

Quantum Confinement Effects in Graphene Nanostructures

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Our research focuses on the rational design, deterministic assembly, and detailed investigation of the physical phenomena emerging from quantum confinement effects in graphene nanomaterials. We pursue a highly integrated multidisciplinary program, founded on synthetic bottom-up approaches toward functional materials with precisely defined structure. We control their assembly into hierarchically ordered architectures, and evaluate inherent physical properties using modern scanning probe techniques across multiple length, time, and energy scales. The technological advancements enabled through our research have sparked the development of low-energy high-performance computing architectures, the next generation of energy conversion nanocatalysts and storage systems, and have established surface mediated chemical transformations as competent synthetic methodologies for target-directed organic synthesis.

About the Speaker

Professor Felix received his Ph.D. in Chemistry from the Swiss Federal Institute of Technology Zurich (ETHZ) in 2008. Prior to joining the Faculty at UC Berkeley as an Assistant Professor he was a German National Academy of Sciences Leopoldina Postdoctoral Research Fellow at Columbia University New York, NY. His research focuses on the rational design of novel organic functional materials for applications in molecular electronic devices such as field effect transistors, solar cells, and single molecule sensors. In an effort to control the structure of these materials both on the single molecule as well as on a macroscopic scale – a prerequisite for a superior performance – he takes advantage of tools derived from supramolecular chemistry and concepts identified in biologically relevant molecular recognition events. Using a newly developed highly controlled ring-opening metathesis polymerization reaction of strained alkynes the Fischer Group explores routes towards highly defined low-dimensional conjugated carbon-rich materials.