

## **Seminar**

### **Advanced particle accelerators driven by ultra-intense lasers - Study of relativistic and nonlinear effects in plasmas**

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I will discuss progress made in the field of laser-driven wakefield accelerators. Research in this area is motivated by the fact that the ultrahigh acceleration gradient in a plasma will lead to a new generation of compact particle accelerators. I will primarily focus on laser-driven electron acceleration and discuss recent results on the generation of high-energy electron beams and advancements in our understanding of this process. In particular I will highlight my own work on developing a tunable accelerator, and our recent results on injecting electrons into plasmas based on the collision of two laser-driven wakes. I will discuss the application of such laser-driven electron beams to the generation of MeV energy photon beams by the process of inverse Compton scattering and show that this technique enabled the first ever measurement of the intrinsic emittance of electron beams produced by laser wakefield acceleration. I will also present some of the parallel breakthroughs in associated laser technology that enabled these advances in laser-driven electron acceleration.

***Monday, Jun 3<sup>rd</sup> 2019***

***11:00 AM (Tea/Coffee at 10:30 AM)***

***Seminar Hall, TIFR-H***