



**AAPPS-DPP 2018 Plenary speaker Name:** Prof. G. Ravindra Kumar

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**Rationale:** Prof. Kumar is an internationally renowned high intensity laser–plasma interaction experimentalist with several breakthroughs in understanding giant magnetic fields in these plasmas, their turbulent behavior, relativistic electron transport in hot, dense matter, ultrafast plasma dynamics and in devising ultra-bright radiation sources.

**Talk Title:** Relativistic electron physics in ultrahigh intensity laser plasma interactions

**Short abstract:** We address one of the most important problems of high energy density science namely, the transport of relativistic, mega-ampere, femtosecond electron pulses through dense matter (solids). We review the progress made so far and present our recent experimental and theoretical studies of the instabilities that the transport experiences, the creation and turbulent evolution of giant magnetic fields and the ultrafast mapping of the electron transport by monitoring emission created by these electrons, employing picosecond time gates. We will attempt to foresee where these studies may be headed.

#### **List of related published papers**

1. *Magnetic Turbulence in a Table-Top Plasma Relevant to Astrophysical Scenarios*, Gourab Chatterjee, K. M. Schoeffler, Prashant Kumar Singh, Amitava Adak, Amit D. Lad, Sudip Sengupta, Predhiman Kaw, L. O. Silva, Amita Das, and G. Ravindra Kumar\*, Nature Communications DOI 10:1038 ncomms15970 (30 Oct 2017)
2. *Mapping the Damping Dynamics of Mega-Ampere Electron Pulses inside a Solid*, Moniruzzaman Shaikh, Amit D. Lad, Gabriele Birindelli, J. Jha, Deep Sarkar, Sheroy Tata, Gourab Chatterjee, Indranuj Dey, Kamallesh Jana, Prashant Kumar Singh, Vladimir T. Tikhonchuk, P. P. Rajeev, and G. Ravindra Kumar, Physical Review Letters 120, 065001 (2018).
3. *Evidence of new finite beam plasma instability for magnetic field generation*, Amita Das, Atul Kumar, Chandrasekhar Shukla, Ratan Kumar Bera, Deepa Verma, Bhavesh Patel, Y. Hayashi, K. A. Tanaka, Amit D. Lad, G. R. Kumar, Predhiman K. Kaw. arXiv:1712.03099v1 [physics.plasm-ph], 2017