

## DOMINIC J. SKINNER

### Address

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Cambridge, MA

### Email

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### EDUCATION

2017-2022    Massachusetts Institute of Technology, Cambridge, MA  
                  PhD in mathematics advised by Professor Jörn Dunkel  
2013-2017    Trinity Hall, University of Cambridge, Cambridge, UK  
                  Part III Mathematics (MMath), distinction  
                  Parts I & II Mathematics (BA), 1st class

### EMPLOYMENT

2022-present    Northwestern University, Evanston, IL  
                  NSF-Simons postdoctoral fellow at the Center for Quantitative Biology

### PUBLICATIONS

H. Kim, **D. J. Skinner**, D. Glass, A. Hamby, B. Stuart, J. Dunkel, and I. Riedel-Kruse. Synthetic cell-cell adhesion logic for programming multicellular interface patterns. Accepted, *Nature*.

H. Jeckel\*, F. Díaz-Pascual\*, **D. J. Skinner\***, B. Song\*, E. J. Siebert, E. Jelli, S. Vaidya, J. Dunkel, and K. Drescher. Multispecies phase diagram reveals biophysical principles of bacterial biofilm architectures. [bioRxiv:10.1101/2021.08.06.455416](https://doi.org/10.1101/2021.08.06.455416).

**D. J. Skinner**, J. Dunkel. Estimating entropy production from waiting time distributions. *Phys. Rev. Lett.*, **127** 198101 (2021). Editors' suggestion and featured in *Physics* magazine.

**D. J. Skinner**, J. Dunkel. Improved bounds on entropy production in living systems. *Proc. Natl Acad. Sci. U.S.A.*, **118**, e2024300118 (2021).

**D. J. Skinner**, B. Song, H. Jeckel, E. Jelli, K. Drescher, J. Dunkel. Topological metric detects hidden order in disordered media. *Phys. Rev. Lett.*, **126**, 048101 (2021).  
Editors' suggestion and featured in *Physics* magazine.

C. Rackauckas, Y. Ma, J. Martensen, C. Warner, K. Zubov, R. Supekar, **D. J. Skinner**, A. Ramadhan, A. Edelman. Universal Differential Equations for Scientific Machine Learning. [arXiv:2001.04385](https://arxiv.org/abs/2001.04385).

P. Pearce, B. Song, **D. J. Skinner**, R. Mok, R. Hartmann, P. K. Singh, H. Jeckel, J. S. Oishi, K. Drescher, J. Dunkel. Flow-induced symmetry breaking in growing bacterial biofilms. *Phys. Rev. Lett.*, **123**, 258101 (2019).

J. R. Lister, **D. J. Skinner**, T. M. J. Large. Viscous control of shallow elastic fracture: Peeling without precursors. *J. Fluid Mech.*, **868**, 119-140 (2019).

### CONFERENCE PROCEEDINGS

**D. J. Skinner**, R. Maulik. Meta-modeling strategy for data-driven forecasting. Tackling Climate Change with Machine Learning workshop, NeurIPS 2020. [arXiv:2012.00678](https://arxiv.org/abs/2012.00678).

## ACADEMIC AND COMMUNITY SERVICE

Referee for *PNAS*, *Phys. Rev. Lett.*, *Phys. Rev. E*, *Soft Matter*, and *J. Chem. Phys.*  
Volunteer mentor for the graduate-undergraduate math mentoring initiative, MIT, 2020-2021.  
Ran the physical applied math group meeting seminar, MIT, 2020-2022.  
Organizer of MIT math music recital, 2022.

## INVITED TALKS

Boston University, Dynamics and PDEs Seminar 2022.  
University of Pennsylvania, Mathematical Biology Seminar 2022 (virtual).  
NORDITA, Soft Matter Seminar 2022 (virtual).  
Memorial University of Newfoundland, Department of Physics 2021 (virtual).

## CONTRIBUTED TALKS AND POSTERS

APS March Meeting 2022.  
Greater Boston Area Statistical Mechanics Meeting 2021.  
Stochastic Physics in Biology, Gordon Research Conference 2021.  
Physics of Life Symposium, Princeton 2021 (virtual).  
Workshop on Stochastic Thermodynamics II 2021 (virtual).  
APS March Meeting 2021 (virtual).  
Tackling Climate Change with Machine Learning workshop, NeurIPS 2020 (virtual).  
APS March Meeting 2020 (virtual).  
Theory in Living Systems Meeting, Boston University 2019.

## AWARDS AND FELLOWSHIPS

Philip Loew Memorial Award (2022).  
MathWorks Science Fellowship (2020-2021).  
Center For The Physics of Biological Function Symposia Travel Award (2020).  
NSF Mathematical Sciences Graduate Internship (2020). *Argonne National Laboratory*.  
Everett Longstreth Jazz Award (2019).  
Emerson Music Scholar (2019-2022).  
MIT Presidential Fellowship (2017-2018).  
Mayhew Prize (2017). *Top honours in applied mathematics in Part III, University of Cambridge*.  
Parks Prize For Mathematics (2017). *Trinity Hall, Cambridge*.  
Wylie Prize For Mathematics (2016). *Trinity Hall, Cambridge*.

## TEACHING EXPERIENCE

Instructor for computational science and engineering 18.085, MIT, Summer 2021  
Teaching assistant for differential equations 18.03, MIT, Fall 2019 and Spring 2020  
Mentor for one month directed reading program, MIT, Winter 2020, 2021, 2022  
Mentor for the research science institute high school program, MIT, Summer 2018, 2019  
Mentor for the Cambridge entrance exam study school, Cambridge, UK, Spring 2015

## **OTHER EXPERIENCE**

Research intern at Argonne National Laboratory, working with Dr Romit Maulik on adaptive sampling and meta-modeling methods for scientific machine learning. 8 week internship, Argonne National Laboratory, Chicago, IL, Summer 2020

Research intern at Microsoft Research working on the C-library for Microsoft's Ziria project, a programming language designed for wireless systems. 8 week internship, Microsoft Research, Cambridge, UK, Summer 2015.

## **PROGRAMMING LANGUAGES**

Extensive experience with MATLAB, Julia, and spectral PDE solver Dedalus. Working knowledge of C, CUDA, python, bash.

## **INTERESTS**

Study double bass under Keala Kaumeheiwa. Principal bassist with MIT's Festival Jazz Ensemble 2017-2022.