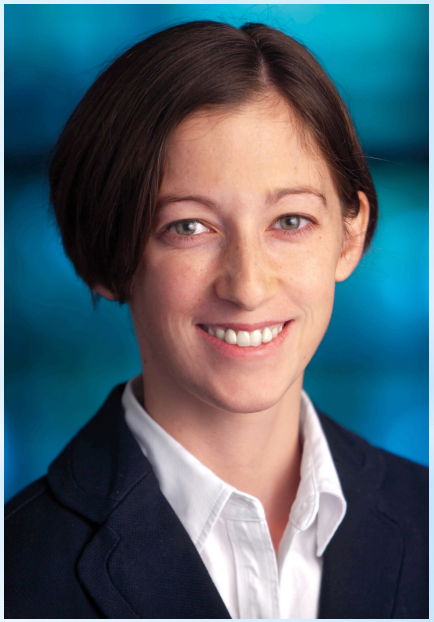
NSF COMPLEXITY LECTURE SERIES

Professor Danielle S. Bassett

Department of Bioengineering
University of Pennsylvania

THURSDAY, JUNE 30TH
10:00 – 11:00 AM
STAFFORD I, ROOM 1235

A Complex Systems Science of Human Learning



ABSTRACT: Complex systems science offers conceptual frameworks, analytical approaches, and computational tools to study systems of interacting parts that display emergent behavior. While traditionally applied to large-scale technological and social systems, recent data suggest that complexity science has an incredibly powerful role to play in our understanding of and support for human learning. In this talk I will review emerging lines of research using tools from complex network theory to understand the reconfiguration of connectivity patterns in the brain that support the learning of new skills or the acquisition of new knowledge. I will then discuss the drivers of those reconfigurations revealed by an intersection of neuroscience and network control theory. Finally, I will describe the complex structure of bodies of knowledge, and address the question of whether some sets of knowledge are easier to learn than others based on that structure. Together, these efforts not only enhance our understanding of human learning, but also have the potential to guide training approaches and inform our presentation of information to students or trainees to maximize acquisition and retention. I will close with futuristic aspirations and goals in using complex systems science to propel the field of neuroeducation towards measurable societal impact.

BIO: Danielle S. Bassett is an Associate Professor in the Department of Bioengineering at the University of Pennsylvania. She is most well-known for her work blending neural and systems engineering to identify fundamental mechanisms of cognition and disease in human brain networks. She received a B.S. in physics from the Pennsylvania State University and a Ph.D. in physics from the University of Cambridge, UK. Following a postdoctoral position at UC Santa Barbara, she was a Junior Research Fellow at the Sage Center for the Study of the Mind. In 2012, she was named American Psychological Association's `Rising Star' and given an Alumni Achievement Award from the Schreyer Honors College at Pennsylvania State University. In 2014, she was named an Alfred P. Sloan Research Fellow and received a MacArthur Research Fellowship. In 2015, she received the IEEE EMBS Early Academic Achievement Award and was named an ONR Young Investigator. In 2016, she received an NSF CAREER award. She lives with her husband and two sons in Wallingford, Pennsylvania.

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