TEMPLE UNIVERSITY
Department of Mathematics

Applied Mathematics and Scientific Computing Seminar

Wednesday, 20 April 2016, 4:00 p.m.
Room 617 Wachman Hall

(refreshments and social at 3:45 p.m)

Network Neuroscience

by Danielle Bassett
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Abstract. Recent advances in noninvasive neuroimaging technologies have offered an unprecedented view into the large-scale organization of the human brain, and the differences in that architecture that make each of us who we are. However, this wealth of data must be met with complementary advances in mathematical methods and physical models to formalize our understanding of that architecture, and concretize a theoretical framework to generalize understanding and to predict patterns of thought and behavior. In this talk, I will discuss a family of such methods and models built on tools from network science, leading to the emerging field of network neuroscience (a blend of applied mathematics, computational science, and neuroscience). I will highlight early successes in this field leading to fundamental understanding of the architecture, dynamics, and energetic constraints on healthy human thought, their development over childhood, and their alteration in psychiatric disease and neurological disorders. I will close by commenting on current frontiers and future potential in health care, business, and education sectors.