
Hsin-Zon Tsai

Jiong Lu, Johannes Lischner, Sebastian Wickenburg, Arash A. Omrani, Alexander Riss, Aaron J. Bradley, Duh Yi-Shiou, Jin Chen, Kenji Watanabe, Takashi Taniguchi, Alex Zettl, Antonio H. Castro Neto, Steven G. Louie and Michael F. Crommie

Department of Physics, University of California, Berkeley, California 94720, USA

ck921125@berkeley.edu

Gate-tunable one-dimensional charge pattern on a graphene device

The ability to modify the electronic properties of monolayer graphene via molecular doping creates opportunities for fabricating novel nanoscale logic and memory devices. Understanding charge transfer properties and electronic behavior at the molecule/graphene interface is essential for tuning the electronic and magnetic characteristics of these hybrid devices. We have created one-dimensional molecular arrays through molecular self-assembly on a gate-tunable graphene device. Using electrostatic gating¹, we were able to control the Coulomb interaction between individual molecules and create switchable periodic charge patterns along the one-dimensional molecular array on graphene surfaces. Scanning tunneling spectroscopy was used to locally probe the electronic structure and the charge state of the molecular array.

References

- [1] Sebastian Wickenburg, Nat. Commun., 7 (2016) 13553