

# ERIC W. JONES

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## EDUCATION

### UC Santa Barbara

Ph.D. Physics 2020

*Thesis Title:* “[Simplification and control of microbial ecosystems in theory and experiment](#)”

*Thesis 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

## 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.*

## SELECTED AWARDS & ACHIEVEMENTS

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

<input type="checkbox"/> <a href="#">PIMS Postdoctoral Fellowship</a>	C\$30,000	2022-23
<input type="checkbox"/> <a href="#">Banting Postdoctoral Fellowship</a>	C\$140,000	2020-22
<input type="checkbox"/> Broida-Hirschfelder Fellowship, UCSB Shoreliners	\$8,000	2020
<input type="checkbox"/> Graduate Division Dissertation Fellowship, UCSB Graduate Division	\$13,600	2019
<input type="checkbox"/> <a href="#">NSF Graduate Research Fellowship</a>	\$132,000	2016-19

*Presentation/Writing Awards*

<input type="checkbox"/> First Place Talk Award, Frontiers in Biophysics	2022
<input type="checkbox"/> First Place, SFU Postdoc Research Day <i>Writing for the Public Contest</i> <a href="#">[link]</a>	2021
<input type="checkbox"/> GSNP Student Speaker Award Finalist at APS March Meeting	2020
<input type="checkbox"/> Janet L. Andersen Award for Undergraduate Research in Mathematical or Computational Biology	2015

*Teaching/Mentoring/Service Awards*

<input type="checkbox"/> Outstanding TA Award, UCSB Physics Department	2020
<input type="checkbox"/> Goodchild Graduate Mentoring Award, UCSB Graduate Division	2019
<input type="checkbox"/> Chair’s Appreciation Award, UCSB Physics Department	2019
<input type="checkbox"/> Department Service Award, UCSB Physics Department	2019
<input type="checkbox"/> 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<sup>†</sup>, 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<sup>†</sup>, **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; <sup>†</sup>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” (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” 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*