

The C10 Activity Report: Structure and Dynamics of Condensed Matter for the C and CC Meeting, IUPAP, Oct., 2015

(Submitted by Raynien Kwo, Chair C10)

C10 Members for the years of 2015 -2017

Officers:

1. Chair: J. Raynien Kwo (2014) (2011) (2008)

Department of Physics, National Tsing Hua University, Hsinchu, Taiwan

Vice-Chair: Laura Greene (2014) (2011)

Department of Physics, University of Illinois, Urbana-Champaign, Urbana, Illinois, USA

Secretary: Hartmut S. Leipner (2014) (2011)

Interdisziplinäres Zentrum für Material-Wissenschaften der Universität Halle-Wittenberg, Halle,
Germany

Members:

2. Maria Luisa Medarde Barragan (2014)

Laboratory for Developments and Methods, Paul Scherrer Institut, Switzerland

Jonas Fransson (2014) (2011)

Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden

Vladimir Kulakovskii (2014)

Solid State Physics Institute, RAS, Central'naya, Chernogolovka, Moscow Region, Russian Federation

Najeh Thabet Mliki (2014) (2011)

Department of Physics, Faculty of Science of Tunis, University of Tunis El Manar, Tunis Tunisia

Kell Mortensen (2014)

Niels Bohr Institute, University of Copenhagen, Universitetsparken, Copenhagen, Denmark

Youichi Murakami (2014)

Institute of Materials Structure Science, High Energy Accelerator Research, Tsukuba, Japan

TaeWon Noh (2014)

Center for Correlated Electron Systems, Seoul National University, Seoul Republic of Korea

Rob Robinson (2014) (2011)

Australian Nuclear Science & Technology Organisation, New South Wales, Australia

Dominik Schaniel (2014)

Laboratory for Crystallography, Magnetic Resonance, and Modelling, Vandoeuvre-l, France

Matt Tucker (2014)

ISIS facility & Diamond light source Ltd, Harwell, Oxford, UK

Mu Wang (2014) (2011)

C10 Activity Report: (From 1/2015 to 10/2015):

1. The C10 Young scientist prize (YSP) 2015 award ceremony was held in APS March meeting, San Antonio, USA, March 3, 2015. The prize winner is Prof. Keji Lai, Assistant Professor of Department of Physics, University of Texas-Austin with citation: “for his outstanding contribution in nanoscale impedance imaging of strongly correlated and low-dimensional quantum materials”. He has delivered an award lecture entitled “Nanoscale Impedance Imaging of Novel Quantum Materials” during APS march meeting on 3/5.
2. In this year we have just completed the process of the C10 YSP for the year 2016. The call for YSP 2016 nomination was announced on 5/1/2015. The deadline was set at 7/15, 2015. Overall, we have received ten new, excellent applicants from countries including Korea, China, India, US, and Europe, etc. The calibers of these candidates are just astounding! We also had three roll over candidates from last year. After conducting the public votes, and eight concerted C10 members have sent in their votes electronically. We have successfully selected the YSP 2016 winner on 9/16.

The winner is Dr. Wenzhong Bao, Fudan University, China.

His citation reads:

Dr. Wenzhong Bao,

Professor, Department of Microelectronics,
Fudan University, China.

“ For his outstanding contribution in electrical and mechanical properties of the low-dimensional quantum materials.”.

Wenzhong Bao received his B.S. degree in Nanjing University, China in 2006 and Ph.D. from Department of Physics and Astronomy at the University of California, Riverside in 2011, then worked as a postdoctoral researcher at University of Maryland, College Park. He has been at the present position since 2015.

Dr. Bao will receive the Prize Certificate, Medal and Monetary Prize in DMP/DCMP Reception that honors the Awardees and Fellows in the annual APS March meeting, March 14 – 18 in Baltimore, Maryland US. He will also give an invited prize talk in the same meeting in one of the invited symposium.

3. Given the very diversity of the fields in C10, the commission members have rarely been able to meet each other during the international conferences, and discuss C10 related key face to face in the past. The international conference of “Materials and Mechanism of Superconductivity” has been the major C10 sponsored conference, held in every three years.

The 11th conference took place at Geneva, Switzerland, Aug. 23-28 this year. The C10 Vice Chair Laura Green has attended this meeting, with her report given at below:

The 2015 International Conference on Materials and Mechanisms of Superconductivity and High-Temperature Superconductivity (M2S HTSC 2015) took place from Sunday, August 23 to Friday, August 28 in Geneva, Switzerland. This C10-IUPAP sponsored conference was the 11th in the successful series of these tri-annual conferences. Some 700 scientists from 42 countries participated. Superconductivity is the phenomenon of electrical current flow without any loss of energy due to resistance. This extremely useful phenomenon is nowadays routinely applied in medical applications of magnetic resonance imaging (MRI), in large scale magnetic guiding systems such as CERN, the presently constructed nuclear fusion energy plant ITER, in high throughput electrical power cables, as well as the maglev train presently in construction by Japanese Railways. The field of superconductivity is heavily driven by experimental progress using the most advanced technology available. Consequently the participants of M2S are actively involved in materials science, experimental techniques, theoretical research and/or applications of superconductivity. The experimental techniques involve materials processing, crystal growth and characterization, low temperature techniques, ultra high vacuum, various kinds of neutron-, electron-, optical-, X-ray, and scanning probe techniques. Superconductivity is also the subject of intense theoretical research, and has spurred novel ground breaking theoretical approaches to the mechanisms of superconductivity and more generally of emergent properties of strongly interacting electrons. More detail may be found at <http://www.m2s-2015.ch/>.



Photo of most of the IUPAP-sponsored participants at M2S 2015 with the Conference Chair, Dirk van der Marel and the C10 vice chair, Laura Greene.

| PARTICIPANT | Affiliation | Type | ABSTRACT Title |
|--------------------------|---|-------------|---|
| Bag, Biplab | Indian Institute of Technology Kanpur | Poster | Magneto-optical imaging of coexistence of magnetic fluctuations along with superconductivity in BaFe _{1-x} CoxAs ₂ single crystals. |
| Charfi Kaddour, Samia | University of Tunis El Manar | Oral | Upper critical field and Nernst effect in slab superconductors |
| Elmassalami, Mohammed | Federal University of Rio de Janeiro | Poster | The influence of multiorbicity and localization effects on the normal-state and superconducting phase diagrams of Fe-based chalcogenides superconductors |
| Fidrysiak, Maciej | Wrocław University of Technology | Poster | Longitudinal spin fluctuations in BaFe ₂ As ₂ |
| Ganguli, Somesh Chandra | Research Scholar, Department of Condensed Matter Physics and Material Science, Tata Institute of Fundamental Research | Poster | Two step disordering of the vortex lattice across the peak effect in a 3-dimensional type II superconductor Co _{0.0075} NbSe ₂ |
| Ghosh, Sayandip | Indian Institute of Technology, Kanpur | Poster | Electronic structure, spin excitations, and orbital ordering in a three-orbital model for iron pnictides |
| Kumar, Sanjeev | Centre for Excellence in Basic Sciences | Poster | Origin of Matching Effect in Anti-dot Array of Superconducting NbN Thin Films |
| Machado, Antonio | Universidade Federal do triângulo Mineiro | Oral | Superconductivity in the Ternary HfV ₂ Ga ₄ compound |
| Mohanta, Narayan | PhD Student, Department of Physics, Indian Institute of Technology Kharagpur | Poster | Role of inhomogeneity in superconductivity at LaAlO ₃ /SrTiO ₃ interface |
| Pimentel Jr., Jorge Luiz | Universidade Federal do Rio Grande | Poster | Spin polarized current and formation of magnetic polarons in rutenocuprates |
| Tran, Lan Maria | Institute of Low Temperature and Structure Research PAS | Poster | Influence of the canted antiferromagnetic structure on the orbital pair breaking effect in Ca and Co-doped EuFe ₂ As ₂ compounds |
| Wells, Frederick | University of Wollongong | Poster | Short-range order and vortex grouping observed in isotropic vortex glass by scanning SQUID microscopy of low-field-cooled YBCO thin films |
| Gerasimenko, Yaroslav | Lebedev Physical Institute of the RAS | Oral | Properties of superconductivity emerging deep into the spin-density wave state in (TMTSF) ₂ ClO ₄ |
| Barisic, Neven | University of Wien | Keynote | Revised phase diagram of the cuprates |
| Plakida, Nikolay | Joint Institute for Nuclear Research | Oral | Kinematical spin-fluctuation pairing in cuprates |
| Teitel'baum, Gregory | E.K. Zavoiskii Institute for Technical Physics of RAS | Oral | The energy spectrum of superconducting cuprates in the pseudogap phase |
| Gasparov, Vitalii | Institute of Solid State Physics Russian Academy of Sciences | Poster | Magnetic field, frequency and temperature dependence of complex conductance of La _{1.65} Sr _{0.45} CuO ₄ /La ₂ CuO ₄ films and k-(BEDT-TTF) ₂ Cu[N(CN) ₂]Br superconductors |