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Magnetism in Nanopatterned Graphene and Graphite Film[1] LI CHEN[2], DECAI YU, ELISABETH LUPTON, FENG LIU, University of Utah
— We report first-principles calculations of magnetic properties of nanopatterned graphene-based nanostructures (GBNs) and nanopatterned graphite films (NPGFs). We introduce a simple geometric rule to design several novel magnetic GBNs: 0D FM nanodots with the highest possible magnetic moments, 1D FM nanoribbons, and 2D magnetic superlattices, whose predicted ground-sate magnetic ordering is confirmed by first-principles calculations. Furthermore, we show that nanopatterned graphite films (NPGFs) can exhibit magnetism similar to GBNs. In particular, graphite films with patterned nanoscale triangular holes and channels with zigzag edges all have ferromagnetic ground states.

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