THE MATERIALS SCIENCE AND ENGINEERING DEPARTMENT
FALL COLLOQUIUM SERIES PRESENTS:

Polina Anikeeva

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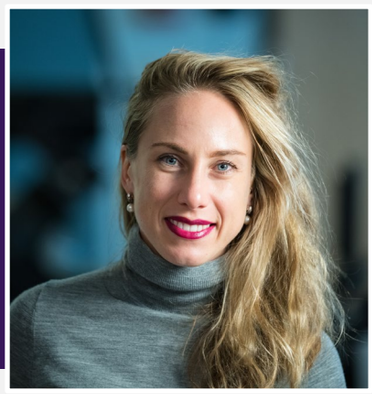

Interrogation of Neural Function Across Scales with Fiber-based and Nanomagnetic Tools

To understand the function and dynamics of the nervous system and to find treatments for the neurological and psychiatric conditions that increasingly affect our aging society, new tools capable of addressing neuronal signaling complexity are urgently needed. These tools must also match the mechanical and chemical properties of the neural tissue to avoid functional perturbation to local circuits. By leveraging fiber drawing, our group creates flexible and stretchable probes capable of recording and stimulation of neural activity as well as delivery of drugs and genes into the brain and spinal cord. We use these probes to interrogate brain circuits, such as those involved in anxiety and fear, and to promote recovery following spinal cord and nerve injury. Simultaneosly, we develop a broad range of magnetic nanotransducers that convert externally applied magnetic fields into thermal, chemical, and mechanical signals, which can then be perceived by ion channels on neurons. Since biological tissues exhibit negligible magnetic permeability and low conductivity, magnetic fields can penetrate deep into the body with no attenuation allowing us to apply the nanomagnetic transducers to remotely control deep brain circuits associated with reward and motivation as well as adrenal circuits involved in regulation of stress hormones.

Polina Anikeeva received her BS in Physics from St. Petersburg State Polytechnic University in 2003, and a PhD in Materials Science and Engineering from MIT in 2009. She completed her postdoctoral training at Stanford, where she created devices for optical stimulation and recording from neural circuits. In 2011, Polina joined the Department of Materials Science and Engineering at MIT, where she is now an Associate Professor. In 2018, Polina joined the faculty of the Brain and Cognitive Sciences. Her lab focuses on the development of flexible and minimally invasive materials and devices for neural recording, stimulation, and repair. Polina is a recipient of NSF CAREER Award, DARPA Young Faculty Award, the TR35, and Vilcek Prize for Creative Promise.

Tuesday, November 3 • 4 pm CT • Zoom

Registration is required. RSVP link is TBD.

Questions? Contact Kristina.lugo@northwestern.edu.

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