Talk

Designing Hybrid Organic-Inorganic Perovskite Glasses as Future Thermoelectric Materials

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Host: Maria Ibáñez

I intend to broaden the international perception of HOIPs beyond photovoltaic materials, explore their fundamental liquid and glass forming behaviour, and create a family of related amorphous materials for power generation from waste heat, i.e. thermoelectrics. In my previous position at the University of Cambridge, I recently discovered this liquid- and glass- forming ability of crystalline hybrid perovskite frameworks. These are important given (i) they are only the second known family of hybrid glasses, i.e. those formed from connected inorganic and organic components, and (ii) apart from moderate electrical conductivity, they were found to exhibit lower thermal conductivities than other glasses from traditional inorganic, and organic families. This behaviour is promising for applications as thermoelectrics, and the further improvement of behaviour such as increasing electrical conductivity to claim high ZT comparable to present thermoelectric materials, alongside exploration of the optical and mechanical properties of this new family of glasses, forms the bulk of my future research interests and challenges.Major Publications 1. Melting of hybrid organic–inorganic perovskites. B K Shaw, A R Hughes, M Ducamp, S Moss, A Debnath, AF Sapnik, M F Thorne, L N McHugh, D Keeble, P Chater, J M Bermudez-Garcia, X Moya, S K Saha, D A Keen, F-X Coudert, F Blanc, T D Bennett, Nature Chemistry, 2021, 13, 778–785.2. Principles of melting in hybrid organic-inorganic perovskite and polymorphic ABX3 structures.B K Shaw, C Castillo-Blas, M Thorne, MLR Gómez, T Forrest, M D Lopez, P Chater, L McHugh, D Keen, T D Bennett, Chemical Science, 2022, 13, 2033-2042.

Friday, February 24, 2023 11:00am - 12:00pm

Heinzel Seminar Room/ Office Building West

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