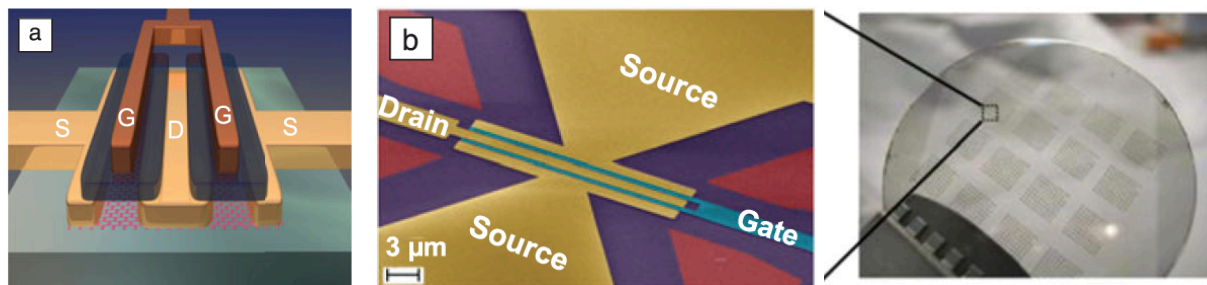


Graphene field-effect transistors

A realistic alternative to Si based technology?

Graphene is with its numerous applications and remarkable properties a material of main interest in current research and a future candidate for electronic devices. The high charge-carrier mobility and the scalability make graphene an option for post-silicon electronics.

The talk aims to give a review of the state of the art in graphene field-effect transistor research. This includes an introduction to the electronic properties of graphene and the working principles of a graphene field-effect transistor. The recent progress in the development of prototypes for high-frequency applications will be outlined with a focus on the current problems that remain to be solved. Furthermore several approaches to open a band-gap in the electronic band structure of graphene, such as graphene nanoribbons and bernal stacked bilayer graphene, will be introduced. Finally an overview of the various approaches to fabricate graphene field-effect transistors with a suitable band gap for applications in digital logic devices will be given.



Pictures from: P. Avouris and F. Xia, MRS Bulletin 37, 2012
D. Reddy et al., J. Phys. D: Appl. Phys. 44, 2011