Condensed Matter Physics Seminar Series

Crystal Growth of Rare Earth Intermetallics: A Platform for Quantum Materials

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The growth, characterization, and physical properties of new systems and architectures of new classes of materials is necessary for advancing the field of highly correlated systems. While solid state synthesis remains a challenge where phase formation, temperature profile, and reaction ratios can lead to unpredictability. Nevertheless, solid state chemists have implemented chemical heuristics to predict the results. Therefore, it is our goal to study the growth of materials to study the interplay between itinerary electrons and localized magnetic moments in “bulk heterostructures” of intermetallics, which plays a critical role in understanding magnetism and emergent behavior. To realize Weyl-Kondo systems, our goal is to discover a new platform to realize the potential for discovery of a new class of heavy electron system in the context of topological metals with strong correlation. While the selection of new phases and the corresponding growth and synthesis is not trivial, our experience working with diverse materials coupled with selection of candidates make our efforts an ideal start to study the interplay of magnetism and correlations. Herein, we will show our strategy to discover and growth of the most promising intermetallic candidates.

Professor Julia Chan (B.S. Chemistry, Baylor University; Ph.D. Chemistry, University of California at Davis) began her faculty appointment at Louisiana State University Fall 2000-2013 and University of Texas at Dallas Fall 2013-2021, after spending two years as a National Research Council Postdoctoral Associate at the National Institute of Standards and Technology in the Materials Science and Engineering Laboratory. In 2022, she returned to Baylor University along with her research group and the lab’s current research efforts is focused on synthesis, crystal growth, and characterization of novel quantum materials. She has been appointed as the Tim and Sharalynn Fenn Family Endowed Chair in Materials Science.

Friday, October 13th, 2023 at 4:00PM
4-330 PAB