

## **On local structures, thermal transport, and strain effects in solid ionic conductors**

**March 15, 2024**

Face to Face Only, 1:00 – 2:00 pm

Houston Science Center (HSC), Rm 102

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### **Abstract:**

The advent of solid-state batteries has spawned a recent increase in interest in lithium conducting solid electrolytes. However, many open questions remain when trying to optimize electrolytes and understand solid-state battery chemistries.

In this presentation, we will show how an understanding of the structure-transport properties of the can help tailor the ionic conductivity. Two examples will be shown in which the first will highlight the need to design anionic disorders and the second the need to study local structures of solid ionic conductors.

In the second part of this presentation, we will show that fast ionic conductors exhibit low thermal conductivities that may be detrimental to solid-state battery operation. The low thermal conductivity stems from large anharmonicities and diffusion-based thermal transport, all of which extends into solid-state battery composites.

Finally, we will explore strain effects in solid electrolytes and how pressure affects microstructure, transport, and electrochemical properties of solid ionic conductors.



**Bio:** Wolfgang Zeier holds a chair in Solid State Chemistry at the University of Münster. In addition, he heads a department at the Helmholtz-Institute Münster, Ionics in Energy Storage. His research interests encompass the fundamental structure-to-property relationships in solids, with a focus on thermoelectric and ion-conducting materials, as well as solid-solid interfacial chemistry for all-solid-state batteries.