Contribution ID: **231** Type: **talk**

The Cherenkov Telescope Array: probing fundamental Physics with the next-generation observatory for very-high-energy gamma rays

Wednesday, 14 July 2021 17:15 (15 minutes)

The Cherenkov Telescope Array (CTA) is the next-generation ground-based observatory for very-high-energy (VHE, E>100 GeV) gamma-rays. It will consist of more than 100 imaging atmospheric Cherenkov telescopes (IACTs) divided between two arrays in the Northern and the Southern hemispheres. Featuring telescopes with different sizes, it will provide coverage of the whole sky over a wide energy range, between ˜20 GeV and ˜300 TeV.
The science topics that CTA wants to address can be divided into three main themes: understanding the origin and role of relativistic cosmic particles, probing extreme environments such as neutron stars and black holes, and exploring frontiers in Physics. Physics frontier topics to be studied with CTA include the particle nature and constituents of Dark Matter in indirect searches through gamma rays, tests of Lorentz invariance using gamma-ray propagation and probes of cosmology. U.S. scientists have led an international collaboration to build and operate a prototype 9.7-m IACT for CTA, the prototype Schwarzschild-Couder Telescope (pSCT), an innovative design proposed as a telescope candidate for CTA. The pSCT features an innovative dual-mirror design and a camera with state-of-the-art silicon photomultiplier detectors. The pSCT has recently successfully detected the Crab Nebula with 8.6 standard deviations utilizing a partially-equipped camera. A funded upgrade of the pSCT focal plane sensors and electronics is currently ongoing, which will bring the total number of channels from 1600 to 11328 and the telescope field of view from about 2.7° to 8°.
In this talk, I will introduce the CTA project with particular focus on its potential to explore frontiers in Physics as well as describe the proposed U.S. participation.

Are you are a member of the APS Division of Particles and Fields?

No

Primary author: CAPASSO, Massimo (Barnard College, Columbia University)

Presenter: CAPASSO, Massimo (Barnard College, Columbia University)

Session Classification: Dark Matter

Track Classification: Dark Matter