UNIVERSITY OF ALBERTA

Pacific Institute *for the* Mathematical Sciences

PIMS-UAlberta Distinguished Lecture

Sebastian Schreiber (University of California, Davis)

3:00pm - 4:00pm
September 18, 2017

CAB 457
University of Alberta

Persistence of species in the face of environmental stochasticity

Stochastic fluctuations in temperature, precipitation and a host of other environmental factors occur at multiple spatial and temporal scales. As the survival and reproduction of organisms, whether they be plants, animals, or viruses, depend on these environmental factors, these environmental fluctuations can drive fluctuations in population abundances. This leads to a fundamental question in population biology: ``Under what conditions do environmental fluctuations hinder or facilitate species persistence?" This question is particularly pressing in light of global climate models predicting increasing temporal variation in many climatic variables over the next century. One fruitful approach to tackling this question is the development and analysis of stochastic models accounting for species interactions, population structure, and environmental stochasticity. I will discuss recent progress on a mathematical theory of persistence and extinction for such models. The theory will be illustrated with examples involving checkerspot butterflies in California, northern pike in Lake Windermere, and prairie grass in Kansas.

SEBASTIAN J. SCHREIBER is a Professor of Ecology and Evolution and member of the Center of Population Biology at the University of California, Davis. Prior to coming to Davis, he received his Ph.D. in smooth ergodic theory at the University of California, Berkeley, and was an Associate Professor of Mathematics at the College of William and Mary and Western Washington University. He describes himself as a "population biologist and mathematician wrestling with the complexities of nature armed with the theories of stochastic processes and dynamical systems." He has authored nearly one hundred scientific papers, as well as a calculus for the life sciences textbook. He serves on the editorial boards of five research journals including Ecology and the Journal of Mathematical Biology.

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