



# NIMBioS

National Institute for Mathematical  
and Biological Synthesis



**NIMBioS Special Seminar**  
**3:30 p.m.\*, Wednesday, March 25, 2015**

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**Mathematics, The University of Arizona**

## **“Taking a Moment to Measure Networks: A Hierarchical Approach”**

Network-theoretic tools contribute to understanding real-world system dynamics, e.g., in epidemics, power outages, and wildlife conservation. Network visualization helps illustrate structural heterogeneity; however, details about heterogeneity are lost when summarizing networks with a single mean-style measure. Researchers have indicated that a hierarchical system composed of multiple metrics may be a more useful determinant of structure, but a formal method for grouping metrics is still lacking. We develop a hierarchy using the statistical concept of moments and systematically test the hypothesis that simple metrics are sufficient to explain the variation in processes that take place on networks, using an ecological systems example. Results indicate that the moments approach outperforms single summary metrics and accounts for a majority of the variation in process outcomes. The hierarchical measurement scheme is helpful for indicating when additional structural information is needed to describe system process outcomes.

**Location: Room 205 at NIMBioS, Claxton Education Bldg, 1122 Volunteer Blvd.**

*\*Join us for refreshments at 3 p.m.*

**The seminar will be live streamed. Visit <http://www.nimbios.org/videos/livestream>.  
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*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*

