Matthew J Michalska-Smith

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Current Positions

Postdoctoral Research Associate
U. Minnesota, Veterinary Population Medicine, Craft Lab — *Since 2018*
› Multistrain disease dynamics in metapopulation livestock populations

Postdoctoral Research Associate
U. Minnesota, Dept. of Plant Pathology, Kinkel Lab — *Since 2018*
› Network structure of multi-layer microbial interaction networks

Education

University of Chicago, Chicago, IL
Ph.D., Ecology & Evolution — *2013-18*
Adviser: Stefano Allesina
Dissertation: "Structural Inferences: three cases of linking pattern and process in ecological networks"

University of Notre Dame, Notre Dame, IN
B.S., Biological Sciences and Theology — *2008-12*

Experience

Instructor
U. Chicago, BSD-QBio — *2015-2017*
(Biological Sciences Division Quantitative Biology Boot-camp for incoming graduate students)
› Beginner/Advanced programming in the biological sciences
› Statistics for large datasets

Teaching Assistant
U. Chicago, Biological Sciences Division — *2014-2017*
› Theoretical Ecology (Winter 2017)
› Biodiversity (with laboratory component; Spring 2016)
› Introduction to Scientific Computing (Winter 2014, 2016)
› Ecology & Evolution (with laboratory component; Winter 2015)

Laboratory Technician
U. Chicago, Dept. Ecology & Evolution, Allesina Lab — *2012-13*
› Theoretical ecology with an emphasis on networks

Publications & Presentations

Publications

1. **Matthew J. Michalska-Smith** and Stefano Allesina. Telling ecological networks apart by their structure: a computational challenge. *PLOS Computational Biology*, 15(6):1–13, 06 Accepted. `https://doi.org/10.1371/journal.pcbi.1007076`.

2. Terrence H Bell, ..., **Matthew Michalska-Smith**, ..., and Etienne Yergeau. Manipulating wild and tamed phytobiomes: Challenges and opportunities. *Phytobiomes Journal*, 2019. `https://doi.org/10.`

1094/pbiomes-01-19-0006-w.

3. **Matthew J. Michalska-Smith**[*], Elizabeth L. Sander[*], Mercedes Pascual, and Stefano Allesina. Understanding the role of parasites in food webs using the group model. *Journal of Animal Ecology*, 87:790–800, 2018. https://doi.org/10.1111/1365-2656.12782.

4. György Barabás, **Matthew J. Michalska-Smith**, and Stefano Allesina. Self-regulation and the stability of large ecological networks. *Nature Ecology & Evolution*, 1(12):1870–1875, 2017. https://doi.org/10.1038/s41559-017-0357-6.

5. Jacopo Grilli, György Barabás, **Matthew J. Michalska-Smith**, and Stefano Allesina. Higher-order interactions stabilize dynamics in competitive network models. *Nature*, 548(7666):210–213, 2017. https://doi.org/10.1038/nature23273.

6. **Matthew J. Michalska-Smith** and Stefano Allesina. And, not or: Quality, quantity in scientific publishing. *PLOS ONE*, 12(6):1–12, 2017. https://doi.org/10.1371/journal.pone.0178074.

7. György Barabás[*], **Matthew J. Michalska-Smith**[*], and Stefano Allesina. The effect of intra- and interspecific competition on coexistence in multispecies communities. *The American Naturalist*, 188(1):E1–E12, 2016. https://doi.org/10.1086/686901.

8. **Matthew J. Smith**, Elizabeth Sander, György Barabás, and Stefano Allesina. Stability and feedback levels in food web models. *Ecology Letters*, 18(6):593–595, 2015. https://doi.org/10.1111/ele.12416.

9. Phillip P. A. Staniczenko, **Matthew J. Smith**, and Stefano Allesina. Selecting food web models using normalized maximum likelihood. *Methods in Ecology and Evolution*, 5(6):551–562, 2014. https://doi.org/10.1111/2041-210X.12192.

10. **Matthew J. Smith**, Cody Weinberger, Emilio M. Bruna, and Stefano Allesina. The scientific impact of nations: Journal placement and citation performance. *PLOS ONE*, 9(10):e109195, 2014. https://doi.org/10.1371%2Fjournal.pone.0109195.

11. Kimbra G. Turner, **Matthew J. Smith**, and Benjamin J. Ridenhour. Whirling disease dynamics: An analysis of intervention strategies. *Preventive Veterinary Medicine*, 113(4):457–468, 2014. https://doi.org/10.1016/j.prevetmed.2013.12.008.

12. Stefano Allesina, Elizabeth Sander, **Matthew J. Smith**, and Si Tang. Superelliptical laws for complex networks. *arXiv preprint*, 2013. https://arxiv.org/abs/1309.7275.

Papers in Progress

1. Lauren Sullivan, David Moeller, Sperry, Katherine Moeller, David, **Matthew J. Michalska-Smith**, and Allison Shaw. Modularity and anti-modularity in food webs. *Conservation Biology*. in Revision.

Posters & Presentations

Ecological Society of America Annual Meeting
Louisville, KY USA *14 August 2019*
Session: Species Interactions II
› Presentation: Characterizing resource competition network structure within the endophytic microbiome

Ecology and Evolution of Infectious Disease Annual Meeting
Princeton, NJ USA *11 June 2019*
› Poster: The effects of metapopulation structure on multi-strain disease dynamics

[*] These authors have contributed equally to this publication.

EpiQ (Quantitative Epidemiology) Seminar Series
St. Paul, MN USA *17 December 2018*
› Presentation: Pattern and process in ecological networks of parasites

Ecological Society of America Annual Meeting
New Orleans, LA USA *6 August 2018*
Session: Communities: Spatial Patterns And Environmental Gradients I
› Presentation: A naïve approach to a longstanding question: Using ordination to identify gradients in ecological data

Public Dissertation Defense
Chicago, IL USA *2 May 2018*
› Presentation: Structural Inferences: three cases of linking pattern and process in ecological networks

NetSci International School and Conference on Network Science
Indianapolis, IN USA *20 June 2017*
› Presentation: Higher-order interactions stabilize dynamics in competitive network models

Ecological Society of America Annual Meeting
Ft. Lauderdale, FL USA *9 August 2016*
Session: Species Interactions
› Presentation: Identifying unique species roles by characterizing differences in ecological network structure

Dissertation Proposal Hearing
Chicago, IL USA *27 August 2015*
› Presentation: Structure and Stability

Ecological Society of America Annual Meeting
Baltimore, MD USA *12 August 2015*
Session: Theoretical Ecology
› Presentation: Looking locally to see globally

ACS International Center Webinar Series
`https://global.acs.org/international-center-events/...` *25 February 2015*
› Webinar: Global Scientific Collaboration: Key to Scientific Success

ICTP-SAIFR School on Pathogen Dynamics, Climate and Global Change
IFT-UNESP, São Paulo, Brazil *21 January 2015*
› Presentation: The Scientific Impact of Nations: Journal Placement and Citation Performance

Undergraduate Scholars Conference, College of Science Joint Annual Meeting
Notre Dame, IN USA *4 May 2012*
› Poster: Modeling Seasonal Influenza in Indiana with an Age-Stratified SEIR Model

Honors & Awards

Honors

Schmidt Science Fellowship Finalist *2018*

Dept. of Ed. Graduate Assistance in Areas of National Need (GAANN) Fellow *2015–2017*

NSF Graduate Research Fellowship Program Honorable Mention *2015*

Funding Awarded

$90 000: Animal Health Capacity Grant
Internal, Univ. Minnesota, Dept. Veterinary Population Medicine *2018–2020*
*wrote grant, but PI's required to be UMN faculty

Travel Awards

$500: University of Minnesota BioTechnology Institute *2019*

$500: Univ. Chicago, Biological Sciences Division *2017*

$500: Univ. Chicago, UChicagoGRAD *2016*

$500: Univ. Chicago, Biological Sciences Division Recruitment *2015*

Schools & Meetings

Ecological Society of America Annual Meeting
Louisville, KY USA *11-16 August 2019*

Ecology and Evolution of Infectious Disease Annual Meeting
Princeton, NJ USA *10-13 June 2019*

Ecological Society of America Annual Meeting
New Orleans, LA USA *5-10 August 2018*

NetSci International School and Conference on Network Science
Indianapolis, IN USA *20-24 June 2017*

Ecological Society of America Annual Meeting
Fort Lauderdale, FL USA *7-12 August 2016*

Ecological Society of America Annual Meeting
Baltimore, MD USA *9-14 August 2015*

ICTP-SAIFR School on Pathogen Dynamics, Climate and Global Change
IFT-UNESP, São Paulo, Brazil *12-23 January 2015*

Non-adaptive selection: explaining macroscopic laws in ecology and evolution
EPFL CIB, Lausanne, Switzerland *7-11 July 2014*

Peer-Reviewing

- BioScience
- Ecography
- Ecology
- Ecosphere
- Environmental Modelling & Software
- Frontiers in Genetics
- J. of Forestry Research
- J. of Theoretical Biology
- Oikos
- PLOS Computational Biology
- PLOS ONE
- Proceedings of the Royal Society of London B
- Scientific Reports
- Scientometrics

Skills & Experience

Programming: **R** (including the `tidyverse` suite of packages), python, julia, C

Data Visualization: `ggplot2`

Other: LaTeX, git