

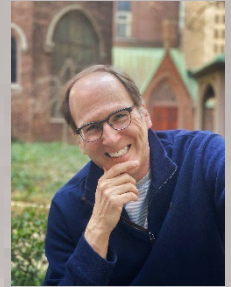
# Synchronization in Nature, Technology, and Mathematics

Friday, September 9, 2022

12:30 PM

Maeder Hall Auditorium

MAE Special Seminar Series  
Research Day



*Steven Strogatz*  
Cornell University

As you read this abstract, your heartbeat is being triggered by thousands of pacemaker cells in your sinoatrial node, all firing in nearly perfect unison. Similar feats of synchronization occur in diverse systems ranging from fireflies and neurons to pendulum clocks and metronomes. Mathematical models of such systems have opened up new directions in nonlinear dynamics, sometimes with applications beyond their original motivation. Prof. Strogatz will discuss two case studies: (1) Charlie Peskin's simplified model for pacemaker cells in the heart, whose analysis led to spinoffs in communications and electrical engineering; and (2) some new results and unsolved problems about how the topology of an oscillator network affects its tendency to synchronize, with connections to stochastic optimization and random graphs.

Steven Strogatz is the Jacob Gould Schurman Professor of Applied Mathematics at Cornell University. He works on nonlinear dynamics and complex systems applied to physics, biology, and the social sciences. His 1998 [Nature paper on "small-world" networks](#), co-authored with his former student Duncan Watts, has been cited more than 45,000 times according to Google Scholar, ranking it among the top 100 most-cited scientific papers of all time. Strogatz has also blogged about math for the *New York Times* and *The New Yorker*, and has been a frequent guest on *Radiolab* and *Science Friday*. His latest book, *Infinite Powers*, was a *New York Times* bestseller and was shortlisted for the 2019 Royal Society Science Book Prize.