



Spring 2011

# ITAMP NEWS

## Workshops '11

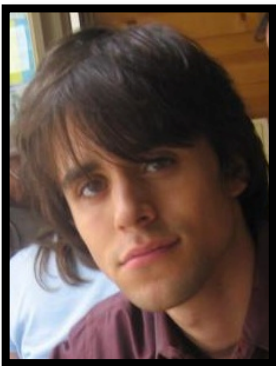
Feb 7-9 **Optomechanics and Macroscopic Cooling**, Cambridge, MA, USA

Organized by Pierre Meystre – Arizona University, Nergis Mavalvala - MIT, Dan Stamper-Kum- UC-Berkeley.

May 18-20 **Hydrogen Cosmology**, CfA, Cambridge MA, USA. Jointly sponsored with ITC. Organizers: Avi Loeb, ITC and Hossein Sadeghpour, ITAMP.

Sept-Oct **Topical Group: Emerging Research Directions in Ultracold Molecule Physics**, Cambridge MA, USA. Organizers: Roman Kreams, John Doyle, Peter Rabl, Dave DeMille, Susanne Yelin, Timur Tscherbul.

## Three Postdoctoral Fellows joined ITAMP, in 2010



### Charles Mathy

Charles comes to ITAMP from David Huse's group at Princeton University. His Ph.D. dissertation deals with the strongly correlated phases of ultracold atoms, including the antiferromagnetic ordered

Neel phase, and mass-imbalanced polarized two-component Feshbach resonant Fermi gases. He is currently studying dynamics of many-body systems that can be realized in a cold atom setting. Charles was raised in Amsterdam where he did his undergraduate work on topological phases in two-dimensional systems at the University of Amsterdam.



### Hendrik Weimer

Hendrik obtained his Ph.D. under the guidance of Hans Peter Büchler at the University of Stuttgart, where he investigated the thermodynamics of

the excitation dynamics in a strongly interacting ultracold Rydberg gas and realization of a novel crystalline phase of such excitations. He was awarded a German Academic Exchange Service (DAAD) fellowship and is spending this year at ITAMP. His currently research interests are primarily focused on strongly interacting Rydberg atoms and nitrogen-vacancy centers in diamond.



### Chris Laumann

Chris earned his Ph.D. in physics from Princeton University under the supervision of Shivaji Sondhi, working on quantum

disordered systems, connections to quantum complexity and topological phases. His current interests are problems of disorder, frustration, and coherence for realistic implementations of large-scale quantum systems. He shares one half of his fellowship at ITAMP and with the Golub Fellowship in Physical Sciences at Harvard.

## New Director Hossein Sadeghpour

In September 2010, Hossein Sadeghpour was appointed Director of ITAMP. Previously he was the Deputy Director (interim).

## 2011 Postdoctoral Fellow

The new appointment for the 2011 will be Mikhail Lemeshko who comes to ITAMP from the Department of Molecular Physics at the Fritz Haber Institute of the Max Planck Society, where he received his Ph.D. working under the supervision of Bretislav Friedrich.

## ITAMP News

### The Cloud

Over the last year, we have embarked on several initiatives to streamline operations at ITAMP, improve outreach to the public, obtain measurable feedback on our programs, and start on an entirely new program. We're now making extensive use of Cloud Applications to collect statistics and feedback from our workshop participants and visitors on both scientific and administrative functions.

A new blog on current happenings has been created and fellows, visitors and postdocs are encouraged to write about their work and experience at ITAMP. The address is [itamp.blogspot.com](http://itamp.blogspot.com).

There is now a call for Proposals for visits and workshops on the ITAMP website. We highly encourage you to submit your ideas to us through these forms.

## YouTube Channel

A new YouTube Channel, *ITAMPphysics*, is now available at [www.youtube.com/ITAMPphysics](http://www.youtube.com/ITAMPphysics). Here you can view full-length talks from recent workshops. More content and archives will become available soon. Become a friend and stay tuned.

## 2011 Winter School

ITAMP's newest program initiative is the 2012 Winter School on Atomic, Molecular and Optical Physics. This school is organized jointly by ITAMP and the B2 Institute at the University of Arizona. The inaugural theme will be ultracold and ultrafast AMO physics which have become major interdisciplinary research area over the last couple of decades.

The school is geared to students with a quantum mechanics background (a requirement) who are or could become interested in graduate research in AMO physics. The sessions will be conducted over two weeks January 7-13 and January 14-20, on the campus of the B2 Institute near Tucson. These dates were chosen to coincide with semester breaks at many US schools, when students are free to attend.

The registration website will soon become available on the ITAMP webpage. We hope that you encourage your students to attend.

## Collaborative Agreement Max-Planck Institute for Physics of Complex Systems (Dresden)

ITAMP and MPIPKS have signed an agreement for collaborations on workshops of mutual interests and exchange of fellows. Two subsequent workshops on the physics of ultracold Rydberg atoms and molecules and plasmas were funded through this collaborative agreement at ITAMP (2009) and MPIPKS (2010). Other similar programs are in planning stages.

## Visitors updates

During the last year, ITAMP hosted more than 35,7 visitors and speakers. They made for a lively and scientifically alive environment. We anticipate more visitors this year. We're happy that Roman Krems (UBC) will spend his sabbatical leave at ITAMP in 2011-2012.

## Workshop Updates

### Neither snow, nor sleet, or Volcano?

The April 2010 workshop, **Fundamental Physics of Charged and Heavy Particle Interferometry** hit an ash snag as the Icelandic Volcano eruption caused flight cancellations throughout Europe. Workshop presenters who were unable to make the journey in person were still able to give their talks thanks to modern technology, presenting their data via telephone and video conferencing.

The September 2010 workshop on **Cold Rydberg Gases and Ultracold Plasmas** (CRYP10) was the second in the series of collaborative workshops with MPIPKS-Dresden and was co-organized by Charles Adams, Thomas Pohl, and Hossein Sadeghpour. The meeting was a clear demonstration of how rapidly the field of ultracold Rydberg atoms has progressed. Some 89 people attended the workshop from 15 different countries. The new frontiers in cold Rydberg atom physics were identified as Rydberg optics and Rydberg molecules. The second week of the workshop was devoted to tutorial talks and lengthy and lively discussions.

The October 7-9, 2010 workshop on **Wavepackets, Chaos, and Scattering: From Chemistry and Back** celebrated the accomplishments of former ITAMP Director, Rick Heller on the occasion of his 65<sup>th</sup> birthday. It was well attended and concluded with a banquet at the Faculty Club. Pictures are viewable online.

The February 2011 workshop on **Optomechanics and Macroscopic Cooling** was co-organized by Pierre Meystre, Nergis Mavalvala, and Dan Stamper-Kurn to address the big question, "You're in the ground state. Now what?" Motivations were to chart new frontiers of nature, quantum metrology, sensing, and new physics.

ITAMP organized or jointly organized six workshops and topical groups in 2010 with a total of over 275 attendees. A heartfelt **thank you** to all of the co-organizers for their effort in making the workshops and topical group a success.

**Fundamental Physics of Charged and Heavy Particle Interferometry**, workshop was held April 19-21, 2010 in Cambridge. Talks are available online.

**Coherence in Ultracold Molecular Physics** was held in Vancouver Canada and was jointly sponsored with UBC on May 20-23, 2010. It was co-organized by Roman Krems, UBC, Moshe Shapiro, UBC, Kirk Madison, UBC, Valery Milner, UBC and Timur Tscherbul, ITAMP.

**Topical Group: Frontiers in Open quantum Systems and Quantum Control Theory**. This two-week event was held August 1-7 and August 8-14 in Cambridge. Tommaso Calarco, University of Ulm, Paola Cappellaro, MIT, and Lorenza Viola, Dartmouth College were the scientific organizers.

**Cold Rydberg Gases and Ultracold Plasmas**, The two-week event took place September 6-17, 2010 and was held as part of a Tandem Workshop program with Max-Planck-Institute for Physics Complex System and ITAMP, Dresden Germany.

**Wavepackets, Chaos, and Scattering: From Chemistry to Physics and Back** on October 7-9, 2010. The scientific organizers were: David Tannor (Weizmann Institute), Jan-Michael Rost (MPIPKS), Frank Grossmann (TU-Dresden), Steve Tomsovic (Washington State University).

**Artificial Atoms in Diamond: From Quantum Physics to Applications** was held November 11-13, 2010. Organizers: Christian Degen, (MIT), Ania Bleszynski Jayich, (UCSB), and Paola Cappellaro, (MIT).

More information about ITAMP workshops can be found at <http://www.cfa.harvard.edu/itamp/workshops.html>



Wavepackets, Chaos and Scattering; From Chemistry to Physics and Back (Or more affectionately called: "HellerFest")



Artificial Atoms in Diamond: From Quantum Physics to Applications.

### 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 help make it happen.

Contact us:  
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Our website is: [www.cfa.harvard.edu/itamp](http://www.cfa.harvard.edu/itamp)

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