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Structural studies of solid-state ionic conductors at the limits of diffraction and beyond

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The structures of solid-state ionic conductors are a compromise between long-range (and hence long-term) lattice stability and short-range coordinative flexibility. To rationally design improved versions for applications such as fuel cells and batteries, we need to understand how this compromise is reached. Diffraction methods alone are inadequate – whether using X-rays or neutrons, *ex situ* or *operando*, conventional crystallography or total scattering analysis – because of their dynamic nature. The time-averaged structure is not the whole story. In this talk I will show how we use experimental X-ray and neutron spectroscopy, and computational structure and dynamics calculations, to supplement diffraction when studying solid-state oxide, proton and lithium ionic conductors. We can then validate the insights gained by making targeted chemical modifications and testing their effects on structure and functional physical properties.

Level of Expertise

Expert

Presenter Gender

Man

Pronouns

He/Him

Which facility did you use for your research

Australian Centre for Neutron Scattering

Students Only - Are you interested in AINSE student funding

Do you wish to take part in the Student Poster Slam

Condition of submission

Yes

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