



北京大 量 材 科

International Center for Quantum Materials, PKU

Seminar

Physics Department, Virginia Commonwealth University, USA

Time: 15: 00 pm, July. 12, 2019 (Friday)

时间: 2019年7月12日 (周五) 下午3:00

Venue: Room W563, Physics building, Peking University

地点: 北京大学物理楼, 西563会议室

Abstract

At the dawn of cluster science, the motivation for studying clusters was to understand how properties of bulk matter evolve – one atom at a time. Five decades and 200 000 papers later, this still remains a desired goal. However, these studies have revealed many unexpected and exciting properties that have given the field of clusters its own identity [1]. In this talk, I will highlight some of these achievements by focusing on: (1) the stability, the appearance of magic numbers, and fragmentation of clusters that linked cluster science to nuclear physics. (2) Unique magnetic properties where clusters of non-magnetic materials become magnetic, those of ferromagnetic materials become super-paramagnetic, and those of antiferromagnetic materials become ferro- or ferrimagnetic. (3) Clusters as superatoms that mimic the properties of atoms and can form the building blocks of a three-dimensional periodic table and a new class of cluster-assembled materials with tailored properties. (4) Examples of cluster-ions as building blocks of energy materials. I will provide experimental evidence wherever available.

[1] Jena, P. and Sun, Q.: “Super Atomic Clusters: Design Rules and Potential for Building Blocks of Materials”, Chem. Rev. **118**, 5755-5870 (2018)

About the speaker

Prof. Puru Jena received his Ph. D. in Physics from the University of California at Riverside in 1970. After postdoctoral appointments, he joined Michigan Technological University as Associate Professor in 1978. Dr. Jena moved to Virginia Commonwealth University (VCU) in 1980 where he was promoted to full Professor of Physics in 1982, and named Distinguished Professor of Physics in 2005. In addition, he served as Program Director at the Materials Science Division of the National Science Foundation, and as Jefferson Science Fellow and Senior Science Advisor at the US Department of State. Prof. Jena's research covers a wide range of topics in nano-structured materials, condensed matter Physics, and materials