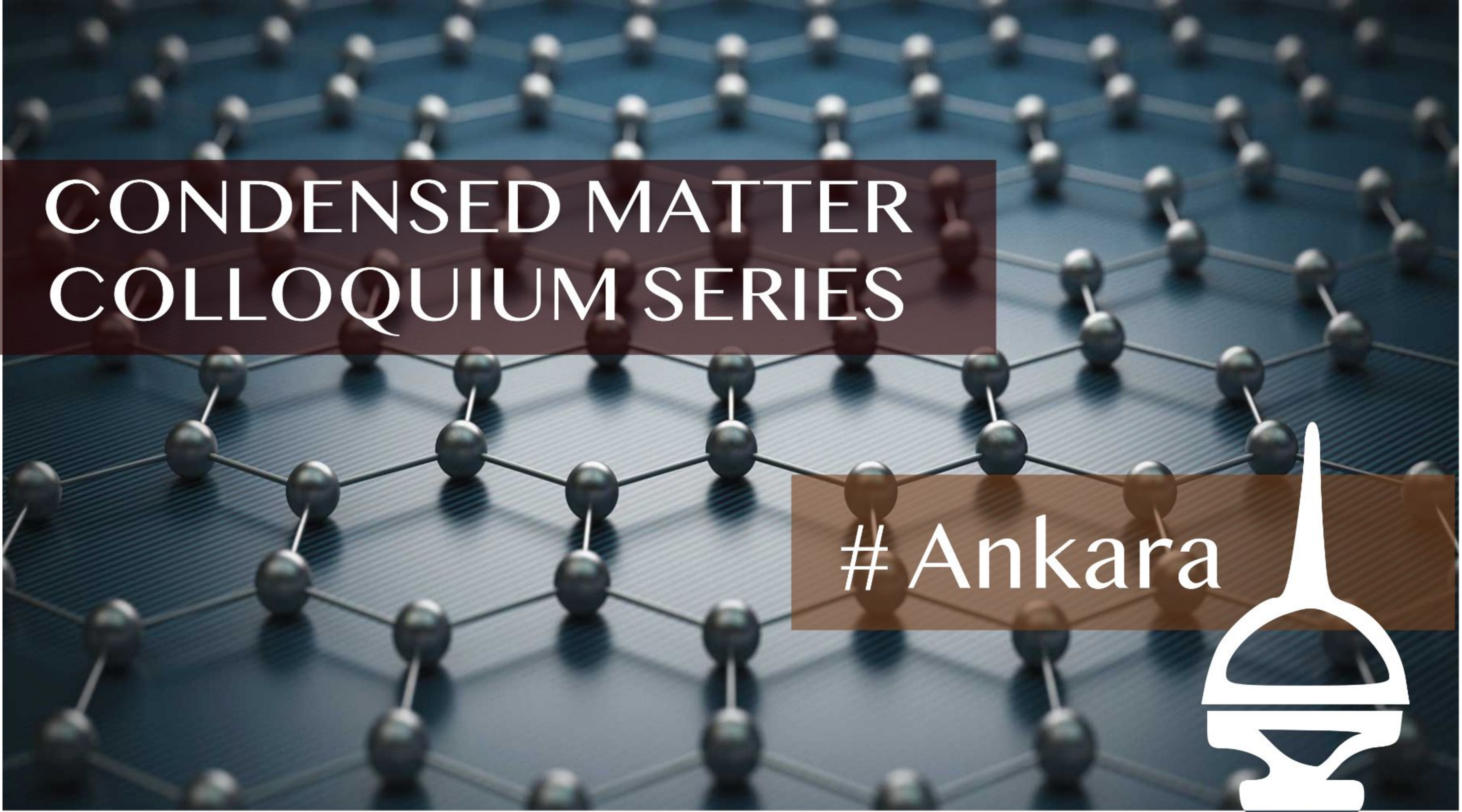

Banu Özkan

Arizona State University

How Allostery (Second Secret of Life) Regulates Signal Propagation Across Scales

In cells, the most complex and important actions are performed by nanomachines — such as the ribosomes that drive protein synthesis. These nanomachines are genuine, performing repeated energy-driven cycling between distinct states and actions. In these cycles, an energy-downhill process drives an energy-uphill one. Due to this two-component linkage, some cycles serve as transducers, converting one type of action to another, often involving a change of "currency" (different molecular types, forces, energies, gradients). Biology's transduction is implemented through allostery, wherein the binding of a molecule at one site on a protein or nanomachine alters the binding or other activity at a different site. We hypothesize that the concept of allostery extends beyond remote modulation within a protein and can couple distant processes within the cell. Specifically, ionic flux and partitioning could couple different nanomachines to orchestrate cellular mechanisms, a concept we term IonicAllostery. In this context, we will present a new framework based on a novel hypothesis and biological concept for the role of ionic interactions in coupling different processes through IonicAllostery. Our approach involves integrating molecular models with cellular-level models to determine whether competition for a limited and dynamic pool of inorganic metal ions can lead to unexpected long-range interactions between different nanomachines.

December, 10
Tuesday

19:00, (Ankara Time)

Click here for zoom link
Meeting ID: 432 931 6595
Password: 326852

Banu Ozkan has completed her Ph.D. in Chemical Engineering through a joint fellowship between Bogazici University (Turkey) and University of California San Francisco (UCSF). She also conducted postdoctoral research at University of Pittsburgh Medical School and UCSF. She currently is professor in the Department of Physics at Arizona State University (ASU) and the director of the Center for Biological Physics. She has received the Young Investigator Award at ASU and the Scialog Award by the Gordon & Betty Moore Foundation.
Dr. Ozkan has developed multi-scale computational methods that will provide protein structure and dynamics fast and accurately. With these methods, she studies the role of protein structural dynamics in evolution and disease pathways with two main goals: (i) to provide mechanistic insights about the critical mutations involved in human disease, and (ii) to reveal functionally important sites in proteins which can be used in the design and modification of function in many diverse enzymes.

For more information visit
acmc.bilkent.edu.tr

If you have any queries, please contact oktel@fen.bilkent.edu.tr
If you'd like to sign up to the mailing list to receive announcements and remainder, please use:
https://forms.gle/dQM6CPqAXiaqLqBD6