Evan D. Randles, Ph.D.

Assistant Professor of Mathematics

Department of Mathematics
Colby College
5834 Mayflower Hill
Waterville, ME 04901

Email: evan.randles@colby.edu
Website: www.colby.edu/∼erandles/
Phone: (207) 859-5834
Fax: (207) 859-5846

Employment

Colby College, Assistant Professor of Mathematics, 2017-present

Cornell University, Visiting Assistant Professor of Mathematics, 2021-2022

University of California, Los Angeles, Assistant Adjunct Professor of Mathematics, 2016-2017

Education

Ph.D. Applied Mathematics, Cornell University, 2016
Thesis: *Convolution powers of complex-valued functions and related topics in partial differential equations*
Advisor: Professor Laurent Saloff-Coste

M.S. Applied Mathematics, Cornell University, 2014

M.S. Mathematics, California State University, Northridge 2011
Masters with Distinction
Thesis: *Spacelike foliations of Robertson-Walker spacetimes by Fermi space slices*
Advisor: Professor David Klein

B.S. Physics, California State University, Northridge 2010
Summa Cum Laude

B.A. Mathematics, California State University, Northridge 2010
Summa Cum Laude

A.S. Welding Technology, College of the Canyons, 2005
With High Honors

Research Interests

Fourier Analysis, Partial Differential Equations, Probability, Mathematical Physics

Research Publications

In preparation

A theory for on-diagonal asymptotics for heat kernels of inhomogneoeus operators. (with Laurent Saloff-Coste)

Riesz transforms associated to positive homogeneous operators.

Submitted/Under Review

Evan Randles. *A note on the completeness of Fourier-based metrics on measures.* (arXiv:2402.039839)

Published

[10] Evan Randles and Laurent Saloff-Coste. *On-diagonal asymptotics for heat kernels of a class of inhomogeneous partial differential operators. Journal of Differential Equations*, **363** 67-125 (2023).

[9] Evan Randles. *Local Limit Theorems for Complex Functions on $\mathbb{Z}^d$. Journal of Mathematical Analysis and Applications*, **519**(2) (2023).

[8] Huan Q. Bui[†] and Evan Randles. *A generalized polar-coordinate integration formula with applications to the study of convolution powers of complex-valued functions on $\mathbb{Z}^d$. Journal of Fourier Analysis and Applications*, **28**(19) (2022).

[7] Evan Randles and Laurent Saloff-Coste. *Davies' method for heat-kernel estimates: An extension to the semi-elliptic setting*, *Transactions of the American Mathematical Society*, **373**(4) 2525-2565 (2020).

[6] Evan Randles and Laurent Saloff-Coste. *Convolution Powers of Complex Functions on $\mathbb{Z}^d$*, *Revista Matemática Iberoamericana*, **33**(3) 1045-1121 (2017).

[5] Evan Randles and Laurent Saloff-Coste. *Positive-homogeneous operators, heat kernel estimates and the Legendre-Fenchel transform*, Stochastic Analysis and Related Topics: A Festschrift in Honor of Rodrigo Bañuelos. Progress in Probability, Vol. 72 (2017).

[4] Evan Randles. *Convolution powers of complex-valued functions and related topics in partial differential equations.* Ph.D. Dissertation. Cornell University, May 2016.

[3] Evan Randles and Laurent Saloff-Coste. *On the Convolution Powers of Complex Functions on Z*, *Journal of Fourier Analysis and Applications*, **21**(4) 754-798 (2015).

[2] David Klein and Evan Randles. *Fermi coordinates, simultaneity, and expanding space in Robertson-Walker cosmologies*, *Annales Henri Poincaré*, **12** 303-328 (2011).

[1] Evan Randles. *Spacelike foliations of Robertson-Walker spacetime by Fermi space slices*. Masters Thesis. California State University, Northridge, May 2011.

[†]Huan Q. Bui was a Colby student at the time of submission.

Research Presentations

Invited Talks

Large-time behavior of heat kernels. Department of Mathematics & Statistics, University of Maine. April 2023.

Local Limit Theorems for Complex Functions on $\mathbb{Z}^d$. Department of Mathematics, University of Connecticut. March 2023.

Positive homogeneous operators, heat kernels, and their estimates. MPESF Seminar (Mathematical Physics: Experiment, Structure, and Framework), University of California, Riverside, January 2023.

On-diagonal asymptotics for heat kernels corresponding to a class of inhomogeneous operators. Joint Mathematics Meetings, January, 2023.

Oscillatory integrals appearing in the study of convolution powers of complex-valued functions. Analysis Seminar, Cornell University, October 2021.

A generalized polar-coordinate integration formula with applications to local (central) limit theorems. Joint Mathematics Meetings (virtual) January 2021.

Higher order partial differential operators and their heat kernels. Colby-Bowdoin-Bates Seminar, Bates College, April 2019.

Convolution powers of complex-valued functions. Department of Mathematics & Statistics, University of Maine, November 2017.

Convolution powers of complex-valued function on $\mathbb{Z}^d$. Department of Mathematics and Statistics, Bowdoin College, October 2017.

Convolution powers of complex-valued functions. Department of Mathematics and Statistics, Swarthmore College. February 2017.

Convolution powers of complex-valued functions. Department of Mathematics and Statistics, Colby College. February 2017.

Convolution powers of complex-valued functions on $\mathbb{Z}^d$. Probability Seminar, University of British Columbia. September 2016.

Convolution powers of complex-valued functions. Department of Mathematics, Colgate University. January, 2016.

Convolution powers of complex-valued functions on $\mathbb{Z}^d$. Analysis Seminar, Cornell University, Ithaca. February 2015

Heat kernel estimates corresponding to higher order partial differential operators. Mathematics colloquium, California State University, Northridge. January 2014.

Convolution powers of finitely supported function on $\mathbb{Z}$. Northeast probability seminar, Columbia University, New York. November 2012

Fermi coordinates, simultaneity, and expanding space. Mathematics & Physics colloquium, California State University, Northridge. December 2010

Talks at Colby

Local Limit Theorems on the Integer Lattice. Department of Mathematics, Colby College. February 2023.

Nash's inequality, ultracontractivity, and unexpected behavior of generalized heat kernels. Science Lunch Talk, Colby College, November 2022.

Relative velocities and expanding space in Robertson-Walker spacetimes. Science Lunch Talk, Colby College, April 2018.

On the range and periodic structure of random walks on the integer lattice. Department of Mathematics & Statistics, Colby College. February 2018.

Expository Talks

A mathematician takes a stroll in the park. Mathematics Department Colloquium, Hood College, November 2021.

The Stability of Matter: an important chapter in mathematical physics (expository talk). *CAM Colloquially!*, the student speaker series. Cornell University, Ithaca. November 2015

Conferences, Summer Schools and Workshops Attended

Joint Mathematics Meetings, San Francisco. January 2024.

Joint Mathematics Meetings, Boston. January 2023.

Seminar on Geometric and Functional Inequalities and Applications, Virtual. 2022-present.

Joint Mathematics Meetings, Virtual. January 2021.

Convergence on Fostering Academic Success in STEM, University of New Hampshire. April 2017.

Probability Summer School, Northwestern University. July 2016.

Finger Lakes Probability Seminar, Cornell University. May 2016.

Joint Mathematics Meetings, Seattle. January 2016.

Cornell Probability Summer School, Cornell University. July 2014.

Rough Path Theory Workshop, IPAM, UCLA. January 2014.

Cornell Probability Summer School, Cornell University. July 2013.

Northeast Probability Seminar, Columbia University. November 2012

Princeton Institute for the Science and Technology of Materials (REU), Princeton University. Summer 2009

Fellowships/Scholarships

2012-2015 NSF Graduate Research Fellowship (GRFP)

2011-2012 Research Training Group Graduate Assistantship in Probability (Funding NSF)

2010-2011 Bridge to the Doctorate Fellow, Louis Stokes Alliances for Minority Participation (LSAMP) Program (Funding NSF-CSU)

2007-2008 PUMP Scholarship, Preparing Undergraduates through Mentoring toward PhDs (PUMP) Program (Funding NSF-DMS-0502258)

Awards

Distinguished Teaching Award, Department of Mathematics, University of California, Los Angeles, Recipient 2017

Award for Outstanding Graduate Achievement, Department of Mathematics, California State University, Northridge, Recipient 2011

Heald Outstanding Graduating Senior Award, College of Science and Mathematics, California State University, Northridge, Recipient 2010

John W. Nagle Outstanding Senior Award, Department of Physics and Astronomy, California State University, Northridge, Recipient 2010

Teaching Experience

As Instructor of Record

Colby College, Spring 2024

- Math 338A, Real Analysis (27 students)
- Math 498A, Topics in Probability: Stochastic Processes (6 students)

Colby College, Fall 2023

- Math 160A, Series and Multivariable Calculus (19 students)
- Math 160B1, Series and Multivariable Calculus (18 students)
- Math 381A, Probability (23 students)

Colby College, Spring 2023

- Math 381A, Probability (16 students)
- Math 411A, Topics in Differential Equations: PDEs (6 students)

Colby College, Fall 2022

- Math 262A, Vector Calculus (24 students)
- Math 381A, Probability (26 students)

Cornell University, Fall 2021

- Math 4220, Applied Complex Analysis (24 Students)

Colby College, Spring 2021

- Math 311A, Ordinary Differential Equations (26 students)
- Math 411A, Topics in Differential Equations: PDEs (21 students)

Colby College, Fall 2020

- Math 122D, Series and Multivariable Calculus (20 students)
- Math 122E2, Series and Multivariable Calculus (21 students)
- Math 311A, Ordinary Differential Equations (24 students)

Colby College, Spring 2020

- Math 253A, Linear Algebra (23 students)
- Math 311A, Ordinary Differential Equations (27 students)

Colby College, Fall 2019

Math 311A, Ordinary Differential Equations (26 students)

Math 352A, Complex Analysis (27 students)

Colby College, Spring 2019

Math 311A, Ordinary Differential Equations (26 students)

Math 411A, Topics in Differential Equations: PDEs (9 students)

Colby College, Fall 2018

Math 122A, Series and Multivariable Calculus (25 students)

Math 122B, Series and Multivariable Calculus (20 students)

Math 311A, Ordinary Differential Equations (27 students)

Math 439X, Topics in Real Analysis: Measure Theory and Integration (2 students)

Colby College, Spring 2018

Math 122A, Series and Multivariable Calculus (18 students)

Math 398A, Fourier Analysis (12 students)

Colby College, Fall 2017

Math 121B2, Single-variable Calculus (23 students)

Math 311A, Ordinary Differential Equations (26 students)

University of California, Los Angeles, Spring 2017

Math 170 A, Probability I (38 students)

Math 170 B, Probability II (30 students)

University of California, Los Angeles, Winter 2017

Math 131 A, Analysis I (33 students)

Math 131 A, Analysis I (35 students)

University of California, Los Angeles, Fall 2016

Math 131 B, Analysis II (28 students)

Math 32A, Calculus of Several Variables (201 students)

Cornell University, Department of Mathematics, Spring 2015

Math 1110, Calculus 1 (21 students)

Honors Students Supervised

Huan Q. Bui, Colby College, 2021

Thesis: *A Generalized Polar-coordinate Integration Formula, Oscillatory Integral Techniques, and Applications to Convolution Powers of Complex-valued Functions on* $\mathbb{Z}^d$.
Currently: Doctoral Candidate in Physics at the Massachusetts Institute of Technology

Yiheng Su, Colby College, 2024

Thesis: Several Approaches to Pólya's Theorem (in progress)

Independent Studies/Directed Readings (all at Colby)

Radon and X-Ray Transforms (1 student), Colby College, Fall 2023

Markov Chains (1 student), Colby College, Spring 2023

Measure Theory (1 student), Colby College, Spring 2020

Functional Analysis (1 student), Colby College, Spring 2020

Summer Research Students at Colby College

Charlotte Maurer, Colby College, Summer 2023

Topic: Distribution theory and integral transforms

Huan Q. Bui, Colby College, Summer 2020

Topic: Convolution Powers

Miscellaneous Teaching Experience

Instructor for CAPS Module: Fractals, Chaos, and the Maine Coastline. Colby College, Summer 2023.

Co-instructor (with Nora Youngs) for CAPS Module: Fractals, Chaos, and the Maine Coastline. Colby College, Summer 2022

Co-instructor (with Nora Youngs) for CAPS Module: Fractals, Chaos, and the Maine Coastline, Summer 2019

Co-instructor (with Nora Youngs) for CAPS Module: Fractals, Chaos, and the Maine Coastline, Summer 2018

Module Instructor for Senior Seminar (module on Fourier Analysis). Ithaca High School-Cornell University, Spring 2015

Recitation Instructor for Math 2220 (vector calculus). Department of Mathematics, Cornell University, Fall 2014.

Summer Insitute Instructor for PUMP. California State University, Northridge, Summer 2010.

Lead Mathematics/Physics Tutor, College of the Canyons, 2005-2006

Additional Supervision/Mentoring

Faculty Sponsor for student internship at Analysis Group, Summer 2023

Faculty Sponsor for student internship at Fujifilm Dimatix, Winter 2023

Second reader for Honors Thesis in Mathematics: Spectral Theorem for Bounded Self-adjoint Operators, Spring 2018

Expository Writing/Course Notes

Introductory Probability, Course Notes for Math 381 at Colby College. (186 Pages)

Ordinary Differential Equations, Course Notes for Math 311 at Colby College. (166 pages)

Partial Differential Equations, Course Notes for Math 411 at Colby College. (70 Pages)

A Primer on the Fourier Transform, Supplementary Notes for Math 411 at Colby College. (20 pages)

Fourier Analysis, Course Notes for Math 398 at Colby College. (63 Pages)

Analysis II, Course Notes for Math 131B at University of California, Los Angeles. (46 pages)

Self-adjoint operators, semigroups, Dirichlet forms, and Hunt processes, Expository (33 Pages)

Fourier Series, Course notes for Senior Seminar at Ithaca High School - Cornell University (45 pages)

The Cane Problem, Expository (3 pages)

Service

Service to Department

Liaison to the office of Off-Campus Studies 2022-present,

Co-organizer of the *Runnals Dinner for Women in Mathematics*, 2022-2024

Advisor to the Class of 2024 (both Math and MAMS, 24 students), 2022-2024

Search committee member, TT search in Mathematics, 2023-2024

Co-organizer of the department colloquium, 2023-2024

Search committee member, VAP search in Mathematics, 2022-2023

Organizer of the *May 12th Celebration of Women in Mathematics*, 2022-2023

Search committee member, Lecturer in Mathematics, 2020-2021

Search committee member, TT search in Mathematics, 2020-2021

Chair of committee to restructure MA 122 (Series & Multivariable Calculus), 2020-2021

Organizer of *Math Mentors Program*, 2019-2020

Co-advisor for *Math Contest in Modeling*, 2018-2021

Search committee member, TT search in Statistics, 2019-2020

Summer calculus coordinator for incoming Colby students, 2018-2020

Search committee member, VAP search in Mathematics, 2018-2019

Search committee member, TT search in Statistics, 2018-2019

Search committee member, VAP search in mathematics, 2017-2018

Search committee member, Faculty Fellow search in Statistics, 2017-2018

Search committee member, TT search in Statistics, 2017-2018

Co-organizer of the department colloquium, 2017-2018

Service to College

Member of Academic Affairs Committee, 2024-present

Member of the Off-campus Advisory Committee, 2023-present

External search committee member, TT search in Computer Science, 2023-2023

Member of Facilities Advisory Committee, 2018-2021

Member of the Off-campus Advisory Committee, 2019-2021

Participation as summer instructor for CAPS Program, Summers of 2018, 2019, 2022, & 2023

Advisor to first-year students (23 students total), 2018-2021 & 2022-present

Service to Discipline

Reviewer for Mathematical Reviews for the American Mathematical Society

Organizer for Joint Math Meetings Special Session: *Analysis and Differential Equations at Undergraduate Institutions*, 2024.

Referee for 4 mathematics journals

General Service

Organizer for *CAM Colloquially!*, the student speaker series. Center for Applied Mathematics, Cornell University, 2015

Volunteer/Mentor. Louis Stokes Alliances for Minority Participation (LSAMP), Bridge to the Doctorate Program, 2014