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Martin Golubitsky* (mg@mbi.osu.edu), Mathematical Biosciences Institute, 1735 Neil Avenue, Columbus, OH 43210. *Patterns of Oscillation in Network Systems*.

Networks of differential equations can be described abstractly by a directed graph whose nodes correspond to systems of differential equations and arrows correspond to coupling between the systems. Suppose that $x(t)$ is a T -periodic solution and $x_i(t)$ and $x_j(t)$ are the coordinates of $x(t)$ corresponding to nodes i and j . The two nodes are *phase-related* if there exists θ such that $x_j(t) = x_i(t + \theta T)$. The phase relation θ is *rigid* if it remains unchanged on perturbation of the coupled system. In this talk we discuss joint work with D. Romano and Y. Wang that shows how rigid phase-shifts are related to network architecture (the graph) and network symmetries. (Received September 07, 2011)