



NIMBioS

National Institute for Mathematical
and Biological Synthesis

“Local Adaptation and Gene Flow Shaping Biodiversity”

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3:30 pm*, Room 403, Blount Hall, 1534 White Ave.

Local adaptation and gene flow are two antagonist biological processes that can influence species' distribution and abundance. While divergent natural selection tends to increase local adaptation among populations inhabiting different environments, gene flow homogenizes the gene pool and can be detrimental to local adaptation. Of particular interest is the process where reproductive isolation evolves as a byproduct of local adaptation, called ecological speciation. Ecological speciation is of interest to theoreticians looking at the conditions that allow local adaptation in face of gene flow, but it is also of interest to field biologists because they can study the process as it is happening. Many factors, such as natural selection, sexual selection, and the differences between environments, can influence the evolution of reproductive isolation. In the first model, I used an individual-based numerical simulation to address the relative contribution of natural selection, sexual selection, and the environmental differences on the progression of the ecological speciation process. In the second model, I then evaluated the effect of phenotypic plasticity on a similar system. As previously been noted, I found that natural selection greatly influences progress toward ecological speciation, but without the added contribution of sexual selection, speciation could not be achieved. Phenotypic plasticity can either promote or constrain progress toward ecological speciation, depending on the timing of migration relative to the expression of the plasticity.

**Join us for refreshments in the NIMBioS Lobby at 3 pm.*