Riva di San Severino Prize

Crystallography with the People

C. Murray[1]

[1]*Freelance Researcher, Berlin, Germany*
drclairemurray@gmail.com

People's curiosity about crystals and the beautiful science of crystallography means there is an exciting opportunity for creative outreach. The types of outreach activities available can be broadly classified into three models: Deficit, Dialogue and Participatory. There has been a shift away from deficit model in public engagement, where the public are perceived to be deficient in awareness and understanding, towards the other two models [1]. The dialogue model involves communication between scientists and the public, whereas the participatory model builds on the dialogue model to frame the communication in such a way that all can contribute and have a stake in the outcomes. The latter two models require very different approaches to crystallography outreach compared the deficit model but create unique and worthwhile opportunities for engagement and impact.

This talk shares different methodologies in crystallography education and outreach centring on the dialogue and participatory models. This includes citizen science with *Project M* [2,3], science communication with *Diamond: The Game* [4] and *The Structure of Stuff is Sweet* [5] and other work. The important questions of how we can represent crystallography equitably will also be discussed [6,7], building on the fundamental idea that *everyone* has the right to enjoy crystallography. Throughout all of this, the mutual benefits and impact of these exchanges between crystallographers and the public will be explored, where having meaningful and genuine conversations that celebrate crystallography contributes to the greater appreciation of and curiosity about our science. We should never underestimate the impact we can have on people's lives.

[1] Trench, B., 2008. Towards an analytical framework of science communication models. Communicating science in social contexts: New models, new practices, pp.119-135.

[2] Murray, C.A., Holland, L., O'Brien, R. and Parker, J.E., 2023. Forming bonds between molecules and communities through Project M. Frontiers in Communication, 8, p.1229616.

[3] Murray, C.A., Project M Scientists, Holland, L., O'Brien, R., Richards, A., Baker, A.R., Basham, M., Bond, D., Connor, L.D., Day, S.J., Filik, J., Fisher, S., Holloway, P., Levik, K., Mercado, R., Potter, J., Tang, C.C., Thompson, S.P. and Parker, J.E., 2024. Project M: investigating the effect of additives on calcium carbonate crystallisation through a school citizen science program. CrystEngComm. 26, pp.753-763.

[4] Murray, C., Dunstan, M., Heron, C., Holland, L., Palmer, S., Price, D. and Basham, M., 2022. Diamond: The Game–a board game for secondary school students promoting scientific careers and experiences. Research for All, 6(1), pp.1-18.

[5] Murray, C., Maynard-Casely, H.E., Harrington, R., McCready, S., Sneddon, D.J., Thomas, L. and Warren, A.J., 2024. Crystals in the community and the classroom. Journal of Applied Crystallography, 57(1). pp.181-186

[6] Murray, C., Anderson, Y., Simms, C.H. and Seery, M.K., 2022. Representations of women and men in popular chemistry textbooks in the United Kingdom and Republic of Ireland. Chemistry Education Research and Practice, 23(2), pp.373-384.

[7] Murray, C., 2022. Bewildering benzene. Nature Chemistry, 14(5), pp.584-584.

Collaborators, colleagues and friends are gratefully acknowledged for their enthusiasm and contributions to this work. Diamond Light Source, the British Crystallographic Association, STFC and the Royal Society of Chemistry are thanked for funding and support.