ERIC W. JONES

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POSTDOCTORAL EMPLOYMENT

PIMS Postdoctoral Fellow, Simon Fraser University, Department of Physics 2022-23
Banting Postdoctoral Fellow, Simon Fraser University, Department of Physics 2020-22
Application of theoretical statistical physics techniques to ecological systems with David Sivak. Experimental collaborations with Will Ludington, Megan Frederickson, and Jane Fowler.

Postdoctoral Researcher, Carnegie Institute for Science, Department of Embryology 2020
Characterization of fruit fly microbiome assembly with Will Ludington. Ecological modeling of stochastic microbiome assembly, the spatial structure of the gut microbiome, and higher-order interactions within microbial systems.

EDUCATION

UC Santa Barbara

Ph.D. Physics 2020
Thesis: "Simplification and control of microbial ecosystems in theory and experiment"
Advisor: Jean Carlson
Certificate in College and University Teaching 2020
M.A. Physics 2018

Colorado School of Mines

B.S. Engineering Physics, Summa Cum Laude 2015
B.S. Computational and Applied Mathematics, Summa Cum Laude 2015

SELECTED AWARDS & ACHIEVEMENTS

Major Fellowships (∼$280,000 USD total)

☐ PIMS Postdoctoral Fellowship	C$30,000	2022-23
☐ Banting Postdoctoral Fellowship	C$140,000	2020-22
☐ Broida-Hirschfelder Fellowship, UCSB Shoreliners	$8,000	2020
☐ Graduate Division Dissertation Fellowship, UCSB Graduate Division	$13,600	2019
☐ NSF Graduate Research Fellowship	$132,000	2016-19

Presentation/Writing Awards

- ☐ First Place Talk Award, Frontiers in Biophysics 2022
- ☐ First Place, SFU Postdoc Research Day *Writing for the Public Contest* [link] 2021
- ☐ GSNP Student Speaker Award Finalist at APS March Meeting 2020
- ☐ Janet L. Andersen Award for Undergraduate Research in Mathematical or Computational Biology 2015

Teaching/Mentoring/Service Awards

- ☐ Outstanding TA Award, UCSB Physics Department 2020
- ☐ Goodchild Graduate Mentoring Award, UCSB Graduate Division 2019
- ☐ Chair's Appreciation Award, UCSB Physics Department 2019
- ☐ Department Service Award, UCSB Physics Department 2019
- ☐ Waltman Award, Colorado School of Mines 2015
  Presented to the campus-wide outstanding graduating senior

PUBLICATIONS

peer reviewed: 10 / first author: 7 / h-index: 7 / total citations: 590 [Google Scholar]

2023 **E. Jones**, J. Derrick, R. Nisbet, W. Ludington, D. Sivak (submitted). "Signal in the noise: temporal variation in exponentially growing populations." [arXiv link]

2023 R. Dodge, **E. Jones**, H. Zhu, B. Obadia, D. Martinez, C. Wang, A. Aranda-Diaz, K. Aumiller, Z. Liu, M. Voltolini, E. Brodie, K. Huang, J. Carlson, D. Sivak, A. Spradling, and W. Ludington. "A gut commensal niche regulates stable association of a multispecies microbiota." *Nature Communications* 14(1):1557 [link]

2022 **E. Jones**, J. Carlson, D. Sivak, and W. Ludington. "Stochastic microbiome assembly depends on context." *Proceedings of the National Academy of Sciences* 119(7):e2115877119 [link]

2021 **E. Jones***, J. Sheng*, S. Wang, and J. Carlson. "Aging-induced fragility of the immune system." *Journal of Theoretical Biology* 510:110473 [link]

2020 **E. Jones**, P. Shankin-Clarke†, and J. Carlson. "Navigation and control of outcomes in a generalized Lotka-Volterra model of the microbiome." In *Advances in Nonlinear Biological Systems: Modeling and Optimal Control*, pg 97-120. Published by the American Institute of Mathematical Sciences. [link]

2020 Z. Wang†, **E. Jones**, J. Mueller, and J. Carlson. "Control of ecological outcomes through deliberate parameter changes in a model of the gut microbiome." *Physical Review E* 101(5):052402 [link]

2019 **E. Jones** and J. Carlson. "Steady-state reduction of generalized Lotka-Volterra systems in the microbiome." *Physical Review E* 99(3):032403 [link]

2018 A. Gould, V. Zhang, L. Lamberti, **E. Jones**, B. Obadia, N. Korasidis, A. Gavryushkin, J. Carlson, N. Beerenwinkel, and W. Ludington. "Microbiome interactions shape host fitness." *Proceedings of the National Academy of Sciences* 115(51):E11951 [link]

2018 **E. Jones** and J. Carlson. "In silico analysis of antibiotic-induced Clostridium difficile infection." *PLoS Computational Biology* 14(2):e1006001 [link]

2018 P. Diaz, P. Constantine, K. Kalmbach, **E. Jones**, and S. Pankavich. "A modified SEIR model for the spread of Ebola in Western Africa and metrics for resource allocation." *Applied Mathematics and Computation* 324:141 [link]

2013 **E. Jones**, P. Roemer, M. Raghupathi, and S. Pankavich. "Analysis and simulation of the three-component model of HIV dynamics," *SIAM Undergraduate Research Online* 7:89 [link]

**equal contribution;* †*undergraduate research advisee*

SELECTED PRESENTATIONS

Invited Talks (11 total)

2023 **The signal in the noise: Variability in microbiome acquisition** at APS March Meeting, Las Vegas, NV

2023 **How do organisms acquire their gut microbiomes?** at the UBC Department of Physics & Astronomy

2023 **How do organisms acquire their gut microbiomes?** at the SFU Physics Department Colloquium

2023 **Whence your microbiome?** at SFU Les Ecologistes

2021 **Dimensionality reduction of a bistable ecological system** at the PIMS-SFU Computational Math Seminar

2020 **Ecological mechanisms of direct and indirect bacteriotherapies in generalized Lotka-Volterra systems** at APS March Meeting, Denver, CO (held online). GSNP Graduate Student Award Finalist Talk.

2020 **The simplification and control of microbial ecosystems** at the SFU Biophysics and Soft Matter Seminar

2020 **The simplification and control of microbial ecosystems** at Emory University. Theory and Modeling of Living Systems Postdoctoral Fellow Candidate Talk.

2020 **Immunosenescence in a coupled model of the innate and adaptive immune responses** at the Santa Fe Institute working group on Aging & Adaptation in Infectious Diseases

2019 **Stochastic colonization of bacteria in the fly gut** at the Department of Mathematics at the University of Hawai'i at Mānoa

2019 **The onset of immunosenescence in a mathematical model of the immune system** at the Santa Fe Institute working group on Aging & Adaptation in Infectious Diseases

Conference Talks and Posters

2022 **How do organisms acquire their gut microbiomes?** at Frontiers in Biophysics, Vancouver, BC. Won the First Place Talk Award.

2022 **Stochastic acquisition of the gut microbiome in *Drosophila*** (poster) at AMS Microbe, Washington, DC

2022 **Stochastic acquisition of the gut microbiome in *Drosophila*** (poster) at APS March Meeting, Chicago, IL [poster link]

2021 **Simplification and control of microbial ecosystems** (poster) at Frontiers in Biophysics [poster link] (held online)

2021 **Stochasticity influences the efficacy of simulated bacteriotherapies** at APS March Meeting (held online)

2020 **Ecological mechanisms of bacteriotherapy in generalized Lotka-Volterra systems** at the web-based Evolutionary and Ecological Systems Biology seminar series (held online)

2019 **Steady-state reduction of generalized Lotka-Volterra systems in the microbiome** at APS March Meeting, Boston, MA

2018 **Simulated *C. difficile* Infection** at Dynamics Days, Denver, CO

MENTORSHIP EXPERIENCE

- Research mentor to undergraduate Parker Shankin-Clarke (April 2018 - June 2020). Graduate advisor for his participation in the UC LEADS and MRL RISE (3x) programs. Our research is published in the *AIMS Special Issue on Biological Systems Modeling*.
- Research mentor to undergraduate Zipeng Wang (May 2018 - June 2020). Our research is published in *Physical Review E*. Zipeng is now a physics graduate student at Johns Hopkins University.
- Graduate Mentor of the Undergraduate Diversity and Inclusion in Physics (UDIP) club at UCSB (May 2018 - August 2020)
- Graduate Mentor for the Summer Institute for Mathematics and Science (SIMS) program (August 2016)

TEACHING EXPERIENCE

- Received the Certificate in College and University Teaching
- Teaching Associate (instructor of record) for upper-division Lagrangian and Hamiltonian mechanics course (PHYS 104, Summer 2019). Course notes available.
- Conceived, designed, and led the Programming Help Sessions (PHS) (Spring 2018, Fall 2018, and Spring 2019). Curriculum freely available.
- Ringleader and lead organizer of Physics Circus, a physics outreach program that performs physics demonstrations at nearby elementary schools (Fall 2019 and Winter 2020, ∼12 events)
- Teaching assistant for courses in complex analysis (PHYS 101, Winter 2016 and Winter 2020) and lower-division calculus-based kinematics (PHYS 20, Fall 2015)

SERVICE

- President of the SFU Postdoctoral Association (August 2022 - Present)
- Member of SFU IDEA (Inclusion, Diversity, and Equity Alliance) (Sept. 2020 - Oct. 2022)
  - Invited speaker at the APS-IDEA New Member Orientation to discuss shared leadership (9/14/21)
  - Organized, advertised, and disseminated the results of a climate assessment in the SFU Physics Department (September 2021 - October 2022)
  - Trained as a facilitator by the Sexual Violence Support & Prevention Office at SFU
  - Mediated four discussions of the film *Picture a Scientist*
- Vice President, Finance of the SFU Postdoctoral Association (August 2021 - July 2022)
- Peer-reviewed 10 manuscripts (5x Physical Review E, 1x Microbiome, 1x mBio, 1x mSystems, 1x Journal of the Royal Society Interface, 1x AIMS Applied Mathematics Book Series)
- Cowrote a successful application with UCSB Physics Department faculty to become an APS Bridge Partnership Institution (June - August 2020)
- Member of the "Workshop to Advance Theory in Ecology" (Pennyslvania State University, 2022)
- Member of the "Aging and Adapation in Infectious Diseases" working group (Santa Fe Institute, 2019 and 2020)
- Organized an Invited Symposium and Focus Session on "Variability in Biological and Living Systems" at APS March Meeting 2023

MEDIA COVERAGE

- "Stochastic microbiome assembly depends on context" was selected and publicized by SFU Research as the Scholarly Impact of the Week (July 2022) [link]
- "Stochastic microbiome assembly depends on context" was covered in a *Carnegie Institution for Science* press release (by Natasha Metzler, 2022) [link]
- The SFU IDEA team was featured in the article "Advocating for data, diversity and departmental change: meet the SFU Physics Inclusion, Diversity and Equity Alliance Team" (by Natalie Lim, 2021) [link]
- "Control of ecological outcomes through deliberate parameter changes in a model of the gut microbiome" was covered in the press by *The UCSB Current* (by Sonia Fernandez, 2020) [link]
- "Microbiome interactions shape host fitness" was adapted for publication in the non-profit journal *Science Journal for Kids* (December 2019) [link]
- "Microbiome interactions shape host fitness" was covered in *The UCSB Current* (by Sonia Fernandez, 2018), *Science Daily*, *Scienmag*, *Phys.org*, *Futurity*, *EurekAlert*, and others [link]

This document was updated 8/14/23