

1145-92-1914      **Alexandria Volkening\*** (volkening.2@mbi.osu.edu), MBI, 3rd Floor Jennings Hall, 1735 Neil Ave., Columbus, OH 43210. *Modeling and analysis of agent-based dynamics: an overview.*

Agent-based dynamics appear across the natural and social world; applications include swarming and flocking, pedestrian crowd movement, traffic flow, and the self-organization of cells during early development of organisms. Though disparate in application, many of these emergent patterns and collective dynamics share similar features (e.g. long-range communication, noise, fluctuations in population size, and multiple types of agents) and face some of the same modeling and analysis challenges. In this talk, we will use the concrete example of pigment cell interactions during zebrafish pattern formation to illustrate various ways of modeling agent behavior, including cellular automaton, agent-based, and continuum (PDE) models. We will discuss the benefits and drawbacks of these different approaches and highlight new ways to analyze collective behavior using TDA. This talk will be a general overview to how agent-based dynamics are described and analyzed mathematically and provide an introduction to the rest of the session. (Received September 24, 2018)