

**TATA INSTITUTE OF FUNDAMENTAL RESEARCH****Homi Bhabha Road, Mumbai-400 005**

January 10, 2019

**ASET Colloquium**

- Speaker** : **Prof. Darin Acosta** (*University of Florida, USA*)
- Title** : **Trigger electronics technologies for current and future particle physics collider experiments**
- Date & Time** : **Friday 18 January 2019 at 16:00 hrs.**
- Venue** : **Lecture Theater (AG-66)**

**Abstract** :

Trigger systems for experiments at particle physics colliders must analyze and select from an enormous amount of raw data generated from billions of collisions per second only a tiny fraction for storage, all within a processing time of just microseconds per collision event. A two-level processing system based on field programmable gate arrays in the first level and CPUs for the second level must implement algorithms to identify and measure particles coming from the collisions with high precision, and retain only those collisions most interesting to the physics program of the experiment. This talk will review the challenges and electronic solutions for such trigger systems, including the use of state-of-the-art technologies and machine-learning artificial intelligence algorithms to extract the best performance. The outlook toward future upgrades and experiments also will be presented.

**About the Speaker:**

Prof. Darin Acosta received his B.S. from the California Institute of Technology in 1987, and his Ph.D. from the University of California, San Diego in 1993. He was a postdoctoral researcher at the Ohio State University before he joined the faculty at the University of Florida in 1997. His research in experimental high-energy physics spans the search for new lepton-quark couplings and compositeness that could arise from new forces and symmetries, searches for Supersymmetric particles, Standard Model measurements, and searches for rare processes such as the Higgs decay into dimuons. He is currently a member of the CMS Collaboration at the CERN LHC. He is an expert on the electronic trigger systems of particle collider experiments that perform real-time analysis of collision data before storage on computer disk.



**Dr. Satyanarayana Bheesette**  
(Coordinator, ASET Forum)