



Unraveling Complex Systems

We are surrounded by complex systems. Familiar examples include power grids, transportation systems, financial markets, the Internet, and structures underlying everything from the environment to the cells in our bodies. Mathematics and statistics can guide us in understanding these systems, enhancing their reliability, and improving their performance. Mathematical models can help uncover common principles that underlie the spontaneous organization, called emergent behavior, of flocks of birds, schools of fish, self-assembling materials, social networks, and other systems made up of interacting agents.

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Image 2: *Electricity 1*, Annemiek van der Kuil.
Image 3: *Hurricane Katrina*, NASA.
Image 4: A voltage-gated potassium channel (Kv1.2) visualized with the VMD software. Courtesy of the Theoretical and Computational Biophysics group, NIH Resource for Macromolecular Modeling and Bioinformatics, Beckman Institute, University of Illinois at Urbana-Champaign.
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