

*Open data in the emerging 21st-century scientific world*

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To mark the International Year of Crystallography, the International Union of Crystallography (IUCr) launched a new journal, IUCrJ, dedicated to publishing high-profile articles on all aspects of the sciences and technologies supported by the IUCr via its commissions, including emerging fields of science underpinned by structural models. A noteworthy aspect of this new high-profile publication was that it was open-access, a characteristic of other recent IUCr publications (Acta Crystallographica Section E, IUCrData). All the remaining IUCr journals also offer authors the opportunity to make their individual articles open-access. Furthermore, all supporting data for any article published in an IUCr journal may be downloaded and re-used in scientific research so long as due credit is given to the original authors. Crystallography has had a long-established culture of sharing data and open communication, anticipating the current interest in making all publicly-funded research open without cost or restrictive licences to the entire community. These aspirations are recognised by new national and supranational policy frameworks, e.g. the European Open Science Cloud vision [1]. The benefits of open access are clear - greater discoverability and cost savings are perhaps the most obvious. However, there has been a rapid rise in the number of open-access journals advertised to provide a vehicle for research publications with the promise of higher citation rates, and high-quality peer review is not always guaranteed. Some open data collections also raise concerns about the quality of the material available - the maintenance of high quality in the publication of results and data sets is a labour-intensive and therefore expensive activity, and it is sometimes not apparent how such quality control is being funded. In late 2015, a group of leading scientific organisations developed an international accord on the values of open scientific data [2]. The IUCr has endorsed this accord, but has also produced a position paper carefully examining its implications for crystallography and related structural sciences [3].

[1] Jones, B. (2015). Towards the European Open Science Cloud. <http://doi.org/10.5281/zenodo.16001>.

[2] Science International (2015): Open Data in a Big Data World. Paris: International Council for Science (ICSU), International Social Science Council (ISSC), The World Academy of Sciences (TWAS), InterAcademy Partnership (IAP).

[3] Hackert, M. L., Van Meervelt, L., Helliwell, J. R. & McMahon, B. (2016). Open Data in a Big Data World: a position paper for crystallography. Chester, UK: International Union of Crystallography.

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