

IUPAP

Report on the 2021 activity

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1. Introduction

The International Union of Pure and Applied Physics (IUPAP) has as its mission to assist the development of Physics worldwide, to support international cooperation in Physics and to promote the application of Physics for the solution of problems of relevance to the humanity. This mission is fulfilled through a series of initiatives concerning: 1) the sponsorship of international conferences; 2) the promotion of communications and publications; 3) support for research and education; 4) promoting the free movement of scientists; 5) the promotion of international agreements on symbols, units of measurement and nomenclature; 6) cooperation with other organizations on multidisciplinary problems. IUPAP members are communities of physicists belonging to a specific nation and currently there are 60 member countries. Each country appoints a "Liaison Committee", which can have from 1 to 20 members.

2. Relevant activities for Italy and for CNR made during 2021 by the Organization

The activities of the IUPAP are carried out through the 18 Commissions, each of which is composed of 14 members, and 11 Working Groups, which have different compositions, for a total of 380 Physicists.

During 2021, 23 International Conferences were sponsored with a total contribution of approximately € 165,000 (a slight decrease compared to previous years due to COVID). The sponsorship by the IUPAP represents an important "label" for the Conferences which usually allows to attract both a substantial participation of scientists and further sponsorships. Precisely in order to promote the free movement of scientists, one of the conditions that the organizers must guarantee in order to receive sponsorship from the IUPAP is the free participation of scientists, and that no one can be excluded on the basis of nationality of origin or political considerations.

The IUPAP has also introduced over the years awards and medals which are awarded to prominent scientists in the various fields of Physics. Particularly coveted are the IUPAP Young Scientist Prizes, reserved for scientists with post-doc experience up to a maximum of 8 years, which often represent a springboard for emerging young physicists.

Below is the report of the activities carried out in some of the IUPAP Commissions:

C3 - The C3 Commission on Statistical Physics has the mandate to promote the exchange of information and views among the members of the international scientific community in the general field of Statistical Physics and applications to related fields. Among its duties, the C3 recommends for Union sponsorship international conferences which qualify for support and assists in the organization of such conferences. In 2021 the C3 Commission has supported the organization of the next IUPAP StatPhys meeting, StatPhys 28, which will be held in Tokyo (<https://statphys28.org>), 7-11 August 2023. In order to avoid a fully online meeting, the Conference, initially planned in August 2022, has been moved to 2023 since the Japan government has suspended all visa procedures because of the COVID pandemic. The C3 governance has participated to the Steering Committee, selecting the plenary and invited speakers. Moreover, the C3 sent out the call for nominations to assign the Boltzmann Medal 2022 and the Early Career Scientist Prizes 2022 which will be awarded during StatPhys28.

C4 - The main activity of the C4 IUPAP Committee in 2021 has been the scientific preparation of the 37th International Cosmic Ray Conference (ICRC), held virtually in Berlin last July. Fiorenza Donato, the Italian member of C4, participated to a series of meetings meant to re-organize the structure of the conference so to get it dynamic and interactive whereas in fully online mode. In addition, she nominated Dr Francesca Calore for one of the two 2021 IUPAP Young Scientist Prize in Astroparticle Physics. She got the prize, and F.D. read the laudation on the opening ceremony. The committee has started the scientific organization of the 38th ICRC, Osaka (Japan) 2022.

C9 - In the year 2021, no meetings of the IUPAP C9 Commission were held in presence, as the International Conference on Magnetism (ICM) that should have been held in 2021 in China was cancelled, therefore the activity carried out was: participation in all virtual meetings for the organization of events, in particular the

ICM'24 conference, and contacts with local organizers; participation in discussions related to the organization of national events for the celebration of the centenary of the IUPAP in 2022; contribution to the definition of the official position of the C9 Commission on changing the SI designation of the "radiant" unit for plane angles and phase angles from a derived dimensionless unit to an independent unit (formerly called the base unit); evaluation of candidates for the assignment of the IUPAP Young Scientist Prize in Magnetism 2021 (18 candidates) and for the assignment of the IUPAP Louis Neel Award in Magnetism 2021 (9 candidates).

C12 - Eugenio Nappi, Italian member of C12, participated on Saturday 12 June 2021 in the annual meeting of the IUPAP C12 Commission of Nuclear Physics. Due to travel restrictions, the meeting was held online by Zoom. The main items on the agenda were the discussion on IUPAP sponsorship requests for conferences in 2022 and the drafting of the text for the IUPAP C12 Young Scientist Award call. Three prizes will be awarded at the upcoming International Nuclear Physics Conference, INPC2022, September 11-16, 2022, in Cape Town, South Africa.

C15 - The major activity in 2021 has been focused in the nomination of the winner of IUPAP C15 Young Scientist Prize. The selection was made by considering curricula of 36 eligible candidates of very high level, from all around the world. The prize was presented during the virtual 32nd International Conference on Photonic, Electronic and Atomic Collisions (ICPEAC 2021). The scientist selected as winners, has been Dr Carlos Hernández-García

C17 - Roberto Pini, as Chair appointed for 2022-2024, supported Chair Tsuneyuki Ozaki in most of the presidency activities of the IUPAP C17 Commission, such as: the designation of the new Vice-Chair and Secretary officers for the period 2022-2024 ; the evaluation of the new 14 members of the IUPAP C17 Commission. The process involved the analysis of the curricula of the candidates proposed by more than 20 countries, a discussion meeting and the vote to propose the list of nominees to the IUPAP Executive Council; support for the drafting of the IUPAP Strategic and Action Plan for the free circulation of scientist; participation in the 30th IUPAP General Assembly (20-October 23, 2021); support for the drafting of the C17 Annual Report. In addition, as Chair elected, Roberto Pini arranged the organization of the Call for the IUPAP C17 Young Scientist Prizes 2022, with the preparation of the poster and the dissemination of information for the nominations in a wide network of scientists and organizations in the sector. The IUPAP Commission C17 distributes biennial prizes for young scientists. Two awards are available to be awarded in 2022. One award is for exceptional contributions of a fundamental nature and the other is for exceptional contributions of an applied nature. Both award winners must have demonstrated significant achievements and achievements in the areas of laser physics and / or photonics. Recipients must not be older than eight years from the date of conclusion of the doctorate (excluding career breaks) by the deadline for applications.

C19 - The IUPAP Young Scientist Medals for 2020 and 2021, each with a Cash Prize of €1,000 and a certificate, have been widely advertised and will be awarded to two scientists working in the field of astrophysics. A "C19 News" was issued in the occasion of the discovery of a Short Gamma Ray Burst from the magnetar in the Sculptor galaxy at 11.5 million light years from the Earth, possibly connected with GW emission. Following the success of the ASTROPHYSICS HIGHLIGHTS 2020 report we are preparing the 2022 version.

3. Activities carried out as Italian Representative in 2021 within the Organization and indications about the effects on the national scientific community

The 30th General Assembly (GA), the highest governing institution of the IUPAP, took place from 20 to 22 October 2021. The GA, due to COVID, was held online and one year later than expected (it was originally scheduled in Beijing in October 2020). During the GA, the members of the Executive Council and the various International Commissions are appointed, as well as the representatives who serve in the various committees between different Unions. In preparation for the General Assembly, in collaboration with Prof. R. Ramponi (Alternate Liaison) we have solicited candidacies for the members of the Commissions through the Board of Directors of the Institutes of the Physical Sciences and Technology of Matter Department of the CNR, the Universities, INAF, INFN, ICTP and INRIM. The applications (17 in total) were submitted by the deadline (June 27, 2021).

At the GA, in which I participated as Representative for Italy, first of all it has been discussed the transformation of the IUPAP from an international non-governmental organization into a "legal entity" in the form of an Association under Swiss law and based in Geneva. This transformation is necessary for both management and accounting reasons. The choice of the office in Switzerland is linked to the fact that there are no taxes for associations such as IUPAP. Consequently, a series of amendments to the IUPAP Statute

and By-laws have been drawn up. Both the transformation into an Association and the amendments to the Statute and By-laws were unanimously approved. Furthermore, the GA approved the new IUPAP Strategic Plan. Very important resolutions, in harmony with the plan, were discussed, modified and finally approved. The assembly adopted the Waterloo Charter for inclusion and gender diversity in physics.

The proposals for the Commissions, elaborated by the Executive Council on the basis of the nominations received, were discussed and approved by the Assembly. Below is the list of Italian members appointed to the various commissions:

n.	Commission	Italian Member	Affiliazione
C2	Symbols, Units, Nomenclature, Atomic Masses and Fundamental Constants	Enrico Massa	INRIM
C3	Statistical Physics	Lucilla de Arcangelis (Chair)	Unicampania
C4	Astroparticle Physics	Fiorenza Donato	UNITO
C5	Low Temperature Physics	Matteo Cirillo	UNIROMA2
C6	Biological Physics	Laura Franca Cantù	UNIMI
C8	Semiconductors	Raffaella Calarco	IMM-CNR
C9	Magnetism	Elisabetta Agostinelli (Vice Chair)	ISM-CNR
C10	Structure and Dynamics of Condensed Matter	Maria Losurdo	NANOTEC-CNR
C12	Nuclear Physics	Diego Bettoni	INFN
C13	Physics for Development	Joseph Niemela (Vice Chair)	ICTP
C16	Plasma Physics	Paola Mantica	ISTP-CNR
C17	Laser Physics and Photonics	Roberto Pini (Chair)	IFAC-CNR
C19	Astrophysics	Pietro Ubertini (Chair)	INAF
C20	Computational Physics	Enzo Marinari	UNIROMA1

It is emphasized that, of the 14 members (3 more than outgoing members), 7 are women, with a perfect "gender balance", three hold the role of "Chair" and two "Vice-Chairs" of the Commissions.

During the General Assembly, various Resolutions were also approved (see attachment), including that relating to the maintenance of the cost of membership fees until 2023, the establishment of two new Working Groups on "Ethics" and "Quantum Science and Technology" and the modification of the mandate of Working Group 5 "Women in Physics". WG5 has carried out an important activity to increase the number of women in Physics and to ensure that their role is duly recognized.

Finally, some special events were presented to commemorate the centenary of the foundation of the IUPAP (2022), among which the most important is the "Centenary Symposium", scheduled in Trieste from 11 to 13 July 2022 (<https://iupap.org/centennial/>). Among the initiatives undertaken in this area, the "Physics for Sustainable Development" Workshop (<https://www.nanoinnovation2022.eu/home/index.php/programme/guest-events/physics-for-sustainable-development>) should also be mentioned, organized by the Italian representatives (Guglielmo Fortunato and Roberta Ramponi) together with all the new Italian members of the IUPAP commissions. The Workshop is an event connected not only to the celebrations for the centenary of the founding of IUPAP but also to the International Year of Basic Science for Sustainable Development (IYBSSD), proclaimed by UNESCO for 2022 and strongly supported by IUPAP. The "Physics for Sustainable Development" Workshop is organized as a satellite event of the NanoInnovation 2022 Conference, which, with its 1500 participants in the 2021 edition (<https://www.nanoinnovation2021.eu/home/>), has become an event for reference for the Italian community active in the development of micro and nanotechnologies and their applications. The

Workshop will be held on 19-4-2022 at the headquarters of the Faculty of Engineering of La Sapienza University in Via Eudossiana in mixed mode (in person and remotely). The IUPAP president, Michel Spiro, is also expected to attend the Workshop.

Signed

Rome, 29-4-2021