

Antoine Remond-Tiedrez

damtp.cam.ac.uk/user/ar2145

Employment

- Simons Postdoctoral Research Fellow**, *University of Cambridge* Jan. 2022–present
Appointment split between the Isaac Newton Institute for Mathematical Sciences and the Department of Applied Mathematics and Theoretical Physics.
- Van Vleck Visiting Assistant Professor**, *University of Wisconsin–Madison* Aug. 2020–Dec. 2021
Joint mentoring from Chanwoo Kim, Leslie Smith, and Sam Stechmann. Partly funded by NSF Grant “Atmospheric Dynamics with Phase Changes and Extreme Rainfall Events” (PI: Leslie Smith and Sam Stechmann).

Education

- PhD in Mathematics**, *Carnegie Mellon University* 2014–2020
Thesis: Nonlinear partial differential equations in fluid mechanics; interfaces, microstructure, and stability.
Advisor: Ian Tice
- Master’s in Mathematics and Physics**, *University of Warwick* 2013–2014
- BSc in Mathematics and Physics**, *University of Warwick* 2010–2013

Research interests

I study nonlinear partial differential equations arising in fluid dynamics. I am particularly interested in free boundary problems, the behaviour of complex fluids (such as micropolar fluids and ferrofluids), and geophysical fluid dynamics.

Publications

- Remond-Tiedrez A. and Tice I. Anisotropic micropolar fluids subject to a uniform microtorque: the stable case. [arXiv:2007.13795](https://arxiv.org/abs/2007.13795).
- Remond-Tiedrez A. and Tice I. Anisotropic micropolar fluids subject to a uniform microtorque: the unstable case. *Comm. Math. Phys.*, 2021.
- Remond-Tiedrez A. and Tice I. The viscous surface wave problem with generalized surface energies. *SIAM J. Math. Anal.*, 2019.

Academic visits

Simons Postdoctoral Fellow during the INI Programme on “Mathematical aspects of turbulence: where do we stand?”.	Spring 2022
Visiting Graduate Student during the ICERM Semester Program on “Singularities and Waves In Incompressible Fluids”.	Spring 2017

Talks

Center for Nonlinear Analysis Seminar, <i>Carnegie Mellon University</i> <i>Moist potential vorticity inversion: a nonlinear PDE from atmospheric dynamics with free boundaries</i>	May 2022
Junior Isaac Newton Crossover (JINX) Seminar, <i>Isaac Newton Institute</i> <i>Instability of an Anisotropic Micropolar Fluid</i>	May 2022
Twelfth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, <i>Athens (USA)</i> <i>Instability of an Anisotropic Micropolar Fluid</i>	Mar. 2022
Programme on the mathematical aspects of turbulence, <i>Isaac Newton Institute</i> <i>Moist potential vorticity inversion: a nonlinear PDE from atmospheric dynamics with free boundaries</i>	Mar. 2022
Nonlinear PDE Seminar, <i>Texas A&M University</i> <i>Variational formulation, well-posedness, and iterative methods for moist potential vorticity inversion: a nonlinear elliptic PDE from atmospheric dynamics with free boundaries</i>	Nov. 2021
PDE and Geometric Analysis Seminar, <i>University of Wisconsin–Madison</i> <i>Variational formulation, well-posedness, and iterative methods for moist potential vorticity inversion: a nonlinear elliptic PDE from atmospheric dynamics with free boundaries</i>	Oct. 2021
Ohio River Analysis Meeting, <i>University of Kentucky</i> <i>Instability of a Anisotropic Micropolar Fluid</i>	Mar. 2021
Applied and Computational Mathematics Seminar, <i>University of Wisconsin–Madison</i> <i>Instability of an Anisotropic Micropolar Fluid</i>	Feb. 2021
Analysis and PDE Seminar, <i>University of Southern California</i> <i>Instability of an Anisotropic Micropolar Fluid</i>	Oct. 2020
Online North East PDE and Analysis Seminar (jointly organized by Brown, Carnegie Mellon, Princeton, and Toronto) <i>Instability of an Anisotropic Micropolar Fluid</i>	May 2020
SIAM Conference on Analysis of Partial Differential Equations, <i>La Quinta</i> <i>Instability of a Non-Isotropic Micropolar Fluid</i>	Dec. 2019

Equadiff 2019, <i>Leiden</i> <i>The Viscous Surface Wave Problem with Generalized Surface Energies</i>	Jul. 2019
SIAM Conference on Computational Science and Engineering, <i>Spokane</i> <i>The Viscous Surface Wave Problem with Generalized Surface Energies</i>	Feb. 2019
Summer School on Mathematical Fluids, <i>University of Southern California</i> <i>Viscous Surface Waves and their Stability</i>	May 2017

Conference sessions and seminars organised

Junior Isaac Newton Crossover (JINX) Seminar, <i>Isaac Newton Institute, University of Cambridge</i>	Spring 2022
SIAM Conference on Analysis of Partial Differential Equations, <i>Online</i> <i>Mini-symposium on "Free Boundaries in Fluids and Fluid-Structure Interactions"</i>	Mar. 2022

Working groups

Working group organised

<i>Department of Mathematics, University of Wisconsin–Madison</i>	
Introduction to PDEs and Waves for the Atmosphere and Ocean <i>SIAM Student Chapter, Carnegie Mellon University</i>	Spring 2021
Malliavin Calculus	Spring 2020
Koopman Spectral Analysis	Fall 2019
Concentration of Measure	Spring 2019
Analysis of Hydrodynamical Models	Fall 2018
Calculus of Variations on Manifolds and Geometric Flows	Spring 2018
Geometric Measure Theory	Fall 2017
Weak Convergence Methods in Nonlinear PDEs	Fall 2016

Working group attended

<i>Center for Nonlinear Analysis, Carnegie Mellon University</i>	
Mathematics of Deep Neural Networks	Fall 2018
Optimal Transport	Spring 2016
Fluid Dynamics	Fall 2016

Conferences, workshops, and summer schools attended

Advances in geophysical and astrophysical turbulence, <i>INI</i>	Mar. 2022
Oxbridge PDE Conference 2022, <i>Oxford</i>	Apr. 2022
Mathematical Advances in Geophysical Flows, <i>CIRM</i>	Apr. 2022

Twelfth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, <i>Athens (USA)</i>	Mar. 2022
SIAM Conference on Analysis of Partial Differential Equations, <i>Online</i>	Mar. 2022
Modelling and analysis of turbulent transport, mixing, and scaling, <i>INI</i>	Mar. 2022
Rigorous analysis of incompressible fluid models and turbulence, <i>INI</i>	Feb. 2022
Turbulence: where do we stand and where are we heading?, <i>INI</i>	Jan. 2022
Ohio River Analysis Meeting, <i>University of Kentucky</i>	Mar. 2021
SIAM Conference on Analysis of Partial Differential Equations, <i>La Quinta</i>	Dec. 2019
Equadiff 2019, <i>Leiden</i>	Jul. 2019
Stability of Nonlinear Waves: Analysis and Computation, <i>Institut Henri Poincaré</i>	Jul. 2019
Workshop on Mathematical Models for Pattern Formation, <i>Carnegie Mellon University</i>	Mar. 2019
Workshop on Nonlinear Differential Equations, Dynamical Systems and Applications, <i>University of Kansas</i>	Oct. 2018
SIAM Annual Meeting, <i>Pittsburgh</i>	Jul. 2017
Summer School and Workshop: Mathematical Analysis of Water Waves and Related Models, <i>UC Davis</i>	Jun. 2017
Water Waves, <i>ICERM</i>	May 2017
Computational Aspects of Water Waves, <i>ICERM</i>	Apr. 2017
Making a splash - Droplets, Jets, and Other Singularities, <i>ICERM</i>	Mar. 2017
Dynamics of Small Scales in Fluids, <i>ICERM</i>	Feb. 2017
Topics in Applied Nonlinear Analysis: Recent Advances and New Trends, <i>Carnegie Mellon University</i>	Jul. 2016
Center for Nonlinear Analysis Summer School, <i>Carnegie Mellon University</i>	Jun. 2016

Awards

Hugh D. Young Graduate Student Teaching Award, <i>Mellon College of Science, Carnegie Mellon University</i> <i>Award given to encourage and recognize effective teaching by graduate students.</i>	2020
SIAM Student Chapter Certificate of Recognition, <i>SIAM</i> <i>In recognition of outstanding efforts and accomplishments on behalf of the SIAM Chapter at Carnegie Mellon University.</i>	2020, 2019, 2018
Excellence in the MPhys Project, <i>University of Warwick</i> <i>Prize for excellence in the final year research project.</i>	2014

Mentoring

Directed Reading Program, University of Wisconsin–Madison

Calculus of Variations, with David Kwak Fall 2021
The Directed Reading Program pairs undergraduate students with mentors that guide the students through readings on a topic of mutual interest for the duration of a semester.

Teaching experience

Instructor, University of Wisconsin–Madison

Linear Algebra and Differential Equations Spring 2021
The Theory of Single Variable Calculus Fall 2020

Instructor, Carnegie Mellon University

Concepts of Mathematics Summer 2018
Concepts of Mathematics Summer 2017

Lead Teaching Assistant, Carnegie Mellon University

Matrices and Linear Transformations Spring 2020
Concepts of Mathematics Fall 2019

Teaching assistant, Carnegie Mellon University

Pre-Calculus (SAMS) Summer 2017
Calculus I for Humanities Fall 2016
Pre-Calculus (SAMS) Summer 2016
Symbolic Programming Methods Summer 2016
Multivariate Calculus Spring 2016
Calculus I Fall 2015
Differential Equations Spring 2015
Multivariate Analysis Fall 2014

Grader, Carnegie Mellon University

Measure and Integration Fall 2017

Other teaching activities

Future Faculty Program, *Carnegie Mellon University* 2014–2020
This program provides graduate students with support in developing and documenting their teaching skills, through seminars, workshops, and teaching consultations.

Summer Academy for Mathematics and Sciences, *Carnegie Mellon University* Summer 2016, 2017
The Summer Academy for Math and Sciences (SAMS) is a six-week program for minoritized student groups interested in pursuing STEM-related undergraduate majors.

Teaching and Learning Summit, <i>Carnegie Mellon University</i>	Oct. 2016
Evidence-Based Teaching in STEM, <i>Carnegie Mellon University</i>	Spring 2016
<i>Semester-long course taught within the Eberly Center for Teaching Excellence and Educational Innovation. This course helps instructors adopt research-based teaching strategies in their classes.</i>	

Service

Academic service, Mathematics Department (Carnegie Mellon University)

President, <i>SIAM Student Chapter</i>	2018–2020
Treasurer, <i>SIAM Student Chapter</i>	2016–2018
Co-organizer, <i>SIAM Student Chapter Graduate Student Panels</i>	
Mini-Symposium: Road to an academic career, with faculty members	Spring 2020
Milestones of a PhD program, with senior graduate students	Fall 2019
Job panel, with recent graduates	Spring 2019
Co-founder and co-organizer, <i>SIAM Student Chapter Working Group</i>	
Malliavin Calculus	Spring 2020
Koopman Spectral Analysis	Fall 2019
Concentration of Measure	Spring 2019
Analysis of Hydrodynamic Models	Fall 2018
Calculus of Variations on Manifolds and Geometric Flows	Spring 2018
Geometric Measure Theory	Fall 2017
Weak Convergence Methods	Fall 2016
Co-organizer, <i>Women and Mathematics at Carnegie Mellon University: Conference on Partial Differential Equations in Mathematical Finance</i>	Apr. 2018

Academic service, Eberly Center for Teaching Excellence and Educational Innovation (Carnegie Mellon University)

Teaching Innovation Award Selection Committee	Spring 2019, 2020
Senior Graduate Teaching Fellow	Spring 2020

Graduate Teaching Fellow	2018–2019
<i>Duties include one-on-one consultations with Eberly Center clients and facilitation of teaching workshops. Both of these services support clients by developing their teaching skills.</i>	

Miscellaneous service, Carnegie Mellon University

Vice President of Finance, <i>Graduate Student Assembly</i>	2017–2019
Representative of the Department of Mathematical Sciences, <i>Graduate Student Assembly</i>	2016–2017