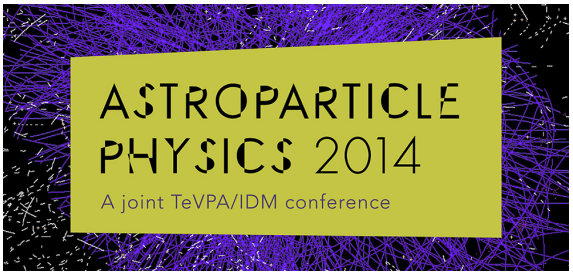

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Constraints on cosmic-ray origin from gamma-ray observations of supernova remnants

Tuesday, June 24, 2014 5:00 PM (25 minutes)

Supernova remnants (SNRs) are thought to be the primary sources of the bulk of Galactic cosmic-ray protons observed at Earth, up to the knee energy at ~3 PeV. Our understanding of CR acceleration in SNRs mainly relies on the so-called Diffusive Shock Acceleration theory which is commonly invoked to explain several observational (though, indirect) lines of evidence for efficient particle acceleration at the SNR forward shocks up to very high energies. In particular, recent observations of young SNRs in the high-energy (HE; 0.1 < E < 100 GeV) and very-high-energy (VHE; E > 100 GeV) gamma-ray domains have raised several questions and triggered numerous theoretical investigations. However, these detections still do not constitute a conclusive proof that supernova remnants accelerate the bulk of Galactic cosmic-rays, mainly due to the diculty of disentangling the hadronic and leptonic contributions to the observed gamma-ray emission.
In this presentation, I will review the most relevant results of gamma ray astronomy on supernova remnants (shell-type and middle-age interacting with molecular clouds) and the constraints derived concerning their efficiency to accelerate cosmic-rays.

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