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**Phonon-mediated superconductivity in graphene by lithium deposition** GIANNI PROFETA, Università dell'Aquila, MATTEO CALANDRA, FRANCESCO MAURI, CNRS et Université P. et M. Curie — Graphene is the physical realization of many fundamental concepts and phenomena in solid-state physics. However, in the list of graphene's many remarkable properties, superconductivity is notably absent. If it were possible to find a way to induce superconductivity, it could improve the performance and enable more efficient integration of a variety of promising device concepts. To this end, we explore, by first-principles DFT calculations, the possibility of inducing superconductivity in a graphene sheet by doping its surface with alkaline metal adatoms [1], in a manner analogous to which superconductivity is induced in graphite intercalated compounds (GICs). As for GICs, we find that the electrical characteristics of graphene are sensitive to the species of adatom used. However, unlike GICs, we find that lithium atoms should induce superconductivity in graphene at a higher temperature than calcium.

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

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