

THE THEORY OF ENTROPY: ITS MATHEMATICS AND MATHEMATICAL PHYSICS

**Speaker: Hong Qian (钱紘)
University of Washington**

Time: Fri., Aug 23rd, 10:00 – 11:30

Venue: Room 106, SCMS

Abstract:

The concept of information entropy is introduced in the limit of "Big Data". Consistent with the notion in physics, it is a Eulerian homogeneous degree-one function of its independent variables, together with a variational principle. Through constrained optimization, Legendre-Fenchel transform leads to a geometric view of the entropy theory. I shall discuss three interesting discoveries: A non-logarithmic entropy function for Markov counting, an information (free energy) manifold I_F , and the Minkowski geometry for the polar set of I_F . This is a joint work with Bing Miao and Yong-Shi Wu.

Author Short Biography:

Professor Hong Qian is Olga Jung Wan Endowed Professor of Applied Mathematics at University of Washington, Seattle. He received his B.A. in Astrophysics from Peking University and Ph.D. in Biochemistry from Washington University in St. Louis, and worked as postdoctoral researcher at University of Oregon and Caltech on biophysical chemistry and mathematical biology. He was elected a fellow of the American Physical Society in 2010. Professor Qian's current research interest is the probabilistic foundation of statistical equilibrium and nonequilibrium thermodynamics and their applications. His recent, coauthored book "Stochastic Chemical Reaction Systems in Biology" was recently published by Springer.