

**N.12: DST-SERB School on Ultra-high Intensity Laser Plasma Interaction: Physics and Applications**

DST-SERB School on “Ultra-high Intensity Laser Plasma Interaction: Physics and Applications” was organized at Raja Ramanna Centre for Advanced Technology (RRCAT), Indore during January 7-25, 2019. Financial sanction for the school was granted on 13<sup>th</sup> September, 2018, and school was announced on 1<sup>st</sup> October, 2018.

Normally such school is targeted for research scholars pursuing Ph.D. and young faculties working in research areas related to the theme of the school. An overwhelming response for this school was received. Total 66 applications (including 03 from the local university) were received for total 40 openings. Screening committee headed by Dr. D. S. Patil, IIT-Bombay selected total 40 participants along with a waitlist which also included a few bright M. Sc. / M. Tech. students. Finally, 35 participants joined the school, which included research scholars, post-doctoral fellows, young faculty members from different institutions, universities, colleges, R & D centres of the country and few bright and research motivated final year students of M. Sc. / M. Tech.

The inaugural function of the school was held on January 7, 2019. Prof. A. K. Das, Vice Chairman, Odisha State Higher Education Council (OSHEC) and former Vice Chancellor, Utkal University, was the Chief Guest and Dr. P. A. Naik, Director, RRCAT, presided over the function. Various senior scientists from RRCAT were also present.

The main aim of this SERB School was to present an overview of the various aspects of plasma production using lasers particularly using ultra-short, ultra-high intensity lasers and its applications viz. particle (electron/proton/ion) acceleration, intense ultra-short duration x-ray generation, coherent x-ray generation using harmonic generation and x-ray laser schemes, THz generation, laser driven shock and nuclear fusion studies etc. Basics of laser, particularly Chirped Pulse Amplification (CPA) based lasers for ultra-short, ultra-high intensity Ti:sapphire laser development and its characterization were also covered. Course syllabus covering above aspects was prepared along with their tutorials. Both, external (9 Nos.) and local (19 nos., from RRCAT) faculties took lectures to cover the various topics in their respective areas of expertise. Six evening lectures from eminent senior scientists from the country were also arranged. Six hands on experiments using state of the art high-power laser systems viz. 10 TW, 150 TW Ti:sapphire and 50 J, 1 ns Nd: glass lasers available at RRCAT were also part of the curriculum. Total lecture hours including tutorials and

experiments were close to 100 hours. Visits to Indus Accelerator Complex and various laser laboratories including upcoming 1 PW, Ti:sapphire laser were also arranged for the participants. A cultural evening, special dinners, and a visit to nearby tourist place, Mandu, during weekend were also arranged.



*Participants of DST-SERB School with organizers.*

The school concluded on January 25, 2019, afternoon. The concluding session was attended by Dr. D. S. Patil, Chairman of DST-SERB School Committee, and Dr. P. A. Naik, Director, RRCAT. A test was organized on the topics covered in the school to judge the participants' performance and understanding acquired on the topics taught during the school. The top three scorers were selected and given prizes. Various activities were summarized and feedbacks of participants were also taken, which was very satisfactory. In particular, the participants liked the exposures to the ultrahigh intensity laser plasma experiments. Certificates to all the participants were distributed in the concluding session.



*Dr. D. S. Patil, Chairman of DST-SERB School Committee distributing certificates to the participants during the concluding function.*

*Reported by:  
J. A. Chakera (chakera@rrcat.gov.in)*