Abstract Submitted
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Magnetic Superatoms[1] J. ULISES REVELES, VICTOR M. MEDEL, A.C. REBER, S.N. KHANNA, Virginia Commonwealth University, V. CHAUHAN, P. SEN, Harish-Chandra Research Institute, DEPARTMENT OF PHYSICS, VIRGINIA COMMONWEALTH UNIVERSITY COLLABORATION, HARISH-CHANDRA RESEARCH INSTITUTE COLLABORATION — The electronic states in metal clusters are grouped in shells much in the same way as in atoms. Filling of the electronic shells leads to stable species called magic numbers. This has led to the preposition that selected stable metal clusters can mimic chemical properties of atoms on the periodic table and can be classified as superatoms. Here, we propose an extension of the superatom concept to magnetic species by invoking systems that hybridize localized and delocalized electronic states. Through first principles studies focusing on the electronic structure and magnetic moment, we show that $TMMg_n$ (TM = Sc, Ti, V, Cr, Mn, Fe, Co, and Ni) clusters exhibit a new class of magnetic superatoms stabilized by magnetic supershells. The talk will include possible applications of the new building blocks.

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