

## Appendix C. Reports of Representatives of Regional and Scientific Associates and Other Bodies

### C1. American Crystallographic Association (ACA)

The American Crystallographic Association, Inc. (ACA) is a non-profit, scientific organization of under 1,200 members. It was founded in 1949. The objective of the ACA is to promote interactions among scientists who study the structure of matter at atomic (or near atomic) resolution. For more details please visit the regularly updated, informative and easy to navigate ACA website (<http://www.amerocrystalassn.org>).

The 2022 ACA Council consisted of Diana Tomchick (President), Cora Lind-Kovacs (Vice-President), David Rose (Past-President), Stephan Ginell (Treasurer), Kushol Gupta (Secretary), and Chelsy Chesterman as the Young Scientists Special Interest Group (YSSIG) representative to the Council (*ex officio*). Gerald Audette continued to serve as the Canadian National Committee for Crystallography (CNCC) representative and Thomas Proffen as the IUCr representative (*ex officio*). Kristin Stevens continues as the ACA Executive Director and Kristina Vitale continues as the ACA Membership Coordinator. Membership of all committees and officers of all special interest groups are listed in the Spring 2022 edition of *RefleXions* (<https://www.amerocrystalassn.org/reflexions-archive>).

In 2022 the Council continued the highly successful once-a-month teleconferences started during the COVID-19 pandemic. The Council also met in person during the ACA Annual Meeting in Portland.

The 72nd Annual Meeting of the American Crystallographic Association was held in Portland, Oregon, 29 July – 2 August 2022. The meeting offered a hybrid option, allowing remote participants to attend a subset of sessions. One change that has occurred because of the COVID-19 pandemic is the pivot to holding Scientific Interest Group (SIG) meetings by Zoom prior to the Annual Meeting. Attendance at these meetings has been robust and diverse, including many new members. Brandon Mercado, Anna Gardberg, Carla Slebodnick and Samantha Powell co-chaired this meeting. The 2022 Transaction Symposium was *The Contributions of Structural Science to Tackling a Pandemic: COVID-19 As a Paradigm*. The meeting was well attended with 563 attendees; around 480 participated in person and 86 remotely. The programme included 8 workshops held the day before the meeting, attracting over 200 participants. Other meeting statistics are available at <https://www.amerocrystalassn.org/past-meetings>.

The 2022 ACA Award Winners (to be presented at the 2023 Annual Meeting) are Kristin M. Hutchins (Margaret C. Etter Early Career Award), Majed Chergui (David G. Rognlie Award), Tamir Gonen (A.L. Patterson Award) and Juan Manuel Garcia-Ruiz (Elizabeth A. Wood Science Writing Award). The 2022 ACA Fellow titles were bestowed on Ian Wilson, Hyotcherl Ihee, Stephen Ginell, Lin Chen and Eddie Snell.

The 2023 (73rd) ACA:SSS Meeting will be held in Baltimore, Maryland, 7–11 July 2023. The meeting will be in-person only.

The ACA/AIP journal *Structural Dynamics* achieved an impact factor of 2.92 in 2022.

The Canadian National Committee for Crystallography (CNCC) (<http://xtallography.ca/>) is chaired by Louise Dawe, the Vice-Chair is Gerald Audette, the Secretary is Michel Fodje and the Treasurer is Brian Patrick.

*Th. Proffen, IUCr Representative*

### C2. Asian Crystallographic Association (AsCA)

AsCA continues to grow in the Asia-Pacific region, with the most recent AsCA conference held on Jeju Island, Korea (Republic of), 30 October – 2 November 2022. The conference attracted in excess of 600 attendees (in person and online), and achieved good gender representation with a ratio of 65%:35% invited talks given by male:female speakers.

A business meeting was held at the conference at which the following items were discussed:

Conference support: A draft policy was presented for AsCA-badged conferences concerning conference support (seed money) from AsCA and distribution of any financial surplus/loss. There was general agreement that conference seed funding was needed; however, it was queried whether AUD 10,000 would be enough. The seed funding should be made available at an early stage of preparations. Members agreed to revisit the amount and details after the next AsCA conference.

AsCA MCR Award: A draft policy was presented to establish two mid-career researcher (MCR) awards. This will be developed further at the next Council meeting.

IUCr 2023 Melbourne, Australia: The organisation is well advanced and sponsorship income looks good. Registration and abstract submission are open. The next AsCA business meeting will be held at the Congress.

AsCA 2024 Malaysia: A brief update was provided, with arrangements to be confirmed in 2023.

AsCA 2025: The AsCA 2025 conference is proposed to be held jointly by Japan and Taiwan.

Elections: The 3-year positions of Vice-President and Secretary/Treasurer were open for election in 2022. Geoff Jameson (New Zealand) was elected Vice-President unopposed. Siegfried Schmidt (Australia) was elected unopposed as Secretary/Treasurer for a second term. Genji Kurisu (Japan) became President, and Xiao-Dong Su (China) became Past President. Jenny Martin (former Past President) stepped off the AsCA Council at the 2022 business meeting.

*J. L. Martin, Past President*

### C3. European Crystallographic Association (ECA)

The ECA Council meeting was held during the 33rd edition of the European Crystallography Meeting (ECM33), Versailles, 23–27 August 2022. The Council discussed scientific and organisational aspects of the ECA activities. Antonia Neels (EMPA/University of Fribourg) was elected Treasurer to the ECA Executive Committee.

ECM33 was successfully carried out, and attracted over 900 participants, from Europe and outside, with a large number of sponsors and quite good gender balance. The 25th anniversary of the ECA and the 50th anniversary of the European Crystallographic Committee were celebrated during ECM33 (<https://ecanews.org/blog/2022/04/03/gold-and-silver-treasures-of-european-crystallography/>). The Perutz Prize was awarded to William Clegg (UK), the Bertaut Prize to Lukáš Gajdos (France) and the Kalman Prize to Eric Collet (France). The organisers of ECM33 decided to donate a part of the financial profit of the conference to ECM35, expected to be held in Lviv, Ukraine, in 2025. The next ECM has been scheduled for Padua, Italy, 26–31 August 2024, in a synergistic combination with the 18th European Powder Diffraction Conference, EPDIC18, 30 August – 2 September 2024.

The 2022 European Crystallographic School, held in Lisbon, 10–15 July 2022, focused on X-ray crystallography of powders, small molecules and proteins, covering the fundamentals of diffraction to the latest developments, including theoretical and practical lectures, hands-on tutorials, and laboratory practical sessions. Lectures were also given on the application of cryo-EM to macromolecules, solid-state NMR, and PDF analysis. 47 students, among undergraduate, graduate, postgraduate and young scientists, and 25 teachers, predominantly from European countries, attended the school. Students showed keen interest and enthusiastic participation in all the sessions. The next school, ECS8, will take place in Berlin, 18–24 June 2023. The first steps towards the organisation of ECS9 in Nancy have been taken.

The ECA has organized a series of virtual lunchtime webinars ([https://ecanews.org/education/eca-lunch-webinars\\_past-events/](https://ecanews.org/education/eca-lunch-webinars_past-events/)). Online Distinguished Lectures on Quantum Crystallography and Complementary Fields have been organized under the auspices of the Quantum Crystallography Commission of the IUCr and the ECA Special Interest Group SIG-02 on Quantum Crystallography with the support of the Department of Chemistry of the University of Warsaw (Poland).

The ECA Executive Committee is in contact with members of the ACA, AsCA, AfCA and LACA to share activities, in particular, to support the OpenLab on Crystallography project and develop crystallography over the continent of Africa.

The ECA General Interest Group devoted to promoting and spreading crystallography through education at different levels (GIG-03) is working on a special project on ‘Women in Crystallography’. Initiatives will be presented at the 26th IUCr Congress in Melbourne.

Two new prizes have been proposed, the Sheldrick Prize (proposed by Professor Isabel Uson) and a prize for young crystallographers in memory of Professor Lodovico Riva di Sanseverino (proposed by GIG-03). The decision on the prizes will be made by the Council.

Owing to the relevant role of heritage science in crystallographic research, a new Special Interest Group (SIG-15) on ‘Crystallography in Art and Cultural Heritage’ has been proposed. It needs to be approved by the Council. This new SIG will be concerned with two main issues: crystallography and symmetry in art; and crystallographic analysis (based on diffraction, X-ray absorption spectroscopy, fluorescence etc.) of artworks and ancient materials.

The ECA's activities are effectively dedicated to supporting and promoting crystallography on a European and also on an international level.

The ECA Executive Committee winter meeting was held in Padua in February 2023 in hybrid form. The next ECA Council meeting has been planned (online) for the end of September 2023.

*A. Altomare, IUCr Representative*

### C4. Latin-American Crystallographic Association (LACA)

The gradual lifting of COVID-19 restrictions in 2022 allowed the members of LACA to organize in-person and hybrid meetings during this period. The main events for LACA in 2022 were as follows.

(1) The IV-LACA School “Phase identification and Microstructural Characterization of Materials using X-ray Powder Diffraction Techniques” was organized (in hybrid format) by Professor Claudio Aguilar at Universidad Técnica Federico Santa María (UTFSM) in Valparaíso, Chile, 24–28 January 2022. The school had as instructors Diego Lamas (Universidad Nacional General San Martín, Argentina), Claudio Aguilar (UTFSM, Chile), Raúl Cardoso-Gil (Max Planck Institute) and David Rafaja (Technical University of Freiberg, Germany), Tom Blanton (ICDD, USA), and Miguel Delgado and Graciela Díaz de Delgado (ULA, Venezuela). Participants on site (23) and online (35) were from Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guatemala, Mexico, Peru, Uruguay, Spain, and the USA. 43% were female and 57% male. Funding for the school was provided by UTFSM, the ICDD, and the IUCr.

(2) The V-Meeting of the Latin American Crystallographic Association (LACA) took place at Universidad de Costa Rica in San José, 28–30 November 2022, in conjunction with the Chemistry Congress CR2022. The meeting was organized by Unión Costarricense de Cristalografía (UCCR), with Dr Andrea Araya Sibaja as Chair of the organizing committee. The IUCr President, Hanna Dabkowska (McMaster University, Canada), attended in person and delivered opening remarks and a Plenary Lecture. Four other plenaries were given in person by Tom Blanton (ICDD, USA) and Jim Kaduk (North Central College & Illinois Institute of Technology, USA) and online by Jennifer Swift (Georgetown University, USA) and Abel Moreno-Cárcamo (UNAM, Mexico). The 40 participants (26 on site and 14 online) represented 13 countries. A total of 13 students and young scientists received travel and subsistence scholarships from IUCr funds to attend the Congress. The programme also included semi-plenaries, oral presentations, and short oral presentations (instead of posters). IUCr prizes were awarded to Teresa García (México), Eduardo Gutiérrez (Argentina), and Analio Dugarte (Venezuela). An honorary mention was given to Cristian Albarracín (Colombia). The CCDC prize was awarded to Julián Ticona Chambi (Bolivia).

During the LACA General Assembly, the delegates decided the members of the new Executive Council for the 2022–2024 period. They are M. Delgado (President, Venezuela), J.R. Vega (Vice-President, Costa Rica), M. Fuentelba (Chile) and Natalia Álvarez (Uruguay) will share the General Secretary role, M. Saleta (Argentina) and Carla Godillo (Guatemala) will share the Adjunct Secretary role, Iris Torriani (Brazil) will be Treasurer, and J. Reyes-Gasga (Mexico) is the Past-President. For the same period, the Deliberative Council will be formed by S. Klinke (Argentina), Javier Ellena (Brazil), A. Araya (Costa Rica), L. Velásquez (Guatemala), J. Martínez-Juárez (México), L. Suescún (Uruguay), and A. Briceño (Venezuela). The new LACA Council will work towards completing the registration process of the association so elections can take place in 2024.

(3) The V-LACA School “Polymorphism: applications in industry” followed (1–3 December 2022) at the Costa Rica National Laboratory of Nanotechnology (LANOTEC-CeNAT-CONARE). Thirty participants from 13 countries attended on site and online and 13 attendees received support from IUCr funds. A CSD workshop was taught remotely by Suzanna Ward and Ilaria Gimondi from the CCDC, with the help of Natalia Álvarez (Universidad de la República, Uruguay) in person. T. Blanton (USA) and M. Delgado (Venezuela) ran a hands-on session on the ICDD’s PDF-4 Database. Other instructors participated on site (J. Kaduk) and virtually: J. Swift (USA), Serena Tarantino and Michele Zema (Italy), Alejandro Ayala and Fabio Furlan-Ferreira (Brazil), and Diego Lamas (Argentina).

The next LACA Congress and School will be organized by Red Uruguaya de Cristalografía (RUCr) in Uruguay in 2024. Natalia Álvarez will be the Chair of the organizing committee.

Latin American member countries also held their own national events. Argentina and Guatemala had very successful crystal growing competitions. It is also worth mentioning that the LACA region is well represented on almost all the Commissions and Committees of the IUCr, as well as on the International Programme Committee for the IUCr Congress in Melbourne, Australia. In addition, three members of the LACA region have proposed candidates for positions on the IUCr’s Executive Committee. The LACA region will continue to make efforts to promote crystallography and to promote the creation of new associations.

*G. C. Díaz de Delgado, IUCr Representative*

### **C5. Worldwide Protein Data Bank (wwPDB)**

The Protein Data Bank (PDB) has been a key resource for macromolecular crystallographers for 50 years, and its policies and development have been strongly influenced by the crystallographic community. Now known as the Worldwide PDB (wwPDB), it comprises five core entities: the RCSB-PDB in the USA, PDBe in Europe, PDBj in Japan, the BMRB (NMR database) and the Electron Microscopy Database (EMDB). The centres collaborate closely and share the load on deposition, maintaining a single open access archive that is freely accessible to anyone – researchers, educators and students – throughout the world.

The wwPDB was formally designated a Scientific Associate of the IUCr in 2015, and the IUCr provides a representative to the wwPDB Advisory Committee (wwPDB-AC). The wwPDB-AC also has representatives from the NMR and cryo-EM communities, as well as regional representation.

Professor Jennifer Martin (Australia) (IUCr Executive Committee member) was appointed IUCr representative in 2021. The wwPDB Principal Investigators invited Professor Martin to Chair the wwPDB-AC from 2022–2024.

The 2022 meeting of the wwPDB-AC was held virtually in October.

There were 14,285 new depositions released in 2022 and the archive was expected to reach >200,000 macromolecular structures in early 2023. This is impressive growth, noting that the 100,000 structure landmark was reached in 2014, the International Year of Crystallography. Numbers of structures in the data bank continue to grow, and the size and complexity of structures also continues to increase. About 87% of structures in the database have been determined by crystallography, though the number determined by cryo-EM is increasing rapidly (4112 by cryoEM in 2022, 9845 by crystallography in 2022). The number of NMR structures remains relatively low in comparison (304 in 2022).

The wwPDB accepted PDBe, China, as an Associate Member in 2022 and PDBi, India, is being considered for future Associate Membership.

*J. L. Martin, IUCr Representative*

### **C6. International Centre for Diffraction Data (ICDD)**

The Commission on Powder Diffraction maintains close links with the ICDD, and has initiated discussions about how this relationship can possibly be developed into something more substantive and of mutual benefit.

*D. G. Billing, IUCr Representative*

### **C7. International Organization for Crystal Growth (IOCG)**

After a hiatus of a few years due to the COVID-19 pandemic, which slowed down events related to the IOCG considerably, we are all now eagerly looking forward to the next meeting of the IOCG. After meeting at the 19th International Conference on Crystal Growth and Epitaxy (ICCGE 19) at Keystone, USA, the IOCG is scheduled to meet again in Italy at the 20th International Conference on Crystal Growth and Epitaxy (ICCGE 20, <https://www.icgge20.org/>) to be held in Naples, Italy, 30 July – 4 August 2023. (This conference was moved from 2022 to 2023, again due to the uncertainties brought about by the pandemic situation.) During the meeting in Naples the election of new IOCG Executive Committee Members and Officers is intended to be convened.

Many members and consultants of the Commission on Crystal Growth and Characterization of Materials (CCGCM) are involved in the organization of the ICCGE 20, and I would like to highlight in particular the huge contribution being made by the two Co-Chairs of this conference, A. Vecchione and A. Zappetini. Several other members of the CCGCM are also involved in various capacities (Programme Chairs, International Advisory Board, session Chairs and of course as invited speakers) in putting together what is going to be a fantastic conference where fruitful exchange of new developments in research in the field, and a free and frank exchange of ideas will be possible in person again. The school preceding this conference, ISSCG18 to be held in Parma, Italy (<https://isscg-18.unipr.it/>), will bring together students and early career researchers in the community, which is crucial to ensure future success in the activities of both the CCGCM and the IOCG.

Some members of the CCGCM also had the opportunity to meet in person last year at the European Conference on Crystal Growth, ECCG-7 (<http://www.escg3-eccg7-paris2022.insight-outside.fr/>) in Paris, July 2022, which was very welcome after a long break.

*G. Balakrishnan, IUCr Representative*

### **C8. Interdivisional Committee on Terminology, Nomenclature and Symbols of the International Union of Pure and Applied Chemistry (IUPAC ICTNS)**

The Chair of the Commission on Crystallographic Nomenclature is a member of the ICTNS.

The only activity of the ICTNS during 2022 seems to have been a “Meet and Greet” Zoom meeting on 10 March (9 March in North America) that took place at a time when I had a previously scheduled activity.

Requests to referee papers and reports submitted to IUPAC arrive regularly because all submissions are sent to all members of the ICTNS. Most submissions are in specialized areas unrelated to crystallography. No reviews were written for IUPAC during 2022.

*C. P. Brock, IUCr Representative*

### **C9. International Science Council (ISC)**

The International Science Council has continued to develop into a grand unified force in science policy since its formation in 2018 from the merger of the International Council for Science (ICSU) and the International Social Science Council (ISSC). The joint effort of natural and social sciences gives voice to science in facing the challenges of a rather troubled world. Providing evidence-based advice and analysis during the crises we have faced and still face with a changing climate, the COVID pandemic and the war in the Ukraine is a key role for an organisation that spans a broad range of scientific expertise. The ISC assumes the important role of speaking for science as a whole and the ISC is certainly emerging as an organization that is well set to work on science for policy and policy for science.

During 2022, most meetings organized under the auspices of the ISC were still online, but the ISC has resumed physical meetings as well. During the year, the ISC hosted almost 200 meetings and webinars covering a broad swathe of subjects, some highly relevant to the IUCr covering such issues as managing and curating data, open access publishing, diversity in science and engagement with young scientists. There were no meetings during 2022 concerning ISC governance. As before, the ISC keeps up the impressive stream of publications on science policy. During 2022 the following titles emerged: In January, *The transformative potential of managed retreat in the face of rising sea levels*, in March, *Principles and Structures of Science Advice: An outline, The normalization of preprints and Briefing Note on Systemic Risk*, in May, *International Science Council Introductory Brochure 2022, Unprecedented & Unfinished: COVID-19 and Implications for National and Global Policy, Policy Brief: Using UNDRR/ISC Hazard Information Profiles to manage risk and implement the Sendai Framework for Disaster Risk Reduction, Policy Brief: Closing the gap between science and practice at local levels to accelerate disaster risk reduction and Policy Brief: Harnessing data to accelerate the transition from disaster response to recovery*, in June, *Position paper of the Scientific and Technological Community Major Group for the 2022 High-level Political Forum*, in July, *ISC Annual Report 2021* and in August, *Conference on the Ukraine Crisis: Responses from the European higher education and research sectors*.

The full activities of the ISC during 2022 will be detailed in the yearly report that is scheduled for publication in July this year.

*S. Lidin, IUCr Representative*

### **C10. ISC Committee on Data for Science and Technology (CODATA)**

CODATA is the interdisciplinary Committee on Data for Science and Technology of the International Science Council. Full details of CODATA's activities are available from its website, <http://www.codata.org>.

In February 2022 we sought advice from the CODATA International Data Policy Committee and its subgroup on Data Rights and Responsibilities (<https://codata.org/initiatives/data-policy/international-data-policy-committee/>) on questions about rights and responsibilities of data ‘ownership’ arising from our Committee on Data Workshops at the IUCr Prague Congress. The details of these deliberations are described at <https://forums.iucr.org/viewtopic.php?f=39&t=445>. The conclusion was that before any data are measured all participants should agree a data management and sharing plan. We are very grateful to this CODATA Committee for their assistance in these matters.

In June 2022 International Data Week was hosted by the Korean Institute of Science and Technology Information (KISTI), in a hybrid conference format, on the overall theme of “Data to improve our world”. I attended virtually, which saved attendance costs. The overall IDW 2022 Programme (including Plenary, SciDataCon and Research Data Alliance 19th Conference sessions) is described at [https://idw2022.org/bbs/content.php?co\\_id=Agenda\\_en&lang=English](https://idw2022.org/bbs/content.php?co_id=Agenda_en&lang=English). Within the CODATA Global Open Science Cloud (GOSC) IDW2022 conference session I presented a talk on our Diffraction Case Study contribution to the GOSC. Our Case Study focuses on an increased role for raw diffraction data, and is described at <https://codata.org/initiatives/decadal-programme2/global-open-science-cloud/case->

studies/diffraction-data/. As well as this global event there were also ‘All GOSC Hands Meetings’ hosted by CODATA specifically for the five case studies involved in this CODATA GOSC initiative. In October 2022 the GOSC International Programme Office Launch event was held, as a virtual event. This office is based in Beijing with expert information and data archiving staff provided by China (<http://english.cnpc.cas.cn/>). The GOSC is a major initiative stemming from the <https://en.unesco.org/science-sustainable-future/open-science/recommendation>, which affirms the importance of Open Infrastructure as one of the key pillars of Open Science. Along with the Action Plan – International Science Council, the UNESCO Recommendation calls for the development of multinational, regional and national Open Science platforms, as integrated and federated e-infrastructures, and urges stakeholders to ensure both that these initiatives interoperate and that no one is left behind. Similarly, an idea to co-design and co-build the Global Open Science Cloud (GOSC) has now developed into a worldwide initiative to encourage cooperation, alignment, and interoperability among Open Science e-infrastructures. (See my report on the UNESCO Initiative on Open Science below.)

In August 2022 CODATA contacted its Representatives for a Research Data Terminology compilation. We provided detailed feedback.

I have kept CODATA informed about the new *IUCrData* Raw Data Letters article category, launched in September 2022, again indicating the increased role for raw diffraction data as the digital data archive technologies have considerably expanded in their capacity. The launch Editorial can be found at <https://iucrdata.iucr.org/x/issues/2022/09/00/me6192/index.html>.

*J. R. Helliwell, IUCr Representative*

#### *Report on the UNESCO Initiative on Open Science*

A UNESCO Recommendation on Open Science was adopted by the General Conference of UNESCO at its 41st session, on 23 November 2021. The Recommendation affirmed the importance of open science as a vital tool to improve the quality and accessibility of both scientific outputs and scientific process, to bridge the science, technology, and innovation gaps between and within countries and to fulfil the human right of access to science. Details of this are at <https://www.unesco.org/en/open-science?hub=686>.

UNESCO convened five ad-hoc Working Groups focusing on key impact areas, bringing together experts and open science entities, organizations, and institutions, according to their field of activity and expertise on:

- (i) Open Science Capacity Building
- (ii) Open Science Policies and Policy Instruments
- (iii) Open Science Funding and Incentives
- (iv) Open Science Infrastructures
- (v) Open Science Monitoring Framework

These have each had three virtual events. Recordings are available at <https://www.unesco.org/en/open-science/implementation>.

I attended these Working Groups and prepared reports for the Editor-in-chief and Managing Editor of IUCr Journals and the IUCr's CEO. A key output of the Working Groups assembled by UNESCO is a helpful toolkit, <https://www.unesco.org/en/open-science/toolkit>. Within this toolkit is a checklist for publishers: <https://unesdoc.unesco.org/ark:/48223/pf0000383327>.

A linked event to this UNESCO initiative and its various events was a three-day hybrid event on open science organised by the UN Library, <https://www.un.org/en/library/OS23>, with a focus on accelerating the UN's sustainable development goals and democratizing the record of science.

On behalf of IUCr I made specific inputs into these events on (i) the importance of global collaborative sharing of instrumentation [citing Warren, J. E., Diakun, G., Bushnell-Wye, G., Fisher, S., Thalal, A., Helliwell, M. & Helliwell, J. R. (2008). *Science experiments via telepresence at a synchrotron radiation source facility*. *J. Synchrotron Rad.* **15**, 191–194] and (ii) a fine example of open science in practice being the ESRF (European Synchrotron Radiation Facility) heritage database for palaeontology, evolutionary biology and archaeology (<http://paleo.esrf.eu/>). Basically, so much of these data can be measured quickly that Europe's palaeontologists decided to share all their data with the whole world's palaeontologists to analyse the data as promptly as possible.

A specific conclusion from the UN/UNESCO deliberations features a growing importance of, and seeking funds for, the prioritising of diamond open access for publications. ‘Diamond’ open access refers to a scholarly publication model in which journals and platforms do not charge fees to either authors or readers, e.g. see [202203-diamond-oa-action-plan.pdf](https://www.scienceeurope.org/202203-diamond-oa-action-plan.pdf) (scienceeurope.org).

*J. R. Helliwell, ad hoc IUCr Representative*

#### *Digital Representation of Measure (DRUM) Initiative of the Committee on Data (CODATA) of the International Science Council (ISC)*

In July 2020 the Chair of the Commission on Crystallographic Nomenclature was appointed to be the IUCr's Ambassador to the DRUM initiative of CODATA. The official IUCr delegate to CODATA itself is John Helliwell. There does not appear to have been any DRUM activity in 2022.

*C. P. Brock, IUCr Representative*

## C11. ISC Committee on Space Research (COSPAR)

COSPAR's (<https://cosparhq.cnes.fr/>) main objective is to promote international collaboration in scientific research in Space, with an emphasis on the exchange of results, information and opinions. This organization is responsible for developing world standards for the space environment and its protection.

COSPAR's highest body is the Council. The Council comprises the Committee's President, Representatives of Member National Scientific Institutions and International Scientific Unions, the Chairs of COSPAR Scientific Commissions, and the Chair of the Finance Committee. The Council meets at the Committee's biennial Scientific Assembly. Between Assemblies on a day-to-day basis COSPAR is run by the Bureau.

COSPAR President for the period 2022–2026 is Pascale Ehrenfreund (Netherlands/USA) and the Vice-Presidents are Catherine Césarsky (France) and Pietro Ubertini (Italy). Members of the Bureau are: Vassilis Angelopoulos (USA), Masaki Fujimoto (Japan), Manuel Grande (UK), Petra Rettberg (Germany), Iwona Stanislawska (Poland) and Chi Wang (China).

The most recent 44th Scientific Assembly of COSPAR was held in Athens, 16–24 July 2022, <https://www.cosparathens2022.org/>.

The 45th COSPAR Assembly will be in Busan, Korea, 13–21 July 2024, <https://www.cospar2024.org/>.

The 46th COSPAR Assembly will take place in Florence, Italy, 1–9 August 2026.

Following the success of the Capacity Building Workshop (CBW) on Crystallography for Space Science in April 2016 in Puebla, Mexico (<http://www.inaoep.mx>), a similar workshop/school was proposed for Addis Ababa, Ethiopia, in 2022. However, owing to the deteriorating security situation, a change of venue has been considered. Yuki Kimura (IUCr) and Carlos Gabriel (COSPAR) will co-chair the workshop.

The Chair of the Scientific Commission on Material and Fluid Sciences in Space Conditions (Scientific Commission G) is M. Avila (Germany), and the Vice-Chairs are K. Brinkert (UK), J. Porter (Spain) and A. Romero-Calvo (USA).

The official journal of COSPAR is *Advances in Space Research (ASR)*, <https://www.journals.elsevier.com/advances-in-space-research>, and had an impact factor of 2.611 (in 2021). *ASR* includes COSPAR's information bulletin *Space Research Today*. Another COSPAR journal, *Life Sciences in Space Research*, <https://www.journals.elsevier.com/life-sciences-in-space-research>, had an impact factor of 2.73 (in 2021), and is a quarterly peer-reviewed scientific journal covering astrobiology, origins of life, habitability, life in extreme environments, effects of spaceflight on the human body, radiation risks and other aspects of life sciences relevant in space research.

In 2022 COSPAR organized two CBWs:

- CRTS-COSPAR Workshop on Oceanography, 12–16 September 2022, Rabat, Morocco.
- Pan-Ocean-Remote-Sensing-Conference Tutorial, 3–6 December 2022, Johor Bahru, Malaysia.

The Panel on Capacity Building (PCB) Fellowship programme is open to young scientists who participated at one of the COSPAR CBWs, enabling them to build on skills gained at the workshop. It provides for visits of 2–6 weeks duration for the purpose of discussing ideas for a future workshop or carrying out joint research with one of the previously agreed lecturers/advisors of the corresponding workshop.

COSPAR co-organizes a limited number of meetings and colloquies each year that are of interest to its Associates. More information about these initiatives can be found at <https://cosparhq.cnes.fr/events/co-sponsored-meetings>.

*Y. Kimura, IUCr Representative*

## C12. International Organization for Standards (ISO)

The Chair of the Commission on Crystallographic Nomenclature is a member of the ISO. The group sends out e-mails once per week that list 25–50 reports on a very wide variety of topics (e.g., information technology, plastics and rubber, ships and marine technology, tobacco products, medicinal herbs, clothing, medical equipment).

A topic of interest to crystallographers seldom appears in these reports, but the report *Quantities and units –Part 1: General* that was adopted during 2022 has a statement that describes the use of non-standard units (e.g., the angstrom). The fourth paragraph of the first section of the Introduction of that report reads as follows:

*It is inevitable that some readers working in particular specialized fields may find that the quantities they are interested in using may not be listed in this International Standard or in another International Standard. However, provided that they can relate their quantities to more familiar examples that are listed, this will not prevent them from defining units for their quantities.*

It seems that the angstrom is safe; there just needs to be an exact conversion factor to a standard unit, which there is.

*C. P. Brock, IUCr Representative*