北京大学物理化学长葛未名创新工场讲座

Peking University Physical Chemistry Chang-Ge Lecture

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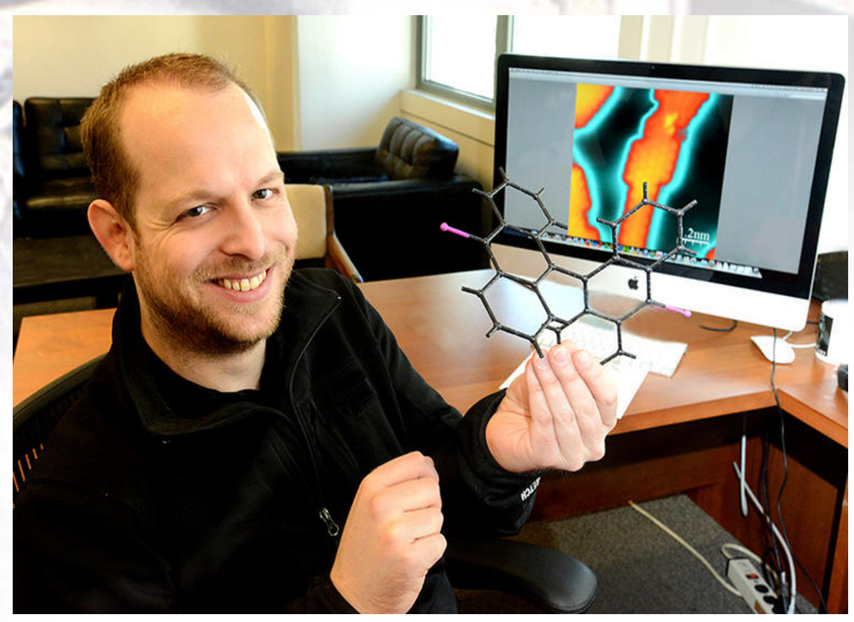
The Road from Semiconductors to Metals: Engineering Topological States in Nanographene



报告人： **Prof. F. R. Fischer**
University of California Berkeley

时　　间：**2021年7月16日 (星期五) 9:30**

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Abstract

Our group has recently demonstrated the rational design and experimental realization of a graphene nanoribbon (GNR) superlattices that hosts a 1D array of symmetry-protected topological states, thus generating otherwise inaccessible electronic structure. This new class of materials can be thought of as an extended form of *poly*-acetylene wherein highly localized half-filled topological states replace the familiar single occupied *p*-orbitals along a conjugated π-system. Experimental results and first-principles calculations reveal that the frontier band structure of these GNR superlattices is defined purely by the coupling between adjacent topological interface states and can be tuned all the way from a semiconductor and a metal.

This novel manifestation of 1D topological phases presents an entirely new route to band engineering in 1D materials based on precise control of their electronic topology, and is a promising new platform for future studies of 1D quantum spin physics and metallicity in low dimensional carbon nanomaterials.

Biography

Dr. Fischer, is a Professor in the Department of Chemistry at the University of California Berkeley, a Faculty Scientist in the Materials Science Division, Lawrence Berkeley National Laboratory, and a Member of the Kavli Energy Nanosciences Institute at the University of California Berkeley and Lawrence Berkeley National Laboratory. He received his Diploma in Chemistry from the University of Heidelberg, Germany, and a Ph.D. in Organic Chemistry from the Swiss Federal institute of Technology Zurich, Switzerland. His research interests merge organic and inorganic materials chemistry, supramolecular chemistry, polymer chemistry, and molecular electronics with advanced scanning probe surface characterization tools.

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