**DEGREES**

**Ph.D. Biology, Arizona State University (ASU)**  2022

Committee: J. Liebig (advisor), B. Hölldobler, S.C. Pratt, J.H. Fewell, Y. Kang

**M.Sc. Biology (thesis), McGill University** 2012

Committee: G.S. Pollack (advisor), R. Krahe, L. Chapman

**B.S. Biology,** Geology minor, **Haverford College** 2009

**Semester in Env. Science, Marine Biological Laboratory, Woods Hole** 2007

**POSITIONS HELD**

**Ecology & Evol. Biology Postdoctoral Fellow, University of Toronto** 2024-present

Supervisors: A.D. Cutter, M.G. Freedman, F.H. Rodd, J.L. Sztepanacz

**Postdoctoral Fellow, York University** 2022-2024

Supervisor: S.M. Rehan

**Project Coordinator, Clinical and Health Informatics, McGill University** 2012-2014

Supervisor: R. Tamblyn

**PUBLICATIONS—9 total—5 first-authored (\*= undergraduate coauthor)**

9. **Pyenson, B.C**. & S. M. Rehan (2024) [**Gene regulation supporting sociality shared across lineages and variation in complexity**](https://doi.org/10.1139/gen-2023-0054)**.** *Genome*. 67. 99-108.

8. **Pyenson, B.C**., Huisken, J. L., Gupta, N.\*, & S.M. Rehan (2024a[) **The brain atlas of a subsocial bee reflects that of eusocial Hymenoptera**.](https://onlinelibrary.wiley.com/doi/10.1111/gbb.70007) *Genes, Brain, & Behavior*. 23:e70007. 1-14.

7. **Pyenson, B.C.**, Albin-Brooks, C., Ghaninia, M., & J. Liebig. (2024b) [**Fertility signaling interacts with dominance behavior in the social regulation of a ponerine ant**](https://drive.google.com/file/d/1u4JYYOguKzBuBncnqgrUtastaOvoPAMm/view?usp=sharing)**.** *Animal Behaviour (****In revision****,* ID: ANBEH-D-24-00520). 65 pages.

6. **Pyenson, B.**, Albin-Brooks, C., Burhyte, C.\*, & J. Liebig (2022) [**Worker-like behavioral and physiological phenotype in queens with removed wings in a ponerine ant.**](https://doi.org/10.1242/jeb.243684) *Journal*

*of Experimental Biology* 225 (18). 1-12: [**October 2022 Editor’s Choice;** [**Feature**](https://doi.org/10.1242/jeb.245039)**]**

5. Bustamante-Orellana, C., Bai, D., Cevallos-Chavez, J., Kang, Y., **Pyenson, B**., & C. Xie (2022) [**Hierarchy Establishment from Nonlinear Social Interactions and Metabolic Costs: an Application to the *Harpegnathos saltator***](https://doi.org/10.3390/app12094239)**.** *Applied Sciences* 12 (9): 4239. 1-21.

4. Choi, T., **Pyenson, B.,** Liebig, J., & T. Pavlic (2022) **[Beyond Tracking: Using deep](http://doi.org/10.1007/s10015-022-00753-y)**

**[learning to discover novel interactions in biological swarms](http://doi.org/10.1007/s10015-022-00753-y).** *Artificial Life and*

*Robotics*. 27: 393-400.

3. Bentley, S.J., Swales, A., **Pyenson, B.C.,** & J. Dawe (2014) **[Sedimentation,](http://doi.org/10.1016/j.ecss.2014.02.004)**

**[bioturbation, and sedimentary fabric evolution on a Modern mesotidal mudflat: a multi-tracer study of processes, rates, and scales](http://doi.org/10.1016/j.ecss.2014.02.004).** *Estuarine, Coastal, and Shelf Science*.141: 56-68**.**

2. **Pyenson, B.C.** & Pollack, G.S. (2012) **[Independent Regulation of Physiological and](http://doi.org/10.1139/cjz-2012-0170)**

**[Behavioral Maturation of Reproduction in Female Crickets,](http://doi.org/10.1139/cjz-2012-0170) *[Gryllus firmus.](http://doi.org/10.1139/cjz-2012-0170)*** *Canadian Journal of Zoology* 90(12): 1370-1377.

1. Sylvan, J.B., **Pyenson, B.C.,** Rouxel, O.J., German, C.R., & K. J. Edwards (2012)

[**Time series analysis of two hydrothermal plumes at 9.50°N East Pacific Rise reveals distinct, heterogeneous bacterial populations**](http://doi.org/10.1111/j.1472-4669.2011.00315.x)**.** *Geobiology.* 10: 178-192.

**Manuscript in Preparation for Submission:**

**Pyenson, B.C.**, Kakish, Z., Nagy, M., Vasarhelyi, G., Dagostino, A.\*, Kirkham, S.\*, Lam, M.\*, Matell, R.\*, Olivas, V.\*, Tuft, R.\*, Pratt, S., & J. Liebig. (2024c) Individual attributes and self-organized dynamics contribute to the establishment of a reproductive hierarchy in a ponerine ant.27 pages. **Target: *Nature***

**GRANTS & FELLOWSHIPS—$326K received, $123K extramural**

EEB Postdoctoral Fellowship ($148,000) University of Toronto 2024

Summer Fellowship ($2,024) SIRG, ASU 2022

Completion Fellowship ($16,911) SIRG, ASU 2021

Inclusive Teaching Fellowship (~$9,000) SOLS, ASU 2021

Grad. Research Support Program ($2,000) GPSA, ASU 2021

Student Research Grant ($1,500) SIRG, ASU 2018

Graduate College Fellowships ($20,000) Grad. College, ASU 2018-2021

Interdisciplinary Research Grant ($1000) SOLS, ASU 2017

Jumpstart Research Grant ($493) GPSA, ASU 2016

Post-Grad. Scholarship-Doctoral ($63,000) NSERC 2015-2018

Doctoral Fellowship-*declined* ($60,000) FRQ 2014-2017

Provost Graduate Fellowship ($1,500) McGill University 2009-2010

Louis Green Fund ($500) Haverford College 2009

Nat. Sci. Center Fund ($401) Haverford College2009

**AWARDS & HONORS**

Editor’s Choice Paper for October *J. Exp. Biol*  2022

West-Eberhard Best Paper Award Runner-Up IUSSI-NAS 2022

Best Paper Award DARS-SWARM 2021

Innovation Fellowship Volunteer ($100) GPSA, ASU 2021

Teaching Excellence Award ($500) GPSA, ASU 2018

Outstanding Mentor Award ($500) GPSA, ASU 2018

Graduate Excellence Award ($200) CLAS, ASU 2017

**MENTORING—14 undergraduates, Outstanding Mentor Award**

Nandini Gupta, York, Honors thesis 2023

**coauthor, Pyenson et al. 2024a**

Annabelle D’Agostino, ASU, two research courses 2020-2021

**coauthor, Pyenson et al. 2024c, now: Medical student, Kansas U.**

Spencer Kirkham, ASU, two research courses 2020-2021

**coauthor, Pyenson et al. 2024c, now: Law student, ASU**

Monica Lam, ASU, two research courses 2020-2021

**coauthor, Pyenson et al. 2024c**

Ruben Matell, ASU, two research courses 2020-2021

**coauthor, Pyenson et al. 2024c, now: Data Scientist, Deloitte**

Victoria Olivas, ASU, two research courses 2020-2021

**coauthor, Pyenson et al. 2024c**

Rose Tuft, ASU, two research courses 2020-2021

**coauthor, Pyenson et al. 2024c, now: Veterinary student**

Sarah Varghese, ASU, research course 2020

Corinne Burhyte, ASU work-study, research course 2017-2019

**coauthor, Pyenson et al. 2022**

Steven Velasco, ASU, volunteer 2017

**acknowledged, Pyenson et al. 2024b, now: Dentist, Arizona**

Alejandra Mayoral, ASU, Honors thesis 2017

**cited, Bustamante-Orellana et al. 2022**

Jeffrey Chien, ASU, Honors thesis 2015-2018

**acknowledged, Pyenson et al. 2024b, now: Engineer, Apple**

Fatima Barat Ali, ASU, Honors thesis, research course 2015-2018

**acknowledged, Pyenson et al. 2024b**

**TEACHING—6 years, 15 courses total, Teaching Excellence Award**

**Instructor of Record, K-12 Science Education, ASU** 2020

Taught graduate students to develop remote K-12 science lessons

**Teaching Assistant, Life Science Courses**  2009-2021

Instructed lab, lecture, and recitation section with active-learning strategies

[**Dreamscape at ASU Virtual Reality**](https://news.asu.edu/20221021-creativity-vr-biology-lab-experience-leads-student-success) -- Ecology & Evolution focus 2021

BIO360: Animal Physiology Lecture & Breakouts 2018

BIO361: Animal Physiology Lab 2019

BIO340: General Genetics Lecture & Breakouts 2017, 2020

BIO112: Cell and Molecular Biology Lab 2010, 2012

BIO206: Methods in Organismal Biology Lab—Biostatistics 2009, 2011

BIO182-General Biology—Ecology & Evolution focus 2019

BIO100-The Living World-- Survey course 2019

BIO281 Lab-General Biology I Lab—Molecular & Cell focus 2015

**Volunteer Instructor, R Workshop, SOLS, ASU** 2018

Helped students navigate the software R for data analysis and visualization

**Science Instructor, The Kew-Forest School, New York City** 2014-2015

Inquiry and project-based assessments, 4 courses, at diverse secondary school

**CURRICULUM DESIGN—3 undergraduate courses revised**

**Inclusive Teaching Fellow, SOLS, ASU** 2021

Revised undergraduate genetics course with 7 professors for inclusion

**Curriculum Design Assistant for two introductory biology courses** 2019-2021

Revised learning objectives and assessments for various concepts

**OUTREACH & SERVICE—Innovation Fellowship Volunteer Award**

**Participant,** DEIJ advisory board, IUSSI, TIDE, BREWS 2024

**Session moderator**, Entomological Society of Ontario 2024

**Public demonstrations** about bee diversity, World Bee Day, York U. 2022-2023

**Director, Graduate Program in Science Education,** ASU2020-2021

**Public demonstration** about insect diversity, Night of the Open Door, ASU 2018-2019

**Public demonstration** about ants, SW Robotics Research Symposium, ASU 2019

**Teaching Award reviewer, GPSA, ASU** 2019

**Research Award reviewer, GPSA, ASU** 2019

**PEDAGOGICAL TRAINING**

Inclusive Teaching Practitioner SOLS, ASU 2021

Methods for Online Teaching SOLS, ASU 2019

Module-Based Teaching Animal Behavior Society 2017

SALTISE-Introduction to Active Learning Dawson College 2017

AP Biology Instruction The College Board 2014

**INVITED TALKS—10 (\*= undergraduate coauthor)**

**Pyenson, B.C.** (2025) The sensory physiology underlying cooperation and ecological specialization. Kennesaw State University.

**Pyenson, B.C.** (2025) Behavior and physiology underlying the evolution of cooperation in social Hymenoptera. Brock University.

**Pyenson, B.C. (**2024) Physiology underlying the evolution of cooperative and specialist behavior. Utah Valley University.

**Pyenson, B.C.** (2024) Understanding insect-plant interactions with transcriptomics. University of Toronto-Mississauga.

**Pyenson, B.C.** (2024) Using the regulation of insect social behavior to explore the neuromolecular basis of sociability.McMaster University

**Pyenson, B.C.** (2024) Impacts of light pollution from urbanization on vulnerable bee-plant interactions.Toronto and Region Conservation Authority.

**Pyenson, B.C.** (2024) The effects of light pollution on a vulnerable specialist bee. David Suzuki Foundation.

**Pyenson, B.C.** Huisken, J. L., Gupta, N.\*, & S.M. Rehan (2023) **[A subsocial bee brain](https://youtu.be/MBcoVWo8zQ8?si=QqqWLWgsVntPKdUu)**

**[reflects the cell diversity of social Hymenoptera](https://youtu.be/MBcoVWo8zQ8?si=QqqWLWgsVntPKdUu).** U. of Toronto Health Network.

**Pyenson, B.C.** (2022) Using *Harpegnathos saltator* to understand how

reproductive phenotypes are regulated. Johannes Gutenberg University Mainz.

**Pyenson, B.C.** (2021) Using *Harpegnathos saltator* to understand how

reproductive phenotypes are regulated. Rockefeller University.

**CONFERENCE PRESENTATIONS (\*= undergraduate coauthor)**

**Pyenson, B.C.** Brent, C.S. & S.M. Rehan (2024**)** Juvenile hormone in a subsocial bee is associated with reproduction but not brood care. Entomological Society of America.

**Pyenson, B.C.** Brent, C.S. & S.M. Rehan (2024**)** Juvenile hormone in a subsocial bee is associated with reproduction but not brood care. Entomological Society of Ontario.

**Pyenson, B.C.** Huisken, J. L., Gupta, N.\*, & S.M. Rehan (2023) A subsocial bee brain

reflects the cell diversity of social Hymenoptera. BeeCon 2023.

**Pyenson, B.C.**, Albin-Brooks, C., Burhyte, C. & J. Liebig (2022**) [Dealation induces the](https://www.youtube.com/watch?v=rWRIsz8ZEOw)**

**[worker- like phenotype in a ponerine ant queen](https://www.youtube.com/watch?v=rWRIsz8ZEOw)**. Soc. Integr. & Comp. Biology.

**Pyenson, B.C.**, Albin-Brooks, C., Burhyte, C. & J. Liebig (2021**) [Dealation induces the](https://www.youtube.com/watch?v=rWRIsz8ZEOw)**

**[worker- like phenotype in a ponerine ant queen](https://www.youtube.com/watch?v=rWRIsz8ZEOw).** Entomology.

**Pyenson, B.C.**, Albin-Brooks, C., Burhyte, C. & J. Liebig (2021**) [Dealation induces the](https://www.youtube.com/watch?v=rWRIsz8ZEOw)**

**[worker- like phenotype in a ponerine ant queen](https://www.youtube.com/watch?v=rWRIsz8ZEOw).**  Animal Behavior Society.

**Pyenson, B.C**., Kang, Y., and J. Liebig (2017) Behavioral regulation of a hierarchy in a

social insect colony. Quebec Society for the Study of Biological Behavior

**CONFERENCE PROCEEDINGS**

Choi, T., **Pyenson, B.,** Liebig, J., & T. Pavlic (2021) **[Beyond Tracking: Using Deep](https://arxiv.org/pdf/2108.09394.pdf)**

**[Learning to Discover Novel Interactions in Biological Swarms](https://arxiv.org/pdf/2108.09394.pdf).** In: *Proceedings of the Fifteenth International Symposium on Distributed Autonomous Robotic Systems; Fourth International Symposium on Swarm Behavior and Bio-Inspired Robotics (DARS-SWARM-2021)*.[**Best Paper Award]**

Choi, T., **Pyenson, B.,** Liebig, J., & T. Pavlic (2021) **[Identification of Abnormal States](https://arxiv.org/pdf/2009.08626.pdf)**

**[in Videos of Ants Undergoing Social Phase Change](https://arxiv.org/pdf/2009.08626.pdf).** In: *Proceedings of the Thirty-Third Annual Conference on Innovative Applications of Artificial Intelligence (IAAI-21).*

**TRAVEL FUNDING**

Q3 Travel Award ($200) Grad. College, ASU 2022

Individual Travel Grant ($159) GPSA, ASU 2021

Q2 Online/Remote Travel Award ($137) Grad. College, ASU 2021

Individual Travel Grant ($500) Grad. College, ASU 2020

Individual Travel Grant ($950) GPSA, ASU 2020

Individual Travel Grant ($475) Grad. College, ASU 2017

Individual Travel Grant ($950) GPSA, ASU 2017

Individual Travel Grant ($400) SOLS, ASU 2017

**PROFESSIONAL AFFILIATIONS**

International Union for the Study of Social Insects (IUSSI-NAS)

Society for Integrative & Comparative Biology

Entomological Society of America

Entomological Society of Ontario

Animal Behavior Society

***Legend***:

BREWS= Broadening Representation & Equity With Science, University of Toronto

CLAS=College of Liberal Arts & Sciences

DARS-SWARM= Distributed Autonomous Robotic Systems; Fourth International Symposium on Swarm Behavior and Bio-Inspired Robotics

FRQ= Fonds de Recherche du Quebec

GPSA= Graduate & Professional Students’ Association

IUSSI= International Union for the Study of Social Insects

NSERC= National Science & Engineering Research Council of Canada

SIRG=Social Insect Research Group

SOLS= School of Life Sciences

TIDE= Toronto Initiative for Diversity and Excellence

**PROFESSIONAL REFERENCES**

**Dr. Jürgen Liebig** ([juergen.liebig@asu.edu](mailto:juergen.liebig@asu.edu)) Phone: ([480) 727-8508](tel:4807278508)

**Associate Professor,**

**School of Life Sciences, Arizona State University**

***PhD Thesis Chair***

***Supervisor****: BIO340-TA; Inclusive Teaching Fellowship*

**Dr. Sandra Rehan** ([Sandra.rehan@gmail.com](mailto:Sandra.rehan@gmail.com)) Phone: (416) 736-2100 x 77822

**Associate Professor**

**Department of Biology, York University**

***Postdoctoral Supervisor***

**Dr. Yun Kang (**[yun.kang@asu.edu](mailto:yun.kang@asu.edu)**)** Phone: ([480) 727-5004](tel:4807275004)

**Professor, Science and Mathematics Faculty**

**College of Integrative Sciences and Arts, Arizona State University**

***PhD Thesis Committee Member***

***Facilitator****: Research Supervision of Undergraduate Students*

**Dr. Michael Angilletta** (ma@asu.edu) Phone: 480-965-4321

**Associate Dean for Learning Innovation,**

**President’s Professor, School of Life Sciences, Arizona State University**

***Supervisor****: BIO182-TA; Dreamscape-TA; Curriculum Design-TA*