1030-92-76 **Mark Alber*** (malber@nd.edu), Department of Mathematics, 255 Hurley Building, University of Notre Dame, Notre Dame, IN 46556-4618. *Social Interactions in Myxobacterial Swarming.*

Many different bacteria are able to spread rapidly over the surface on which they are growing, using a movement strategy known as swarming. When cells cover a surface at high density and growth is limited by competition between cells for nutrients, that strategy permits them to continue rapid growth, especially at the colony edge. Myxococcus xanthus, one of the myxobacteria, expands its swarms at one third the speed of individual cell gliding over the same surface. Its cells have pilus engines at their front end that pull by retracting the pili, and slime secreting engines. These two motility engines cause different social interactions between cells. During movement, a cell's polarity reverses regularly every 10 minutes or so and reversal is required for swarming.

In this talk we will describe a new stochastic cell-based model for studying the effects of social interactions between cells and discuss the role of Frz system in Myxobacteria signaling network in connection with the cell's polarity reversals. The simulations do yield a constant rate of swarm expansion, which has been observed experimentally. Also the model is able to quantify the contributions of two types of motility to swarming. (Received July 18, 2007)