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Tunable magnetism in nanomaterials and systems WANLIN GUO, Nanjing University of Aeronautics and Astronautics, ZHUHUA ZHANG — Tunable magnetism in nanomaterials and systems are especially attractive and hold great promise for applications in nanoelectronics and spintronics. Here we show some of our recent findings along this direction. First, we present a novel magnetoelectric effect in graphene nanoribbons settled on silicon substrates whereby the ribbon edge magnetization can be tuned linearly by applied bias voltage (***Phys.Rev.Lett***, **103**, 187204, 2009), and this effect is robust to material and geometry variations (***Phys.Rev.B*** 81, 155428, 2010). We also realize an electrical control of magnetism in ZnO ribbons (***ACS Nano*** **4**, 2124, 2010), and even a tunable magnetic ordering in sandwich nanowires by changing charge states (***J.Am.Chem.Soc***.**132**, 10215, 2010). Contrast to the zero-gap graphene, both hexagon-BN sheets and nanotubes are generally insulating. We provide two efficient recipes to narrow the wide gap of BN: applying external electric fields for nanoribbons and increasing tube curvature for nanotubes. Of more interesting is that ferromagnetic ordering is obtained in BN nanotubes by fluorination and it can be remarkably modulated by applying radial pressure (***J.Am.Chem.Soc***.**131**, 6874, 2009). Our revealed control of magnetism in a wide range of nanomaterials may open up new vistas towards spintronics.

Wanlin Guo
Nanjing University of Aeronautics and Astronautics

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