

Thursday, September 12, 2019

4:30–5:20 pm / SAS 2102

**How Mathematical Techniques can be
used to Better Understand Cardiovascular
Dynamics in Health and Disease**

Mette Olufsen

Dating back to the 1600s modeling has been used to study cardiovascular dynamics enabling scientist to answer essential questions. In fact, todays knowledge that the cardiovascular system is circulating was first discovered via a mathematical model. In this talk I will discuss the role mathematical analysis has played in cardiovascular physiology and how we use mathematics to analyze data and study questions that cannot be answered from experiments alone. Several topics will be highlighted discussing how to merge imaging with dynamic data to understand what vessels should be opened with balloons for patients with pulmonary hypertension, how to understand what potentially happens in patients with postural orthostatic hypertension, and how to use modeling to potentially develop a new method for early detection of sepsis. Mathematical techniques used involve modeling (ODEs and PDEs), signal processing, sensitivity analysis and parameter estimation, topological data analysis.

NCSU Society for Undergraduate Mathematics

SUM Series

Mathematics and pizza!