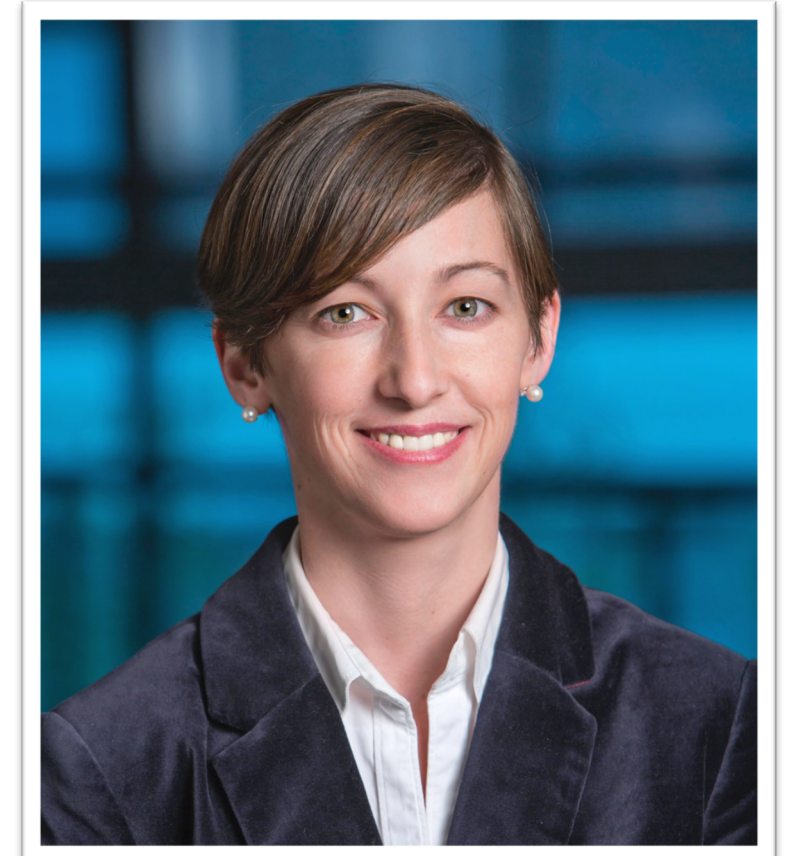




# UConn BIRC Virtual Seminars

Two Part Series  
Danielle Bassett, PhD, University of Pennsylvania



**Part 1 - May 19<sup>th</sup> at 12-1:15pm ET via Zoom**  
**Science as Culture**

Science is made by humans, and the progress of science is to some degree determined by the culture of scientists. How do we build scientific knowledge? How do the questions we ask change with time? How do we choose questions to ask? Here I will discuss a few of our recent studies in which we examine the titles, keywords, abstracts, and reference lists of neuroimaging papers to better understand the culture of our particular sector of science. We'll touch on the evolving landscape of topics and the role of interdisciplinarity, before diving deeply into recent evidence of gender and racial disparities in whom we choose to cite in our papers. The work raises important questions about what kind of culture -- along with its goals, values, and ethics -- we might hope to create in the future.

**Part 2 – June 2<sup>nd</sup> at 12-1:15pm ET via Zoom**  
**Perturbation and Control for Human Brain Network Dynamics**

The human brain is a complex organ characterized by heterogeneous patterns of interconnections. Non-invasive imaging techniques now allow for these patterns to be carefully and comprehensively mapped in individual humans, paving the way for a better understanding of how wiring supports our thought processes. While a large body of work now focuses on descriptive statistics to characterize these wiring patterns, a critical open question lies in how the organization of these networks constrains the potential repertoire of brain dynamics. In this talk, I will describe an approach for understanding how perturbations to brain dynamics propagate through complex wiring patterns, driving the brain into new states of activity. Drawing on a range of disciplinary tools – from graph theory to network control theory and optimization – I will identify control points in brain networks and characterize trajectories of brain activity states following perturbation to those points. Finally, I will describe how these computational tools and approaches can be used to better understand the brain's intrinsic control mechanisms and to inform stimulation devices to control abnormal brain dynamics, for example in patients with medically refractory epilepsy.

**Bio:** Danielle S. Bassett is the J Peter Skirkanich Professor at the University of Pennsylvania, with affiliations in the Departments of Bioengineering, Physics & Astronomy, Electrical & Systems Engineering, Neurology, and Psychiatry. She is also an External Professor at the Santa Fe Institute. 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 Penn State University and a Ph.D. in physics from the University of Cambridge, UK as a Churchill Scholar, and as an NIH Health Sciences Scholar. She has received multiple prestigious awards, including American Psychological Association's 'Rising Star' (2012), Alfred P Sloan Research Fellow (2014), MacArthur Fellow Genius Grant (2014), Early Academic Achievement Award from the IEEE Engineering in Medicine and Biology Society (2015), Harvard Higher Education Leader (2015), Office of Naval Research Young Investigator (2015), National Science Foundation CAREER (2016), Popular Science Brilliant 10 (2016), Lagrange Prize in Complex Systems Science (2017), Erdos-Renyi Prize in Network Science (2018), AIMBE College of Fellows (2020). She is the author of more than 280 peer-reviewed publications, which have garnered over 21,000 citations, as well as numerous book chapters and teaching materials. She is the founding director of the Penn Network Visualization Program, a combined undergraduate art internship and K-12 outreach program bridging network science and the visual arts.

**Remote access Registration: <https://bit.ly/3chxe82>**

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**\*Please note: In order to join virtually, we suggest you register at least one week in advance via zoom\***  
**For more information on the BIRC Speaker Series, visit: <https://birc.uconn.edu/events/speaker-series/>**