ARIEL GOODWIN

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EDUCATION

Ph.D. Applied Mathematics 2022 - 2027 (Expected)
Cornell University, Center for Applied Mathematics GPA: 4.13/4.00

Committee: Adrian Lewis (Advisor), Kathryn Mann, and Soroosh Shafiee

B.Sc. Honours Mathematics and Computer Science 2018 - 2022
McGill University, Department of Mathematics GPA: 3.98/4.00

AWARDS AND SCHOLARSHIPS

NSERC Postgraduate Scholarship - Doctoral (PGS D) 2024 - 2027
Natural Sciences and Engineering Research Council of Canada (NSERC), held at Cornell University

· To support doctoral research

NSF Mathematical Sciences Graduate Internship 2023
National Science Foundation (NSF), held at the National Renewable Energy Laboratory

· To support a summer research project on manifold optimization for optimal power flow

Cornell Fellowship 2022
Cornell University

· Recruitment fellowship for academic merit, covering one year of Ph.D. studies

Sir Edward Beatty Memorial Scholarship in Mathematics 2021
McGill University

· For academic achievement in mathematics

NSERC Undergraduate Student Research Award 2021
NSERC, held at McGill University

· To support a summer research project on statistical estimation and convex optimization

Dr. Feng Qian Scholarship 2020
McGill University

· For academic achievement in computer science

NSERC Undergraduate Student Research Award 2020
NSERC, held at McGill University

· To support a summer research project on convex analysis and nonsmooth optimization

Seba Abbott Smith Scholarship 2018 - 2022
McGill University

· For academic merit and leadership in (post)-secondary school

PUBLICATIONS AND PREPRINTS

Convex optimization on CAT(0) cubical complexes
With A.S. Lewis, G. López-Acedo, and A. Nicolae. *Advances in Applied Mathematics*, 2025.

Maximum Entropy on the Mean and the Cramér Rate Function in Statistical Estimation and Inverse Problems: Properties, Models, and Algorithms
With Y. Vaisbourd, R. Choksi, T. Hoheisel, and C.-B. Schönlieb. *Mathematical Programming*, 2025.

A subgradient splitting algorithm for optimization on nonpositively curved metric spaces
With A.S. Lewis, G. López-Acedo, and A. Nicolae. Submitted, 2024.

Riemannian Optimization Applied to AC Optimal Power Flow
With J. Maack and D. Sigler. *IEEE Power & Energy Society General Meeting (PESGM)*, 2024.

Recognizing weighted means in geodesic spaces
With A.S. Lewis, G. López-Acedo, and A. Nicolae. Submitted, 2024.

From perspective maps to epigraphical projections
With M.P. Friedlander and T. Hoheisel. *Mathematics of Operations Research*, 2023.

TEACHING EXPERIENCE

Teaching Assistant 2023 - 2024
Cornell University

- MATH 2930: Differential Equations for Engineers (Summer 2024)
- MATH 2940: Linear Algebra for Engineers (Spring 2024)
- MATH 1920: Multivariable Calculus for Engineers (Fall 2023)

Teaching Assistant 2019 - 2021
McGill University

- MATH 248: Honours Vector Calculus (Fall 2021)
- PHYS 131: Mechanics and Waves (Fall 2019/2020/2021)

SERVICE

Directed Reading Program Mentor 2024 - 2025
Cornell University

- Mentored undergraduate students in projects on differential geometry, probability, and optimization

Reviewer

- *Journal of Optimization Theory and Applications, SIAM Journal on Applied Algebra and Geometry*

PRESENTATIONS

Incremental Minimization in Spaces of Nonpositive Curvature July 2025
International Conference on Continuous Optimization, University of Southern California Talk

An Invitation to Hadamard Space November 2024
Applied Mathematics Student Colloquium, Cornell University Talk

Incremental Minimization in Spaces of Nonpositive Curvature November 2024
Midwest Optimization Meeting, University of Waterloo Poster

The Maximum Entropy on the Mean Method for Linear Inverse Problems July 2022
International Conference on Continuous Optimization, Lehigh University Talk

Epigraphical Projections in Nonsmooth Optimization August 2020
Undergraduate Research Conference, McGill University Talk

SKILLS AND INTERESTS

Programming Skills	Julia, Python, C++, C, OCaml, Java, MATLAB, LaTeX
Languages	English, French
Research Interests	Optimization, Geometry, Algorithms, Probability, Data Science
Other Interests	Running, Skiing, Board/Video Games