

Abstract Submitted
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Emergence of skyrmions from rich parent phases in the molybdenum nitrides JIADONG ZANG, Univ of New Hampshire, WEI LI, Shanghai Institute of Microsystem and Information Technology, CAS, CHIMING JIN, High Magnetic Field Laboratory, CAS, RENCHAO CHE, Fudan University, WENSEN WEI, LANGSHENG LIN, LEI ZHANG, HAIFENG DU, MINGLIANG TIAN, High Magnetic Field Laboratory, CAS — We report a new family of skyrmion materials originated from the antisymmetric Dzyaloshinskii-Moriya (DM) interactions. Based on the symmetric tensor technique, the molybdenum nitrides with the β -manganese structure, A_2Mo_3N with $A=Fe, Co, Rh$, are predicted to support the skyrmion phase. This prediction is directly proved in doped $Fe_xCo_{1-x}Rh_{0.5}Mo_3N$ components by high resolution Lorentz transmission electron imaging. Interestingly, the parent compounds Fe_2Mo_3N , Co_2Mo_3N , and Rh_2Mo_3N exhibit ferromagnetic, anti-ferromagnetic, and even superconducting orderings respectively. Magnetism in these parent phases is theoretically clarified by the first principle calculations, where the corrected nature of the magnetism is revealed..

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