

C18 - Mathematical Physics

Report to the Council & Committee Chairs (Fall 2019)

Bruno Nachtergaele, Chair

The main periodic IUPAP sponsored event associated with the Commission on Mathematical Physics (C18) is the triennial International Congress on Mathematical Physics (ICMP). The most recent ICMP took place in summer 2018 in Montreal, Canada. The IAMP Executive Council announced that the next ICMP will take place in Geneva in August 2021.

Instead of awarding one prize every year, C18 has elected to recognize three researchers with a IUPAP Young Scientist Prize once every three years in sync with the schedule of the ICMP conferences. This allows us to publicly announce the winners during a prize ceremony held in conjunction with the opening of the ICMP conference. We believe that this schedule has helped raise the profile of the prizes and offers a great opportunity to advertise IUPAP's role in the international community. Therefore, we will issue a call for nominations in 2020 with an early fall deadline in order to allow the selection committee to make a timely recommendation. This is important to provide the winners with enough time to make plans to attend the award ceremony. The organizers of the ICMP typically also invite the winners to give a presentation at the conference. The selection committee will consist of the C18 chair and four additional commission members. The recommendation of the selection committee is voted on by the full membership of C18.

The officers of C18, Alain Joye (vice-chair), Rajesh Gopakumar (secretary) and myself (chair), reviewed the application by Mariia Perel for IUPAP support of the 16th International Conference on Integral Methods in Science and Engineering (IMSE 2020), to be held in St.Petersburg Department of Steklov Mathematical Institute RAS, St. Petersburg, July 13-17, 2020. A recommendation to support this conference was endorsed unanimously by the members of C18 and forwarded to Associate Secretary General Nemetudi.

The officers of C18 provided IUPAP with the verso side for a flyer as requested. For your information, the text is attached to this report.

Flyer: IUPAP Commission on Mathematical Physics (C18)

The Commission on Mathematical Physics was established by the International Union of Pure and Applied Physics in 1981 to promote the exchange of information and views among the members of the international scientific community in the general field of mathematics, of problems originating in or relevant to physics.

As a field of mathematics and of physics, Mathematical Physics thrives on its diversity of scientific problems and mathematical approaches. Physicists are generally well aware that the development of physics stimulated the creation of new mathematics (for instance, calculus for analytical mechanics and the theory of distributions in Dirac's quantum mechanics) and also that new physical theories came to rely heavily on previously created mathematics (for instance, Riemannian geometry in Relativity and the theory of group representations in the quantum physics of atoms, molecules, condensed matter, and particle physics). Most physicists are less aware, however, of the degree in which this bi-directional process continues to influence both fields today. An overarching goal of C18 is to highlight the importance of this mutually beneficial interaction and to support continuing exchange between mathematics and physics.

C18 shares the goal of making current-day interactions between physics and mathematics visible and more widely known within the International Association of Mathematical Physics (IAMP, founded in 1976). The synergy between C18 and IAMP helps both to be more effective. Therefore, C18 traditionally proposes affiliate membership to the President of IAMP. The triennial International Congress of Mathematical Physics (ICMP) is also the main periodic event in mathematical physics and it is routinely supported by IUPAP, most recently the XIXth ICMP, which took place July 23-28, 2018, in Montréal, Canada.

Once a year, IUPAP calls for applications for conference support through its commissions. C18 is helped by the News Bulletin of the IAMP to get the word out and decides which conferences it will present to the Council of Commission Chairs for financial support or endorsement. Examples of conferences supported in the recent past are QMATH and the 2019 Quantum Theory and Symmetry conference.

Every three years, three IUPAP Young Scientist Prize winners are selected by C18 and honored at a prize ceremony at the ICMP. Since the creation of the IUPAP Young Scientist Prize in Mathematical Physics, twelve young mathematical physicists have received the distinction: 2018: Weikuo Chen, Vadim Gorin and Phan Thanh Nam; 2015: Roland Bauerschmidt, Joseph Ben Geloun, and Nicolas Rougerie; 2012: Ivan Corwin, Alessandro Giuliani, and Wojciech de Roeck; 2009: Rupert L. Frank, Benjamin Schlein, and Simone Warzel.