1080-37-80 **Yunjiao Wang*** (`yw19@rice.edu`), 6100 Main Street, CAAM, Rice University, Houston, TX 77005, and **Marty Golubitsky** and **David Romano**. *Rigid phase-shifts in periodic solutions of network systems.*

This work is motivated by animal gaits, which are time periodic and in which the movements of legs are robustly phase-related. A natural question arises: what kind of network systems may support periodic solutions with such robust phase-relations? In this talk, I will show that only those networks with 'certain symmetries' can admit this kind of solutions. The result may be not very surprising. The proof, however, took researchers in the field of coupled cell systems more than a decade. (Received January 10, 2012)