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Physics with the Cherenkov Telescope Array

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The Cherenkov Telescope Array (CTA) is the next generation observatory for ground-based gamma-ray astronomy. Current instruments (HESS, MAGIC and VERITAS) have made huge progress in the observation of cosmic sources of photons in the ~ 50 GeV to ~ 50 TeV energy range using Imaging Atmospheric Cherenkov Telescopes (IACTs). CTA will extend the range of these observations at both low and high energies, will improve their sensitivity by a factor of about 10 and will increase the precision of photon energy and direction measurements. This talk presents briefly the designs of the 23 m, 12 m and 4 m diameter IACTs that CTA will use to achieve this performance, before discussing the impact the array will have on studies of Fundamental and Astroparticle Physics. Topics covered include: searches for Dark Matter (DM) and axion-like particles (ALPs); studies of possible violation of Lorentz invariance; and studies of the sources and acceleration mechanisms of high energy cosmic rays.

Summary

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