

High-energy astrophysics with Cherenkov telescopes

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Abstract

High-energy astrophysics deals with the most energetic phenomena observable in our Universe. In the last two decades many progresses have been made in this field, due to the advancements in technologies for ground based detection of very-high-energy ($E > 100\text{GeV}$) gamma rays from astrophysical sources both within and outside our galaxy. Imaging Atmospheric Cherenkov Telescopes (IACTs) detect the Cherenkov light emitted by relativistic particles produced by very-high-energy cosmic ray particles and gamma rays. Many high-energy sources have already been discovered largely due this technique. With the MAGIC (Major Atmospheric Gamma Imaging Cherenkov) telescopes, a system of two IACTs, major advancements has been made in the field, including providing data above the energy threshold of 15GeV and the discovery of over 36 extragalactic objects emitting very-high-energy gamma rays. This seminar gives a brief description of high energy astroparticle physics, the ground-based imaging atmospheric Cherenkov technique for observing high energy sources, the MAGIC telescope and other IACTs and highlights multimessenger events discovered with this technique.

Keywords: Astroparticle Physics, Very-High-Energy gamma-rays, IACT, MAGIC, Multi-messenger astrophysics.

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