Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Ultrafast collinear scattering and carrier multiplication in graphene MARCO POLINI, NEST, Istituto Nanoscienze-CNR and Scuola Normale Superiore, I-56126 Pisa, Italy — Graphene is emerging as a viable alternative to conventional optoelectronic, plasmonic, and nanophotonic materials. The interaction of light with graphene creates a non-equilibrium carrier distribution, which first relaxes on an ultrafast timescale to a hot Fermi-Dirac distribution and then cools via phonon emission. While the slower relaxation mechanisms have been extensively investigated, the very initial stages of relaxation, ruled by fundamental electron-electron interactions, still pose a challenge. In this talk I will discuss recent results based on a pump-probe experiment featuring extreme temporal resolution (sub-10 fs) and broad spectral coverage. By comparing these results with a microscopic theory based on the Boltzmann equation I will shed light on the physical mechanisms that control the non-equilibrium dynamics of hot carriers in graphene. Reference: D. Brida, A. Tomadin, C. Manzoni, Y. J. Kim, A. Lombardo, S. Milana, R. R. Nair, K. S. Novoselov, A. C. Ferrari, G. Cerullo, and M. Polini, arXiv:1209.5729.

Marco Polini
NEST, Istituto Nanoscienze-CNR and
Scuola Normale Superiore, I-56126 Pisa, Italy

Date submitted: 29 Nov 2012 Electronic form version 1.4