

**MICHIGAN STATE UNIVERSITY**  
Department of Statistics and Probability

## **COLLOQUIUM**

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### **Bayesian Models for Richly Structured Data in Biomedicine**

**Tuesday, October 22, 2019**

**10:20 AM - 11:10 AM**

**Refreshments 10:00 AM**

**C405 Wells Hall**

#### **Abstract**

Modern scientific endeavors generate high-throughput, multi-model datasets of different sizes, formats, and structures at a single subject-level. In the context of biomedicine, such data include multi-platform genomics, proteomics and imaging; and each of these distinct data types provides a different, partly independent and complementary, high-resolution view of various biological processes. Modeling and inference in such studies is challenging, not only due to high dimensionality, but also due to presence of rich structured dependencies such as serial, functional, graphical, and shape-based correlations. In this talk I will cover some regression and clustering frameworks for modeling data, where the statistical atoms lie on non-Euclidean spaces such as densities, trees and shapes. Using coherent data-based projections, basis functions and metric spaces, we will show how to build probabilistic frameworks that can extract maximal information from such data for inference. These approaches will be illustrated using several biomedical case examples especially in oncology.

*To request an interpreter or other accommodations for people with disabilities, please call the  
Department of Statistics and Probability at 517-355-9589.*