IWR Colloquium Winter Term 2017 / 2018

January 24, 2018 / 16:15h
Mathematikon, Conference Room / 5th Floor
Im Neuenheimer Feld 205, 69120 Heidelberg

Speaker:
Prof. Huan-Xiang Zhou • University of Illinois at Chicago, USA

Title:
“Electrostatics in Protein Structure and Action"

Abstract:
Proteins are made up of 20 types of amino acids with varying physical properties. Amino acids with ionizable and polar groups, through forming ion pairs, hydrogen bonds, and other less specific electrostatic interactions, impart important properties to proteins. Modulation of the charges on these amino acids, e.g., by pH and by phosphorylation and dephosphorylation, have profound effects such as protein denaturation and switch-like response of signal transduction networks. This talk will present a unifying theme among the various effects of protein charges and polar groups. Simple models will be used to illustrate basic ideas about electrostatic interactions in proteins, and these ideas in turn will be used to elucidate the roles of electrostatic interactions in protein structure, folding, binding, condensation, and related biological functions. In particular, I will examine how charged side chains are spatially distributed in various types of proteins and how electrostatic interactions affect thermodynamic and kinetic properties of proteins. Both important historical developments and recent experimental and theoretical advances in quantifying electrostatic contributions of proteins will be highlighted.

Prof. Zhou is the most recently appointed Romberg Guest Professor at the HGS MathComp. The program invites distinguished researchers to stay at the graduate school for an extended period. Over the course of three years, the Romberg professors are visiting the graduate school several times, developing new ideas in close collaboration with doctoral students and fellow researchers.

Website Prof. Zhou: http://chem.uic.edu/profiles/huan-xiang-zhou/
Website IWR-Colloquium: www.iwr.uni-heidelberg.de/iwr-colloquium
Website HGS MathComp: www.mathcomp.uni-heidelberg.de