T 36: Gamma Astronomy II

Time: Tuesday 17:00–18:30 Location: POT/0151

T 36.1 Tue 17:00 POT/0151

Status of the Medium-Sized Telescopes of the Cherenkov Telescope Array — •Florian Leitgeb for the CTA MST-Collaboration — Deutsches Elektronen-Synchrotron DESY, Platanenallee 6, D-15738 Zeuthen, Germany

The Cherenkov Telescope Array (CTA) is the next-generation ground-based observatory for gamma-ray astronomy at very high energies. In its initial Alpha Configuration, it will consist of 64 imaging atmospheric Cherenkov telescopes of different sizes and designs, which will be deployed in the form of two large arrays in the northern hemisphere at the Roque de Los Muchachos Observatory on La Palma (Canary Islands, Spain) and in the southern hemisphere at the Paranal Observatory in the Atacama Desert (Chile), respectively.

The core energy range (100 GeV to 10 TeV) will be covered by the Medium-Sized Telescopes (MSTs), which are planned to be deployed at both sites. An international collaboration of institutes and universities from various countries is responsible for the design, construction and commissioning of the MSTs. The MST effort is grouped into three subprojects: one for the telescope structure, and two for the Cherenkov cameras which differ in their camera design.

In this contribution, an overview of the MST telescope and the status of the MST project will be presented, including the plans for building one pre-production telescope, a so-called pathfinder, per site ahead of the bulk production.

T 36.2 Tue 17:15 POT/0151

Status of the Large-Sized Telescopes of the Cherenkov Telescope Array — •Martin Will for the CTA-Collaboration — Max-Planck-Institut für Physik, München

The Cherenkov Telescope Array (CTA), the next-generation ground based observatory for gamma-ray astronomy at very high energies, will consist of Imaging Atmospheric Cherenkov Telescopes of different sizes and designs. Two arrays are foreseen, one in the northern hemisphere at the Roque de Los Muchachos Observatory on La Palma (Canary Islands, Spain) and one in the southern hemisphere at the Paranal Observatory in the Atacama Desert (Chile).

The Large-Sized Telescope (LST) will be part of both arrays. With its reflective surface of 23 meter diameter, the LSTs are optimized to detect gamma-rays in the low energy range (20 GeV to 3 TeV). LST-1 in La Palma is close to finishing its commissioning phase and scientific data taking has started.

In this presentation, the status and plans for the LSTs in La Palma and Chile will be shown.

T 36.3 Tue 17:30 POT/0151

LST-1 observations of BL Lacertae flare in 2021 — •seiya nozaki[1], katsuaki asano[2], gabriel emery[3], juan escudero pedrosa[4], and chaitanya priyadarshi[5] for the CTA-Collaboration — [1]Max Planck Institute for Physics, Munich, Germany — [2]Institute for Cosmic Ray Research, Chiba, Japan — [3]University of Geneva - DPNC, Geneva, Switzerland — [4]Institute of Astrophysics of Andalusia - CSIC, Granada, Spain — [5]Institute for High Energy Physics, Barcelona, Spain

The Cherenkov Telescope Array (CTA) will be the next-generation very-high-energy gamma-ray observatory. Three different sizes of telescopes are planned to be built to cover a wide energy range. The Large-Sized Telescope (LST), with a 23-m diameter mirror dish, is designed to detect low-energy gamma-ray signals upwards from a few tens of GeV. This energy range plays a crucial role in the exploration of the extragalactic objects, especially transient sources. The first prototype of LST (LST-1) located at La Palma (Canary Islands, Spain) has been in a commissioning phase since 2018 and already started to observe gamma-ray sources. In 2021, LST-1 observed BL Lacertae and detected enormous gamma-ray flares with a large flux variability. In this contribution, we will report the results of LST-1 observations of BL Lacertae in 2021, including the energy spectrum down to around the energy threshold of LST-1 and sub-hour-scale fast flux variability.

T 36.4 Tue 17:45 POT/0151

Status and results of TAIGA — Michael Blank[1], Martin Brückner[3,4], Alaa Kuotb Awad[1], Razmik Mirzoyan[2], Andrea Porelli[3], •Martin Tluczykont[1], and Ralf Wischnewski[3] — [1]Institut für Experimentalphysik, Universität Hamburg, Deutschland — [2]Max Planck Institut für Physik, München, Deutschland — [3]Deutsches Elektronen Synchrotron, Zeuthen, Deutschland — [4]PSI, Zürich, Schweiz

TAIGA (Tunka Advanced Instrument for Gamma-ray and cosmic ray Astrophysics) is implementing a new, hybrid air Cherenkov observation technique to access the TeV to PeV gamma-ray regime, particularly important to spectrally resolve the cutoff regime of cosmic-ray pevatrons. The TAIGA complex consists of a distributed array of 120 wide angle (0.6 sr) air Cherenkov timing stations (TAIGA-HiSCORE) covering 1.1 square-km, three 4.2m imaging air Cherenkov telescopes (TAIGA-IACTs) with a field of view of 9.6deg, and a surface and underground scintillator-based muon detector array. For a proof-of-principle of the hybrid method, combining IACTs with a non imaging timing array, first the individual components were tested. Both the HiSCORE array and the IACTs were found to operate within expectations using simulations and comparisons to real data. Measurements of a light source onboard the international space station were used to verify the pointing of HiSCORE and IACTs. Recently, the Crab Nebula was detected using data from the first TAIGA-IACT in stand alone mode. In the beginning of March 2022, we froze the collaboration work, but the German team is continuing to work with the available data.

T 36.5 Tue 18:00 POT/0151

FACT - Ten Years of Operation — •Daniela Dorner[1], Bernd Schleicher[1], and FACT Collaboration[2] — [1]Universität Würzburg, Germany — [2]www.fact-project.org

The First G-APD Cherenkov Telescope (FACT) started operation in October 2011. Designed for remote and automatic operation and using semiconductor photosensors, the duty cycle of the instrument is maximized and the gaps in the light curves minimized. Thanks to the unbiased observing strategy, a unique and unprecedented data sample has been collected. The physics program consists of monitoring of bright TeV blazars combined with follow-up observations of multi-wavelength and multi-messenger alerts. The presentation summarizes the lessons learned from ten years of operation and the results of this legacy data sample.

T 36.6 Tue 18:15 POT/0151

The MAGIC of VHE gamma-ray astronomy: 20 years, 200 peer-reviewed publications and beyond — •David Paneque for the MAGIC-Collaboration — Max Planck Institute fuer Physik, Muenchen, Deutschland

The MAGIC telescope system consists of two 17-m diameter mirror dish telescopes located at 2200m a.s.l. on the Canary Island of La Palma, in Spain. The year 2023 is the 20th anniversary of MAGIC, reaching the milestone of 200 peer-reviewed publications over a wide range of research areas, covering astrophysics with Galactic and extragalactic objects, dark matter searches, and studies of cosmology via the propagation of gamma rays from distant sources. MAGIC has become a world-wide leading instrument for gamma-ray astronomy in the energy range from 20 GeV to beyond 100 TeV, and an active participant in various multiwavelength and multimessenger observational campaigns. In the conference I will give a status report of this instrument, including the discussion of a few recent highlight results.