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From Atomic Clusters towards Nano-Materials with Controlled properties[1] S.N. KHANNA, M.C. QIAN, A.C. REBER, J.U. REVELES, R. ROBLES, P.A. CLAYBORNE, S.V. ONG, K. CASALENUOVO, Virginia Commonwealth University, A.W. CASTLEMAN JR., A. SEN, P.W. WEISS, H. SAAVEDRA, A. UGRINOV, N. CHAKI, Pennsylvania State University — One pathway towards the synthesis of nanomaterials with controllable properties is to assemble solids using chosen clusters as the building blocks. The talk will outline a new protocol that enables synthesis of nanomaterials from clusters and highlight how the character of the cluster emerges in the assembled material. Through studies on assemblies involving polyvalent anions As_7^{-3} and As_{11}^{-3} and alkali based cations, we will show how the studies can provide novel ways of controlling the bandgap through energy level of the countercation and the degree of charge transfer. The theoretical predictions will be compared with experimental findings.

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