

Effects of stoichiometry in single crystals of strongly correlated systems

Dr. Halyna Hodovanets
Assistant professor of Physics
Missouri S&T



**Chemistry
Seminar on
Strongly
Correlated
Systems**

**Monday
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pm in 126
Schrenk**

**Please contact
Dr. Amitava
Choudhury at
choudhurya@mst.edu
for further
information.**

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Abstract: Single crystals allow the study of intrinsic anisotropic properties of materials without the grain boundaries that are present in polycrystalline materials. Different single crystal growth techniques have their own advantages; however, the high-temperature flux growth technique allows one to obtain single crystals with relative ease and little expense, provided the liquidus line for the system in question is accessible. The binary diagrams that show us the extent of such liquidus lines, line compounds (stoichiometric compounds), and compounds with width of formation (nonstoichiometric compounds) are widely studied and are available. However, minute details of ternary phase diagrams are not readily available, given their complexity, and it is sometimes not known beforehand if the ternary compound has exact or varied stoichiometry. I will present the effect of stoichiometry on the physical properties of CeAlGe, a Weyl semimetal candidate, and a strongly correlated antiferromagnet, CeAuBi₂ and Pr₉Ge₁₆, a ferromagnet with a new crystal structure.

About the speaker: Dr. Halyna Hodovanets is an Assistant Professor in the Physics Department. She was born in a small town in the Carpathian Mountains, Ukraine. She received her M.S. Degree in Physics from Minnesota State University, Mankato. For her MS thesis, she investigated the crystallization process of Nd-Fe-B Melt-spun ribbons. Being captivated by solid-state physics, she continued her graduate education at Iowa State University, earning her Ph.D. in Condensed Matter Physics. There, she grew many single crystals of intermetallic compounds and studied their fascinating anisotropic properties. She did postdoctoral training and was promoted to Assistant Scientist at the Maryland Quantum Materials Center at the Department of Physics, University of Maryland. She was an Assistant Professor at Texas Tech University before coming to Missouri S&T. Dr. Hodovanets' research focuses on the synthesis and discovery, characterization, and optimization of novel quantum materials (e.g. Weyl semimetals, superconductors, antiferro- and ferromagnets, magnetocaloric, and thermoelectric materials) in a single crystalline form. Her interest is in the exotic electronic and quantum states of matter that are realized in quantum materials and can be tuned with chemical substitution, magnetic field, or application of pressure.