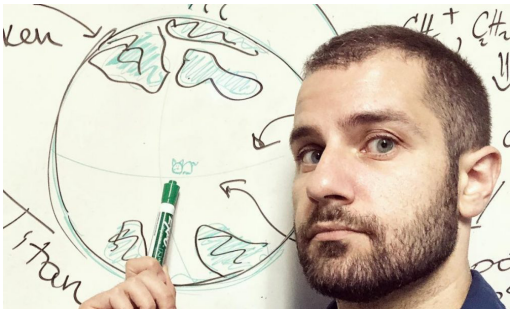
KANSAS STATE UNIVERSITY

College of Arts and Sciences
Department of Chemistry

DEPARTMENTAL SEMINAR

Thursday, 10 April | 1:05 pm | KG 004

"Fantastic Structures and Where to Find Them: from Minerals on Titan to Densely Packed Pentagons and Reactions under Pressure"



Associate Professor Tomče Runčevski
Southern Methodist University
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Abstract: The structure of materials determines their physicochemical behavior, especially in the context of organic solids, which can form various solid forms, either crystalline or amorphous. In this talk, I will highlight recent advances in experimental techniques aimed at identifying and stabilizing the thermodynamically favored forms of organic materials—particularly in the context of planetary science, where such materials may serve as mineral analogs on Titan, Saturn's enigmatic moon. We will also discuss how kinetic control strategies, such as rapid quenching, can be employed to trap metastable phases of physiologically active compounds, enabling the design of new drugs, supplements, and pesticides with finely tuned properties. Finally, we will explore how fundamental equations of state can be used to derive new strategies that facilitate topotactic chemical reactions, offering novel routes for transforming solid materials in a controlled and targeted manner.

Bio: Tom Runčevski was born in Macedonia where he finished his undergraduate studies in chemistry in 2011. He did his PhD at the Max Planck Institute for Solid State Research in Stuttgart, Germany, with Prof. Robert E. Dinnebier, where he graduated in 2014 with honors. After one-year postdoctoral stay at the Max Planck Institute, he joined UC Berkeley and Lawrence Berkeley Nat Lab in 2015, as a postdoctoral researcher with Prof. Jeffrey R. Long. In 2018, he started his independent career at the Southern Methodist University, as an assistant professor of chemistry. In 2024 he was early promoted to associate professor with tenure. He has received the Otto Hahn Medal, NSF CAREER award, ACS PRF award, Stephenson award, Sam Taylor Fellowship, among others.