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Subject: EM: Neuroscience Speaker Series: Dr. Dean Pospisil (Pitzer '12) Princeton University

From: Tom Borowski

NEUROSCIENCE SPEAKER SERIES



Dr. Dean Pospisil
Pitzer College '12

Princeton Neuroscience Institute
Princeton University

**The fly connectome reveals a path to the
effectome**

Wednesday, November 13
4:30 PM

Burns Lecture Hall
Department of Natural Science

Abstract: A goal of neuroscience is to obtain a causal model of an entire nervous system. The recently reported whole-brain fly connectome specifies the synaptic paths by which neurons can affect each other, but not how strongly they do affect each other *in vivo*. To overcome this limitation, we introduce a combined experimental and statistical strategy for efficiently learning a causal model of the fly brain, which we refer to as the ‘effectome’. We then analyse the connectome to propose circuits that dominate the dynamics of the fly nervous system. We discover that the dominant circuits involve only relatively small populations of neurons—thus, neuron-level imaging, stimulation and identification are feasible. This approach also re-discovers known circuits and generates testable hypotheses about their dynamics. Overall, we provide evidence that fly whole-brain dynamics are generated by a large collection of small circuits that operate largely independently of each other. This implies that a causal model of a brain can be feasibly obtained in the fly.

Dr. Pospisil will also discuss his path from Pitzer college to studying art and neuroscience on a Watson Fellowship to graduate studies in computational neuroscience.