1030-92-428 **Hillel J.Chiel**, Department of Mathematics, Case Western University, and **Peter J. Thomas***, Department of Mathematics, Case Western University. *Noise-induced limit cycle transitions in a coupled oscillator network.* Preliminary report.

Many neural motor control systems contain central pattern generator (CPG) neural networks. CPG networks typically can produce one or more stable rhythmic behaviors, for example corresponding to different quadruped gaits. In the marine mollusk *Aplysia californica*, a CPG networkcontrolling feeding movements can produce biting, swallowing and rejection behaviors by changing the phase relationships of activity in individual network units. We investigate a simplified D_4-equivariant model of a CPG neural network in which two stable limit cycles coexist,

with the goal of understanding how noise (stochastic perturbations) might facilitate switching from one activity pattern to another. In particular we ask whether there are conditions under which random perturbations of

the deterministic network dynamics are simultaneously weak enough to preserve the form of the deterministic limit cycle attractors, but strong enough to induce spontaneous switching between them. (Received August 15, 2007)