



Seminar, Department of Physical Sciences, Bose Institute, Kolkata

Cosmic rays at PeV energies
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Abstract: The origin of cosmic rays remains unclear, with particles up to the second knee or ankle of cosmic ray energy spectra believed to be of galactic origin. Supernova remnants (SNRs) are commonly regarded as the most likely origins of galactic cosmic rays up to the knee or even up to the ankle. The maximum attainable energy is one of the key unsettled issues concerning the SNR model of cosmic ray origin. Under this framework, the mass composition of cosmic rays will be heavier beyond the knee, as the knee is a proton knee. However, the conclusions of different EAS experiments on primary mass composition in the PeV energy region are not unequivocal. Supernova explosions, on the other hand, tend to cluster in space and time because big OB stars develop in clusters and have limited lifetimes. As a result, overlapping shocks from SNRs and huge star winds created by OB associations can accelerate cosmic rays to PeV energy. Recent IceCube detection of a few high-energy neutrino events in spatial coincidence with a few of the known gamma-ray blazars suggests that the blazars may be the most plausible extragalactic sources of high-energy cosmic rays. In this presentation, our understanding on these issues will be addressed.

- **Date/time: January 09, 2024 (Tuesday) at 12:00 noon**
- **Venue: Physics Seminar Room (204, second floor, UAC, BI)**