

IUPAC

International Union of Pure and Applied Chemistry

Activities Report - Year 2022

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1. Introduction

IUPAC initiatives were carried out partly on-line and in presence during 2022. Numerous activities have been promoted and implemented such as the presentation of interdisciplinary IUPAC projects, the sponsorship, organization and participation to national and international events, the preparation of special thematic issues in IUPAC journals, the publication of articles and editorials in journals of IUPAC and the Italian Chemical Society. The role of CNR and Italy in IUPAC has grown significantly and thanks to the work carried out by the NAO Commission, the interest and active participation of many young researchers has increased.

2. Main activities carried on by (Union name) during 2022 relevant for Italy and for CNR

IUPAC has granted sponsorship to national and international conferences, organized by CNR and academia, increasing their visibility and international participation:

1. *Global Women Breakfast 2022@CNR NAO. Gender and cultural diversity in chemical research: experiences and conversation.*
Conference Chairs: S. Borsacchi (CNR), E. Carignani (CNR), A. Sanson (CNR) 16/2/2022, on-line.
Participation of CNR President (Prof. M.C. Carrozza) and of many scientists from IUPAC, ISC, OPCW.
2. *14th Postgraduate Summer School in Green Chemistry*
School Chairs: F. Aricó, P. Tundo (Venice University, Ca' Foscari) 3 – 8/7 2022, Venice.
3. *44th International Conference on Coordination Chemistry (ICCC2020)*
Conference Chair: M. Peruzzini (CNR) 28/8 – 2/9 2022, Rimini. On this occasion IUPAC has participated to the opening session of the Conference with a short lecture given by Prof. Jan Reedijk, distinguished Member of the Union.
4. *Italian French International Conference on Magnetic Resonance*
Conference Chairs: M. Geppi (Pisa University), L. Delevoye (CNRS) 27 – 30/9 2022, Milan.
5. *31st International Symposium on the Chemistry of Natural Products and 11th International Conference on Biodiversity (ISCNP31 & ICOB11)*
Conference Chair: R. Riccio (Salerno University) postponed to 2023, Naples.
6. *Alessandro Volta's legacy and the great challenges of humanity: the past and the future of electrochemistry.* In the occasion of the International Year of Basic Sciences for Sustainable Development (IYBSSD).
Conference Chairs: M. Peruzzini (CNR), S. Borsacchi (CNR) 24/10/2022, Como.
Participation of IUPAC President (Prof. J. Garcia Martinez), ISC President (Prof. Peter Gluckman) e la IUPAC ChemRawn President (Prof. F. Kerton).
7. *Avogadro Colloquia 2022. From Water to Chemicals: Vision and Opportunities of a Sustainable Hydrogen Society.* Event for the celebration of CNR centenary.
Conference Chairs: L. Armelao (CNR), G. Guerra (SCI) 15 – 16/12 2022, Aula Marconi, CNR, Roma.
Participation of CNR President (Prof. M.C. Carrozza), IUPAC President (Prof. J. Garcia Martinez) and EuChemS President-elect (Prof. A. Agostiano).

3. Activities carried on by the Italian Delegate within the Union during 2022 and impact on the Italian scientific community

- President of the IUPAC Division of Inorganic Chemistry (Div II).

In this role she coordinated the division's activities, organized the annual meeting (June 28 – 29, 2022, online) and prepared the annual activities newsletter (<https://iupac.org/body/200/>).

- Special Issue on *Pure and Applied Chemistry*.
The special issue on Pure and Applied Chemistry dedicated to the memory of Mary Good was prepared during 2022 and it is in the process of being published. *Guest editors*: L. Armelao (Italy), L. Öhrström (Sweden), D. Rabinovich (USA), M. Hasegawa (Japan).
- IUPAC projects and publications.
During 2022, the activities of two IUPAC projects led to the preparation of the following technical reports:
 - *Toward a Comprehensive Definition of Valence* (Project 2018-030-2-200)
“Toward a definition of valence as a quantity (IUPAC Technical Report)”
P. Karen, I. S. Butler, V. Tomišić, M. Yamashita, L. Armelao
submitted to *Pure and Applied Chemistry*
<https://iupac.org/project/2018-030-2-200/>
 - *Gold Book Update of Terms for Inorganic Chemistry* (Project 2020-022-1-200)
“Definition of materials chemistry (IUPAC Recommendations)”
M. Drábik, R. Macaluso, L. Krivosudský, L. Armelao
submitted to *Pure and Applied Chemistry*
<https://iupac.org/project/2020-022-1-200/>

Participation to a new IUPAC project started in 2022 and focused on current and urgent issues of e-waste:

- *Effective teaching tools and methods to learn about e-waste* (Project 2022- 016-1-021)
<https://iupac.org/project/2022-016-1-021/>

4. Evaluation of the participation in terms of benefits and membership cost

The assessment of participation at IUPAC is very positive. The visibility, active presence and international relations of the Italian chemical scientific community, both CNR and academia, have grown significantly. In the two-year period 2022-2023, the presence of Italian representatives in the IUPAC divisions and committees increased, both in top positions and as members of the various divisional groups. A group of young researchers (Young Observers, YOs) participated actively to many IUPAC events and proposed numerous activities in collaboration with colleagues from other countries. In this way, the involvement of the Italian community in the international IUPAC activities as well as the support of IUPAC (financing, sponsorships) to national initiatives organized by CNR and academia have been significantly increased.

5. Evaluation of Italians' attendance and how to improve interest and involvement

The assessment of participation in IUPAC is very good. The initiatives and interest of the members of the NAO Commission, and the synergy with the YOs have significantly increased the Italian contribution to IUPAC. To further improve the involvement it would be important to increase communication towards the scientific community and present the relevant activities of IUPAC in symposia and conferences. In every dissemination activity, the presence of Italy in IUPAC and the role of CNR as National Adhering Organization (NAO) were highlighted.

6. Italian experts with important roles within the Union or within related Commissions and Programs (if known)

Division Presidents (elected for the biennium 2022 – 2023):

- Pierangelo Metrangolo (Milan Polytechnic University), Physical and Biophysical Chemistry Division (Division I).
- Lidia Armelao (CNR), Inorganic Chemistry Division (Division II).
- Roberto Terzano (Bari University), Chemistry and the Environment Division (Division VI).

Division Secretaries (elected for the biennium 2022 – 2023):

- Luisa Torsi (Bari University), Analytical Chemistry Division (Division V).
- Pietro Tundo (Venice University), Interdivisional Commission on Green Chemistry for Sustainable Development (ICGCSD).

Division and Standing Committees members (elected and appointed for the biennium 2022 – 2023):

Alessandra Sanson (CNR, Division II, AM), Paolo Maria Scrimin (Padova University, Division III, TM), Guido Raos (Milan Polytechnic University, Division IV, NR), Matteo Guidotti (CNR, Division VI, AM), Michele Saviano (CNR, Division VII, NR), Silvia Borsacchi (CNR, ChemRawn, AM), Maurizio Peruzzini (CNR, ChemRawn, AM), Elisa Carignani (CNR, ChemRawn, invited member).

IUPAC recognitions to Italian scientists:

- Nicola Senesi (Bari University), appointed Emeritus Fellow of Chemistry and the Environment Division (Division VI).

7. If Union with CNR Commission, short summary about the 2022 CNR Commission activities

- 1) Commission meetings. The NAO-CNR met 5 times in 2022, 4 times virtually (2/2, 12/4, 28/6, 23/9) and 1 time in person, on 14/12, in Rome, at the CNR headquarters, jointly with the Italian IUPAC Young Observers and dr. Augusta Maria Paci, Italian delegate in ISC.
- 2) Participation in the review process of the IUPAC statute and regulations. An Italian delegation actively participated in the IUPAC Special Council Meeting held virtually on 4th June 2022, in which proposals for substantial changes to the IUPAC statute and regulations were voted, at the conclusion of a long process of review and discussion that began in 2019, in which NAO-CNR also actively participated.
- 3) Participation in the 1st IUPAC NAO Forum. The NAO-CNR participated in the first NAO World Forum, organized by IUPAC and held virtually on July 13rd 2022. During the Forum, that represents an innovative and direct communication channel between IUPAC and the NAOs, the IUPAC plan for a new organization was discussed, the state of the art of the 2023 IUPAC World Chemistry Congress was presented, and large space was given to the International Year of Basic Sciences for Sustainable Development. The IYBSSD initiative was wanted by UNESCO and IUPAC is one of the main partners. Finally, the importance of an increasing digitalization process in Chemistry, and particularly in IUPAC, was also discussed.
- 4) Organization of national and international events. The NAO-CNR organized two events of national and international relevance: 1. “Global Women Breakfast (GWB)” (16th February 2022 online) and 2. Event for IYBSSD (International Year of Basic Sciences for Sustainable Development) “The legacy of Alessandro Volta and the great challenges of humanity: the past and the future of electrochemistry” (Como, 24th October 2022).
- 5) Communication activities. The NAO-CNR has regularly disseminated its own activities and those of IUPAC through the continuous updating of the Commission website (www.iupac.cnr.it) that was completely renovated in 2019. The communication activity has been strengthened and extended with the opening of a Twitter account.

6) Publications (submitted in 2022)

- Borsacchi, S., Guidotti, M., Sanson, A., Minguzzi, A., Pozzi, A., Paci, A. M., Kerton, F. and Peruzzini, M.. "Alessandro Volta: Still Fully Charged After 200 Years" *Chemistry International*, Vol. 45, no. 2, 2023, p. 17-21. <https://doi.org/10.1515/ci-2023-0205>
- S. Borsacchi, M. Guidotti, A. Sanson, A. Minguzzi, A. Pozzi, A.M. Paci and M. Peruzzini "Alessandro Volta and electrochemistry as a driving force for a sustainable future: an Italian IUPAC event for the International Year of Basic Sciences for Sustainable Development", *La Chimica nella Scuola*, 2023, 1, 90-93.

7) IUPAC Projects

Projects chaired by Italian scientists

- Alessandro Volta's Heritage: the Past and Future of Electrochemistry
Chairs: S. Borsacchi (CNR), M. Peruzzini (CNR)
IUPAC Committee: ChemRawn
<https://iupac.org/project/2022-018-1-021/>
- Enhancing Capabilities for the Mitigation of Chemical Risk: the Dissemination of the Emergency Response Guidebook in Russian-Speaking Countries
Chairs: M. Guidotti (CNR), A. Martyniuk
- IUPAC Division: Chemistry and the Environment Division (Division VI).
https://iupac.org/projects/project-details/?project_nr=2020-020-2-600

Project participation of Italian scientists

- Effective Teaching Tools and Methods to Learn about E-Waste
Membri: L. Armelao (CNR), S. Borsacchi (CNR), P. Kurup, A. Lykknes, R. Macaluso, M. Peruzzini (CNR), O. E. Popoola, D. Purchase, A. Sanson (CNR), Angela Serpe (Università di Cagliari)
IUPAC Committee: ChemRawn
<https://iupac.org/project/2022-016-1-021>

- 8) Italian IUPAC Young Observer. The NAO-CNR has worked in close and continuous synergy with the 10 Young Observers selected in 2021, young researchers from the CNR and Italian universities. Elisa Carignani (CNR) represented them in all NAO meetings. The activity of the Italian YOs has been fully recognized and appreciated in IUPAC, and is listed below.

Projects chaired by Italian YOs:

- Task Group Chair: F. Piscitelli (CNR) "LC-MS quantitative method validation and performance: an exemplified guide" **Analytical Chemistry Division**, and Chemistry and the Environment Division, Chemistry and Human Health Division <https://iupac.org/project/2021-036-1-500/>
- Task Group Chair: A. Minguzzi (University of Milano): "Introducing the IUPAC Seal of Approval for a wider adoption of IUPAC recommended symbols, terminology and nomenclature: Stage 1 - Symbols" **Analytical Chemistry Division**, and Committee on Publications and Cheminformatics Data Standards, Physical and Biophysical Chemistry Division, <https://iupac.org/project/2022-008-4-500/> (Task group member: Fabiana Piscitelli)

Project participation of Italian YOs:

- “IUPAC SMILES+ Specification” Task group member: Elena Lenci (University of Firenze) **Committee on Publications and Cheminformatics Data Standards**, and Chemical Nomenclature and Structure Representation Division <https://iupac.org/project/2019-002-2-024/>
- “Gold Book Update of Terms for Organic and Biomolecular Chemistry” Task group member: Gianluigi Albano (University of Bari) **Organic and Biomolecular Chemistry Division**, and Joint Subcommittee on the IUPAC Gold Book, <https://iupac.org/project/2021-020-1-300/>
- "Minimising environmental impacts of tyre and road wear particles" Task Group Member: Elisa Carignani (CNR) **Chemistry and the Environment Division**, and Polymer Division, Analytical Chemistry Division. <https://iupac.org/project/2021-028-3-600>
- “Harmonizing carbon sequestration measurement” Task group member: Nicola Sangiorgi (CNR) **Chemistry and the Environment Division** and Committee on Chemistry and Industry
- “Alessandro Volta's heritage: the past and the future of electrochemistry” Task group member: Alessandro Minguzzi (University of Milano) **Committee on Chemical Research Applied to World Needs (ChemRawn)** <https://iupac.org/project/2022-018-1-021>

8. Conclusions

The ongoing activities of the Italian Representative at IUPAC and of the members of the NAO CNR Commission have significantly increased the Italian participation in the Union, especially of young researchers, and increased the number of successful events and initiatives related to IUPAC in Italy. It is important that CNR continues to support the Commission work and the participation of young researchers to international and national events organized by IUPAC. To improve the involvement, communication to the scientific network will be increased and IUPAC activities will be presented whenever possible in symposia and conferences. The Commission aims at stimulating the presentation of interdisciplinary IUPAC projects and to have, in IUPAC divisions and permanent commissions, an active, qualified and representative presence of the national scientific community.

Roma, April 27th, 2023

Signature

