

International Union of Crystallography, IUCr

Activities' Report - Year 2021

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1. Introduction

The International Union of Crystallography spreads the principles of crystallography in the field of molecular sciences and materials. Furthermore, it promotes international cooperation between researchers of different scientific backgrounds, with the common interest of establishing the three-dimensional distribution of atoms in the matter. By defining the important correlations between structure and properties, Crystallography has become an indispensable tool for all the research activities, having acquired a deep multi-disciplinary character. In about a century, amazing results have been achieved for the progress of human knowledge thanks to the knowledge of most of the matter around us. In particular, the excellence of the crystallographic approach is confirmed by the many Nobel prizes awarded to crystallographers. In the most recent decades, many functionalities of the large molecules of life have been understood thanks to their structural determination (e.g., ribosomes). This has had a high impact on the health, since it is possible to fix some arisen defects in these molecule by using for instance ad hoc drugs and maintaining their vital functions.

It is important to remember that in the approximately seven decades of IUCr life, Italy has always played a proactive role. For example, it provided a president (Prof. Mario Nardelli), as well as two presidents of the associated European Crystallographic Association (ECA), such as Carmelo Giacovazzo and Alessia Bacchi. Many Italians have offered their competent contribution to the progress of IUCr and ECA. Two of the IUCr three-year congresses (with up to 3000 participants) have been organized in Italy (Rome 1961 and Florence 2005), while also two European Crystallographic meetings (ECM) of ECA have been assigned to Italy (Turin 1985 and Padua in 2024). For these and many other reasons, the Italian crystallography continues to be a cornerstone of IUCr. From the instrumentation point of view, Italian workers are well equipped, despite the country's undeniable economic difficulties. Among other things, cutting-edge equipment has been acquired or being acquired for the Cryo-crystallography in Milan (Univ.), in Florence (Univ.) and in Naples (CNR).

For all the mentioned reasons, the CNR representatives at the IUCr underlines a solid situation of Italian crystallography. As evidence of this, we can recall the great vitality of the Italian Association of Crystallography (AIC), having Dr. Angela Altomare (CNR-Bari) as President. The AIC is very active at all national and international levels with congresses, schools, workshops and more.

2. Main activities carried on by IuCr during 2021 relevant for Italy and for CNR

For Italy and Europe, the most important crystallographic event of 2021 was the 25th Congress of the IUCr and the General Assembly of the International Union of Crystallography, held from 14-22 August 2021 in Prague, Czech Republic, in hybrid form. The congress was supposed to take place in 2020, but had been moved to 2021 due to the pandemic situation. Italy contributed to the success of the Event with a qualified representation with various speakers and heads of micro symposia. In particular, three Keynotes were given by colleagues Artioli, Boscherini and Macchi, 22 oral presentations (of which 10 as invited speakers chosen by the chairs) and 25 colleagues played the role of Chair of the various micro-symposia. The General Assembly of the Union has also ratified that the next congress (XXVI) and its general assembly to be held in 2023 in Melbourne, Australia, from 22-29 August, and that the next one in 2026 will be held in Calgary. , Canada ..

In 2021, the Italian community has had the XLIX Meeting of the Italian Crystallographic Association (AIC) from the 6th to the 9th of September 2021 in Parma, as an online event. Moreover, the AIC Crystal Growth Section organized in Turin on December 16-17 the conference “Crystal Growth: from Theory to Applications”. Additional activities, as on line event, organized by AIC members and aimed to promote the diffusion of the crystallographic sciences, have been supported by AIC. A list is available at: www.cristallografia.org.

In addition, the AIC Crystal Grown Commission is organizing the International Conference on Crystal Growth and Epitaxy-ICCGE-20 to be held in Naples in July-August 2023, an important meeting for crystal growth community.

3. Activities carried on by (Italian Delegate name) within the Union during 2021 and impact on the Italian scientific community

The General Assembly of the Union held during the 25th IUCr Congress renewed its executive committees and the members of the scientific commissions. The CNR Commission for relations with the IUCr sent proposals from the various candidates in the different areas to the IUCr secretariat. With great satisfaction, Italy, which since 2011 did not have its own representative on the IUCr Executive Committee, saw her colleague Angela Altomare (CNR, Bari) elected to the Executive Committee, with the recognition of international fame and her major contribution to crystallography. given by Dr. Altomare, and the undoubted scientific value of Italian crystallography. Furthermore, the involvement of Italians from the various scientific commissions is important with as many as 20 Italians involved (three chairs, seven full members and 12 consultants). It should be emphasized that almost all of the colleagues proposed by the Commission were elected.

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

The IUCr with more than 20,000 members is one of the largest scientific unions in the world and is still growing even for the accession of several new nations after the International Year of Crystallography (IYCr2014).

As already mentioned, the IUCr mission is the international dissemination of its basic culture and the international cooperation. Hence, it is essential that Italy continues to be part of such a vast scientific community. The cost incurred by the CNR for membership (approx. 6000 euros per year) appears to be sustainable in light of the great benefits for both from our national crystallographic community but also that of many neighboring scientific sectors, which make abundant use of the crystallographic techniques and their applications.

From the point of view of economic return, it should also be emphasized that almost all the events for crystallography organized in Italy receive some economical support from the Union, often with an advantage with respect to the paid association fees.

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

Through the activity of the Italian representative and of the CNR-IUCr Commission, as well as of the IUCr outreach officer (the Italian Michele Zema of the University of Bari), the programs and the IUCr activity are monitored in details. In particular, the Italian colloques, who are part of the 21 scientific committees of the Union receive first-hand information on the up to date research in each different sector. These persons have therefore the opportunity of reporting these pieces of information thus stimulating frontier initiatives also in our laboratories. From this point of view, the Italian Association of Crystallography (AIC) promotes in its congresses and schools the meeting between the aforementioned Italian IUCr commissioners and the world of researchers, especially the young.

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

There are many names of Italian researchers with important roles in world crystallography. Prof. Consiglio Tedesco (University of Salerno) is part of the Executive Committee of the European Crystallographic Association, Dr. Michele Zema (University of Pavia), after various positions held in the IUCr itself, now has the fundamental role of "Outreach Officer", Prof. Roberto Fornari (UniPr) is Past President of the International Organization of Crystal Growth. Andrea Zappettini is also the coordinator of the European Network of Crystal Growth. In addition, Prof. Matteo Leoni (UniTn) is Past Chair of the Board of Directors of the International Center for Diffraction Data (ICDD) ..

7. Short summary about the 2021 CNR Commission activities

The CNR can count on the advices of the "Commission for the Participation of the CNR in the IUCr". In 2019, this commission was renewed and has the following composition: Michele Saviano (President), Andrea Ienco (Secretary), Roberta Oberti, Gilberto Artioli, G. Diego Gatta, Andrea Ilari, Giuseppe Zanotti, Andrea Zappettini, Michele Zema e, Angela Altomare as the AIC President in charge. During 2021, the commission held some teleconferences for the planning of the various activities of crystallographic interest. In particular the commission has confirmed the proposed potential appointments of Italians for the IUCr Commissions and Dr. Angela Altomare (CNR, Bari) for the Executive Committee, in agreement with the AIC, which will be submitted to the next General Assembly that, due to the problems of the Covid-19 pandemic, was postponed to 2021, during the IuCr Congress in Praga, also postponed to 2021. Interactions with Chester's IUCr staff were also frequent, also because the outreach office Michele Zema, member of the commission, is always available with new pieces of information and useful links.

8. Conclusions

The IUCr continues to be a vital international body for almost all scientific disciplines, in many cases playing a leading role for the international community. Its mission and aims are well illustrated on the website www.iucr.org. In Italy, most crystallographers are well connected not only to the IUCr's activities but also to those of the European associate ECA (www.ecanews.org), besides the very active national partner AIC (www.crystallography.org). Hence, there are many reasons why I wish recommending to the CNR not only to support the complex network of international contacts already in place, but also to better favor the most active researchers of the Italian crystallography in their efforts gaining international weigh, especially through the channels of the IUCr.

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