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Maria-Veronica Ciocanel* (ciocanel.1@osu.edu), **Riley Juenemann**, **Adriana Dawes** and **Scott McKinley**. *Topological Data Analysis for Ring Channels in Intracellular Transport*.

Contractile rings are cellular structures made of actin filaments that are important in development, wound healing, and cell division. In the reproductive system of the worm *C. elegans*, ring channels allow nutrient exchange between developing egg cells and the worm and are regulated by forces exerted by myosin motor proteins. In this talk, I will present an agent-based modeling and data analysis framework for the interactions between actin filaments and myosin motors inside cells. This approach may provide key insights for the mechanistic differences between two motors that are believed to maintain the rings at a constant diameter. In particular, we propose tools from topological data analysis to analyze time-series data of filamentous network interactions. Our proposed methods clearly reveal the impact of key parameters on significant topological circle formation, thus giving insight into ring channel formation and maintenance. (Received September 03, 2019)