

SMS Fall 2023 Seminar Series

Friday April 19 | 3pm | Biodesign Auditorium

Zintl phases, electride, and hydride: synthesis, properties, and applications

There are many technologies where progress towards higher efficiencies and broad application are materials limited. This seminar will outline the requirements for efficient energy conversion from waste heat directly to electricity (thermoelectric property) for Zintl phases and an electride-hydride solid solution. Zintl phases are a subset of intermetallics, compounds made from all metals and in the case of Zintl phases, exhibit ionic and covalent bonding resulting in semiconducting properties. Electrides are materials where an electron serves the role of an anion. I will provide the context of the important structural and electronic design of Zintl phases with the $\text{Ca}_{14}\text{AlSb}_{11}$ structure type, the utility of hydrides for synthesis, and the investigation of an electride-hydride solid solution. These investigations will demonstrate the strength of chemical principles in discovery.

Susan Kauzlarich
Distinguished Professor , University of California, Davis

Susan Kauzlarich (she/her) is a Distinguished Professor of Chemistry at the University of California Davis. She received her BS degree in Chemistry from the College of William and Mary and her PhD from Michigan State University. She joined the University of California Davis faculty after postdoctoral work with John Corbett at Iowa State University. She is a world-renowned expert on Zintl phases and the synthesis and characterization of nano-materials, with interests ranging from solar photovoltaics to thermoelectrics and quantum materials. She pioneered the inclusion of rare earth and transition metal analogs of Zintl phases. Prof. Kauzlarich is a Fellow of the American Association for the Advancement of Science and the American Chemical Society. She received the Mayer Distinguished Scholar Award from Argonne National Laboratory, the Francis P. Gavan – John M. Olin Medal, and the American Chemical Society 2022 Inorganic Chemistry Award. She received a NASA Tech Brief Award for her work on thermoelectric power generation. She has been very active in service to the profession: she currently serves as a Deputy Editor for *Science Advances* after 15 years as an Associate Editor for *Chemistry of Materials*. She has been recognized for her outstanding mentoring of STEM students, including a U.S. Presidential Award for Excellence in Science, Math, and Engineering Mentoring (2008).

