

# Joseph Bak-Coleman

## PERSONAL DETAILS

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## PROFESSIONAL APPOINTMENTS

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**Postdoctoral Scholar** Sep 2020 - Present  
*University of Washington*  
Center for an Informed Public

**UW Data Science Postdoctoral Fellow** Sep 2020 - Present  
*University of Washington*  
eScience Institute

## EDUCATION

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**Ph.D. Ecology and Evolutionary Biology** 2014-2020  
*Princeton University*  
Supervisors: Professor Iain Couzin, Professor Dan Rubenstein  
Dissertation Title: Collective behavior in a connected world

**M.A. Ecology and Evolutionary Biology** 2016  
*Princeton University*  
Supervisors: Professor Iain Couzin, Professor Dan Rubenstein

**M.S. Biology** 2014  
*Bowling Green State University*  
Supervisor: Professor Sheryl Coombs  
Thesis Title: The role of the lateral line during rheotaxis

**B.S. Neuroscience** 2011  
*Bowling Green State University*

## MANUSCRIPTS

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- [4] **J. Bak-Coleman** et al. "Combining interventions to reduce the spread of viral misinformation". In: (2021). URL: [osf.io/preprints/socarxiv/4jtvvm](https://osf.io/preprints/socarxiv/4jtvvm).
- [3] M. Sosna et al. "Quantifying the spatial distribution of risk in fish schools." In: (prep).
- [2] **J. Bak-Coleman** et al. "Collective wisdom in polarized groups." In: (prep).
- [1] K. Tombak et al. "Zebra groups aggregate in response to Petrucci's passive forces, disaggregate in response to Darwn's hostile forces." In: (prep).

## PUBLICATIONS

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- [12] **J. Bak-Coleman** et al. “Stewardship of Global Collective Behavior”. In: *PNAS* (2021).
- [11] S. Coombs, **J. Bak-Coleman**, and J. Montgomery. “Rheotaxis revisited: Multi-behavioral and multisensory frameworks for understanding how fish orient to flow.” In: *The Journal of Experimental Biology* (2020).
- [10] L. Liang et al. “Energy savings in freely swimming fish”. In: *Nature Communications* (2020).
- [9] C. Winkylmayr, A. Kao, and **J. Bak-Coleman**. “The wisdom of stalemates: consensus and clustering as filtering mechanisms for improving collective accuracy”. In: *Proceedings B* (2020).
- [8] M. Sosna et al. “Structural encoding of perceived risk in fish schools”. In: *PNAS* (2019).
- [7] A. Kao et al. “Counteracting estimation bias and social influence to improve the wisdom of crowds.” In: *Journal of the Royal Society, Interface* 15 (2018).
- [6] A. Chicoli et al. “Rheotaxis performance increases with group size in a coupled phase model with sensory noise: The effects of noise and group size on rheotaxis”. In: *European Physical Journal: Special Topics* 224 (2015).
- [5] M. Kulpa, **J. Bak-Coleman**, and S. Coombs. “The lateral line is necessary for blind cavefish rheotaxis in non-uniform flow”. In: *The Journal of Experimental Biology* 218 (2015).
- [4] **J. Bak-Coleman**, D. Smith, and S. Coombs. “Going with, then against the flow: Evidence against the optomotor hypothesis of fish rheotaxis”. In: *Animal Behaviour* 107 (2015).
- [3] A Chicoli et al. “The effects of flow on schooling *Devario aequipinnatus*: school structure, startle response and information transmission”. In: *Journal of Fish Biology* (2014).
- [2] **J. Bak-Coleman** and S. Coombs. “Sedentary behavior as a factor in determining lateral line contributions to rheotaxis”. In: *The Journal of Experimental Biology* 217 (2014).
- [1] **J. Bak-Coleman** et al. “The spatiotemporal dynamics of rheotactic behavior depends on flow speed and available sensory information.” In: *The Journal of Experimental Biology* 216 (2013).

## AWARDS AND FUNDING

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CIP Innovation Fund Rapid Response Workshop	\$2.5K
CIP Innovation Fund Experimental approaches to studying misinformation online	\$10K
CIP Postdoctoral fellowship (2 years)	*\$150K
UW eScience Institute Data Science Postdoctoral fellowship	\$2K
Princeton University Graduate Student Fellowship (6 years)	*\$550K
BGSU CURS Summer Research Fellowship	\$2.5K
BGSU SETGO Summer Research Fellowship	\$3.5K
Choose Ohio First Bioinformatics Scholarship (3. years)	\$12K
Flow Sensing in Air and Water Travel Award	\$2K

\*Approximate

## OTHER ARTICLES

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- A High-Speed Scientific Hive Mind Emerged, *Scientific American*, 2021\*
- Meta’s ‘average user’ data obscures harm to thousands... *The Conversation*, 2021\*
- Journalists are exposing Facebook’s problems. We’ll need academics... *Tech Policy Press*, 2021\*
- How to Mislead with Statistics, *Significance*
- The Long Fuse: Misinformation and the 2020 Election *Election Integrity Partnership*, 2021
- Information gerrymandering in social networks skews collective decision-making. *Nature*, 2019
- The ignorance of the crowd. *Scientific American*, Nov. 2017\*
- Why did Donald Trump get elected? Ask the bees. *Wired*, Dec. 2016\*

\*denotes primary/sole author

## SEMINARS AND CONFERENCE PARTICIPATION

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Keynote Speaker, Social Media As A Crisis Discipline Workshop (Berkman Klein Center, Harvard)	*2021
Machine Learning Ethics, Transparency and Accountability Seminar Speaker (Twitter)	*2021
Plenary, DARPA ISAT SLICE Workshop (Stanford Internet Observatory)	*2021
Whole U Seminar Series (University of Washington)	*2021
Online Behavioral Interventions Workshop (Max Planck Institute for Human Development)	*2021
Collective Intelligence Workshop (Santa Fe Institute)	*2021
Humphrey Fellowship Seminar (University of Washington)	*2021
IC2S2 Satellite Panel (Konstanz)	*2021
iSchool Seminar Series (University of Washington)	*2021
IC2S2 (Amsterdam)	2019
Invited Lecture (Lenoir-Rhyne University)	*2019
Van Bavel Lab Meeting (New York University)	*2019
Collective Behavior, Social Media and Systemic Risk (Princeton University)	*2018
Yale Institute for Network Science (Yale University)	*2018
Distributed, Collective Computation in Biological and Artificial Systems (Janelia Farm)	2018
Integrated Behavioral Research Group (Princeton University)	2018
Metropolitan Society of Natural Historians (AMNH)	*2016
Integrated Behavioral Research Group (Princeton University)	2016
Animal Behavior Society (Bloomington, IN)	2012
International Congress of Neuroethology (College Park, MD)	2012
Ecological and Evolutionary Ecology of Fishes (Windsor, ON)	2012
J.P. Scott Seminar (BGSU)	2011
Flow Sensing in Air and Water (Bonn, Germany)	*2011
Undergraduate Honors Society Seminar (BGSU)	*2011
SETGO Symposium (BGSU)	2011
J.P. Scott Seminar (BGSU)	2010

\* Invited

## SELECTED MEDIA COVERAGE

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As Climate Change Fries the World, Social Media Is Frying Our Brains. *Bloomberg*  
It's Time to Treat Social Media Like the Climate Crisis, Researchers Argue. *Gizmodo*  
Why some biologists and ecologists think social media is a risk to humanity. *Vox*  
The coronavirus pandemic drove life online. It may never return., *NBC News*  
Social-Media Companies Took an Aggressive Stance During the Election. Will It Continue?, *WSJ*  
Misinformation by a thousand cuts: Varied rigged election claims circulate, *NBC News*  
Project Veritas Video Was a 'Coordinated Disinformation Campaign,' Researchers Say. *NYT*

## TEACHING

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<b>Guest Lecturer</b> <i>Calling Bullshit</i> 2020	University of Washington
<b>Guest Lecturer</b> <i>Comparative Physiology</i> 2017-2018	Princeton University
<b>Assistant in Instruction</b> <i>Comparative Physiology</i> <i>Conservation Biology</i> <i>Life on Earth: Chaos and Clockwork of Biological Design</i> 2014-2018	Princeton University
<b>Adjunct Instructor</b> <i>Introductory Biology, Taxonomy</i> 2014	Owens Community College

## SERVICE

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Lab meeting and Seminar Series Organizer, **Center for an Informed Public**, 2020-present  
Hidden Curriculum Happy Hour Organizer, **Center for an Informed Public**, 2021  
Misinfo rapid-response workshop organizer, **Center for an Informed Public**, 2021  
Election Integrity Partnership Analyst Team Lead, **Election Integrity Partnership**, 2020  
EEB Scholars Host and Speaker, **Princeton**, 2018-2019  
DEI Recruiting, **ABRCMS**, 2018  
CBSMSR Conference Organizer, **Princeton**, 2017  
Graduate Representative, **Princeton**, 2016-2018  
DEI Recruiting, **ABRCMS**, 2017  
Prospective Student Week Organizer, **Princeton**, 2014-2019  
Behavior Seminar Series Organizer, **Princeton**, 2015-2016  
Graduate Retreat Organizer, **Princeton**, 2016-2017  
President of Biology Graduate Student Association, **BGSU**, 2011-2013

## TECHNICAL SKILLS

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Python	Advanced
Bayesian Inference	Advanced
Machine Learning	Proficient
React	Proficient
Javascript	Proficient
R	Proficient
Computer Vision	Proficient
Matlab	Proficient
Full stack development	Proficient
Deep Learning	Familiar

## PEER REVIEW

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Animal Behavior  
Biology Open  
Entropy  
Journal of Experimental Biology  
Nature Communications  
Physics Review Letters  
Patterns  
PLOS Computational Biology  
PNAS  
Proceedings B  
Science Advances