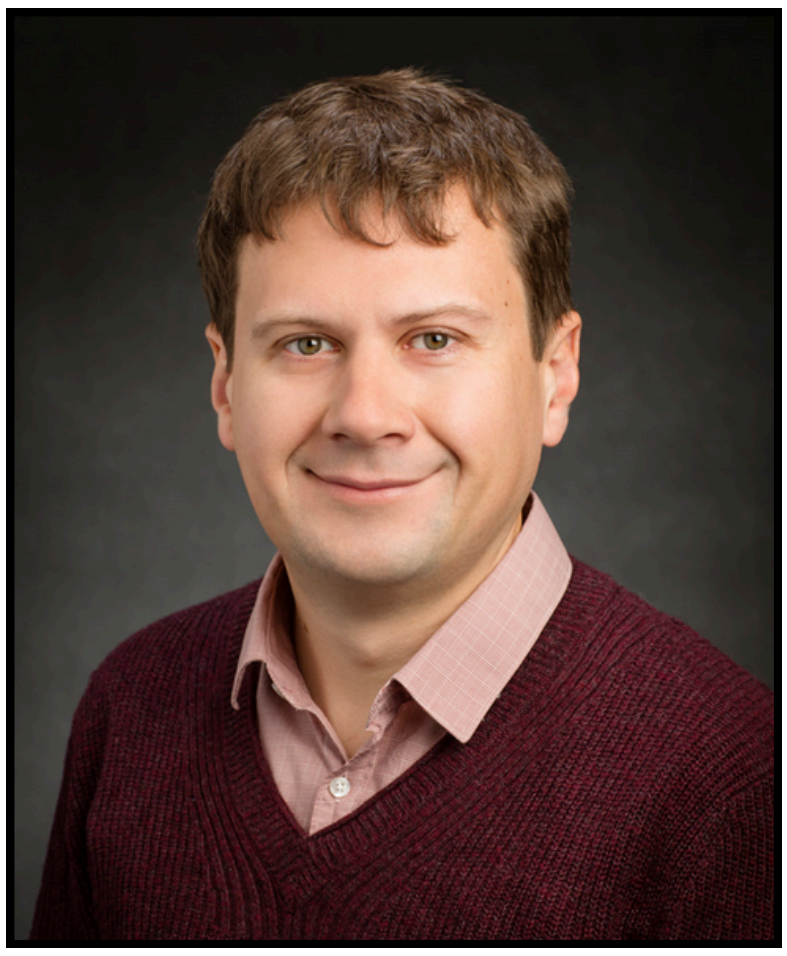
ASU Department of Physics
Arizona State University

COLLOQUIUM

Thursday, November 21, 2024

Refreshments at 3:15pm outside PSF 101
Colloquium from 3:30pm - 4:30pm in PSF 101



Seeing the Unseen with Supercomputers

Dr. Aleksei Aksimentiev

University of Illinois Urbana-Champaign

Abstract:

Notwithstanding dramatic advances in experimental characterization of nanoscale systems, some of the nanoscale processes are simply too fast to register by experimental approaches or involve displacements at scales too fine for direct experimental observation. Microscopic simulations have emerged as a kind of a computational microscope that can characterize processes inaccessible to experimental techniques, revealing not only the sequence of events underlying an experimental measurement but also the forces and energies involved. This lecture will use several systems to illustrate the application of high-end all-atom, coarse-grained, and multi-resolution simulations to obtain information inaccessible to experimental approaches. The topics to be covered will include nanopore protein sequencing, viral genome packaging and DNA nanomachines. The lecture will provide a forward-looking perspective on modeling an entire biological cell at all-atom resolution.

Biography:

Dr. Aleksei Aksimentiev received his Master's degree in physics from Ivan Franko National University of Lviv (Ukraine), and his Ph.D. in chemistry from the Institute of Physical Chemistry, Warsaw, Poland. After a brief postdoctoral training at Mitsui Chemicals, Japan, he joined the Theoretical and Computational Biophysics Group, Urbana, IL, as a postdoctoral research associate. In 2005, he became a faculty member of the Physics Department at the University of Illinois, where he is currently a professor of physics. His research interests include biological and synthetic DNA systems, nanopore sequencing, and molecular mechanisms of viral infection.

Host: Prof. Rizal Hariadi
View our Fall 2024 Physics Colloquium schedule at https://physics.asu.edu/colloquia