

## RESEARCH AREAS

Fast methods for partial differential equations, spectral methods, *hp* element methods, fast direct solvers, computational fluid & solid mechanics, and multigrid methods

## EDUCATION

<b>Harvard University</b>	2015–2020
Ph.D. in Applied Mathematics	
M.S. in Applied Mathematics	
Advisors: Alex Townsend, Chris Rycroft	
<b>Tufts University</b>	2009–2013
B.S. in Mathematics, Computer Science	
Honors: <i>summa cum laude</i> , Highest Honors in Thesis	
Advisor: Christoph Börgers	

## PROFESSIONAL EXPERIENCE

<b>Flatiron Institute</b>	New York, NY
<i>Flatiron Research Fellow</i>	2020–present
<i>Research Associate</i>	Summer 2019
<b>Lawrence Berkeley National Laboratory</b>	Berkeley, CA
<i>Affiliate</i>	Summer 2017
<b>Walt Disney Animation Studios</b>	Burbank, CA
<i>Graduate Associate</i>	Summer 2016
<b>Wolfram Research</b>	Somerville, MA
<i>Developer</i>	2014–2015
<i>Junior Developer</i>	2013–2014
<b>Apple Inc.</b>	Cupertino, CA
<i>Software Engineering Intern</i>	Summer 2012

## AWARDS & HONORS

Leslie Fox Prize for Numerical Analysis (Second Prize)	2019
<i>Institute of Mathematics and its Applications</i>	
Copper Mountain Student Paper Competition Winner	2019
<i>19th Copper Mountain Conference on Multigrid Methods</i>	
Certificate of Distinction in Teaching	2018
<i>Derek Bok Center, Harvard University</i>	
National Defense Science & Engineering Graduate Fellowship	2016–2019
<i>U.S. Air Force Research Laboratory</i>	
Phi Beta Kappa Society	2013

Ralph S. Kaye Memorial Prize Department of Mathematics, Tufts University	2013
Benjamin G. Brown Scholarship Tufts University	2013

## JOURNAL PUBLICATIONS

- [8] D. FORTUNATO, A. BARNETT, AND D. STEIN, *A fully adaptive Poisson solver for smooth two-dimensional domains*, in preparation.
- [7] P. MILLER, D. FORTUNATO, M. NOVAGA, S. SHVARTSMAN, AND C. MURATOV, *Generation and motion of interfaces in a mass-conserving reaction-diffusion system*, submitted to SIAM J. Appl. Dyn. Syst. (2022), <https://arxiv.org/abs/2210.00585>.
- [6] D. FORTUNATO, *A high-order fast direct solver for surface PDEs*, submitted to SIAM J. Sci. Comput. (2022), <https://arxiv.org/abs/2210.00022>.
- [5] P. MILLER, D. FORTUNATO, C. MURATOV, L. GREENGARD, AND S. SHVARTSMAN, *Forced and spontaneous symmetry breaking in cell polarization*, Nat. Comput. Sci., 2 (2022), pp. 504–511, <https://doi.org/10.1038/s43588-022-00295-0>.
- [4] D. FORTUNATO, N. HALE, AND A. TOWNSEND, *The ultraspherical spectral element method*, J. Comput. Phys., 436 (2021), pp. 110087, <https://doi.org/10.1016/j.jcp.2020.110087>.
- [3] D. FORTUNATO AND A. TOWNSEND, *Fast Poisson solvers for spectral methods*, IMA J. Numer. Anal., 40 (2020), pp. 1994–2018, <https://doi.org/10.1093/imanum/drz034>.
- [2] D. FORTUNATO, C. RYCROFT, AND R. SAYE, *Efficient operator-coarsening multigrid schemes for local discontinuous Galerkin methods*, SIAM J. Sci. Comput., 41 (2019), pp. A3913–A3937, <https://doi.org/10.1137/18M1206357>.
- [1] A. MIJAILOVIC, B. QING, D. FORTUNATO, AND K. VAN VLIET, *Characterizing viscoelastic mechanical properties of highly compliant polymers and biological tissues using impact indentation*, Acta Biomater., 71 (2018), pp. 388–397, <https://doi.org/10.1016/j.actbio.2018.02.017>.

## PRESENTATIONS

ICIAM 2023, Tokyo	August 2023
SIAM Conference on Computational Science and Engineering, Amsterdam	February 2023
Computational Mathematics Seminar, CU Boulder	October 2022
Fluid Mechanics and Waves Seminar, NJIT	September 2022
SIAM Annual Meeting, Pittsburgh, PA	July 2022
Outstanding Challenges in Computational Methods for Integral Equations, Oaxaca	May 2022
Fast Direct Solvers, Purdue University	October 2021
Flatiron-Wide Algorithms & Mathematics, Flatiron Institute	October 2021
ICOSAHOM 2020, Vienna, Austria	July 2021
Numerical Analysis and PDE Seminar, University of Delaware	May 2021
SIAM Conference on Computational Science and Engineering, Fort Worth, TX	March 2021
Canadian Mathematical Society Winter Meeting	December 2020
Sidney Fernbach Fellowship Seminar, Lawrence Livermore National Laboratory	February 2020
Numerical Methods for Partial Differential Equations Seminar, MIT	December 2019
Numerical Analysis Seminar, Flatiron Institute	July 2019
28th Biennial Numerical Analysis Conference, Glasgow, UK	June 2019
19th Copper Mountain Conference on Multigrid Methods, Copper, CO	March 2019
SIAM Conference on Computational Science and Engineering, Spokane, WA	February 2019
Scientific Computing and Numerical Analysis Seminar, Cornell University	November 2018

ICOSAHOM 2018, London, UK  
SIAM Conference on Computational Science and Engineering, Atlanta, GA  
SIAM Student Chapter, Tufts University

July 2018  
February 2017  
November 2014

## TEACHING EXPERIENCE

### Harvard University, *Teaching Fellow*

- AM 205: Advanced Scientific Computing: Numerical Methods I Fall 2019
- AM 225: Advanced Scientific Computing: Numerical Methods II Spring 2018

### Tufts University, *Teaching Assistant*

- COMP 170: Computation Theory Spring 2012
- COMP 15: Data Structures Spring 2011
- COMP 11: Introduction to Computer Science Fall 2010

## SKILLS

*Languages:* C++11, C, MATLAB, Mathematica, Python, L<sup>A</sup>T<sub>E</sub>X

*Technologies:* BLAS, LAPACK, Git, OpenMP

## PROFESSIONAL ACTIVITIES

Referee for: Journal of Computational Physics, Journal of Scientific Computing, Advances in Computational Mathematics, IMA Journal of Numerical Analysis, SIAM Journal on Matrix Analysis and Applications

Member of SIAM and AMS