DIVISION OF ATOMIC, MOLECULAR AND OPTICAL PHYSICS NEWSLETTER

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INSIDE...

FROM THE CHAIR

Tim Gay

Welcome to Calgary

Our annual meeting in Calgary, to be held jointly with the Canadian

techniques which need to be developed and built due to the different nature of the LCLS compared to ultrafast lasers or synchrotron sources. In addition, tours to the LCLS site will be arranged.

The goal of the school is to disseminate information about scientific opportunities in ultrafast science and train students and posdocs on the new FEL facilities as well as inform researchers who are interested to join this exciting new field. Lectures will be presented by expert scientists in the various aforementioned fields. The attendees will be expected to participate in the discussions since we plan to offer these lectures in an interactive style mode to make it effective and interesting to the audience.

Please see **http://photonscience.slac.stanford.edu/pulse/uxss2007/index.php**.

AMO THEORY AT THE SANTA BARBARA KAVLI INSTITUTE

Peter Zoller

Margaret Murnane and I currently represent AMO physics on the Advisory Board of the Kavli Institute for Theoretical Physics at UC Santa Barbara, and I am one of the organizers of the KITP program "Strongly Correlated Phases in Condensed Matter and Degenerate Atomic Systems," which is running from February through mid-June, 2007, with a conference to be held in April. With this message to the AMO community, I want to address the problem that the AMO theory seems to be in general underrepresented at KITP, both in terms of the number of high-quality proposals for new programs - although there were very successful programs in the past - and also in terms of the number of participants. This must change if AMO theory is to become an identified, recognized subfield of theoretical physics.

KITP, under the leadership of its Director David Gross, has a significant interest in developing a stronger AMO theory component in its programs. This reflects the increasing visibility of AMO physics during the last fifteen years, a consequence both of exciting developments within AMO itself, but also of its growing interdisciplinary connections with other fields, in particular condensed matter physics and quantum information science.

The current program on Strongly Correlated Phases in Condensed Matter and Degenerate Atomic Systems is a good example of such a successful interdisciplinary program, which brings together condensed matter theorists, and AMO theorists and experimentalists. On the condensed matter side, there has been an explosion of theoretical proposals for novel and exotic quantum phases, and transitions between them, in particular outside the conventional weakly-interacting solid-state paradigm. On the other hand, cold atoms and molecules might provide realizations and a testing ground for these new developments. One such example is the role that may be played by AMO scientists in solving the puzzle of high-Tc superconductivity with the help of cold fermions in an optical lattice.

The KITP has a program on Coherent Control in the pipeline for spring and summer, 2009, to be organized by D. Tannor et al. This program will focus on coherent control techniques in atomic, molecular physics and chemistry, and will also contain a strong component on ultrafast science, stimulated also by a recent very successful program Attosecond Science (2006). Other recent programs involving AMO physics include Quantum Optics (2002), Quantum Gases (2004) and Topological Phases and Quantum Computation (2006).

The key message I wish to convey is that it is important for the AMO theory community to become more involved in programs at KITP, and further integrate and link AMO theory efforts to theoretical physics in general. This requires submitting high quality proposals that demonstrate that AMO theory is a lively subject and that the community identifies itself as an equal partner with other subfields of theoretical physics. We are at present witnessing an exciting time where traditional boundaries between different fields, for example AMO physics of cold atoms and condensed matter theory, disappear and communities merge. It will be important in particular for the younger generation to both benefit from this new interface, but

also to be able to compete within the emerging larger communities with rather different cultures.

KITP + ITAMP SYNERGY

Kate Kirby and Mikhail Lukin

ITAMP is interested in working with potential organizers of long-term workshops at KITP to support and facilitate planning meetings and smaller workshops for drawing up a KITP proposal. ITAMP is also interested in supporting, via its long- and short-term visitor program, AMO theory collaborations which result from KITP programs. Working together, KITP and ITAMP can stimulate and make possible a variety of productive interactions that further AMO theoretical endeavors.

ROCHESTER CONFERENCES

Joe Eberly

Conferences of interest to our members have announced their dates for early summer 2007, to immediately follow the DAMOP annual meeting, which should enhance the convenience for international visitors to both sites.

The Rochester Conference on Coherence and Quantum Optics, which has been held once each six years since 1960, will have its ninth meeting (CQO9) on campus at the University of Rochester sharing the week of June 10-16, 2007 with a sister conference, the International Conference on Quantum Information (ICQI). The conferences will be held back-to-back with coordinated sessions on the Wednesday.

Topics of interest in CQO9 will include all aspects of optical coherence and quantum optics, including topics such as cavity QED, singular optics, quantum coherence in condensed matter systems, particle coherence in Bose and Fermi contexts, Schrödinger cats, quantum control, coherence in the ultra-short wavelength regime, and theory and observation of quantum entanglement.

Themes that will be included in ICQI include quantum imaging, creation and measurement of high-order entanglement, transverse effects and Schmidt modes, state discrimination and cryptography, orbital angular momentum and entanglement, quantum lithography, linear optical computing, and optical storage of quantum information.

More complete descriptions and additional information about registration, deadlines, publication requirements, etc., will be available on the OSA website under the Meetings category starting at **http://osa.org/meetings/topicalmeetings/CQO/default.aspx** and **http://osa.org/meetings/topicalmeetings/ICQI/default.aspx**.

CLEO/QELS 2007 CONFERENCE TO BE HELD MAY 6-11, 2007

The annual CLEO/QUELS Conference will be held this year in Baltimore, MD from the 6th to the 11th of May. The conference website is **http://www.cleoconference.org**. You can download a copy of the Attendee Brochure to preview all the benefits of attending at: **http://www.cleoconference.org/materials/07AttendeeBrochure.pdf**. The early registration deadline is April 12, 2007. Register at **http://www.cleoconference.org/registration/**.

INVITATION FOR CONTRIBUTIONS TO IJMS SPECIAL