVCat Features

TeVCat is an online database of TeV gamma-ray sources which can be accessed with any modern web browser. The URL of the site is `http://tevcat.uchicago.edu`. A picture of the primary user interface, showing an interactive skymap and sortable table of gamma-ray source information, is shown in Figure 2. TeVCat is a work-in-progress, but among the features currently available are:

- **Information on all claimed sources of VHE Emission:** For each object claimed in the scientific literature to be a source of VHE gamma rays, a comprehensive table of information will be available, including, initially, the following:

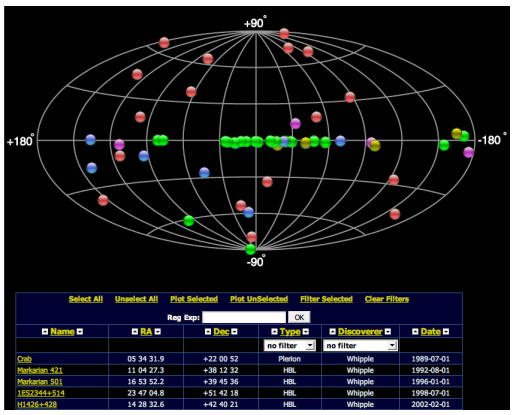

Figure 2: The TeVCat interface.

- Distance
- Source coordinates
- Angular Extent
- Alternative names
- Spectral information
- Hyperlinked References
- Discovery Date and Observatory

In the future, additional information could be made available, including:

- "Global" Spectra
- Lightcurves
- Relevant Pictures and Figures
- Possible Associations

All available information is provided in an easy-to-access format, with features allowing for searches and sorting of objects, based on these properties.

- **VHE Sky Maps:** An up-to-date map of the VHE sky serves as the main interface to TeVCat. By filtering on different source attributes (e.g. discoverer, date of discovery, source class, etc.) or by just choosing the objects which they wish to display, this map can be customized by TeVCat users. Different overlays can be superimposed on this map to show the parts of the sky visible from VHE observatories at different times of the year.

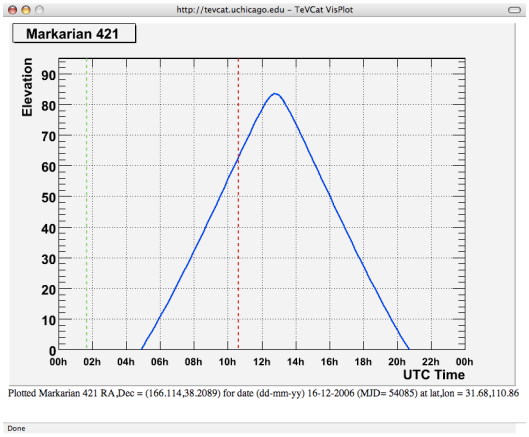

Figure 3: An example of the observability plots that TeVCat can produce. This one shows the observability of the active galactic nucleus, Markarian 421, from VERITAS for the 16th of December, 2006. Overlaid on the map are lines detailing the start (green) and end (red) of astronomical twilight.

- **Observability Plots:** For each TeVCat source, observability plots, based on user-defined criteria, can be produced. An example of such a plot is shown in Figure 3. In this way, users can generate time versus elevation plots for any of their favorite targets for any night at any of the worlds major VHE observatories or, at a user defined latitude and longitude. This may prove useful in the planning of multi-wavelength campaigns.
- **User Contributions:** TeVCat will have a user interface that will allow users to submit additional information and to send comments or corrections. The catalog will be updated to incorporate these suggestions once they have been vetted by TeVCat personnel.

Summary

TeVCat is a new gamma-ray source catalog designed to help the astronomical community keep abreast of the exciting field of gamma-ray astronomy. With sky maps, source information, observability calculators, and more, TeVCat aims to be a

key resource for gamma-ray science. More details on the database will be available at the conference.

References

[1] Cangaroo-III, icrhp9.icrr.u-tokyo.ac.jp

[2] H.E.S.S., www.mpi-hd.mpg.de/hfm/HESS

[3] MAGIC, wwwmagic.mppmu.mpg.de

[4] VERITAS, veritas.sao.arizona.edu

[5] Milagro, www.lanl.gov/milagro