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**Christopher E Miles\*** ([cemiles@uci.edu](mailto:cemiles@uci.edu)). *Learning interactions of collective motion in the mitotic spindle*. Preliminary report.

Recent innovations in imaging and machine learning have rapidly advanced the ability to track multiple particles moving simultaneously, but statistical tools for characterizing the mechanisms of these movement lag behind. When the particles may interact, the motion of the full collective, rather than individual particles, must be considered. I will discuss some recent attempts to learn the interactions between particles in the case study of chromosomes moving during mitosis. Beyond doing inference itself, I will also propose a framework for model selection and uncertainty quantification. These learned interactions are then be tested against biological experiments, confirming that the framework provides underlying microscopic information otherwise impossible to discern from individual trajectories. (Received September 21, 2021)