

Attosecond Photonics: Science & Technology

Overview

Attosecond pulses are at the forefront of photonic science and technologies having made their advent recently. Electronic processes occur on attosecond timescales processes – the ‘clocks’ for electronic dynamics tick at a billionths of a billionth of a second, which is an attosecond. Hence attosecond photonics is fundamentally as fast if not faster than possible electronic. For the scientist, this is the future of dynamics allowing us to see the world around us and “film” these fast motions for the first time in human history. As a consequence this opens doors to steering and controlling reactions involving atoms and molecules, leading to hitherto unforeseen possibilities.

For specialists in photonic technologies and engineering, this course will introduce and excite you into forefront technologies which have made attosecond pulses possible and continue to push the envelope. Control and synthesis of light waves at petahertz frequencies and detection of signals at these super-high rates leads to new horizons in future technology - mapping electronic waveforms, optical ‘oscilloscopes’, optical switching, nano-optics and more.

The key tools of attosecond science and technology, physics and optics, fundamentals and applications, will be imparted in this course by experts. The participants will take home a rich variety of information and perspective from this course over a broad, yet significantly deep, pool of knowledge at the state-of-the-art in forefront of science and technology. Interactive lecture sessions, realistic simulations and hands-on activities will take the participant through this exciting journey.

Dates for the Course	07th to 11th November, 2016
Host Institute	IIT Madras
No. of Credits	2
Maximum No. of Participants	35
You Should Attend If...	<ul style="list-style-type: none">▪ You are research scientist or engineer interested in photonics light and light-based science and technologies.▪ You are a physicist and wish to get introduced to the exciting field of attosecond science and technology.▪ You are a student or faculty in an educational institution interested in learning about this field and wish to introduce courses on the same in the near future.
Course Registration Fees	The participation fees for taking the course is as follows: Student Participants: Rs.2000 Faculty Participants: Rs. 6000 Government Research Organization Participants: Rs. 10000 Industry Participants: Rs. 20000 The above fee is towards participation in the course, the course material, computer use for tutorials and assignments, and laboratory equipment usage charges. Mode of payment: Demand draft in favour of “Registrar, IIT Madras” payable at Chennai The demand draft is to be sent to the Course Coordinator at the address given below.
Accommodation	The participants may be provided with hostel accommodation, depending on the availability, on payment basis. Request for hostel accommodation may be submitted through the link: http://hosteldine.iitm.ac.in/iitmhostel

Course Faculty



Uwe Morgner is a Professor of Physics and the Dean of the School of Natural Sciences at the University of Hannover. He leads a group at the Institute for Quantum Optics at this university and specializes in femtosecond and attosecond science and technology. This multi-faceted group works on ultrafast and few-cycle lasers, XUV laser physics, surgery and machining with femtosecond pulses. A noted expert in laser technologies, he co-founded Venteon Technologies, a Laser Quantum company which builds state of the art femtosecond lasers.



Ram Gopal is a scientist at the Tata Institute of Fundamental Research in Hyderabad. He works in femtosecond and attosecond science with particular attention to atomic systems and plasmas produced in intense laser pulses. He worked earlier at the Max Planck Institute for Nuclear Physics in Heidelberg, where he worked on attosecond pulse generation and application.



Sivarama Krishnan is a faculty member at the Department of Physics, Indian Institute of Technology – Madras, Chennai, whose research interests are in light-matter interaction and the dynamics of electrons from the angstrom and nanoscale systems.



Anil Prabhakar is a professor of Electrical Engineering at the Indian Institute of Technology – Madras, Chennai. He works in generating and applying ultrashort light pulses to various technologies including multiphoton microscopy and surgery, and memory technology toeing the fine line between physics and engineering. He is one of the founders of Unilumen Photonics a fiber laser and photonic technologies company. He is also involved in developing assistive technologies.

Course Coordinator

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