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## On the derivation of discrete time mathematics models for mutualist populations

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In this talk, we review different methods to derive discrete time model from continuous models. We apply the methods to continuous-time models of mutualism, and investigate the dynamics of the discrete models. For each discrete time model, we study parameter values for a coexistence equilibrium exists, then we investigate the asymptotic stability of the coexistence equilibrium and the emergence of a Neimark-Sacker bifurcation. Our results show that the outcome of the discrete time models depend strongly on their derivation from the continuous model. In particular the discrete model is not necessarily dynamically consistent with their continuous counterparts.