



NIMBioS

National Institute for Mathematical
and Biological Synthesis



NIMBioS Interdisciplinary Seminar

3:30 p.m.*, Tuesday, September 9, 2014

Dr. Elizabeth Hobson
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“Emergent Social Properties and the Evolution of Social Complexity”

Group-level properties, such as dominance hierarchies, emerge from the outcomes of individual-level events. Although individuals can gain critical benefits from their position in the hierarchy, we have a limited understanding how real-world hierarchies form or what signals and decision rules individuals use to construct and maintain them in complex groups. A study of aggression in two groups of captive monk parakeets (*Myiopsitta monachus*) found that a transition to large-scale ordered aggression occurred in newly-formed groups after one week, with individuals thereafter preferring to direct aggression against those nearby in rank. Network motifs in the form of chains of aggression among individuals provided information about relative rank and were highly predictive of behavioral preferences. I present a new theory, the “knowledge-behavior feedback loop,” which links an individual’s knowledge of rank with its consequent behavior. I use this framework to explain the transition from unstructured to strategic aggression and the formation and persistence of dominance hierarchies in groups capable of both social memory and social inference. I will discuss how this work provides insight into the social and cognitive complexity of the monk parakeet and how this approach could be used more broadly to understand the evolution of social complexity in other species.

Location: Tom Hallam Auditorium, Room 206 at NIMBioS, Claxton Education Bldg, 1122 Volunteer Blvd.

*Join us for refreshments at 3 p.m. in Room 205.

For more information about this and other NIMBioS Seminars, visit <http://www.nimbios.org/seminars>

The National Institute for Mathematical and Biological Synthesis (NIMBioS) brings together researchers from around the world to collaborate across disciplinary boundaries to investigate solutions to basic and applied problems in the life sciences. NIMBioS is sponsored by the National Science Foundation, with additional support from The University of Tennessee, Knoxville.

