

## How to make graphene superconducting

***Prof Francesco Mauri***

*Institut de Minéralogie et de Physique des Milieux Condensés*

*Université Pierre et Marie Curie, Paris*

Tuesday August 28, 15:00, Room MXF1

**Abstract:** Graphene represents a physical realization of many fundamental concepts and phenomena in solid state physics, but in the long list of its remarkable properties a fundamental one is missing, i.e. superconductivity. Making graphene superconducting would have great impact, as the facile manipulation of this material by nanolytographic techniques would pave the way to nanosquids, one-electron superconducting quantum dots, superconducting transistors and cryogenic solid-state coolers. Here we show how one can create and engineer a superconducting transition by adatoms' doping [1]. Density-functional theory calculations show that the occurrence of superconductivity depends on the adatoms' chosen, in close analogy to the case of graphite-intercalated compounds (GICs). However, most surprisingly, and contrary to the case of GICs, Li-covered graphene is found to be superconducting at much a higher temperature with respect to Ca-covered graphene.

[1] G. Profeta, M. Calandra, F. Mauri, *Nature Physics* **8**, 131-134 (2012)