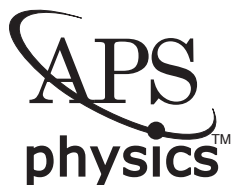


Edited by Barbara Jones



A Division of the
American Physical Society

DCMP Newsletter

The Division of Condensed Matter Physics

Winter 2012

Dear DCMP Members,

We bring you this Winter Newsletter to make a number of announcements that you should find of great interest. These include: our election results, our Buckley, Isakson, and Davison-Germer Prize winners, and DCMP's new APS Fellows. We also provide a glimpse of 2012 APS March Meeting events that DCMP organized or is co-sponsoring. This includes invited sessions with a variety of exciting scientific themes, award sessions, and innovative outreach/education sessions. You will still need to find detailed information in the APS March Meeting Program and Show Guide for 2012. But we thought that you would enjoy getting an overview of what is in store for Boston, February 26 to March 2.

We would like to draw your attention to a plenary session on "Emergent Physics at the Mesoscale." This special symposium of five invited talks is sponsored by the Kavli Foundation, and spearheaded by our Chair, Sam Bader. It will take place in the middle of the meeting, on Wednesday afternoon, February 29th, 2:30 – 5:30 pm. Following this session, there will be a Town Hall meeting for an open discussion on the topic of the symposium and related issues.

The purpose of the symposium is to initiate a dialogue to define scientific opportunities at the Mesoscale for the next decade. A goal is to reinvent Meso science and to create an engaging narrative to inspire the next generation of researchers, much as Nano did this past decade. We also hope to energize science policy makers, our sponsors, and an enlightened public on the deep and intriguing questions posed by Mesoscale science.

We have aimed to make the talks span topical areas, both basic and applied. Examples of seminal questions include: are there as yet undiscovered rules that govern Mesoscale phenomena? On the road from Nano to Macro, what challenges does the Mesoscale pose? What new scientific tools and facilities are needed to explore the Meso realm? How can mastering the Meso realm benefit society at large?

The planning of the March Meeting has been restructured especially to accommodate this special symposium to give it something of a plenary character. As a result, the meeting has many more interesting sessions on Friday than it typically does, and we hope as a result that you will all plan to stay the entire week.

The DCMP invited symposia and special events that are listed in this Newsletter involve about 223 invited speakers. The DCMP program itself will encompass contributed sessions with thousands of additional presenters. You will be able to choose from almost 9,000 presentations overall. The March Meeting is your meeting! We hope you will enjoy it! We invite you to participate in our Tuesday afternoon DCMP-co-sponsored Reception, followed by our Business Meeting where you can tell the members of our Executive Committee of your vision for the future of our Division.

We hope to see you in Boston!

—Barbara Jones, Chair Elect & 2012 DCMP Program Chair

DCMP Election Results

Here are the results of the 2011 Division of Condensed Matter Physics election for Vice-Chair, Councilor, and Members-at-Large of the Executive Committee:

Vice-Chair: Arthur Ramirez
Councilor: Frances Hellman
Members-at-Large: Paul Canfield,
M. Cristina Marchetti,
Ali Yazdani

Approximately 20% of the 5,636 DCMP members voted in this election.

I would like to extend congratulations to those elected, and express my gratitude to all those who agreed to stand as candidates --- the Division greatly benefits from our colleagues who are willing to run for office and serve the condensed matter physics community.

I would also like to thank our colleagues who are leaving office: Warren Pickett (Past Chair), Shirley Chiang, Melissa Hines, and Heinrich Jaeger (Members-at-Large), and Arthur Epstein (Councilor). All five have performed valuable service for the Division.

Finally, sincere thanks to Andrea Liu, Chair of the Nominating Committee; to Sara Conners, Jim Egan and their IT colleagues at the APS for their help with the online component of the election; and to Leanne Poteet from APS Special Publications for preparing and mailing the paper ballots.

—Nick Bonesteel, DCMP Secretary-Treasurer

New APS Fellows Sponsored by DCMF

EITAN EHRENFREUND

Technion, Israel Institute of Technology

For elucidating magnetic and optical phenomena in conducting polymers, semiconductor quantum wells and quantum dots

ADY STERN

Weizmann Institute of Science

For understanding decoherence processes in quantum electronic devices, and for proposing experiments to study fractional charges

ANDREW MACKENZIE

University of St Andrews

For studies of the electronic structure of ruthenium oxides

CHETAN NAYAK

University of California, Santa Barbara

For study of non-Abelian anyons in condensed matter systems and their applications to topological quantum computing

CYNTHIA REICHHARDT

Los Alamos National Laboratory

For characterization of collective phenomena in driven systems with long-range interactions, and including non-equilibrium phase diagrams, avalanches, noise and fractal flow

DANIEL COX

University of California, Davis

For identifying energetic and symmetry principles for observation of non-Fermi liquid and Kondo impurity physics

DANIEL K. SCHWARTZ

University of Colorado, Boulder

For research into the behavior of molecules at interfaces

DESMOND MCMORROW

University College London

For experimental studies of strongly correlated electron systems using x-ray and neutron scattering

DILANO SALDIN

University of Wisconsin, Milwaukee

For advancement of the theory of electron and X-ray diffraction and microscopy

FENG LIU

University of Utah

For contributions to the theory of nanostructures and strain-induced nanoscale self-assembly

HARALD BRUNE

Ecole Polytechnique Federale de Lausanne

For contributions to understanding of nucleation, epitaxial growth, and the self-assembly of nanostructure superlattices

JEAN-PHILIPPE ANSERMET

Ecole Polytechnique Federale de Lausanne

For research on spintronics in metallic systems and magnetic nanowires

JOHN BEAMISH

University of Alberta

For measurements of the shear modulus of solid ^4He at low temperatures

KONSTANTIN EFETOV

Ruhr-Univ Bochum

For applying the supersymmetry method to disordered, granular, and mesoscopic metals and superconductors

KUN YANG

Florida State University

For significant theoretical contributions to our understanding of novel phenomena in quantum Hall systems

MANFRED BAYER

Universitat Dortmund

For optical spectroscopy of charge and spin excitations in semiconductor quantum-dot structures

MANFRED SIGRIST

ETH, Honggerberg

For research on unconventional superconductivity in cuprates, ruthenates, and heavy fermion materials

MARK TUOMINEN

University of Massachusetts, Amherst

For contributions to nanoscale science and technology

MICHEL J.P. GINGRAS

University of Waterloo

For theory of geometrically-frustrated magnetic materials and the spin ice ground state in pyrochlore magnets

NANDINI TRIVEDI

The Ohio State University

For contributions to strongly correlated Fermi and Bose systems and disorder-driven quantum phase transitions

NICHOLAS CURRO

University of California, Davis

For application of nuclear magnetic resonance techniques to heavy fermion and superconducting materials

RUSLAN PROZOROV

Iowa State University

For high-resolution measurements of the London penetration depth of superconductors

TAPASH CHAKRABORTY

University of Manitoba

For understanding of the spin structure of the fractional quantum Hall effect and the electronic properties of quantum dots

WERNER HANKE

Universitat Wurzburg

For theory of quantum many-body effects and optical properties of materials

YOSEF YESURUN

Bar Ilan University

For elucidating vortex dynamics in the cuprate superconductors

ZHONG FANG

Chinese Academy of Science

For applying first-principle calculations to topological aspects of spin-orbital physics

ZLATKO TESANOVIC

Johns Hopkins University

For theory of topological defects, fluctuations and correlations in high-temperature and high-magnetic-field superconductors

DCMP-Sponsored Prize Winners for 2012

OLIVER E. BUCKLEY PRIZE (DCMP)

Charles L. Kane, *University of Pennsylvania*

Laurens W. Molenkamp, *University of Wuerzburg*

Shoucheng Zhang, *Stanford University*

For the theoretical prediction and experimental observation of the quantum spin Hall effect, opening the field of topological insulators.

FRANK ISAKSON PRIZE (DCMP)

Dmitri Basov, *University of California, San Diego*

For innovative and insightful use of infrared spectroscopy to probe correlated electron systems.

DAVISSON-GERMER PRIZE (DAMOP & DCMP)

Jean Dalibard, *Kastler Brossel laboratory at ENS, France*

For his seminal contributions to the physics of light-atom interactions and cold atomic gases.

DCMP March Meeting Invited Sessions and Special Events

DCMP INVITED SESSIONS

MONDAY FEBRUARY 27

- 8:00 Superconducting Fluctuations in Cuprates
New Correlated Electron Physics Using Scanning Tunneling Microscopy and Other Probes
Excitonic and Correlation Effects in Single-Layer Graphene
- 11:15 Superconducting Coherence, Fluctuations & Inhomogeneity in Mesoscopic & Low-Dimensions
Equilibration and Relaxation in Cold Atoms (DAMOP)
Magneto-Electric and Magneto-Optical Properties of Topological Insulators
- 14:30 Stripe Order and Fermi-Surface Reconstruction in Cuprate Superconductors
Novel Phases in Strongly Correlated Iridates (DMP)
Recent Advances in the Physics of Fractures (GSNP)
Topological Quantum Computing with Majorana Fermions (GQI)

TUESDAY FEBRUARY 28

- 8:00 Electronic Properties of the Pseudogap Phase in Cuprates
Current-Driven Spin Textures (GMAG)
- 11:15 Quantum Computing with Superconducting Circuits (GQI)
Strongly Interacting Cold Fermi Gases (DAMOP)
- 14:30 Fermiology of Electron and Hole Doped Cuprates - A Guide to High Temperature Superconductivity
Spin Liquids with Disorder (GMAG)
Quantum Design of Low-Dimensional Materials
Structures for Enhanced Solar Energy Conversion (FIAP)

WEDNESDAY FEBRUARY 29

- 8:00 Alkaline Iron Selenides vs Iron Pnictides: Properties and Their Implications
Dynamics of Strongly Correlated Systems: Control and Ultrafast X-Ray Probes (GIMS)
Transport Studies of Topological Insulators
- 11:15 Recent Advances in Pnictide Superconductors
Rare Fluctuation Effects in Strongly Disordered Systems (DCOMP)
DCMP Prize Session: Buckley, Isakson, MGM
- 14:30 **Plenary Session: Emergent Physics at the Mesoscale**
- 17:30 **Town Hall Meeting - open discussion on Emergent Physics at the Mesoscale**

THURSDAY MARCH 1

- 8:00 Spin Fluctuations and Cooper Pairing in Unconventional Superconductors
Holography and Strongly Correlated Electron Matter
Flexible and Rolled Up Semiconductor Nanomembranes (FIAP)
- 11:15 Fractional Topological Insulators
Spin Coupling and Kondo Screening in Individual Magnetic Spins
Electrons, Spins, and Collective Modes in Nanofilms
Silicon Spin Qubits: Relaxation and Decoherence (GQI)
- 14:30 Full Counting Statistics, Fluctuation Theorems, and Many-Body Entanglement
Two Dimensional Electron Systems at Oxide Interfaces (DMP)
Physics for Everyone: Innovative Materials for Energy (DMP)

FRIDAY MARCH 2

- 8:00 Competing Phases and Quantum Criticality in Strongly Correlated Systems
New Anisotropy-Driven Phenomena in Colloidal Suspensions (GSNP)
Topological Phases in Magnets
Novel Mechanisms of Multiferrocity
- 11:15 Active Responses of Biological Materials to Mechanical Stress (DBIO)
Frontiers of Non-Equilibrium Transport Theories (DCOMP)
Non-Abelian States in the 1st Excited Landau Level: Experimental Status and Theoretical Outlook
Optical Processes in Nitrides and Other Wide-Band-Gap Semiconductors
Interaction Driven Broken Symmetry States in Bilayer Graphene

PRIZE/AWARDS CO-SPONSORED BY DCMP

WEDNESDAY FEBRUARY 29

- 11:15 DCMP/CSWP Prize invited talks: Buckley, Isakson (DCMP), Maria Goeppert Mayer Award (CSWP)

THURSDAY MARCH 1

- 8:00 The IUPAP/C10 Young Scientist Prize winner invited talk is the last talk in the invited session above on Spin Fluctuations and Cooper Pairing in Unconventional Superconductors

OUTREACH & EDUCATION SESSIONS CO-SPONSORED BY DCMP

SUNDAY FEBRUARY 26

- 2:00 Public Lecture: The Physics of Superheroes (DMP)

MONDAY FEBRUARY 27

- 8:00pm Physics Community Outreach:
The Kitchen as a Lab

THURSDAY MARCH 1

- 11:15 Nuclear Power, One Year After Fukushima
- 2:30 Physics for Everyone: Innovative Materials for Energy (DMP/DCMP)

SPECIAL PUBLIC OUTREACH LECTURE

SUNDAY FEBRUARY 26

- 2:00 Public Lecture: The Physics of Superheroes (DMP), Blackman Theatre, 360 Huntington Avenue, Boston, MA 02115 eventful.com/boston_ma/events/physics-superheroes-/E0-001-044320538-0

SPECIAL MONDAY EVENING EVENTS

MONDAY FEBRUARY 27

- 5:45pm APS Awards Ceremony (5:45-6:45 PM) Convention Ctr Room: 253AB
- 6:45pm APS Welcome reception (6:45-8 PM), Convention Ctr, Ballroom East
- 8:00pm Physics Community Outreach: The Kitchen as Lab (8-9 PM), Convention Ctr, 253AB

DCMP CO-SPONSORED RECEPTION FOR PRIZE/ AWARD WINNERS, NEW FELLOWS, AND TRIBUTE TO PETER ADAMS (OF PRB)

TUESDAY FEBRUARY 28

- 5:30pm Reception (with DMP/DCOMP/DCP) until 7:00pm, Westin Hotel, Grand Ballrooms AB
- 7:00pm DCMP Business Meeting, Westin Hotel, Paine

SPECIAL 2011 NOBEL PRIZE PERSPECTIVE

THURSDAY MARCH 1

- 5:45pm Convention Center

PHYSICS SING-ALONG / LISTEN-ALONG

WEDNESDAY FEBRUARY 29

- 9:00pm Westin Hotel, Grand Ballroom, Section E.

A rollicking event with physics-related lyrics set to familiar tunes. Sing along with lyrics that are distributed at the event, or just listen. It is always much more fun than one expects.

LUNCH WITH THE EXPERTS

TUESDAY FEBRUARY 28

- 1:00 p.m. - 2:30 p.m. Convention Center

This is an event for graduate students, who must pre-enroll to participate.

www.aps.org/meetings/march/events/stud-tchr/experts.cfm

Graduate students must sign up in person at the March meeting. Sign-up will open Monday, February 27 at 1:00 pm, near the Registration Desk. DCMP and other APS units will have tables at this luncheon anchored by topical experts.

Join DCMP Please tell your colleagues about DCMP and encourage them to join.

Instructions appear on the APS website on how to affiliate and DCMP.

To become an APS member, go to: www.aps.org/membership/join.cfm

For APS members to join DCMP or any other APS unit: www.aps.org/membership/units/join-unit.cfm