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INPP Seminar | Clustering phenomena in nuclear structure and reactions, March 29

Ohio University College of Arts & Sciences

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Categories: Events
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The Institute of Nuclear and Particle Physics (INPP) presents **Alexander Volya**, of Florida State University, presenting "Clustering phenomena in nuclear structure and reactions," on Tuesday, March. 29, at at 4 p.m. in Edwards Accelerator Lab, Roger W. Finlay Conference Room.

Alexander Volya

Abstract: Using the atomic nucleus as a research laboratory we study generic phenomena of finite quantum many-body systems, such as shell structure, clustering, superfluidity and superconductivity, as well as the onset of chaotic dynamics and its interplay with collective motion.

In this presentation I summarize our progress in the study of nuclear clustering where we use the modern configuration interaction approach combined with ideas and methods from reaction physics. The construction of alpha channels where the intrinsic wave function of the alpha particle is obtained from a no-core shell model calculation is one of our major new developments. Several studies of realistic nuclei addressing role of different structural components of the alpha particle will be presented.

Weakly bound or resonance many-body states restructure relative to the reaction continuum leading to a few very broad super-radiant states, while at the same time other states become narrow and nearly decoupled from decay. The recent observations of very broad alpha clustering states in ^{18}O are discussed as a possible manifestation of this super-radiance phenomenon.