



SERB School on "Ultrahigh Intensity Laser Produced Plasmas: Physics and Applications"

January 07 –25, 2019



Organised by:
Raja Ramanna Centre for Advanced Technology
Indore 452 013, India

Sponsored by:
Science and Engineering Research Board (SERB)
Department of Science & Technology, New Delhi
<http://www.serb.gov.in/home.php>

About SERB School

Research in plasma physics over the years has opened numerous areas of investigations in both theoretical and experimental domain. Studies on laser plasma interaction were initiated immediately after the invention of LASER with the aim of achieving sustainable source of energy through controlled nuclear fusion. Over the years investigations relevant to this area spurred the growth of ever increasing high power laser facilities and also opened variety of interesting theoretical as well as experimental fields in intense laser plasma interactions. In recent times, the ultrashort high power lasers are being employed for wide range of fundamental as well as applied research areas such as fast ignition approach for inertial confinement fusion, development of advanced particle acceleration techniques, generation of ultrashort x-rays, coherent attosecond pulses with their potential applications in material science, industry, medicine, and security etc.

Raja Ramanna Centre for Advanced Technology is a unit of Department of Atomic Energy, Government of India, engaged in research and development of Lasers, Particle Accelerators, and related technologies. Since its inception, the centre has indigenously developed a variety of high power laser systems, advanced plasma diagnostics, and employed them for experimental studies on intense laser-plasma interaction relevant to inertial confinement fusion and to understand the behaviour of matter under extreme conditions (high pressure and temperature). The centre also hosts wide range of state-of-the-art Chirped Pulse Amplification (CPA) based ultrashort high power lasers which are being used for research and development on laser driven compact particle (electron/proton/ion) accelerators, bright sources of coherent x-rays, attosecond science, fast electron generation and transport etc. and their applications. The centre is also augmenting a Peta-watt Laser Facility, which will be commissioned soon for advanced research in the above mentioned fields.

Aims and Objectives

To provide broad as well as in-depth knowledge to the participants of fundamental plasma physics and advanced ultra-high intense laser-plasma interaction physics and diagnostic methods. Through hands-on experiments, participants will also be provided exposure to the advanced ultrahigh intense laser-plasma experimental facilities involving ultrashort high power Ti:sapphire laser systems.

Course Content

- Fundamental Plasma Physics
- Basics of Laser Plasma Interaction (LPI)
- Advanced Topics on Ultrashort Lasers
- Physics of Ultrahigh Intensity LPI
- Laser Driven Particle Acceleration
- Fast Electron Generation and Transport
- Coherent x-rays and Attosecond Science
- Basics of Inertial Confinement Fusion

Hands-On Experiments

Measurement of

- Femto-second Laser Pulse Duration
- Plasma Density by Interferometry
- Ion Velocity using Thompson Parabola

Generation of

- High Order Harmonic Radiation in Plasma
- Fast Electrons and Characterization
- THz Radiation in Air / Dielectric Plasma

Probable List of External Speakers

- | | |
|-------------------|------------------|
| •A. K. Ganguly | IIT-Delhi |
| •A. Khare | Delhi Univ. |
| •D. S. Patil | IIT-Bombay |
| •M. Khan | Jadavpur Univ. |
| •M. Krishnamurthy | TIFR, Mumbai |
| •P. Jha | Lucknow Univ. |
| •S. Sengupta | IPR, Gandhinagar |
| •V. K. Tripathi | IIT-Delhi |

Participation and Funding: Applications are invited from Research Scholars, Post-doctoral Fellows and Young Faculty Members from Institutions, Universities, Colleges, and Young researchers from R & D Centres. A few bright and research motivated final year students of M. Sc./M. Tech. may also be considered. The total number of participants in the school is restricted to about **Forty**. All the selected participants will be provided to-and-fro III AC train or bus fare, free lodging and boarding.

Self-financed Participants: Few bright and young participants from Industry are permitted along with regular school attendees. Travel and lodging arrangements are to be made by the participants on their own.

Programme Planning Committee

Prof. D. S. Patil	IIT-Bombay, Chairman
A. K. Das	OSHEC, Bhubaneswar, Special Invitee
Prof. H. Bailung	IASST, Guwahati, Member
Prof. P. A. Naik	RRCAT, Indore, Member
Prof. Manoranjan Khan	Jadavpur University, Member
Prof. K. Subramanian	IUCAA Pune, Member
Prof. Pallavi Jha	Lucknow University, Member
Dr. S. K. Nema	FCIPT IPR, Gandhinagar, Member
Dr. Amitava Roy	SERB, DST, Programme Coordinator
Dr. Nilotpal Ghosh	SERB, DST, Member Secretary
Dr. J. A. Chakera	RRCAT, Indore, School Director
Dr. A. Moorti	RRCAT Indore, School Co-Director

How to Apply

The application can be uploaded on <http://www.plasmaschool.in> OR sent to the E-mail: plasmaschool@gmail.com

The application must accompany: CV with address of contact (affiliation, e-mail, phone/mobile number), record of past academic achievements, area of research along with a list of publications, if any.

A recommendation letter from Research Supervisor / Head of the Department or Institution must be submitted with the application.

Deadlines

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| ▪ Last date of application | : | October 30, 2018 |
| ▪ Intimation to selected participants | : | November 15, 2018 |
| ▪ Confirmation by the participants | : | November 20, 2018 |

For Further Details Contact: Dr. J. A. Chakera, School Director / Dr. A. Moorti, School Co-Director

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