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THINK IN THE NEXT

in cooperation with the UCLA Sociology Department's Knowledge & Cognitive Systems Working Group presents

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12:00 p.m. – 1:30 p.m.

Haines Hall, Room 279
UCLA

"How Science & Technology Think (and How to Think Better)" by James A. Evans

This talk investigates processes by which science, as a system, thinks, and how understanding it can create opportunities to improve it. I begin by describing a generative model of future articles and patents using a high-dimensional, multi-membership block model embedded in a Hidden Markov Process, which reveals how the complex network of modern science provides a substrate on which a scientist – and indeed science as a whole – thinks. Then I explore its consequences for ongoing discovery and relevance for human prosperity. I evaluate the process by which the dense atmosphere of science's own internal puzzles largely decouple it from societal needs. I show how novel combinations of "content" and "context" predict high impact science, and trace a process of "humble innovation" where scientists achieve success by searching broadly, but appear to build on the shoulders of their audience. The success of context (e.g., subfield) combinations in amplifying the impact of novel configurations of content suggests institutional barriers that bound scientific imagination, and how their identification can be used to predict impactful new research. Finally, I document the rise of large teams in science and scholarship, and demonstrate how small teams systematically disrupt science and technology more than large ones, which has increasingly caused science to chase popular trends and extend yesterday's ideas. I explore the implications of these patterns for understanding collective thinking as a whole, and their potential for helping us re-engineer the institutions of discovery and invention.