

Title: *Transit times for nonautonomous compartmental systems with applications to ecology*

Abstract: Compartmental models play an important role to describe the dynamics of systems that involve mass movements between different types of pools. We develop a theory to analyse the average ages of mass in different pools in a linear compartmental system with time-dependent (i.e. non-autonomous) transfer rates, which involves transit times that characterise the average time a particle has spent in a particular pool. We apply our theoretical results to investigate a nine-dimensional compartmental system with time-dependent fluxes between pools modelling the terrestrial carbon cycle.

Joint work with Alan Hastings, George Chappelle, Matthew Smith, Yiqi Luo, Folashade Augusto, Benito Chen-Charpentier, Forrest Hoffman, Jiang Jiang, Katherine Todd-Brown, Ying Wang, Ying-Ping Wang.