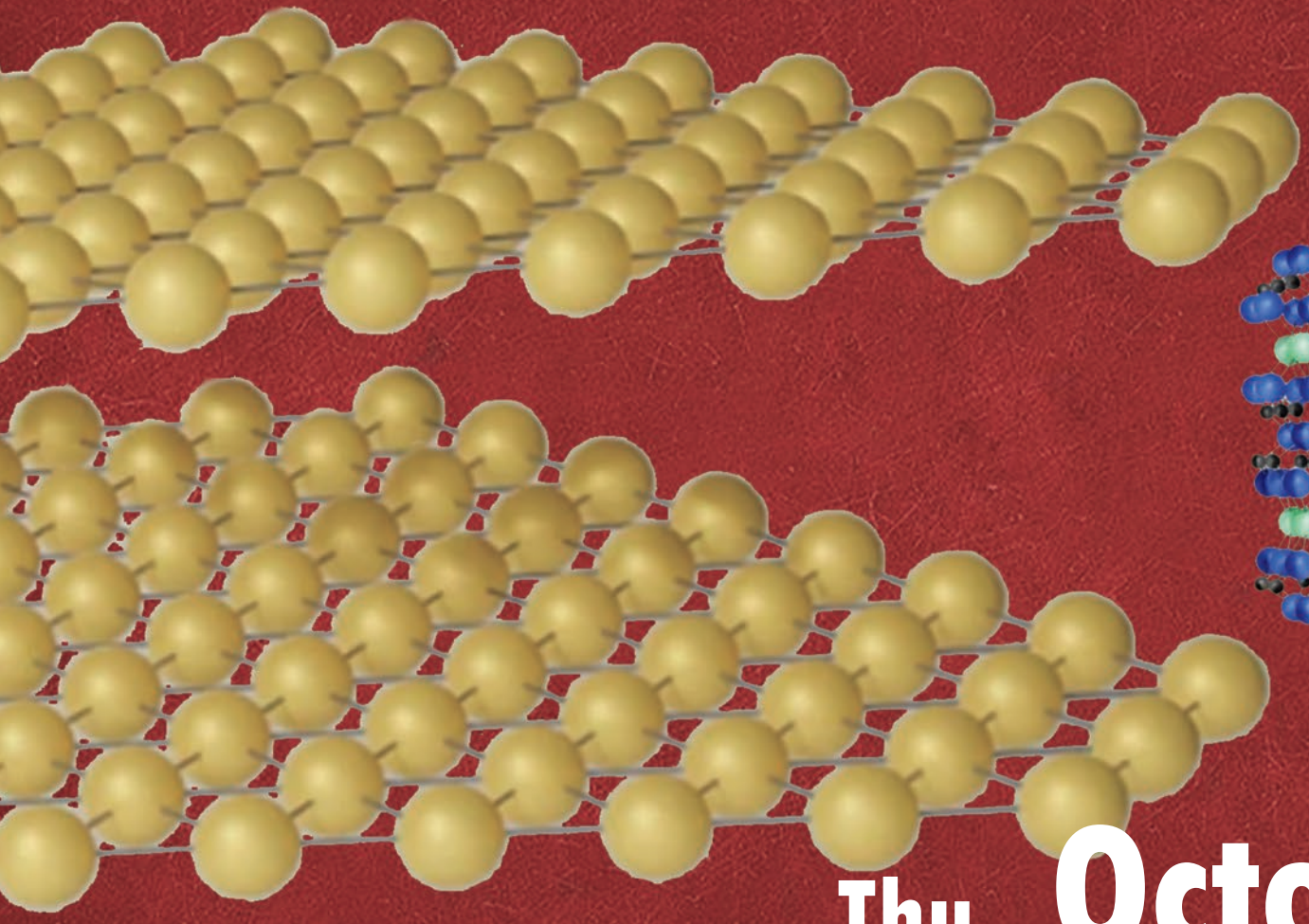
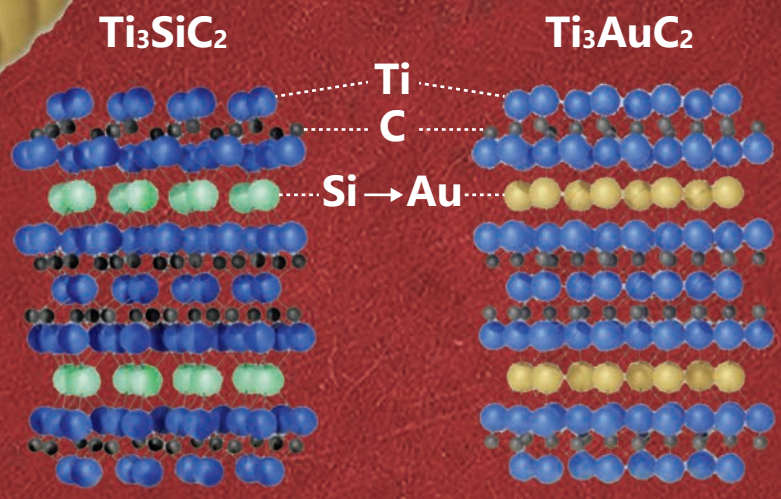
OIST OKINAWA INSTITUTE OF SCIENCE AND TECHNOLOGY
沖縄科学技術大学院大学

OIST Presidential Lecture 2024

Discovery of Goldene: A Single-Atom Layer of Gold





Thu., October 10

10:00 – 11:30 L4E48

The quest to create monolayer gold has been limited to a few atomic layers, stabilized on or inside other materials due to metals' tendency to form 3D shapes. We report the exfoliation of single-atom-thick 2D gold (goldene) by wet-etching Ti_3C_2 layers from Ti_3AuC_2, a nano-laminated ceramic formed by substituting the Si layer in Ti_3SiC_2 thin films with Au. Goldene sheets are freed via diluted Murakami's reagent, with surfactants preventing coalescence. Goldene shows 2% in-plane lattice contraction, increased Au 4f binding energy, and potential applications in sensors and catalysis for water splitting, minimizing Au use with its high surface-area-to-volume ratio.

Prof. Lars Hultman

Lars Hultman is a professor in the Thin Film Physics division at Linköping University and the CEO of the Swedish Foundation for Strategic Research. He holds numerous patents, has published 930 papers, and is recognized by awards and honors including the ERC Advanced Grant and Wallenberg Scholar. He serves as Chamberlain to Sweden's King Carl XVI Gustaf and is also a member of several prestigious Academies of Sciences and Engineering.

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