

C10 Report (the Structure and Dynamics of Condensed Matter)

at the Council & Commission Chairs Meeting,

Rio de Janeiro, October 21-22, 2012

Submitted by Yasuhiko Fujii, Chair

1. Associate Member

Prof. Tae Won Noh (Department of Physics and Astronomy, Seoul National University, Korea) was approved as an Associate Member of C10 by the C&CC Meeting at Cape Town on February 23-24, 2012.

2. IUPAP C10 Young Scientist Prize 2013

We announce the winner:

Dr. Claudio Castelnovo

Lecturer and SEPnet Fellow, Department of Physics,
Royal Holloway College, University of London, UK

“For his contributions to understanding of new types of order, from the identification of emergent magnetic monopole excitations in spin-ice to the role of thermal fluctuations in topological computing.”

Dr. Castelnovo received his undergraduate and Masters degrees in Dipartimento di Fisica, Universita degli Studi di Milano, Milan, Italy in 1995-2000 and Ph.D in Physics Department, Boston University, Boston, U.S.A. in 2001-2006. In 2006-2009 he was a Post-Doctoral Fellow in Rudolf Peierls Centre for Theoretical Physics, University of Oxford, UK and became Lecturer at the present position since 2010.

3. C10-Sponsored Conferences

(2012) The 10th International Conference on Materials and Mechanisms of Superconductivity (M²S 2012) was successfully held at Washington, D.C., U.S.A. on July 29 – August 3, 2012.

(2013) No conferences proposed.

(2014) The 11th International Conference on the Structure of Surfaces (ICSOS-11, University of Warwick, UK, July 21-25, 2014) to be proposed for IUPAP endorsement.

(2015) The 11th International Conference on Materials and Mechanisms of Superconductivity (M²S 2015, Geneva, Switzerland) to be proposed for IUPAP endorsement.

4. The Issue on “Soft Matter”

(1) The original assignment given at the IUPAP General Assembly (London, Nov. 2011)

There is a substantial overlap between the Commissions C5, C8, C9 and C10 all covering aspects of condensed matter physics. It is proposed to dedicate C10 specifically to the emerging field of soft matter physics. The name could be either “Commission on Soft Matter” or “Commission on the Structure and Dynamics of condensed and soft matter”.

<Executive Council recommendation>: *Chair of C10 should consult C10 members and broader community in order to bring a recommendation on the action to be taken with this proposal to the late 2012 Executive Council meeting.*

(2) The summary of C10 members’ opinion

C10 has recognized the emerging soft matter physics as an important research field but nobody has agreed to such a proposal as C10 will be dedicated to soft matter.

C10 has covered important research fields, which are NOT covered by any other Commissions, such as superconductors, strongly-correlated systems, ferroelectrics, nano-materials, surface/interfaces, crystal growth, and defect/dislocation/impurities as well as large-scale facilities such as synchrotron radiation, reactor- and accelerator-based neutron and electron microscopes essentially important for the condensed matter research.

(3) The broader communities' comments

The C10 Chair briefly contacted Chairs/Vice Chairs of C5 (Low Temperature Physics), C6 (Biological Physics), C8 (Semiconductors), and C9 (Magnetism) during the last C&CC Meeting at Cape Town and on other occasions.

None of these Commissions has an intention to extend its research field towards soft matter physics because it is out of their scope. However, some of C10 members are still asking reconsideration by C6.

(4) Based on discussion so far made, C10 has reached the following conclusion at this stage:

4a) Title of Commission C10

- No change (Commission on the Structure and Dynamics of Condensed Matter)
 - Commission on the Structure and Dynamics of Condensed and Soft Matter
 - Commission on Structure and Dynamics of Soft and Hard Condensed Matter
- Since the soft matter is a sub-field of condensed matter, the first (no change) is preferable but the second/third title will be tolerable.*

4b) Modification of Mandate of C10

In order for C10 to include soft matter explicitly, its mandate should be modified regardless of the title as follows:

Art. 1 To promote the exchange of information and views among the members of the international scientific community in the general field of Condensed Matter Physics including:

- a. the properties and behaviour of atoms and molecules in the liquid and solid states; → *in the liquid, soft and hard condensed states*
- b. the characteristics of the solid and liquid states of matter including reduced dimensionality systems (in collaboration with other commissions as appropriate); → *the liquid, soft and hard condensed states of matter*
- c. the modelling of condensed matter; <No change>
- d. the application of condensed matter physics to technology. <No change>

4c) All discussion has been made so far only among C10 members (14 ordinary and 1 associate members) being all solid state physicists without any soft matter physicist.

- C10 doesn't know even that "the structure and dynamics of soft matter" is what they will aim at in IUPAP activities.
- *In order to promote further discussion on this issue, C10 should like to have some soft matter physicists as associate members.*
- *After C&CC's approval of these associate members to be nominated later (max. 3), C10 will reactivate discussion with soft matter physicists' point of view and submit its final Report to C&CC in a year.*
- *Accordingly new members of C10 will be selected in the next term (2015-2017) unless a completely new Commission, i.e. Commission on Soft Matter Physics, is established separately.*

5. No Core Conference for C10

C10 has sponsored some International Conferences such as M²S and ICSOS, but there is no major conference where most of C10 members can attend and hold the Commission Meeting face-to-face like ICLTP (C5), ICPS (C8) and ICM (C9). To improve such a situation, C10 is planning to have a small face-to-face meeting locally at any international conferences (or even regional conferences) where more than two C10 members will attend.

6. Other s

(1) C10 Web page initiated

The Vice Chair, Prof. Jiří Erhart, has accepted to play a role of an editor of the C10 Web in the

page of IUPAP Web Site where any information of our C10 activities will be posted in the column "Reports" by C10's own effort. He has been contacting the Administrator of IUPAP to start it.

(2) 2014 International Year of Crystallography (IYCr2014)

The General Assembly of the United Nations adopted a text by which it established 2014 as the International Year of Crystallography on July 3, 2012. Introducing the text, the representative of Morocco said that it decided to proclaim the Year considering that crystallography was ever-present in modern life in drug development, nanotechnology, biotechnology and the development of new materials, and that 2014 marked the centenary of the science.

The Assembly, through the text, invited the United Nations Educational, Scientific and Cultural Organization (UNESCO) to facilitate implementation of the Year and encouraged all Member States, the United Nations system and all other actors to promote awareness of the Year and of the importance of crystallography. Morocco's representative said it was hoped that the Year would have a significant educational component, particularly in developing countries where the science was least developed.

C10's mission is closely related to crystallography so that C10 will cooperate with the International Union of Crystallography (IUCr) on possible projects for IYCr2014. Currently one of C10 members, Prof. Claude Lecomte (France), has served as Vice President of IUCr.