

Colloquium
Dahlem Center for Complex Quantum Systems

Graphene, the beautiful, the fast, and the strong

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Time: Tuesday, January 6, 2015, 16:00 c.t.

Location: Hörsaal A (1.3.14)

Abstract:

Graphene, 10 years after its discovery by the "Scotch tape" method keeps many of our senses alive. Exploring these senses, I will present several recent results and start with the growth mechanism of chemical vapor deposited single crystal graphene, including the dynamics of regular as well as beautiful snow flake shaped graphene (graphlocons). Inside graphene and moving at record mobilities, we find electrons, which are often described using relativistic equations and offer many fascinating properties. These properties can not only be probed by transport but also directly at graphene's atomic surface using low temperature scanning probes, revealing quantum correlations. Finally, but not to be neglected, graphene's unique strength allows for interesting applications as an atomic window to sealed liquid environments of interest for bio-fluids or wet imaging at the nanometer scale. These mechanical properties in combination with the use of different carbon isotopes, as well as Raman imaging also allows us to explore the phonon world, where properties such as phonon localization and phonon engineering emerge, closing our tour of the beautiful, the fast and the strong.