UCLA Department of Physics & Astronomy

COLLOQUIUM

Thursday, May 5th, 2024 at 4 p.m.
PAB 1-434

Why Networks Matter: Embracing Biological Complexity

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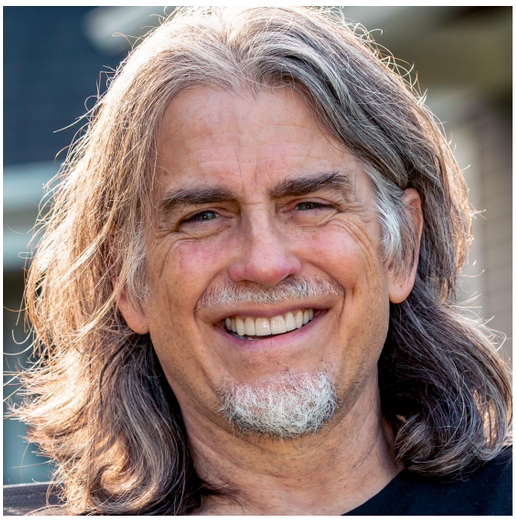

One of the central tenets of biology is that our genetics—our genotype—influences the physical characteristics that we manifest—our phenotype. But with more than 25,000 human genes and more than 6,000,000 common genetic variants mapped in our genome, finding associations between our genotype and phenotype is an ongoing challenge. Indeed, genome-wide association studies have found thousands of small effect size genetic variants that are associated with phenotypic traits and disease. The simplest explanation is that genes and genetic variants work together in complex regulatory networks that help define phenotypes and mediate phenotypic transitions—such as from health to disease. Drawing on inspiration from fields that include physics, we have developed methods to infer regulatory networks from large biomedical data sets and have found that the networks, and their structure, provide unique insight into how genetic elements interact with each other to influence the phenotypes we observe. We will explore the ways in which modeling regulatory networks provides insight into functional changes that can drive cancers and other complex diseases.

Refreshments at 3:30 p.m. PAB Patio. **Undergraduates Welcome!**