Electronic Supplementary Material

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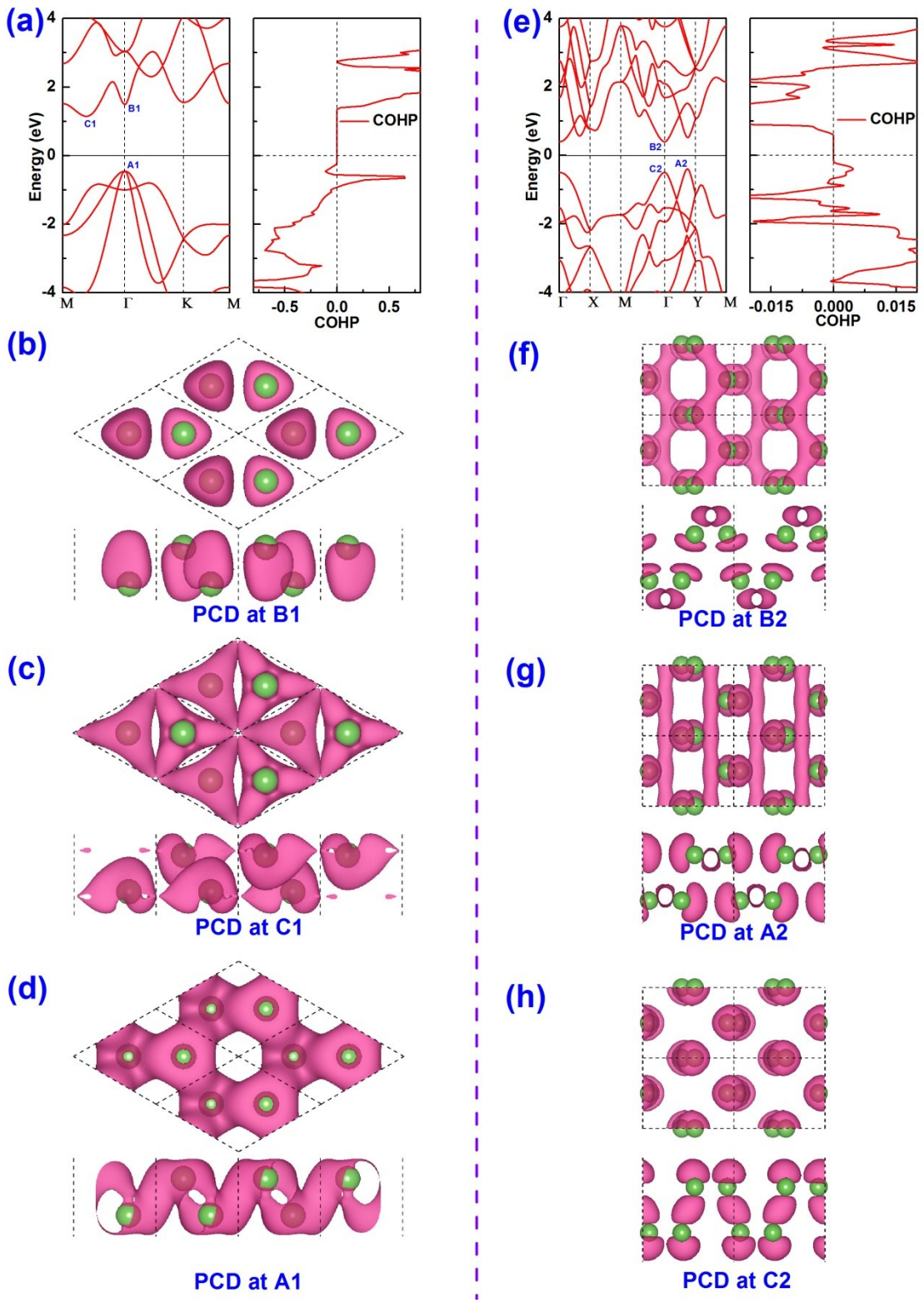
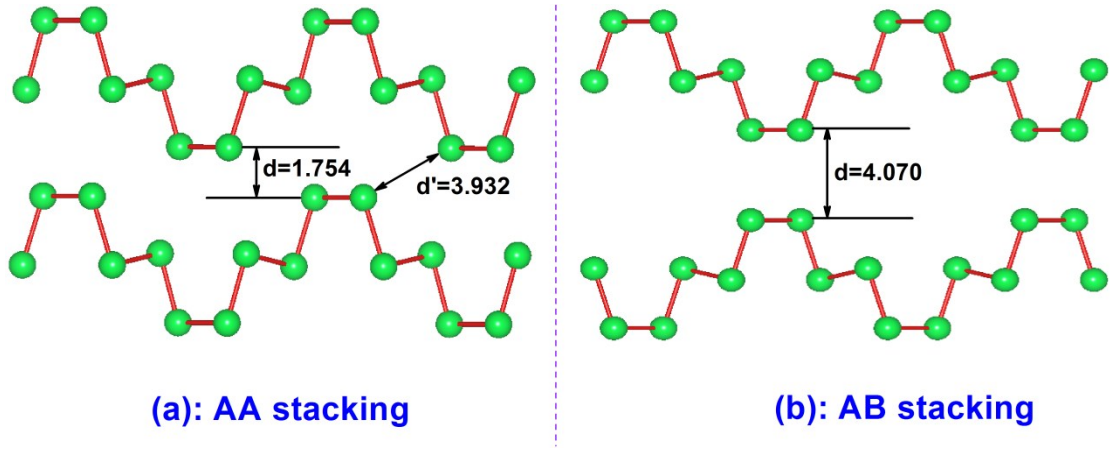


Fig. S1: (a) and (e) stands for the energy band of chair- and stirrup-shaped arsenene, respectively. The top and side view of the partial charge density (PCD) at B1, C1 and A1 for C-As is shown in (b), (c) and (d), respectively, and the top and side view of PCD at B2, A2 and C2 for S-As is shown in (f), (g) and (h), respectively. The isosurface of the PCDs is 0.0015e/Å^3.



(a): AA stacking (b): AB stacking

Fig. S2: (a) and (b) respectively stands for 1x2x1 supercell of the well-optimized side elevation of 2 layered (AA and AB stacking) T-As. The balls in blue stands for As atoms. The unit of the value shown in this diagram is angstrom.

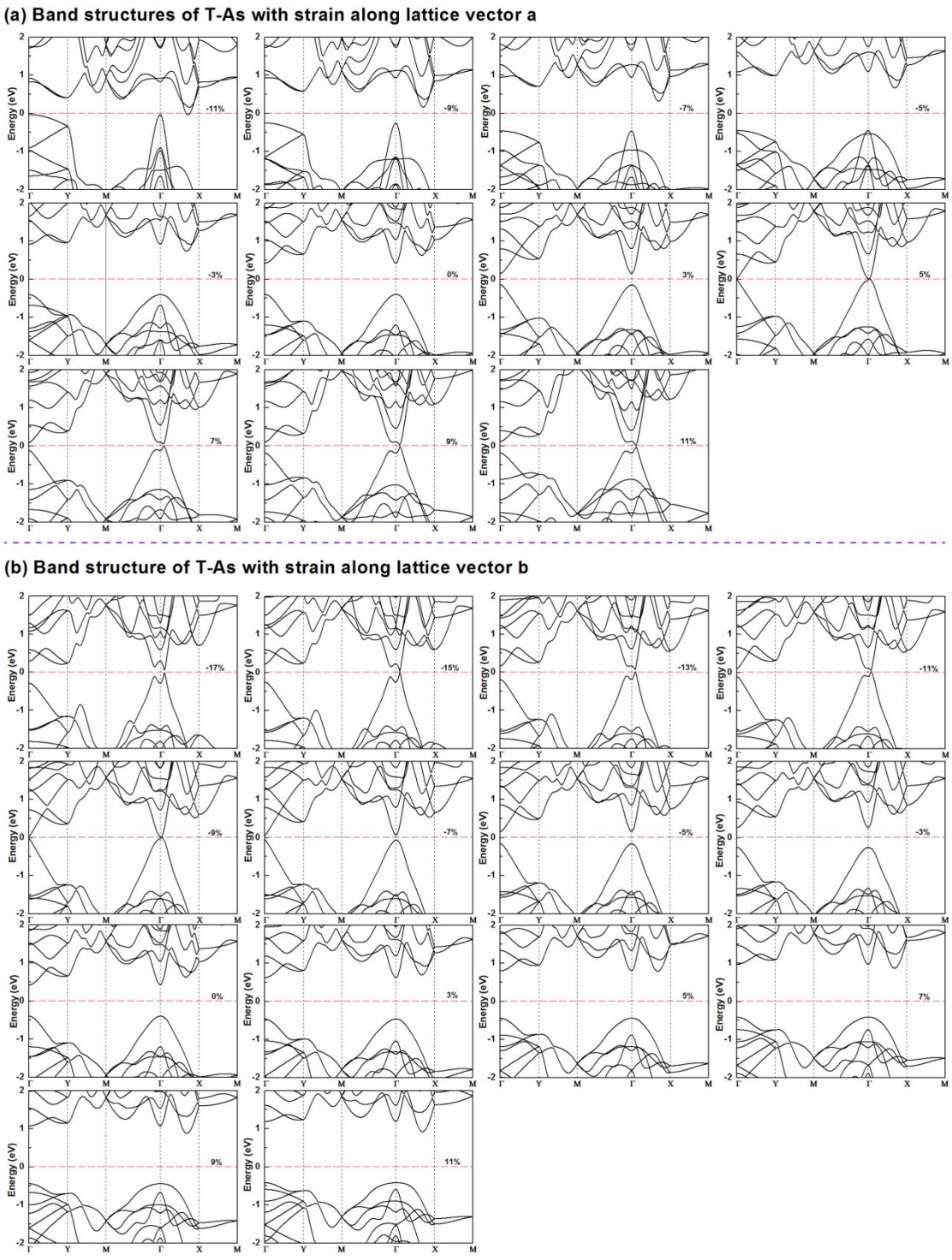


Fig. S3: (a) and (b) show the band gaps as functions of uniaxial strain for T-As

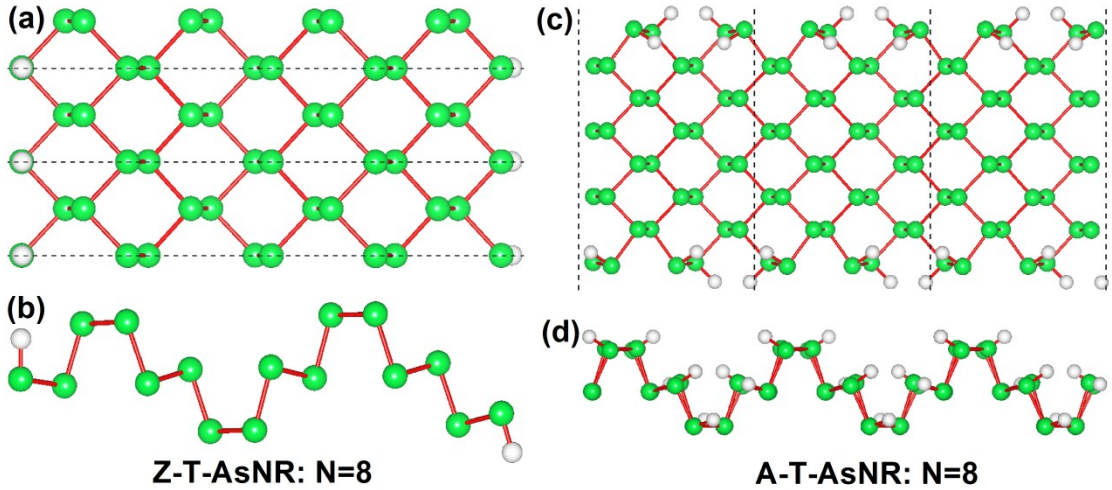


Fig. S4: (a), (b) and (c), (d) are the top and side view of DFT-optimized structures of Z-T-AsNR and A-T-AsNR with the width of N=8, respectively. The balls in blue and white stands for As and H atoms.

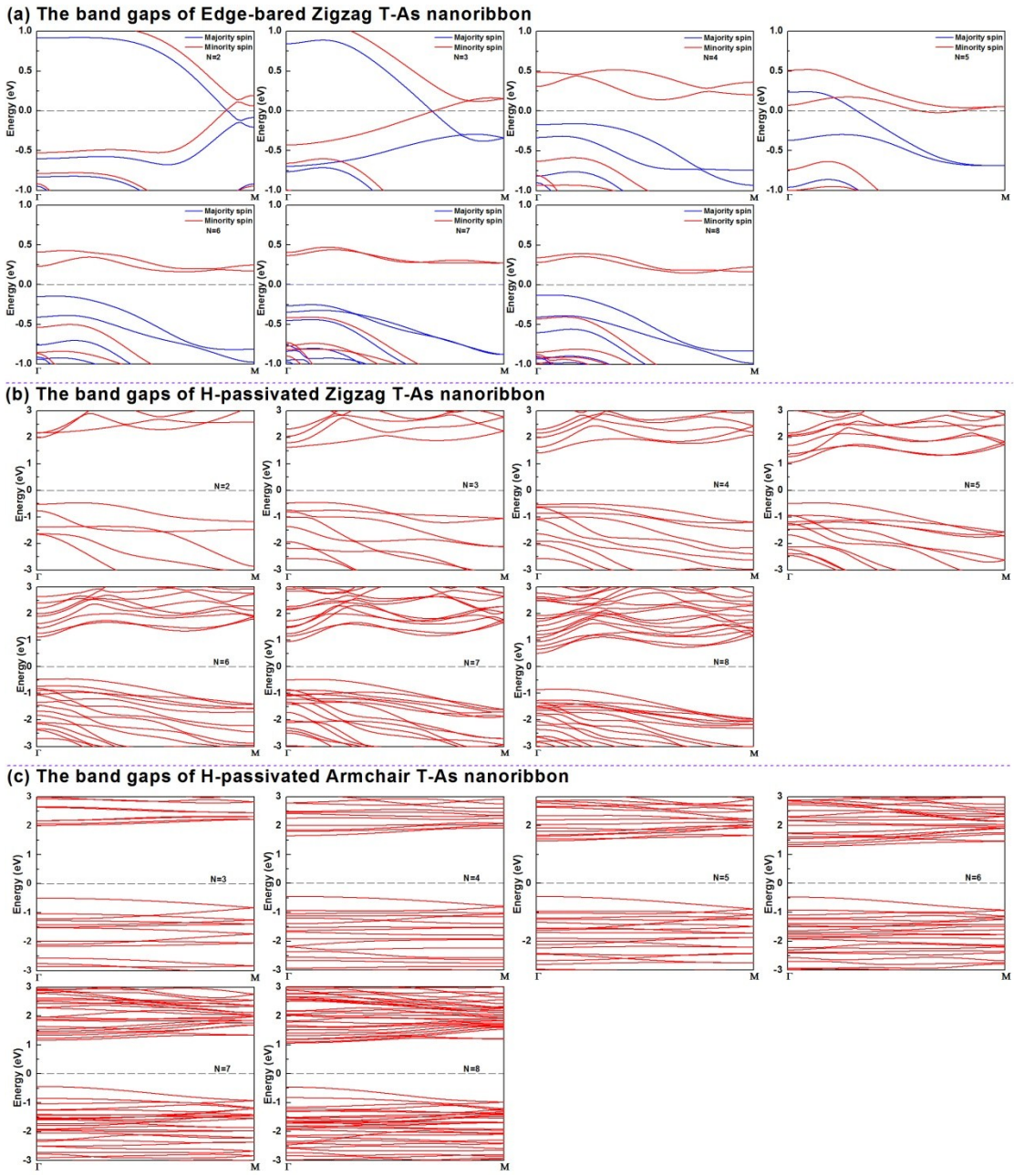


Fig. S5: (a), (b) and (c) respectively stand for width-dependence of the band gap for T-As. The letter N stands for the width of a specific nanoribbon.