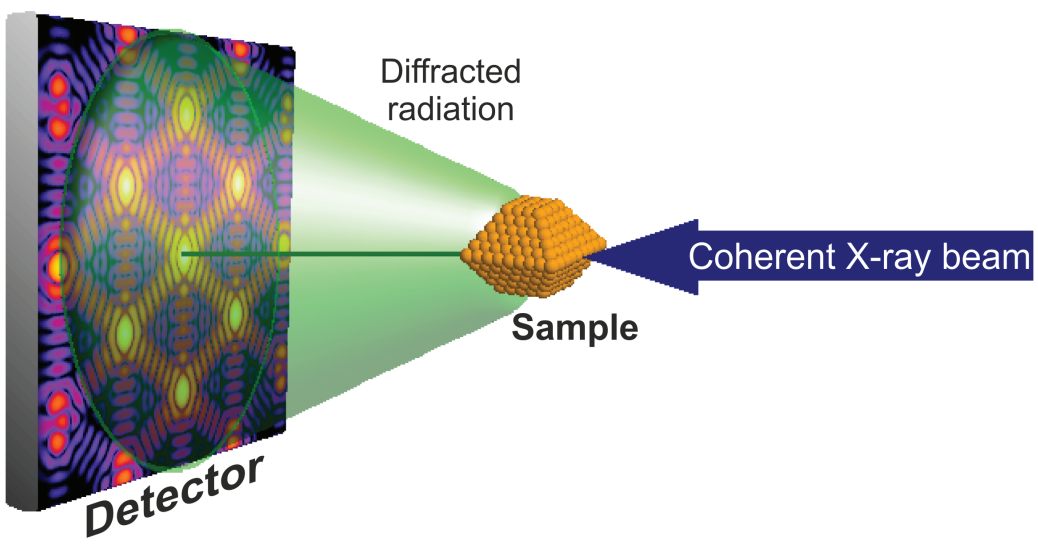
Ivan A. Vartaniants

Colloidal Crystals: Structure and Dynamics

Photonic crystals are important materials for the development of the present technology. They serve as photonic band gap materials in a wide range of light frequencies. Understanding the structure and dynamics of these materials with nondestructive methods is of high importance for different applications of these novel materials. In this talk I will present our studies of the structure of colloidal crystals performed by coherent x-ray diffraction imaging method (CXDI). It will demonstrate how arrangements of particles, as well as individual defects, can be visualized in 2D and 3D colloidal crystals with high-resolution CXDI. Next, I will present studies of the colloidal crystals' structure under incremental heating, and finally will discuss results of the pump-probe experiments performed at the free-electron laser Linac Coherent Light Source at Stanford.



Ivan Vartaniants received his Ph.D. in Theoretical and Mathematical Physics from the Moscow Engineering Physical Institute (MEPhI) in 1984. He was a leading research scientist at the Institute of Crystallography of the Russian Academy of Sciences and visiting research scientist at the Max-Planck-Institutes for Solid State Research and Metal Research in Stuttgart, and at the University of Illinois at Urbana-Champaign, where he took up a position of visiting Research Associate Professor in 2001-2004. Since 2004 he has been a senior scientist and group leader at DESY, and since 2011 Professor (part time) of Physics at National Research Nuclear University, MEPhI, Moscow. His present research interests are in the field of applications and theory of coherent x-ray scattering and high-resolution coherent x-ray imaging. His special interest lies in time resolved studies with novel free-electron lasers such as FLASH and LCLS. He is an author/coauthor of over 130 publications in peer reviewed journals and is a member of the Scientific Advisory Committee of the MAX IV synchrotron radiation facility in Lund, Sweden, and a member of the Proposal Review Panel of the free-electron laser FERMI in Trieste, Italy. He is also a member of the International Scientific Advisory Committees of the conference series "Coherence" and "X-TOP."

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