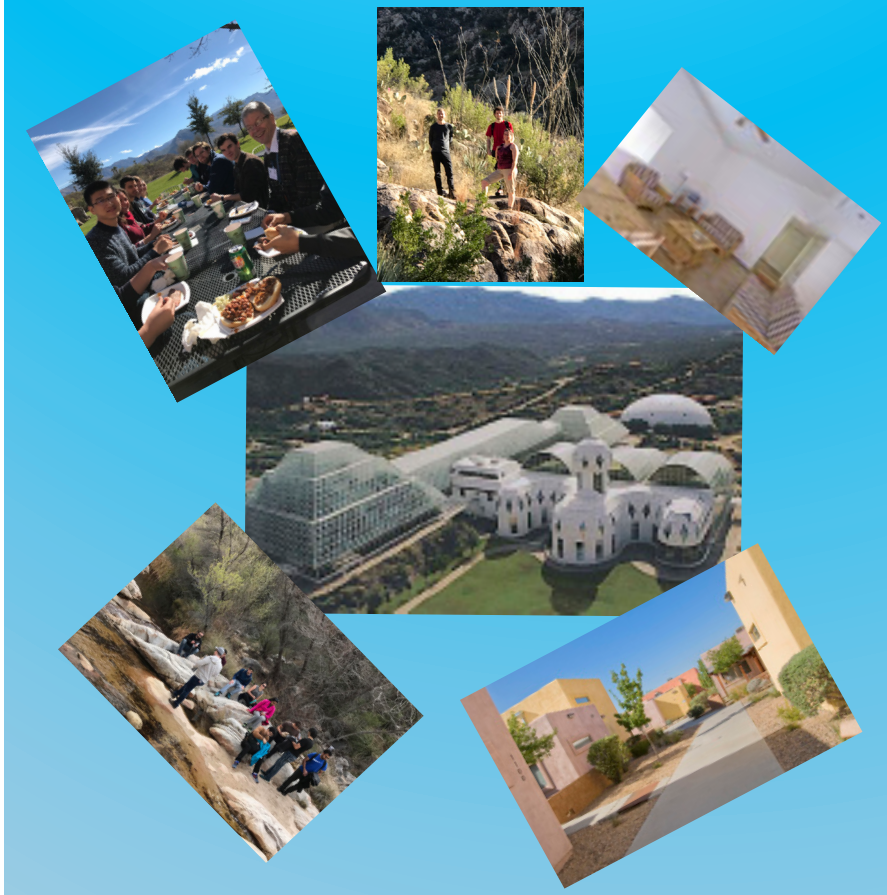
ITAMP, 60 Garden St., Cambridge, MA 02138 Tel. 617 495-9524

B2, 32540 S. Biosphere Road, Oracle Arizona 85623 Tel. 520 838-6200

ITAMP

Winter Graduate School on Atomic, Molecular and Optical Physics:

Strong Interactions in Rydberg physics & chemistry



February 27 - March 5, 2022

at Biosphere 2 Conference Center in Arizona

Notes

Welcome

Welcome to the 10th ITAMP Winter Graduate School on Atomic, Molecular and Optical Physics. This year's program focuses on Strong Interactions in Rydberg Physics and Chemistry. We are delighted to have researchers who are undisputed world leaders in this field and outstanding teachers. We are grateful for their willingness to invest the considerable amount of time required to prepare and present their lectures.

Our primary goal for this school is to enable and encourage informal interactions as well as formal discussions during the school. We hope that you will take advantage of the unique setting of the Biosphere 2 campus and its relaxed and informal environment to interact extensively with the lecturers. Most of them will be able to spend several days with us. So, don’t miss this opportunity!

We have several extracurricular activities planned. So, it’s not just all work and no play. The schedule of lectures includes free afternoons for the faculty and students to enjoy the outdoors, or just relax in the beautiful surroundings of the B2 Campus.

Enjoy!

Hossein Sadeghpour

Events

We have planned excursions and events during the week and a sign up sheet will be available.

- Hike/Outing
- Poster Session
- Possibly private cars riding to Saguaro National Park

Notes

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PROGRAM

2022 ITAMP/B2 SCHOOL SCHEDULE

		SUN	MON	TUE	WED	THUR	FRI	SAT	SUN
		2/27/2022	2/28/2022	3/1/2022	3/2/2022	3/3/2022	3/4/2022	3/5/2022	3/6/2022
Start	End								
8:00	9:00		BREAKFAST	BREAKFAST	BREAKFAST	BREAKFAST	BREAKFAST	BREAKFAST	BREAKFAST
9:00	10:00	Arrival	Tilman Pfau	Stephen Hogan	Chris Greene	Jim Shaffer	Stephen Hogan	Departure	Departure
10:00	11:00	Pickup Registration Packets and Keys	Chris Greene	Tilman Pfau	Tilman Pfau	Misha Lukin	Peter Schmelcher		
11:00	12:00		Jim Shaffer	Peter Schmelcher	Jim Shaffer	Valentin Walther	Misha Lukin		
12:00	1:30		LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH - FOR THOSE WITH 3/6 DEPARTURES	
1:30	5:30		FREE AFTERNOON	FREE AFTERNOON	OUTING Catalina Mountain HIKE	FREE AFTERNOON	FREE AFTERNOON		
5:30	6:30	DINNER - SELF SERVE (Available from 5pm to 10pm)	Stephen Hogan	Chris Greene		Misha Lukin			
6:30	7:30		DINNER	DINNER	DINNER	DINNER	DINNER	DINNER - FOR THOSE WITH 3/6	
7:30	8:30		Peter Schmelcher	Valentin Walther	Poster Session	Poster Session			

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Lecturers

Christopher Greene
Purdue
Email: chgreene@purdue.edu

Prof. Greene's current research is on electron-molecule collisions and dissociative recombination, ultrafast laser interactions with atoms and molecules, photofragmentation in atomic and molecular systems, ultracold few-body and many-body quantum systems and Rydberg molecules.

Lecturers

Stephen Hogan
UCL
Email: s.hogan@ucl.ac.uk

Prof. Hogan's current interests are in Rydberg excitation in cold atoms and molecules, light antimatter formation and quantum information processing, and hybrid interfaces and Rydberg-atom interferometry.

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Lecturers

Mikhail Lukin
Harvard University
Email: lukin@physics.harvard.edu

Prof. Lukin's research focuses on theoretical and experimental studies in quantum optics, atomic physics, and quantum information science. The emphasis is on studies of quantum systems consisting of strongly interacting photons, atoms, molecules and electrons. Recent developments include large-scale programmable 1D and 2D Rydberg arrays as quantum simulators, evidence for quantum scarring and protected topological states.

Lecturers

Tilman Pfau
University of Stuttgart
E-mail: t.pfau@physik.uni-stuttgart.de

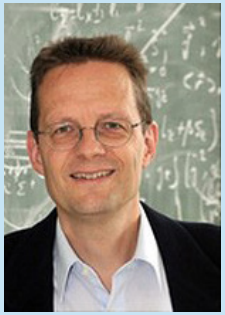
Prof. Pfau's current interests are on control and manipulation of interacting dipolar spin systems which form stable quantum droplets, coherent interactions in room temperature Rydberg vapor cells, ultracold Rydberg excitations in the blockaded regime in Bose condensates and formation of Rydberg.

Lecturers

James Shaffer
Quantum Valley Ideas Laboratories
Email: jshaffer@qvil.ca

Prof. Shaffer's recent focus is on precision quantum sensing and detection of electromagnetic radiation with Rydberg atoms for applications in quantum computing and simulations, metrology and interferometry. He has been heavily involved in detection and excitation of exotic Rydberg molecules including trilobite molecules.

Lecturers



Peter Schmelcher
Hamburg
E-mail: peter.schmelcher@physnet.uni-hamburg.de

Prof. Schmelcher is interested in theoretical studies of nonequilibrium quantum dynamics of correlated ultracold Bosonic and Fermionic ensembles, nonlinear excitations in condensates, quantum scattering in confined geometries and molecules, including Rydberg molecules, in external fields.

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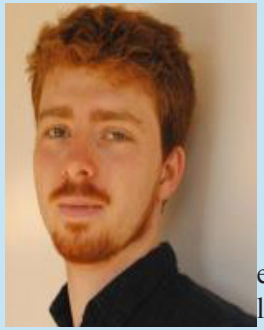
Lecturers



Valentin Walther
Harvard University, ITAMP
Email: valentin.walther@cfa.harvard.edu

Dr. Walther is pursuing novel Rydberg excitations in semiconductor excitons, their lifetimes and specific properties including lifetimes, and interactions in solid state medium.

Winter School Group Photo 2016

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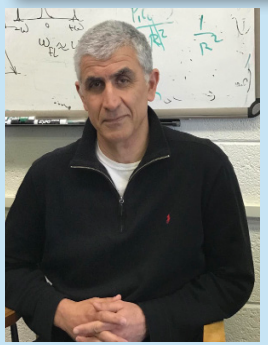
Organizer



Hossein Sadeghpour
Director
Center for Astrophysics|Harvard & Smithsonian

Research Interests:
Theoretical AMO physics, collision of cold and ultracold atoms and molecules in traps, formation of ultralong range Rydberg molecules, and presion photometry for cosmological surveys, and heating in ion microtraps.

ITAMP began life in 1989 at the Harvard-Smithsonian Center for Astrophysics. It is the only theoretical AMO "user facility" in the United States. It hosts workshops and visiting scholars, sponsors a speaker series, maintains a prestigious postdoctoral fellowship program, organizes a winter school on AMO physics, and hosts an endowed lecture series. ITAMP workshops and winter schools are archived on the institute YouTube channel. A Call for Proposal to organize workshops are available at http://itamp.harvard.edu.

ITAMP thrives in the larger Cambridge-area AMO physics ecosystem.The mission of ITAMP is to further the cause of theoretical AMO physics by providing resources, scientific and administrative expertise, enhancing collaborative efforts between theory and experiment, and advocating for theoretical AMO physics.

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Winter School Group Photo 2020

Winter School Group Photo 2017

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Winter School Group Photo 2018

Winter School Group Photo 2019

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