

Bryan Currie

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Research Interests

Mathematical Phylogenetics: extremal tree balance and identifiability

Education

Expected 2028 | PhD in Mathematical Sciences, New Jersey Institute of Technology (NJIT)
2022 | BA in Mathematics, Middlebury College (Midd)

Papers

1. **Currie, Bryan**, and Kristina Wicke. "On the maximum value of the stairs2 index." [arXiv:2401.08838](https://arxiv.org/abs/2401.08838) (2024).
2. **Currie, Bryan L.**, Jill R. Faudree, Ralph J. Faudree, and John R. Schmitt. "A Survey of Minimum Saturated Graphs." *The Electronic Journal of Combinatorics*, Dynamic Surveys, Oct. 2021, <https://doi.org/10.37236/41>.

Contributed Talks and Poster Presentations

July 2024 | Talk: *Measuring tree balance using the stairs2 index: A new result regarding extremal trees*, 3rd Joint Congress on Evolutionary Biology, Montreal
October 2023 | Poster: *Some Effects of Behavior amid an Epidemic Disease*, SIAM-NNP conference
April 2022 | Talk: *Synchronization of Electrically Coupled Neurons*, Joint Mathematics Meetings (Virtual)

Workshops

July 2024 | Algebra in Phylogenetics Workshop at University of Hawai'i at Mānoa, worked in group headed by Dr. John Rhodes

Research Positions

Graduate Research Assistant to Dr. Kristina Wicke (NJIT), September 2023 – present

- Studying extremal cases of balance of phylogenetic trees
- Paper, "On the maximum value of the stairs2 index" coauthored and submitted for publication (preprint: <https://arxiv.org/abs/2401.08838>)
- Exploring extensions of balance indices to phylogenetic networks

Undergraduate Research Assistant to Dr. Jennifer Crodelle (Midd), June 2021 – August 2021

- Studied effect of electrical coupling on neuronal synchrony as quantified by a few measures, one tailored to the project
- Used MATLAB to conduct simulations of neurons with different electrical and synaptic coupling strengths

- Abstract accepted to give a 15-minute talk at the Joint Mathematics Meetings in Seattle (originally January 2022, eventually held virtually April 2022)

Undergraduate Research Assistant to Dr. John Schmitt (Midd), June 2020 – May 2021

- Coauthored, with Professor John Schmitt (Middlebury College) and Professor Jill Faudree (U. of Alaska, Fairbanks), a significant update to “A Survey of Minimum Saturated Graphs” published on October 11th, 2021 (<https://doi.org/10.37236/41>)
- Wrote new sections on Saturation Games and Induced Saturation, contributed heavily to sections on Bootstrap Percolation and Host Graphs other than K_n
- Prepared summaries of scholarship 2011-2020 for most sections to aid fellow coauthors in updating

Professional Experience

Exponent Fellow at the National Museum of Mathematics, July 2022 – August 2023

- Museum focused on inspiring love and appreciation of mathematics for all ages
- Worked as docent on exhibit floor
- Originated and taught two lessons on combinatorics/number theory aimed at ages 6-11

Awards

May 2022 | Parker Prize – Middlebury College Math department award for best senior work
(thesis title: *Some Effects of Behavior amid an Epidemic Disease*)