AMO THEORY INPUT WANTED

Have an idea for a workshop you want to organize? Have some sabbatical time? Would you like to bring a group of people together? ITAMP can make it happen.

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Winter School 2013
January 4-11
B2 Institute
University of Arizona
Tucson, AZ

Workshops, Topical Groups, & Schools


ITAMP/B2 Institute Winter Graduate School on AMO Physics. at University of Arizona: Biosphere 2, Tucson, Arizona, January 4-11, 2013

Finite temperature and low energy effects in cold atomic and molecular few- and many-body systems. Organizers: Doerte Blume, Washington State, Barbara Capogrosso-Sansone, University of Oklahoma, Seth Rittenhouse, Washington University; March 25-27, 2013

Ultracold Rydberg Physics: A collaborative workshop. Organizers: Thomas Pohl and Jan M. Rost, MPIPKS, Dresden, Germany, July 8-12, 2013

Workshop: “Quantum Applications with Trapped Ions” Sep.16-18
Topical Group Discussion: “Scalable Trapped Ion Quantum Systems” Sep. 19-25
Organizers: Peter Rabl, TU Vienna & Chris Monroe, IQI

Synthesis and spectroscopy of large carbon molecules. Organizers: Michael McCarthy, CFA and Hossein Sadeghpour, ITAMP, October 21-23, 2013

Ultrafast atomic and molecular physics with cutting edge light sources: New opportunities and challenges. Organizers: Brett Eory, Kansas State, Yineed Kumarappan, Kansas State, Mark Vrakking, Max-Born-Institute, November 4-6, 2013

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From atomic to mesoscale: The role of quantum coherence in systems of various complexities. Organizers: Svetlana Malovskaya (Stevens Institute), Irina Novikova (William & Mary), and Christian Buth (Argonne Nat’l Lab), March 3-5, 2014

2013 Benjamin Franklin Medal in Physics

We are pleased that Alex Dalgarno, founding director of ITAMP, was awarded the 2013 Benjamin Franklin Medal in Physics. He traveled to the Franklin Institute in Philadelphia in April 2013 to receive the medal. The prize citation reads:

“For his many fundamental contributions to the development of the field of molecular astrophysics, which led to a better understanding of interstellar space, including the giant molecular clouds that are the birthplaces of stars and planets.”

SEND YOUR STUDENTS TO THE ITAMP/B2 INSTITUTE 2014 WINTER SCHOOL!

2013 Postdoctoral Fellows

Eric Kessler received his master's degree in physics at Michigan State University in 2007 and his Ph.D. in theoretical quantum optics in the group of Ignacio Cirac at the Max-Planck-Institute in Munich (Germany). During his studies he worked on the description of open quantum systems, coherent nuclear spin dynamics in semiconductor nanostuctures, and quantum phase transitions. After he joined ITAMP in April 2013 his research focus moved towards the integration of concepts from open quantum dynamics and solid-state quantum information processing for applications in quantum metrology, e.g., in the context of neural network activity and quantum clock networks.

Michael Knap joins ITAMP from Graz University of Technology, Austria, where he developed numerical techniques to explore spectral properties of strongly correlated lattice bosons and non-equilibrium steady states. He is especially interested in understanding the nonequilibrium dynamics of strongly interacting many-particle systems and the novel phenomena that emerge from the collective behavior of the particles. Currently his research is at the interface between many-body physics and atomic physics.

Long Term Visiting Fellows

Doerte Blume (Washington State University)
Alexander Dodonov (Institute of Physics, University of Brasilia)
Brett Ersy (Kansas State University)
Roberto Onofrio (University of Padova)
Janine Sherertz (Holy Cross)
Ronnie Kosloff (Hebrew University, Jerusalem)
Ninidu Moseyeva (Technion Israel Institute of Technology, Haifa)
Peter Schmelcher (University of Hamburg)
Mei Zhang (Chinese Normal University)

2013 Winter School

The Winter Graduate School has had its second year of great success. ITAMP and the B2 Institute in Arizona organized an eight day graduate school in AMO physics, January 4-11, 2013. The main topic was quantum control of mesoscopic systems. The B2 Institute campus, where the winter school is held, is located at the bottom of the Catalina Mountains near Tucson. Students attended the school from all over the world. Particular attention was paid to recruiting students from under-represented schools. The next Winter School on "Ultracold Rydberg physics and engineering", will be January 4-12, 2014. The lectures of the past winter schools are available on the ITAMP YouTube channel.

ITAMP News (In Brief)

In 2013, ITAMP organized the Second Winter School with the B2 Institute, 3 workshops and a topical Group at ITAMP and a joint workshop with Kansas State University is planned for November. During the '12-'13 academic years, ITAMP and HQO supported 12 speakers from all over the world, and 8 seminars were held in collaboration with Harvard's Chemistry and Chemical Biology Department. In addition, 8 long-term visitors, and more than 30 short-term visitors/speakers visited ITAMP both in the Harvard Physics Department and at the Harvard-Smithsonian Center for Astrophysics.

Brett Ersy was awarded a 2012-13 Simon Foundation Fellowship, and spent 6 weeks of his sabbatical at ITAMP in late 2012 working on ultracold and ultrafast physics.

Susanne Yelin was awarded the Lamb Award for Laser Sciences with Shaul Mukamel (UC-Irvine) and Peter Nordlander (Rice). The Lamb Award is sponsored by the Physics of Quantum Electronics Conference (PQE).

Advisory Board Meeting

The Advisory Board met on November 8-9, 2012. The new member of the board is Doerte Blume from Washington State University.

ITAMP collaborates with German Institutes

ITAMP continues its longstanding collaborative research with MPIPKS in Dresden. In May 2012, new collaborations with The University of Hamburg, Center for Free-electron Laser (CFEL) and The Center for Quantum Technologies (ZQI) were initiated.

ITAMP YouTube Channel

The ITAMPYouTube channel (www.youtube.com/itampphysics) is going strong with over 41,000 views. The uploaded videos from workshops and the Winter School can be viewed on this channel.

Farewell

Chris Laumann is planning to spend three months this fall as a visitor scholar at the Perimeter Institute in Waterloo, ON before starting as an Assistant Professor at the University of Washington in Seattle in January. He is joining the condensed matter theory faculty and will be working on various topics in quantum condensed matter, cold atoms and information theory.

Workshop Updates

June 2012 - Quantum Simulations

A small focused group met for a week to discuss the frontier where research in quantum computing meets theoretical chemical dynamics. The workshop aimed to survey experimental and algorithmic approaches for quantum simulations of chemical dynamics and to couple this to some developing quantum hard ware technologies including simulation fidelity, coherence times, qubit-scaling, architecture, bus, and memory storage.

December 2012 - Theory of Electron-Molecule Collisions for Astrophysics, Biophysics, and Low Temperature Plasmas

A fairly large workshop on electron-molecule collisions bringing together theorists and experimentalists from atomic, molecular, chemical, biological, and astrophysical backgrounds, as well as physicists providing databases, was held at ITAMP in December. Topical problems in biophysics, tokamak edge plasma, as well as in astrophysics, require accurate electron-molecule collisional data over vast energy scales (1 meV-100 eV). In particular, data (cross-sections, rate coefficients, branching ratios) are urgently needed for collisions of electrons with vibrationally excited molecules. The workshop successfully included members from the quantum chemistry community to forge future collaborations and to exchange ideas.

March 2013 - Finite temperature and low energy effects in cold atomic and molecular few- and many-body systems

Long-term visitor Doerte Blume (Washington State) and former ITAMP postdoctoral fellows Barbara Capogrosso-Sansone (Oklahoma) and Seth Rittenhouse (Western Washington) organized a successful workshop that brought together theorists and experimentalists who work on cold atom systems and share an interest in finite temperature effects. Challenges in the theoretical description of systems which sit between “few” and “many” bodies as well as connections between atomic, molecular, and optical and condensed matter physics were explored.