Supplementary Material

Collective Magnetic Behavior of Graphene Nanohole Superlattices

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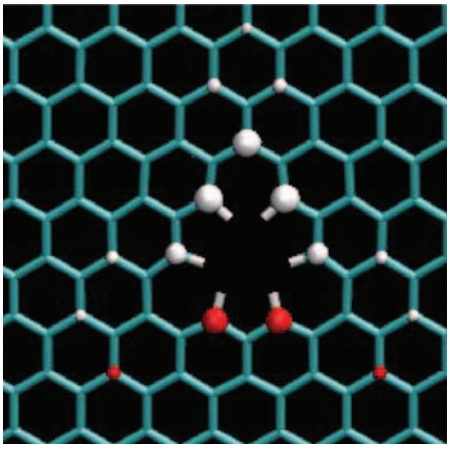

Figure S-1 The spin-density plot of the ferrimagnetic configuration of a 4-atom triangular NH. White and red balls indicate the up- and down-spin density isosurface at 0.02e/Å^3, respectively; blue and white sticks represent C−C and C−H bonds, respectively

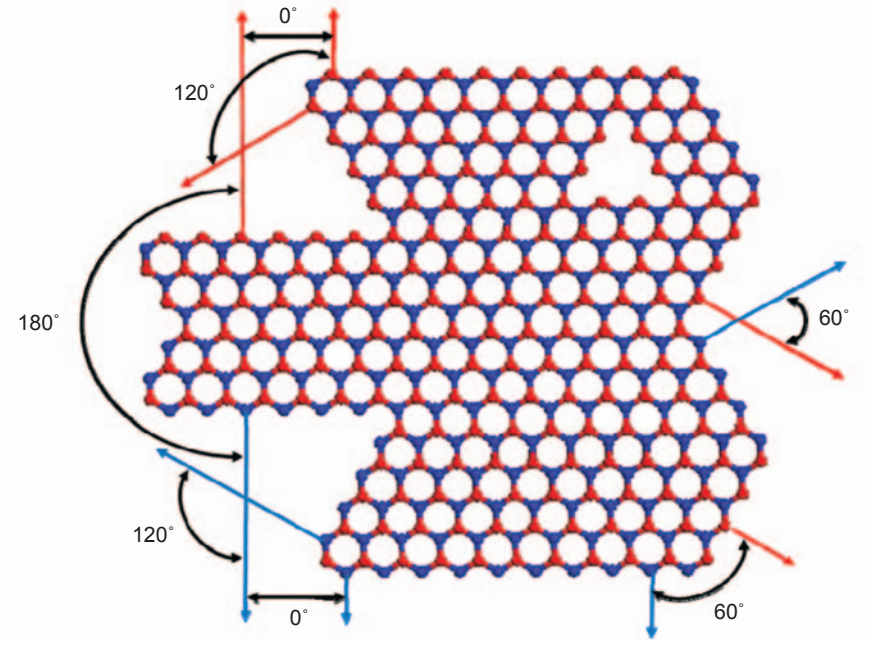

Figure S-2 Schematics of the underlying geometric relationship between zigzag edges in graphene. It illustrates that the edges are on the same sublattice [A (red) or B (blue)] if they are at an angle of 0° or 120° to each other, but different sublattices if at an angle of 60° or 180°. Note that the angle between edges is defined formally as the angle between the normal vectors of the edge

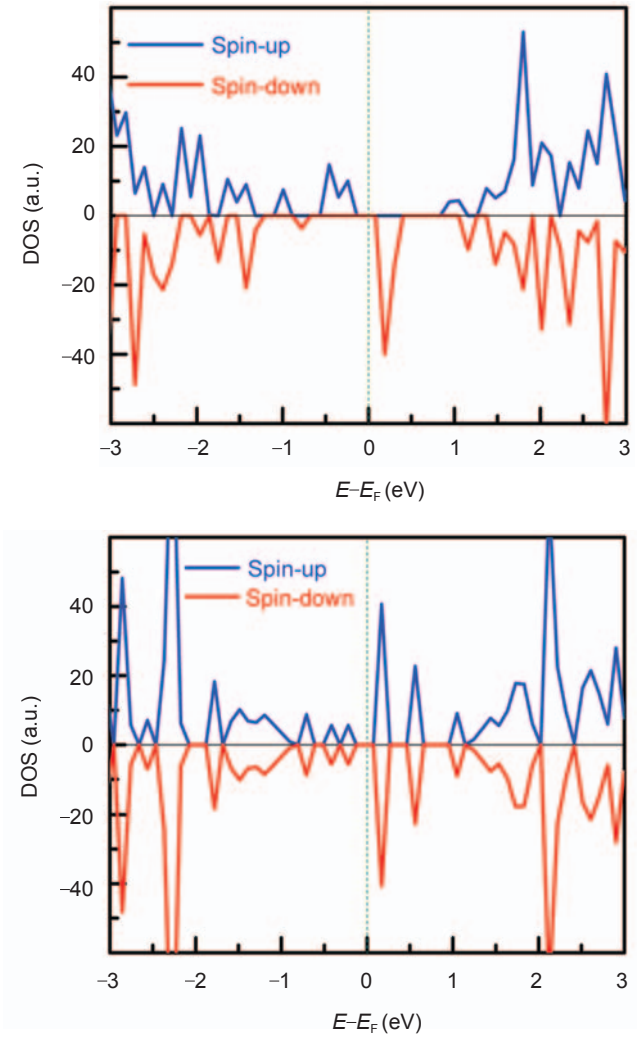

Figure S-3 The density of states (DOS) of GNH superlattices. Upper panel: DOS of a FM superlattice containing two parallel NHs (Fig. 3(a)); Lower panel: DOS of an AF superlattice containing two antiparallel NHs (Fig. 3(b)). Note the small gap at Fermi energy

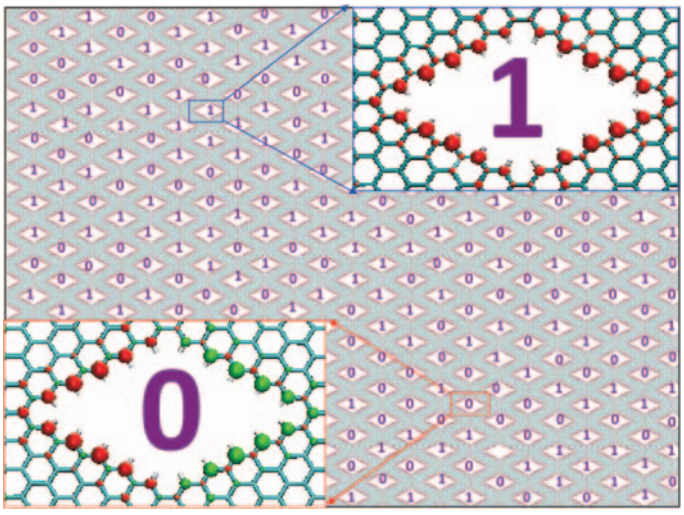

Figure S-4 Illustration of a magnetic storage medium consisting of a patterned array of rhombus GNHs. The insets show the detailed structure of "0" and "1" bit, represented by the ground-state AF configuration (S=0) and the excited FM configuration (S=N), respectively. Red and green balls show the spin-up and spin-down density at an isosurface value of 0.02 e/Å^3