

# SUTER SCIENCE SEMINARS 2023-24

## Sociality and the Evolution of Reproductive Signals in Bees

**Nathan Derstine, PhD**  
*USDA-NIFA Postdoctoral Fellow*  
*Pennsylvania State University*  
*State College, PA*



**Wednesday, March 13, 2024**  
**10:10 a.m. • Science Center, room 104**

*Social insects produce chemical signals that communicate individual reproductive potential. This informs cooperative and non-cooperative social behaviors within a colony. The chemical signals that convey this information in social species are an evolutionary innovation since they were not required by their solitary ancestors. However, the mechanisms by which these signals evolved is an open question. In this seminar, Dr. Derstine will both describe his path towards a career in science and his recent research on the role and evolution of reproductive signals in bees, with a particular focus on signals from the Dufour's gland.*

Dr. Nathan Derstine is a chemical ecologist and physiologist interested in the chemical mediation of insect behavior, the mechanisms that maintain cooperative behaviors in social insects, and the evolutionary processes that shape pheromone diversity. After graduating from EMU with a biology degree in 2010, he took a somewhat non-traditional path to a PhD, first working at USDA-ARS, then receiving a MSc. degree from Simon Fraser University, going back to work for USDA-APHIS, and ultimately receiving his PhD in Entomology at Penn State University in 2023. He is now a USDA-NIFA Postdoctoral Fellow in Etya Amsalem's lab at Penn State. His current research seeks to understand the phenomenon of "zombie bees", more specifically, the mechanism of behavioral manipulation used by a conopid fly when parasitizing its bumble bee host and causing it to dig its own grave. In the small windows of time not (delightfully) occupied by science or his one-year-old daughter, he enjoys ultimate frisbee, cooking, and gardening.



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