

ERIC W. JONES

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EDUCATION

UC Santa Barbara, 2015 - 2020

Ph.D. Physics, June 2020

Thesis Title: "Simplification and control of microbial ecosystems in theory and experiment" [\[link\]](#)

Thesis Advisor: Dr. Jean Carlson

M.A. Physics, March 2018

Certificate in College and University Teaching, April 2020

Colorado School of Mines, 2011 - 2015

B.S. Engineering Physics, Summa Cum Laude

B.S. Computational and Applied Mathematics, Summa Cum Laude

POSTDOCTORAL EMPLOYMENT

Banting and PIMS Postdoctoral Fellow with the [Sivak Group](#), September 2020 - Present

Simon Fraser University, Department of Physics

Application of statistical physics techniques to ecological systems. Experimental collaborations with Will Ludington and Megan Frederickson.

Postdoctoral Researcher with the [Ludington Lab](#), June 2020 - August 2020

Carnegie Institute for Science, Department of Embryology

*Ecological modeling of microbiome community assembly in the gut of *Drosophila melanogaster*, with a focus on priority effects of colonization, the spatial distribution of colonization in the gut, and higher-order interactions within microbial systems.*

SELECTED AWARDS & ACHIEVEMENTS

Major Fellowships (~\$280,000 USD total)

- [PIMS Postdoctoral Fellowship](#) (C\$30,000) (September 2022 - August 2023)
- [Banting Postdoctoral Fellowship](#), awarded by NSERC (C\$140,000) (Sept. 2020 - August 2022)
- Broida-Hirschfelder Fellowship, UCSB Shoreliners (\$8,000) (Winter 2020)
- Graduate Division Dissertation Fellowship, UCSB Graduate Division (\$13,600) (Fall 2019)
- [NSF Graduate Research Fellowship](#) (\$132,000) (September 2016 - September 2019)

Presentation/Writing Awards

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

Teaching/Mentoring/Service Awards

- Outstanding TA Award, UCSB Physics Department (May 2020)
- Goodchild Graduate Mentoring Award, UCSB Graduate Division (\$1,000) (June 2019)
- Chair's Appreciation Award, UCSB Physics Department (May 2019)
- Department Service Award, UCSB Physics Department (May 2019)
- Waltman Award, Colorado School of Mines (\$5,000) (May 2015)

Presented to the campus-wide outstanding graduating senior

PUBLICATIONS

peer reviewed: 10 / first author: 7 / h-index: 7 / total citations: 541 [\[Google Scholar\]](#)

1. **E. Jones**, J. Derrick, R. Nisbet, W. Ludington, D. Sivak (submitted). “Signal in the noise: temporal variation in exponentially growing populations.” [\[arXiv link\]](#)
2. 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 (2023). “A gut commensal niche regulates stable association of a multispecies microbiota.” *Nature Communications* 14(1):1557 [\[link\]](#)
3. **E. Jones**, J. Carlson, D. Sivak, and W. Ludington (2022). “Stochastic microbiome assembly depends on context.” *Proceedings of the National Academy of Sciences* 119(7):e2115877119 [\[link\]](#)
4. **E. Jones***, J. Sheng*, S. Wang, and J. Carlson (2021). “Aging-induced fragility of the immune system.” *Journal of Theoretical Biology* 510:110473 [\[link\]](#)
5. **E. Jones**, P. Shankin-Clarke[†], and J. Carlson (2020). “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. [\[link\]](#)
6. Z. Wang[†], **E. Jones**, J. Mueller, and J. Carlson (2020). “Control of ecological outcomes through deliberate parameter changes in a model of the gut microbiome.” *Physical Review E* 101(5):052402 [\[link\]](#)
7. **E. Jones** and J. Carlson (2019). “Steady-state reduction of generalized Lotka-Volterra systems in the microbiome.” *Physical Review E* 99(3):032403 [\[link\]](#)
8. A. Gould, V. Zhang, L. Lamberti, **E. Jones**, B. Obadia, N. Korasidis, A. Gavryushkin, J. Carlson, N. Beerenwinkel, and W. Ludington (2018). “Microbiome interactions shape host fitness.” *Proceedings of the National Academy of Sciences* 115(51):E11951 [\[link\]](#)
9. **E. Jones** and J. Carlson (2018). “In silico analysis of antibiotic-induced *Clostridium difficile* infection.” *PLoS Computational Biology* 14(2):e1006001 [\[link\]](#)
10. P. Diaz, P. Constantine, K. Kalmbach, **E. Jones**, and S. Pankavich (2018). “A modified SEIR model for the spread of Ebola in Western Africa and metrics for resource allocation.” *Applied Mathematics and Computation* 324:141 [\[link\]](#)
11. **E. Jones**, P. Roemer, M. Raghupathi, and S. Pankavich (2013). “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

1. **The signal in the noise: Variability in microbiome acquisition** at APS March Meeting, Las Vegas, NV (3/7/23)
2. **How do organisms acquire their gut microbiomes?** at the UBC Department of Physics & Astronomy (2/16/23)
3. **How do organisms acquire their gut microbiomes?** at the SFU Physics Department Colloquium (2/3/23)
4. **Whence your microbiome?** at SFU Les Ecologistes (1/26/23)
5. **Dimensionality reduction of a bistable ecological system** at the PIMS-SFU Computational Math Seminar (11/12/21)
6. **Ecological mechanisms of direct and indirect bacteriotherapies in generalized Lotka-Volterra systems** at APS March Meeting, Denver, CO (held online) (3/4/20). GSNP Graduate Student Award Finalist Talk.

7. **The simplification and control of microbial ecosystems** at the SFU Biophysics and Soft Matter Seminar (2/13/20)
8. **The simplification and control of microbial ecosystems** at Emory University (2/5/20). Theory and Modeling of Living Systems Postdoctoral Fellow Candidate Talk.
9. **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 (1/14/20)
10. **Stochastic colonization of bacteria in the fly gut** at the Department of Mathematics at the University of Hawai'i at Mānoa (5/16/19)
11. **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 (4/30/19)

Conference Talks and Posters

8. **How do organisms acquire their gut microbiomes?** at Frontiers in Biophysics, Vancouver, BC (6/17/22). Won the First Place Talk Award.
9. **Stochastic acquisition of the gut microbiome in *Drosophila*** (poster) at AMS Microbe, Washington, DC (6/12/22)
10. **Stochastic acquisition of the gut microbiome in *Drosophila*** (poster) at APS March Meeting, Chicago, IL [[poster link](#)] (3/16/22)
11. **Simplification and control of microbial ecosystems** (poster) at Frontiers in Biophysics [[poster link](#)] (held online) (6/29/21)
12. **Stochasticity influences the efficacy of simulated bacteriotherapies** at APS March Meeting (held online) (3/17/21)
13. **Ecological mechanisms of bacteriotherapy in generalized Lotka-Volterra systems** at the web-based Evolutionary and Ecological Systems Biology seminar series (held online) (6/23/20)
14. **Steady-state reduction of generalized Lotka-Volterra systems in the microbiome** at APS March Meeting, Boston, MA (3/6/19)
15. **Simulated *C. difficile* Infection** at Dynamics Days, Denver, CO (1/4/18)

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” (Pennsylvania State University, 2022)
- Member of the “Aging and Adaptation 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” for 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 3/13/23