

Commission C15: Atomic, Molecular and Optical Physics

Report (November 2019 – October 2020) to the IUPAP Council & Commission Chairs meeting

Submitted by Roberto Rivarola (Chair)

C15 officers:

Chair:

Roberto Rivarola

Instituto de Física Rosario (IFIR), Universidad Nacional de Rosario and Consejo Nacional de Investigaciones Científicas y Técnicas,

Bv. 27 de Febrero 210 Bis Rosario Santa Fe 2000, Argentina

Email: rivarola@ifir-conicet.gov.ar

Vice-chair:

Dominique Vernhet

Institut des NanoSciences de Paris, Sorbonne University – Campus Pierre et Marie Curie

B840, 4 place Jussieu, 75252 Paris cedex 05, France

Email: dominique.vernhet@insp.jussieu.fr

Secretary:

Wonho Jhe

Seoul National University

599 Gwanak-ro, Gwanak-gu, Seoul 151-742, Korea

Email: whjhe@snu.ac.kr

C15 Activities:

The major activities from November 2019 to October 2020 are categorized into the following items.

1. IUPAP C15 Young Scientist Prize

Dr. Philippe Hauke, from the University of Trento, in Italy, was selected to receive the IUPAP Young Scientist Prize in Atomic, Molecular, and Optical (AMO) Physics, corresponding to the year 2020 “*For his outstanding contributions to the development of quantum technologies based on Atomic, Molecular and Optical systems, ranging from quantum annealing, over quantum metrology, to quantum simulations of strongly-correlated condensed-matter systems and lattice gauge theories.*”

He obtained his PhD in 2013 from ICFO – The Institute of Photonic Sciences, Castelldefels, Barcelona, in Spain. Afterwards, he held positions as Assistant at the University of Innsbruck, in Austria and as group leader at Heidelberg University, in Germany. In fall 2019, he became Associate Professor at the INO-CNR BEC Center and the Physics Department of the University of Trento. His research focuses on developing the theoretical basis for novel quantum

technologies. The vision is to harness the pristine control available in synthetic quantum systems such as cold atoms, trapped ions, superconducting qubits, or photonic devices for solving outstanding problems of practical relevance. Philipp Hauke's group develops methods to characterize and measure entanglement as a quantum resource, derives algorithms to solve hard NP-complete problems through quantum annealing, and designs quantum simulations of strongly-correlated systems.

The award was planned to be presented during the International Conference on Atomic Physics (ICAP-27) in Toronto, Canada, on July 2020, however, this conference has been postponed for two years to July 2022, due to the pandemic. The lecture of Philipp Hauke and the ceremony during which the YSP C15 diploma and the medal are given to the laureate have been also postponed to be presented during the ICAP-27 meeting in 2022 or at the occasion of the International Conference on Photonic, Electronic and Atomic Collisions, to be held in July 2021 in Ottawa, Canada. This is still a question to be decided between the organizers of those two conferences supported by IUPAP.

2. Conference Support

The following conferences were planned to be supported by IUPAP in 2020:

- Type- A conference:

The International Conference on Atomic Physics

Location: Toronto, Canada.

Date: July 20th-24th, 2022 – Delayed to July 2022 due to pandemics.

Local Chair: Prof. Joseph Thywissen, University of Toronto, Canada

- Type –B Conference:

20th International Conference on Highly Charged Ions

Location: Matsue, Japan

Date: September 07th – 11th, 2020 – Delayed to September 2021 due to pandemics.

Local Chair: Hajime Tanuma

3. Present activities of Commission C15.

- All members of C15 are at present being consulted to contribute to the elaboration of the IUPAP Strategic Plan.

Other activities:

- IUPAP is promoting various initiatives to publicise the activities of the Union also in preparation of the Centenary celebrations. A member of the C15-Commission was proposed to integrate the Working Group on the Centenary, WG17.

Future schedule:

- Two applications for IUPAP support were sent on time:
Type-A conference: XXXII International Conference on Photonic, Electronic and Atomic Physics (ICPEAC 2021)
Location: Ottawa, Canada
Date: July 20th -27th, 2021
Local Chair: Tom Kirchner, York University, Toronto, Canada

Type-B conference: 20th International Conference on the Physics of Highly Charged Ions (ICHCI 2020), postponed to 2021
Location: Matsue, Shimane, Japan
Date: September, 2021, Final date to be defined.
Local Chair: Hajime Tanuma, Tokyo Metropolitan University, Tokyo, Japan
- The YSP prize has been awarded annually alternating between the two major “flagship” conferences of the AMO Physics field regularly supported by IUPAP, ICPEAC (International Conference on Photonic, Electronic, and Atomic Collisions) or ICAP (International Conference on Atomic Physics). At the beginning of next year, the C15 commission will start with the process of selection of the 2021 YSP. It is planned that the YSP winner, following the tradition, will give a lecture at the XXXII International Conference on Photonic, Electronic and Atomic Physics to be held in Ottawa and will receive a medal and a certificate at the banquet of the conference. Also, a check of 1,000 euros is sent to the awarded.
- All the members of the C15 have accepted to serve one more year given the global pandemic situation that led to postpone also the IUPAP General Assembly.