

# Eric W. Jones

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**Friday, January 31, 11:00 am. Osborne A204**

## **Our noisy gut: Stochastic assembly of the gut microbiome and its spatial structure**



The gut microbiome—the ecosystem of bacteria that resides within our guts—influences our 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, explaining 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, and place limits on their efficacy.

### **Short Bio**

Dr. Eric Jones is an Assistant Professor at the University of Colorado Colorado Springs in the Department of Physics and Energy Science. The Jones Lab studies the spatial ecology of bacteria that colonize the gut microbiome with an objective of improving microbiome-based medical therapies that treat diseases like *C. difficile* infection and ulcerative colitis. Jones received his PhD in Physics from the University of California at Santa Barbara and performed his postdoctoral research at Simon Fraser University as a Banting Postdoctoral Fellow and Pacific Institute for the Mathematical Sciences Postdoctoral Fellow. Jones grew up in Colorado, graduating from the Colorado School of Mines in 2015 with degrees in Engineering Physics and Computational and Applied Mathematics. His interdisciplinary research group applies techniques from statistical physics, microbial ecology, and mathematical biology to make sense of noisy biological datasets.