

## Dr. Eric Jones

*Simon Fraser University*

**Thursday, January 25, 3:00 pm. Osborne A204**

### **What's in your gut? Stochastic assembly of the gut microbiome and its spatial structure**



The gut microbiome—the ecosystem of bacteria that resides within our guts—influences host health, but we do not yet fully understand how our gut microbiome is assembled over the course of our life. Hosts are constantly exposed to microbial species that may or may not colonize, leading to a combinatorially large number of possible microbiome compositions. We mathematically characterize this process of microbiome assembly using well-controlled fruit fly experiments and find that the assembly process is stochastic, which explains how the vast diversity of microbiome compositions across individuals is maintained.

In conjunction with microscopy images of colonizing bacteria, we develop ecological theory that links bacterial colony size to accessible experimental measurements. Our findings yield design principles for microbiome-based therapies like fecal microbiota transplantation and probiotics, and place limits on their efficacy.

#### **Short Bio**

Dr. Eric Jones studies how bacteria colonize the gut microbiome, and his objective is to improve microbiome-based medical therapies that treat diseases like *C. difficile* infection and ulcerative colitis. His interdisciplinary research applies techniques from statistical physics, microbial ecology, and mathematical biology to make sense of noisy biological datasets. Dr. Jones' postdoctoral research at Simon Fraser University has been supported by the Banting Postdoctoral Fellowship and Pacific Institute for the Mathematical Sciences Postdoctoral Fellowship. In 2020 he received his doctorate in physics from the University of California at Santa Barbara. Dr. Jones graduated from the Colorado School of Mines in 2015 with degrees in Engineering Physics and Computational and Applied Mathematics, hiked the Colorado Trail in 2017, and is excited to return to his Colorado roots.