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SPEAKER SERIES

PRESENTS

Remote control of biology using magnetic materials and devices

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Department of Bioengineering
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Friday, Dec. 3, 10:30 am US central time
Room: CBB 108 (in-person only)

LECTURE ABSTRACT

Miniature implanted devices capable of manipulating and recording biological signals promise to improve the way we study biology and the way we diagnose and treat disease; however, to create an effective bioelectronic network we must overcome myriad engineering challenges. In this talk, I will describe how we can leverage unique device physics and material properties to overcome some of these challenges. Specifically, I will show how magnetoelectric materials allow us to effectively transmit data and power to mm-sized devices deep inside the body. I will also describe how we can engineer fast magnetic control of genetically targeted neurons. Overall, these technologies provide a suite of miniature magnetic neural interfaces that could support next-generation brain-computer interfaces and closed-loop bioelectronic medicine.

SPEAKER BIOSKETCH

Jacob Robinson is an Associate Professor in Electrical & Computer Engineering and Bioengineering at Rice University, and an Adjunct Associate Professor in Neuroscience at Baylor College of Medicine. His research group uses nanofabrication technology to create miniature devices to manipulate and monitor neural circuit activity. He received a B.S. in Physics from UCLA in 2003 and a Ph.D. in Applied Physics from Cornell University in 2008. He then began a postdoctoral research position in the Department of Chemistry and Chemical Biology at Harvard University, where he created silicon nanowire devices to probe the electrical and chemical activity of living cells. In 2012, he joined the ECE and BioE departments at Rice. Dr. Robinson is a performer on several DARPA neurotech and bioelectronics programs and currently leads one of the N3 teams creating non-surgical neural interfaces. Dr. Robinson is the recipient of the DARPA Young Faculty Award, the Materials Today Rising Star Award, and is a Senior Member of IEEE. He currently serves as the co-chair of the IEEE Brain Initiative and a core member of the IEEE Brain Neuroethics working group.
http://www.robinsonlab.com

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