

AVENGe - Advances in Very-High Energy Astrophysics with Next-Generation Cherenkov Telescopes

Monday, 29 May 2023 - Wednesday, 31 May 2023

Roma

Book of Abstracts

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Galactic Plane Survey KSP: status & perspectives

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Galactic PeVatron candidates in the LHAASO J1956+2845 sky region

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In recent years the number of known sources emitting in the TeV-PeV regime has increased significantly thanks to facilities like LHAASO and HAWC. The more natural candidates, for energetic and ambient properties, are pulsars and their environment.

However, due to the limited angular resolution of the current instruments, many of the observed sources have more than one lower-energy counterpart. The identification and the classification of these sources is one of the primary goals of future facilities as CTAO, thanks to the designed sensitivity and angular resolution above 1 TeV.

In this talk I will present the sky region containing LHAASO J1956+2845, a case study to test the CTAO performances. This region extends for about 2 degrees and contains three HAWC sources, two of which are spatially coincident with LHAASO J1956+2845. Three middle-aged pulsars and three SNR/PWN systems are located in the field, but the associations are yet to be done, and it is not clear yet which of them is the principal contributor to the ~100 TeV emission.

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Axion-like Particles and Lorentz Invariance Violation

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Status and Perspectives of Intergalactic Magnetic Field Studies

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Status of the CTA Key Science Project

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The Galactic Center at VHE

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Extragalactic survey: some updates based on recent findings (Solicited Talk)

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The Fermi-LAT experience: lesson learned (Solicited talk)

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Search for new TeV sources from our MWL and spectroscopic survey

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GRB at VHE: lessons learned so far

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Prospects of detecting early VHE emission from compact binary mergers: synergy between Einstein Telescope and CTA

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Multi-wavelength context of the Cherenkov Telescope Array

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TeV emitters are typically multi-wavelength sources, generally highly variable and occasionally highly polarized. This makes it critical to line up ground-based dedicated facilities for identification, follow-up and monitoring of CTA targets in polarized and total radio-to-optical light. Furthermore, the CTA itself provides suitable infrastructure for the implementation of specific observing techniques, such as the still pioneering Stellar Intensity Interferometry.

As part of the “CTA Plus” program funded by the Italian Research Ministry under the EU PNRR aegis, 4 initiatives will be implemented: a wide-field optical polarimetric imaging camera for the VST (VSTPol), a fast optical/IR photometer and optical polarimeter (eSiFAP) for the TNG, radio receiver upgrades for the INAF radio antennas, and a prototype for stellar intensity interferometry with the SSTs, to be tested on the ASTRI MiniArray. This talk will describe the instruments design and the observing strategies, and highlight the synergies with CTA.

Collaboration:

PNRR program CTA+ (WP1400 radio, infrared, optical support for CTA)

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Galactic PeVatron candidates in the LHAASO J1956+2845 sky region

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In recent years the number of known sources emitting in the TeV-PeV regime has increased significantly thanks to facilities like LHAASO and HAWC. The more natural candidates, for energetic and ambient properties, are pulsars and their environment.

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Collaboration:

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High-Energy Variability in PWNe

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Despite the long held assumption that PWNe at high energy could be counted as “stable candles”, detection of gamma-ray flares in the Crab nebula, led us to revisit our ideas about the working of such systems. Given the lack of resolution of current gamma-ray observations, analysis of variability was performed at other wavelengths in search for possible counterparts that could guide us to the origin of these violent events without much luck. I will review here the status of our knowledge of high-energy variability (and variability in general) in PWNe, as well as the various models that have been proposed, and what are the prospect of observing similar events in other systems.

Collaboration:

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The Galactic Transients KSP

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The Galaxy Cluster KSP, Status and Perspectives

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Pevatrons & SFR Status and Perspective

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Blazar monitoring by the Whole Earth Blazar Telescope (WEBT) Collaboration

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Born in 1997 to provide an optical follow-up of gamma-loud blazars observed by the Compton Gamma Ray Observatory, the Whole Earth Blazar Telescope (WEBT) is a large collaboration including several tens of astronomers around the northern hemisphere who monitor blazars mainly in the optical (including polarimetry), but also in the radio and near-infrared bands. Since 2000 the Collaboration has been led by Italian researchers from the INAF- Osservatorio Astrofisico di Torino and has actively collaborated with other teams, in particular the AGILE, Fermi, and MAGIC ones. The strength of the WEBT is the high temporal resolution of the light curves, which can be obtained thanks to the distribution in longitude of its members. This allows us to study the details of the blazar multiwavelength behaviour, and to propose models for its interpretation. We are looking forward to a fruitful collaboration with the VHE community in the era of the new-generation Cherenkov telescopes.

Collaboration:

Whole Earth Blazar Telescope (WEBT)