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"
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 non-equilibrium statistical mechanics techniques to ecological systems, with the aim of developing an ecological control theory for the microbiome. Experimental collaborations with Will Ludington.

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

- ☐ Banting Postdoctoral Fellow awarded by NSERC (C$140,000) (for September 2020 - August 2022)
- ☐ PIMS Postdoctoral Fellow (C$30,000) (for September 2022 - August 2023)
- ☐ NSF Graduate Research Fellow ($132,000) (September 2016 - September 2019)

- ☐ Outstanding TA Award, UCSB Physics Department ($200) (May 2020)
- ☐ GSNP Student Speaker Award Finalist at APS March Meeting ($500) (March 2020)
- ☐ Doctoral Student Travel Grant, UCSB Academic Senate ($500) (March 2020)
- ☐ Broida-Hirschfelder Fellow, UCSB Shoreliners ($8,000) (Winter 2020)
- ☐ Graduate Division Dissertation Fellow, UCSB Graduate Division ($13,600) (Fall 2019)
- ☐ Goodchild Graduate Mentoring Award, UCSB Graduate Division ($1,000) (June 2019)
- ☐ Chair's Appreciation Award, UCSB Physics Department ($200) (May 2019)
- ☐ Department Service Award, UCSB Physics Department (May 2019)
- ☐ Dynamics Days Travel Award ($300) (January 2018)
- ☐ q-bio Summer School Tuition Waiver ($1,500) (June 2017)
- ☐ Janet L. Andersen Award for Undergraduate Research in Mathematical or Computational Biology (August 2015)
- ☐ Waltman Award, Colorado School of Mines ($5,000) (May 2015)
  Presented to the campus-wide outstanding graduating senior

PUBLICATIONS

peer reviewed: 8 / first author: 5 / h-index: 4 / total citations: 155 [Google Scholar]

1. 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]
2. **E. Jones** and J. Carlson (2019). "Steady-state reduction of generalized Lotka-Volterra systems in the microbiome." *Physical Review E* 99(3):032403 [link]
3. 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]
4. **E. Jones** and J. Carlson (2018). "In silico analysis of antibiotic-induced Clostridium difficile infection." *PLoS Computational Biology* 14(2):e1006001 [link]
5. 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]
6. **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]

IN REVISION:

7. **E. Jones**, P. Shankin-Clarke†, and J. Carlson. "Efficient navigation and control of outcomes in generalized Lotka-Volterra systems in the microbiome." [arXiv link]
8. **E. Jones***, J. Sheng*, S. Wang, and J. Carlson. "Aging and fragility in a coupled innate-adaptive immune model." [arXiv link]

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

SELECTED PRESENTATIONS

1. **Ecological mechanisms of bacteriotherapy in generalized Lotka-Volterra systems** at the web-based Evolutionary and Ecological Systems Biology seminar series (6/23/20) (held virtually)
2. GSNP Graduate Student Award Finalist Talk on **Ecological mechanisms of direct and indirect bacteriotherapies in generalized Lotka-Volterra systems** at APS March Meeting, Denver, CO (3/4/20) (virtual session)
3. Invited talk on **The simplification and control of microbial ecosystems** at the Biophysics and Soft Matter Seminar at Simon Fraser University (2/13/20)
4. Theory and Modeling of Living Systems Postdoctoral Fellow Candidate Talk on **The simplification and control of microbial ecosystems** at Emory University (2/5/20)
5. Invited talk on **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)
6. Invited talk on **Stochastic colonization of bacteria in the fly gut** at the Department of Mathematics at the University of Hawai'i at Mānoa (5/16/19)
7. Invited talk on **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)
8. **Steady-state reduction of generalized Lotka-Volterra systems in the microbiome** at the APS March Meeting, Boston, MA (3/6/19)
9. **Simulated *C. difficile* Infection** at Dynamics Days, Denver, CO (1/4/18)
10. **Predictive Measures of HIV Clearance** at MAA Mathfest, Washington, D.C. (8/7/15)

TEACHING EXPERIENCE

- Teaching Associate (instructor of record) for upper-division Lagrangian and Hamiltonian mechanics course (PHYS 104), for a class of 20 students in Summer 2019.
- Conceived, designed, and led the Programming Help Sessions (PHS) (Spring 2018, Fall 2018, and Spring 2019). These five 90-minute session sessions teach programming skills (including *nix commands, vim, LaTeX, and Python) to undergraduate physics majors. Curriculum freely available at `github.com/erijones/phs`.
- Teaching assistant for courses in complex analysis (PHYS 101, Winter 2016 and Winter 2020) and lower-division calculus-based kinematics (PHYS 20, Fall 2015)

MENTORSHIP EXPERIENCE

- Research mentor to undergraduate Parker Shankin-Clarke (April 2018 - June 2020), and formal graduate advisor for his participation in the UC LEADS (May 2018 - June 2020) and MRL RISE (three times) programs. Parker has presented our joint research three times, and it has been submitted to the AIMS Special Issue on Biological Systems Modeling.
- Research mentor to undergraduate Zipeng Wang (May 2018 - June 2020). Zipeng has presented our joint research twice, and it has been published in Phys Rev E. He will attend Johns Hopkins University in Fall 2020 to begin graduate school in physics.
- 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)

SERVICE

- Peer-reviewed two manuscripts (1x mBio, 1x AIMS Applied Mathematics Book Series)
- Volunteered for the Conference for Undergraduate Women in Physics (CUWiP), hosted by the Women in Physics (WiP) group at UCSB
- Assisted with prospective physics graduate visit day (February 2016, 2017, 2018, and 2019)
- Graduate Student Association (GSA) Representative from the Physics department, acting as treasurer (September 2016 - June 2017)

MEDIA COVERAGE

- The article "Microbiome interactions shape host fitness" has been adapted for publication in the non-profit journal *Science Journal for Kids* (December 2019) [link]
- The article "Microbiome interactions shape host fitness" has been covered in the press by *The UCSB Current* (written by Sonia Fernandez, 2018), *Science Daily*, *Scienmag*, *Phys.org*, *Futurity*, *EurekAlert*, and others [link]
- The article "Control of ecological outcomes through deliberate parameter changes in a model of the gut microbiome" has been covered in the press by *The UCSB Current* (written by Sonia Fernandez, 2020) [link]

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