1077-92-2588   **X Rosalind Wang**, **Jennifer M Miller*** (`millerje@math.udel.edu`), **Joseph T Lizier**, **Mikhail Prokopenko** and **Louis F Rossi**. *Measuring Information Storage and Transfer in Swarms.*

Collective behavior of aggregations, such as flocks of birds or groups of autonomous robots, emerge without central control. Individuals within the group base their movement decisions on interactions with nearby individuals. Under certain conditions, local interactions drive the entire aggregation into distinct configurations suggesting a cascade of information is moving through the swarm. By applying an information-theoretic framework to a mathematical model of swarming, we can gain insight into how information propagates through the group. The transitions between large-scale dynamics, such as two groups combining, correspond to changes in the overall information transfer and active information storage. These measures can provide us with knowledge about the dynamics within the models that may not be apparent from simply observing the group. From a robotics standpoint, knowledge of information transfer within the group may allow us to temporarily switch off communication between individuals without affecting the overall group behavior. (Received September 22, 2011)