Title
Elemental 2D materials beyond graphene: Insights from computational theory

Abstract
The presentation will address recent developments related to elemental 2Dmaterials beyond graphene, with a focus on silicene, germanene, and arsenene.Several examples will be discussed in order to illustrate how computationaltheory based on first-principles calculations can contribute to understandingbasic physical and chemical phenomena in 2D condensed matter. Silicene is ofparticular interest due to its compatibility with established Si technology.Regrettably, strong interaction with common substrates eliminates the Diracstates. Alternative substrates will be analyzed and the effects on siliceneevaluated with respect to technological requirements. Germanene attracts moreand more attention, because effects of spin-orbit coupling are accessible incontrast to lighter 2D materials. While the same is true for arsenene, thematerial's strongly buckled structure is not compatible with Dirac physics.Recovering the sp^2 bonding, on the other hand, makes it possible to realizeunusual properties.

Biography
Dr. Schwingenschlögl is a Professor of Materials Science & Engineering at King Abdullah University of Science and Technology (KAUST). His research interests in condensed matter physics and first-principles materials modeling focus on two-dimensional materials, interface and defect physics, correlated materials, thermoelectric materials, metal-ion batteries, nanoparticles, and quantum transport. Dr. Schwingenschlögl joined KAUST as founding faculty member in 2008, having previously worked at the International Center of Condensed Matter Physics in Brasilia, Brazil, and the Universität Augsburg in Germany.