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Watering Graphene for Devices and Electricity WANLIN GUO, JUN YIN, XUEMEI LI, ZHUHUA ZHANG, Nanjing University of Aeronautics and Astronautics — Graphene bring us into a fantastic two-dimensional (2D) age of nanotechnology, which can be fabricated and applied at wafer scale, visible at single layer but showing exceptional properties distinguished from its bulk form graphite, linking the properties of atomic layers with the engineering scale of our mankind. We shown that flow-induced-voltage in graphene can be 20 folds higher than in graphite, not only due to the giant Seebeck coefficient of single layer graphene, but also the exceptional interlayer interaction in few layer graphene. Extremely excitingly, water flow over graphene can generate electricity through unexpected interaction of the ions in the water with the graphene. We also find extraordinary mechanical-electric-magnetic coupling effects in graphene and BN systems. Such extraordinary multifield coupling effects in graphene and functional nanosystems open up new vistas in nanotechnology for efficient energy conversion, self-powering flexible devices and novel functional systems.

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