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Lea Jenkins* (lea@clemons.edu) and **Anastasia Wilson**. *The Math of Chemistry: Using Scientific Computing to Understand Filtration and Separations Processes*.

Filtration and separations processes are ubiquitous in our everyday lives. They are involved in a wide range of production environments, including polymer fiber production and production of biopharmaceuticals. Filtration devices also provide us access to clean water, and they help our car engines run smoothly. Our body also uses filtration processes to efficiently trap and remove impurities. In this talk, I will present an overview of filtration processes used in the polymer fiber and biopharmaceutical industries, including a synopsis of several mathematical problems that arise in the context of modeling these processes. I will also describe theoretical work and numerical results associated with our efforts to develop simulation frameworks for engineers interested in optimizing their manufacturing capabilities based on effective filtration. (Received January 04, 2016)