Nicholas Irons

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Education

2019– **PhD, Statistics**, *University of Washington*, Seattle, WA, USA.
∗ Courses: Statistical Inference, Machine Learning, Convex Optimization, Stochastic Modeling

2018–2019 **MASt, Mathematics**, *University of Cambridge*, Cambridge, UK.
∗ Selected courses: Bayesian Inverse Problems, Inverse Problems in Imaging, Convex Optimization, Modern Statistical Methods, Statistical Learning, Bayesian Modeling and Computation

2014–2018 **BA, Mathematics**, *Northwestern University*, Evanston, IL, USA.
∗ Minors in Physics and Classics
∗ GPA: 3.97 / 4.00
∗ Honors Thesis: *Deformation Quantization and the Moyal Product*
∗ Selected courses: Probability and Stochastic Analysis, Measure Theory, Functional Analysis, Algorithms, Abstract Algebra, Real Analysis, Differential Equations, Category Theory, General and Algebraic Topology, Differential Geometry, Computation Theory, Semiclassical Analysis

Research Experience

University of Washington

2020 **Zaid Harchaoui Group**, *Department of Statistics*.
∗ Developing methods to estimate from data tools relevant in the study of optimal transport, sampling, density estimation, and generative models.

2020 **Adrian Raftery Group**, *Department of Statistics*.
∗ Developing a Bayesian model incorporating deaths data and random sample viral and serological test data to probabilistically estimate SARS-CoV-2 infection counts and to address systematic undercounting in confirmed COVID cases due to selection bias and test availability.

Northwestern University

2016–2017 **Jens Koch Group**, *Department of Physics and Astronomy*.
∗ Collaborated with experimentalists at UChicago to analyze a superconducting qubit.
∗ Applied Python optimization methods to determine circuit parameters from experimental data.
∗ Designed algorithms using quantum electrodynamic theory to simulate qubit dynamics.
∗ Implemented the algorithms to explain observed behavior of the qubit-resonator system.

2015 **Erik Andersen Lab**, *Department of Molecular Biosciences*.
∗ Generated nearly isogenic lines of the nematode *C. elegans* to test quantitative trait loci implicated in resistance to abamectin, an anthelmintic drug.
∗ Populated climate variables for the locations of the lab's wild isolate strains using R and NOAA climatology data, thereby enhancing the lab's nematode database.

Publications

[1] N. Irons and A. E. Raftery
Combining deaths data and random sample testing to estimate SARS-CoV-2 prevalence.
In preparation.

[2] N. Earnest, S. Chakram, Y. Lu, N. Irons, R. K. Naik, N. Leung, L. Ocola, D.A. Czaplewski, B. Baker, J. Lawrence, J. Koch, and D. I. Schuster,
Realization of a Λ System with Metastable States of a Capacitively Shunted Fluxonium,
Physical Review Letters **120**, 150504 (2018).

[3] B. Baker, A. C. Y. Li, N. Irons, N. Earnest, and J. Koch,
Adaptive Rotating-Wave Approximation for Driven Open Quantum Systems,
Physical Review A **98**, 052111 (2018).

Teaching Experience

University of Washington

2020 **Teaching Assistant**, *Department of Statistics*.
Stat 311: Elements of Statistical Methods
Stat 342: Introduction to Probability and Mathematical Statistics

Northwestern University

2016–2018 **Teaching Assistant**, *Department of Mathematics*.
Math 220-0: Differential Calculus of One-Variable Functions
Math 224-0: Integral Calculus of One-Variable Functions
Math 230-0: Differential Calculus of Multivariable Functions

2015–2017 **Tutor**, *Departments of Mathematics and Physics and Astronomy*.
∗ Held weekly pooled office hours for the following courses: differential and integral calculus, linear algebra, Newtonian mechanics, electromagnetism, optics.

2015–2016 **Chemistry Mentor**, *Academic Mentoring Program (AMP)*.
∗ Developed worksheets and facilitated weekly study sessions for students in general chemistry.

Skills & Activities

Proficient in LaTeX, Mathematica, Python, R.
Experienced with C++, Matlab, Unix.
Proficient in Latin.
Enjoys classical literature and history, running, and film.

Honors & Awards

University of Washington

Provost Fellowship ($5000)	Fall 2019
Statistics Department Fellowship ($5000)	Fall 2019

Northwestern University

Phi Beta Kappa	Spring 2018
Mathematics Departmental Honors	Spring 2018
Summa cum Laude	Spring 2018
Ruth Dunbar Davee Endowed Merit Scholarship ($120,000)	Fall 2015–Spring 2018
Dean's List	Fall 2014–Spring 2018
Honorable Mention for Outstanding Achievement in Mathematics by a Senior	Spring 2018
Honorable Mention for Outstanding Achievement in Mathematics by a Junior	Spring 2017
Weinberg College Research Grant ($3000)	Summer 2016
Undergraduate Research Grant ($3000)	Summer 2015