

Caleb Cook Ryan

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education

- 2021-now PhD, Biology, University of Waterloo, *Canada*
thesis: Personality, Individuality, and the Social Lives of Bats
advisor: Hugh Broders. committee: Julie Messier, Richard Eibach
- 2021 BSc, Environmental Sciences and Ecology*, University of Waterloo, *Canada*
thesis: Individual specialization of Little brown bat (*Myotis lucifugus*) roosting behaviors
**graduated with honours*

research positions

- 2025 - now Pre-doctoral Fellow, Smithsonian Tropical Research Institute; *Panamá*

funding and awards

Research Funding

- 2025 Theodore Roosevelt Memorial Research Grant, American Museum of Natural History (USD\$3K)
2023 Theodore Roosevelt Memorial Research Grant, American Museum of Natural History (USD\$3.5K)

PhD Scholarships and Awards

- 2025 Science Graduate Award, University of Waterloo (CAD\$6k)
2024 Journal of North American Bat Research Award, North American Society for Bat Research (USD\$500)
2024 Graduate Student Research Dissemination Award, University of Waterloo (CAD\$500)
2024 Bat Award, International Society for Neuroethology (€500, Declined)
2024 Science Graduate Award, University of Waterloo (CAD\$6k)
2023 Graduate Student Research Dissemination Award, University of Waterloo (CAD\$500)
2023 Science Graduate Award, University of Waterloo (CAD\$6k)
2022 Science Graduate Award, University of Waterloo (CAD\$6k)
2021 Science Graduate Award, University of Waterloo (CAD\$6k)

Undergraduate Scholarships and Awards

- 2019, 2020 Dean's Honour Roll, University of Waterloo
2019 Academic All-Canadian, USPORTS
2018, 2019 All-OUA Academic, Ontario University Athletics

2018, 2019 President's Athlete Academic Honour Roll, University of Waterloo
 2017 University of Waterloo Merit Scholarship, University of Waterloo (CAD\$1k)

publications

2025

3. Vanderwolf, Karen J., Donald F. McAlpine, **Caleb C. Ryan**, Hugh G. Broders (2025) *Pseudogymnoascus destructans* environmental reservoir decreases eleven years after an outbreak of white-nose syndrome. *Ecosphere*
 *featured by [CBC News](#)

2020

2. Banerjee, Arinjay, Kaushal Baid, Taylor Byron, Alyssa Yip, **Caleb Ryan**, Prasobh Raveendran Thampy, Hugh Broders, Paul Faure, and Karen Mossman (2020) Seroprevalence in Bats and Detection of *Borrelia burgdorferi* in Bat Ectoparasites. *Microorganisms*.

2019

1. **Ryan, Caleb C.**, Lynne E. Burns, and Hugh G. Broders (2019) Changes in Underground Roosting Patterns to Optimize Energy Conservation in Hibernating Bats. *Canadian Journal of Zoology*

Submitted for peer review

- Caleb C. Ryan**, Julia Sunga, Jessica Humber, Heather L. S. Arsenault, Alistair M. Mackenzie, Hugh G. Broders (*in review*) Conserving cryptic complexity: Bats with broker roles structure *Myotis lucifugus* maternity societies pre- and post-white-nose syndrome.

invited talks

Department Seminars

5. A Monitoring Approach to Studying Individual Behavior and Social Relationships, Smithsonian Tropical Research Institute, *Panamá*, 20 June 2025
4. Bat Traffic on a Forest Highway: Spatial, Social, and Behavioural Dynamics of Flying Bats, Museum für Naturkunde (Museum of Natural History), *Germany*, 9 July 2024
3. Individuality and the Social Lives of Bats: An Interdisciplinary Approach to Bat Research, Bambi Seminar, Smithsonian Tropical Research Institute; *Panamá*, 4 April 2024
2. Behavior, Ecology, and the Social Lives of Bats, Department of Life Sciences, University of the West Indies at Mona; *Jamaica*, 17 February 2024
1. Doing Interdisciplinary Science (Stories from the Field), Department of Knowledge Integration, University of Waterloo; *Canada*, 12 January 2024

Conference Symposia

1. **Caleb C. Ryan**, Julia Sunga, Jessica Humber, Alistair MacKenzie, Hugh G. Broders. Social Cohesion of Bat Groups Post-White-Nose Syndrome is Highly Vulnerable to Further Losses. Allee Symposium, Animal Behaviour Society Conference, London, ON, *Canada*. 28 Jun 2024

Non-Academic Seminars

1. Personality, Individuality, and the Social Lives of Bats, Parry Sound Naturalist Society, *Canada*, 19 October 2022

conference presentations

2024

14. **Caleb Ryan**, Felix Lawson, Nancy B. Simmons, and Hugh Broders. Investigating the Diversity of Social Strategies Among Neotropical Bats North American Symposium on Bat Research, Guadalajara, Mexico. 24 Oct 2024 (Talk)
** awarded Journal of North American Bat Research Award for best student presentation*
13. Lily Hou, Lucas Greville, **Caleb Ryan**, Hugh Broders, and Liam McGuire. The Impact of Post-Hibernation Energetic Constraints on Reproductive Timing in *Myotis lucifugus*. North American Symposium on Bat Research, Guadalajara, Mexico. 25 Oct 2024 (Talk)
12. Michela Contursi, **Caleb Ryan**, Sepidar Golestaneh, and Hugh Broders. Dawn Swarming as a Signalling Strategy for Social Group Integration and Cohesive Roost Settlement. North American Symposium on Bat Research, Guadalajara, Mexico. 24 Oct 2024 (Talk)
11. Sepidar Golestaneh, **Caleb Ryan**, Michela Contursi, and Hugh Broders. What Makes the Bats Boogie? Impact of Humans, Traps, and Other Bats on Bat Behaviour North American Symposium on Bat Research, Guadalajara, Mexico. 24 Oct 2024 (Talk)
10. Michela Contursi, **Caleb Ryan**, Sepidar Golestaneh, and Hugh Broders. Early birds? No, Bats! The Curious Case of Dawn Swarming in Little Brown Bats. Animal Behaviour Society Conference, London, ON, *Canada*. 27 Jun 2024 (Talk)
9. Sepidar Golestaneh, **Caleb Ryan**, Michela Contursi, and Hugh Broders. Curiosity Caught the Bat: How do Bats Respond to Human and Trap Presence at Swarming Sites? Animal Behaviour Society Conference, London, ON, *Canada*. 27 Jun 2024 (Talk)
8. Contursi, M.M.C, **Ryan, C.C.**, Golestaneh S., and Broders, H.G. (2024). A Case of the Zoomies? Unraveling the Intricacies of Dawn Swarming Behaviour in Temperate Bats. Ontario Ecology, Ethology, and Evolution Colloquium (OE3C), University of Waterloo, Waterloo, Ontario, *Canada* (Talk)

2023

7. **Caleb Ryan**, Nancy B. Simmons, and Hugh Broders. Bat Traffic on a Forest Highway: Interspecific and Interindividual Variation in How Bats Use Trails in a Tropical Forest North American Symposium on Bat Research, Winnipeg, MB, Canada. 14 Oct 2023 (Talk)
 6. Sepidar Golestaneh, **Caleb Ryan**, Michela Contursi, and Hugh Broders. Luring out the truth: Separating the motivations for swarming by characterizing how bats respond to different acoustic lures North American Symposium on Bat Research, Winnipeg, MB, Canada. 14 Oct 2023 (Talk)
 5. Hugh Broders, **Caleb Ryan**. Minimal recovery of bat populations in Maritime Canada ten years after the arrival of *Pseudogymnoascus destructans* North American Symposium on Bat Research, Winnipeg, MB, Canada. 16 Oct 2023 (Talk)
 4. Michela Contursi, **Caleb Ryan**, Sepidar Golestaneh, and Hugh Broders. Pre-dawn Rallying Behaviour may Maintain Social Group Integration in *Myotis lucifugus* Maternity Societies North American Symposium on Bat Research, Winnipeg, MB, Canada. 14 Oct 2023 (Talk)
- 2022
3. **Caleb Ryan**, Julia Sunga, and Hugh Broders. Individual Social Roles in the Organization of *Myotis lucifugus* Maternity Societies International Bat Research Conference, Austin, TX, USA. August 9th, 2022 (Talk)
- 2019
2. **Caleb Ryan**. Changes in Underground Roosting Patterns to Optimize Energy Conservation in Hibernating Bats. North American Symposium on Bat Research. Kalamazoo, MI, USA. October 23rd, 2019 (Talk)
 1. Alexandra Sauk, **Caleb Ryan**, and Hugh Broders. Using DNA Barcoding to Determine Community Structure of Bat Ectoparasites in Atlantic Canada North American Symposium on Bat Research. Kalamazoo, MI, USA. October 23rd, 2019 (Talk)

teaching

Guest Lectures

2024 Biol 211: Vertebrate Zoology, Biol 359: Evolution 1

Graduate Student Teaching Experience

2024 Biol 211: Vertebrate Zoology (Lab)

2023 BME 274L: Biology for Engineers (Lab), Biol 211: Vertebrate Zoology (Lab)

2022 Biol 110: Introductory Zoology (Lab), Biol 211: Vertebrate Zoology (Lab)

2021 Biol 443: Fermentation Biotechnology (Virtual), Biol 211: Vertebrate Zoology (Lab - Virtual)

service

Institutional Service

2022 Biology Representative, Graduate Student Association, University of Waterloo
2021-2022 Councillor, Biology Graduate Student Association, University of Waterloo

Journal Peer Review

2025 Animals
2023 Behavioural Ecology and Sociobiology
2022 Journal of Mammalogy, Journal of Integrative Research and Reflection
2020 Ecology and Evolution, Journal of Integrative Research and Reflection