

# Curriculum Vitae - Fabio Pusateri

August 2023

## Bibliographical information

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NAME AND TITLE: Fabio Giuseppe Pusateri, Associate Professor,  
Mathematics Department, Faculty of Arts & Science,  
University of Toronto

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Toronto, ON, M5S 2J6  
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Email: [fabiop@math.toronto.edu](mailto:fabiop@math.toronto.edu)  
Website: <https://web.math.toronto.edu/~fabiop>

## Academic Qualifications

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|------|-------------------|--|
| 2011 | Ph.D. Mathematics | New York University, Courant Institute |
| 2006 | M.S. Mathematics  | University of "Roma Tre"               |
| 2004 | B.S.              | University of "Roma Tre"               |

## Employment

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|------|---------------------------------|-----------------------|
| 2022 | Associate Professor             | University of Toronto |
| 2018 | Assistant Professor             | University of Toronto |
| 2014 | Assistant Professor             | Princeton University  |
| 2011 | Instructor, Postdoctoral Fellow | Princeton University  |

## Research Interests

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Analysis of PDEs, Dispersive and Wave Equations  
Fluid Dynamics, Water Waves  
Harmonic Analysis and applications  
Hamiltonian Dynamics

## Grants and Awards

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- *Coxeter-James prize*, Canadian Mathematical Association. February 2022.
- *Ambrosetti Medal*, SISSA, SNS, UMI, September 2021.
- *ISAAC Award*, International Society for Analysis and its Applications, July 2019.
- *Connaught New Researcher Award*, University of Toronto, 06/2019 – 06/2021, CAD 20K.
- *Grant supplement*, NSERC, 2018/2019, CAD 12.5K.
- *Grant RGPIN-2018-06487*, NSERC, 07/2018 – 06/2023, CAD 115K.

- *NSF Grant DMS 1265875*, National Science Foundation (NSF), 09/2013 – 07/2017, USD 109K.
- *Simons Fellowship*, Simons Foundation, 09/2011 – 06/2014, USD 225K.  
(Postdoctoral Fellow salary)
- *Dean's Dissertation Fellowship*, NYU School of Arts and Science, 09/2010 – 05/2011.
- *MacCracken Fellowship*, NYU School of Arts and Science, 09/2006 – 05/2011.

## Publications (Authors always appear in alphabetical order)

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31 Refereed publications, 3 submitted to publisher.

2 books (Memoirs of American Mathematical Society; one published and one to appear).

Citations: 1373. h-index: 19. i10-index: 27 (see [Google Scholar](#))

2023

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Kairzhan, A. and Pusateri, F. *Asymptotic stability near the soliton for quartic Klein-Gordon in 1D*. 35 pages, arXiv:2206.15008. To appear in **Pure and Applied Analysis**.

Arbunich, J., Faupin, J., Pusateri, F. and Sigal, I.M. *Maximal Speed of Quantum Propagation for the Hartree equation*. **Comm. PDE** (2023).

Germain, P., Pusateri, F. and Zhang, Z. *On 1d quadratic Klein-Gordon equations with a potential and symmetries*. **Arch. Ration. Mech. Anal.** (2023) volume 247, 17.

2022

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Léger, T. and Pusateri, F. *Internal mode-induced growth in 3d nonlinear Klein-Gordon equations*. arXiv:2203.05694. **Rend. Lincei Mat** vol. 33, no. 3, pp. 695-727.

Germain, P. and Pusateri, F. *Quadratic Klein-Gordon equations with a potential in one dimension*. arXiv:2006.15688. **Forum Math. Pi** 10 (2022), Paper No. e17, 172 pages. (Open Access)

Pusateri, F. and Soffer, A. *Bilinear estimates in the presence of a large potential and a critical NLS in 3d*. arXiv:2003.00312. 94 pages. To appear in **Memoirs of the AMS**.

2021

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Arbunich, J., Pusateri, F., Sigal, I. M. and Soffer, A. *Maximal Speed of Quantum Propagation*. **Lett. Math. Phys.** (2021), vol 111, Article no. 62.

Pusateri, F. and Sigal, I.M. *Long-time behavior of time-dependent Density Functional Theory*. **Arch. Ration. Mech. Anal.** (2021) volume 241, pages 447-473.

Berti, M., Feola, R. and Pusateri, F. *Birkhoff normal form for gravity water waves*. **Water Waves**, 3 (2021), 117-126.

2020

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Deng, Y. and Pusateri, F. *On the global behavior of weak null quasilinear wave equations*. **Comm. Pure Appl. Math.** 73 (2020), no. 5, pp 1035-1099.

Chen, G. and Pusateri, F. *The 1d nonlinear Schrödinger equation with a weighted  $L^1$  potential*. arXiv:1912.10949. 45 pages. To appear in **Analysis & PDE**.

2019

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Ionescu, A. and Pusateri, F. *Long-time existence for multi-dimensional periodic water waves.* **Geom. Funct. Anal.** 29 (2019), no. 3, pp 811-870.

Berti, M., Feola, R. and Pusateri, F. *Birkhoff normal form and long time existence for periodic gravity water waves.* 71 pages. [Open access link.](#) *Comm. Pure Appl. Math.* 76 (2023), no. 7, 1416-1494.

2018

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Ionescu, A. and Pusateri, F. *Global regularity for 2d water waves with surface tension.* **Mem. Amer. Math. Soc.** (2018), vol. 256, no. 1227.

Pusateri, F. and Widmayer, K. *On the Global Stability of a Beta-Plane Equation.* **Analysis & PDE** Vol. 11 (2018), no. 7, 1587-1624.

Germain P., Pusateri, F. and Rousset, F. *The nonlinear Schrödinger equation with a potential.* **Annales IHP C**, Analyse non Linéaire, Vol. 35 (2018), no. 6, 1477-1530.

2017

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Ionescu, A. and Pusateri, F. *Recent advances on the global regularity for water waves.* **Philosophical Transactions A.** 20170089, volume 376, issue 2111. 28pp.

Deng, Y., Ionescu, A., Pausader, B. and Pusateri, F. *Global solutions for the 3D gravity-capillary water wave system.* **Acta Mathematica** 219 (2017), 213-402.

Murphy, J. and Pusateri, F. *Almost global existence for cubic NLS equations in one space dimension.* arXiv:1605.03247. **DCDS-A** 37 (2017), 2077-2102.

2016

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Ionescu, A. and Pusateri, F. *Global analysis of a model for capillary water waves in 2D.* **Comm. Pure Appl. Math.** 69 (2016), no. 11, 2015-2071.

Germain P., Pusateri, F. and Rousset, F. *Asymptotic stability of solitons for mKdV.* **Advances in Math.** 299 (2016), 272-330.

2015

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Ionescu, A. and Pusateri, F. *Global existence for the gravity water waves system in 2D.* **Inventiones Math.** 199 (2015), no. 3, 653-804.

Beck T., Pusateri F., Sosoe, P. and Wong, P. *On Global Solutions of a Zakharov type System.* **Nonlinearity** 28 (2015), no. 9, 3419-3441.

Oh, S.-J. and Pusateri, F. *Decay and scattering for the Chern-Simons-Schrödinger System.* **Int. Math. Res. Notices.** (2015), no. 24, 13122-13147.

2014

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Ionescu, A. and Pusateri, F. *Nonlinear fractional Schrödinger equations in one dimension.* **J. Funct. Anal.** 266 (2014), no. 1, 139-176.

Pusateri, F. *Modified scattering for the Boson Star equation.* **Comm. Math. Phys.** 332 (2014), no. 3, 1203-1234.

2013

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Pusateri, F. *Space-Time Resonances and the null condition for wave equations.* **Boll. Uni. Mat. Ita.** 6 (2013), no.3, 513-529.

Hani, Z., Pusateri, F. and Shatah, J. *Scattering for the Zakharov system in three dimension.* **Comm. Math. Phys.** 322 (2013), no. 3, 731-753.

Pusateri, F. and Shatah, J. *Space-Time resonances and the null condition for first order systems of wave equations.* **Comm. Pure and Appl. Math.** 66 (2013), no. 10, 1495-1540.

2011

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Pusateri, F. *On the limit as the surface tension and density ratio tend to zero for the two-phase Euler equations.* **J. Hyperbolic Differ. Equ.** 8 (2011), no. 2, 347-373.

Kato, J. and Pusateri, F. *A new proof of long range scattering for critical NLS equations.* **Diff. Int. Equations** 24 (2011), no. 9-10, 923-940.

2009

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Chierchia, L. and Pusateri, F. *Analytic Lagrangian Tori for the Planetary Many-Body Problem.* **Ergodic Th. Dynam. Sys.** 29 (2009), no. 3, 849-873.

Submitted to publisher

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Deng, Y., Ionescu, A. and Pusateri, F. *On the wave turbulence theory of 2d gravity waves, I: deterministic energy estimates* 89 pages. arXiv:2211.10826.

Chen, G. and Pusateri, F. *On the 1d nonlinear Schrödinger equation with a non-generic potential.* 54 pages. arXiv:2205.01487.

Léger, T. and Pusateri, F. *Internal modes and radiation damping for quadratic Klein-Gordon in 3D.* 127 pages. arXiv:2112.13163.

Non-Refereed

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Pusateri, F. *Some topics in hyperbolic and dispersive PDE.* Thesis (Ph.D.)-New York University. 2011. 167 pp. ISBN: 978-1124-80947-2, ProQuest LLC.

Pusateri, F. *On the one fluid limit for vortex sheets.* 20 pages arXiv:0908.3353.

Ionescu, A. and Pusateri, F. *A note on the asymptotic behavior of 2D gravity waves.* 8 pages .pdf

## Presentations

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### CONFERENCES

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- January 2022, SITE NYU Abu Dhabi (Conference) “Long Time Behavior and Singularity Formation in PDEs”.
- [postponed to date TBD] BIRS (Workshop) “Mathematical Questions in Wave Turbulence”.
- December 2021, ICERM (Workshop) “Hamiltonian Methods and Asymptotic Dynamics”.
- September 2021, BIRS (Workshop) “Singularity Formation in Nonlinear PDEs”.
- July 2021, BIRS (Workshop) “New Mechanisms for Regularity, Singularity, and Long Time Dynamics in Fluid Equations”.

- July 2019, 12th International ISAAC Congress (Plenary Speaker, ISAAC prize recipient), Aveiro, Portugal.
- June 2019, CAIMS Annual Meeting 2019, Whistler, BC (Session speaker).
- May 2019, Fields Institute (Workshop) “Nonlinear Dispersive PDEs and Inverse Scattering”, Toronto, ON.
- April 2019, IMACS Conference “Nonlinear Evolution Equations and Wave Phenomena”, Athens, GA (Session speaker).
- November 2018, “Recent developments in nonlinear waves”, UIC, Chicago, IL (Workshop).
- October 2018, FRG (Workshop) University of Chicago, Chicago, IL.
- October 2017, (Conference) “Analysis and Dynamics” in celebration of L. Chierchia, Lecce, Italy.
- September 2017, AMS sectional meeting, Buffalo, NY (Session speaker)
- June 2017, (Conference) “Water Waves and Related Models”, Bodega Marine Lab, CA.
- April 2017, ICERM semester program (Workshop) on “Water Waves ”.
- March 2017, IMACS conference “Nonlinear Evolution Equations and Wave Phenomena”, Athens, GA (Session speaker).
- September 2016, FRG (Workshop) MIT, Boston, MA.
- August 2016, SIAM Conference “Nonlinear Waves and Coherent Structures”, Philadelphia, PA (Session speaker).
- July 2016, AIMS conference on “Dynamical Systems, Differential Equations and Applications”, Orlando, FL (Session speaker).
- June 2016, “Nonlinear Waves”, IHES, Paris, France (Conference).
- May 2016, Oberwolfach (Workshop) “Nonlinear Evolution Problems”, Germany.
- September 2015, (Workshop) “Water Waves and Related Fluid Models”, Clay Research Conference, Oxford University, UK.
- March 2015, AMS sectional meeting, Georgetown, DC (Session speaker).
- February 2015, PDEs for Fluids, Brown University (RTG Workshop).
- October 2014, AMS Sectional Meeting, San Francisco State University, San Francisco, CA (Session speaker).
- May 2014, BIRS (Workshop) “Dynamics in Geometric Dispersive Equations and the Effects of Trapping, Scattering and Weak Turbulence”.
- August 2013, Oberwolfach (Workshop) “Nonlinear Waves and Dispersive Equations”, Germany.
- March 2013, SIAM SEAS Annual Meeting, Knoxville, TN (Session speaker).
- September 2012, “New perspectives in nonlinear PDEs”, Rome, Italy (Conference).
- July 2012, “Nonlinear Hamiltonian PDEs”, Ascona, Switzerland (Conference).
- September 2011, XIX UMI Congress, Bologna, Italy (Session speaker).
- April 2011, “Harrington Symposium on Dispersive PDEs”, University of Texas, Austin, TX (Symposium speaker).

#### INVITED LECTURES

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- (Upcoming) NYU workshop on Wave Turbulence - November 2023
- (Upcoming) Penn State Department Colloquium - November 2023
- SUSTech Analysis and PDE seminar (Shenzhen, China) online - March 2023
- VAPS seminar (joint GATech, UCI, UCLA, Brown, Columbia and others) online - February 2023
- CMS plenary prize talk - December 2022
- PDEs and Harmonic Analysis Seminar, KAIST (Korea) online - November 2022
- PDE seminar, UC Davis - May 2022
- Math and Stats Colloquium, Queen’s University - March 2022
- U Kentucky Student Seminar - December 2021
- Ambrosetti Prize Lecture at SISSA, November 2021

- [postponed] Applied Math seminar, Brown University - April 2020
- [postponed] Differential equations seminar, University of Michigan - April 2020
- University of Chicago ‘Calderón-Zygmund Seminar’ - online, May 2021
- Seminario EDPs, Universidad de Chile - online, December 2020
- Analysis Seminar Milano-Napoli - online, December 2020
- Enriques-Lebesgue seminar, Milan-Nantes - online, November 2020
- MU-MST joint Colloquium - online, June 2020
- PDE Seminar via Zoom, Shanghai-Tech - online, June 2020
- SUNY Differential equations seminar - Albany, NY, April 2019
- Princeton University Analysis seminar - Princeton, NJ, April 2019
- University of Kentucky Analysis and PDE seminar - Lexington, KY, October 2018
- Rice University Colloquium Seminar - Houston, TX, February 2017
- University of Toronto Colloquium Seminar - Toronto, ON, January 2017
- University of Wisconsin Colloquium Seminar - Madison, WI, January 2017
- UCSB Colloquium Seminar - Santa Barbara, CA, January 2017
- UPenn Analysis Seminar - Philadelphia, PA, November 2016
- Johns Hopkins University Analysis Seminar - Baltimore, MD, September 2016
- Courant Institute/NYU Analysis Seminar - New York, NY, March 2016
- Rutgers University Nonlinear Analysis Seminar - New Brunswick, NJ, March 2016
- Mathematical Analysis, Modeling, and Applications (two lectures) - SISSA, Trieste, Italy, Jan 2015
- CUNY Analysis and PDE seminar - New York, NY, December 2015
- UCLA-Caltech Analysis and PDE seminar - Los Angeles, CA, November 2014
- UCLA Analysis and PDE Seminar - Los Angeles, CA, May 2014
- University of Chicago ‘Calderón-Zygmund Seminar’ - Chicago, IL, May 2014
- UPenn Analysis Seminar - Philadelphia, PA, April 2014
- University of Minnesota PDE Seminar - Minneapolis, MN, January 2014
- Princeton University Analysis Seminar - Princeton, NJ, December 2013
- Georgia Tech Colloquium Seminar - Atlanta, GA, December 2013
- University of Michigan Differential Equations seminar - Ann Arbor, MI, October 2013
- Brown University PDE Seminar - Providence, RI, September 2013
- UCLA Analysis Seminar - Los Angeles, CA, May 2013
- Courant Institute/NYU Analysis Seminar - New York, NY, May 2013
- Princeton University Analysis Seminar - Princeton, NJ, September 2012
- UPenn Analysis Seminar - Philadelphia, PA, December 2011
- Princeton University Analysis Seminar - Princeton, NJ, April 2011
- Brown University PDE Seminar - Providence, RI, October 2010
- University of ‘Roma Tre’ Analysis Seminar - Rome, Italy, June 2010

## Teaching

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UNIVERSITY OF TORONTO

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### i. Undergraduate courses

- Partial Differential Equations - MAT351 (AY 2023-2024)
- Reading course “Advanced Harmonic Analysis and applications” - MAT490 (Summer 2023, 1 student)
- Introduction to Real Analysis - MAT357 (Winter 2023)

- Reading course “Introduction to Harmonic analysis and applications” - MAT491H (Winter 2023, 3 students)
- Reading course “Introduction to classical harmonic analysis and applications to fluid equations” - MAT1951 (Winter 2023, 1 student)
- Introduction to Fluid Mechanics (Topics course) - MAT482 (Fall 2022)
- Reading course “Introduction to Sobolev spaces and applications to Nonlinear PDE” - MAT495H (Summer 2022, 1 student)
- Introduction to Real Analysis - MAT357 (Winter 2022)
- Introduction to Real Analysis - MAT357 (Winter 2021)
- Introduction to Real Analysis - MAT357 (Winter 2020)  
(Designed and added new section on Fourier Transform)
- Reading course “Linear and Nonlinear waves” - MAT491H (Fall 2019)

## ii. Graduate courses

- Partial Differential Equations II - MAT1062H (Winter 2024)
- Reading course “Pseudo- and Para-differential calculus and the analysis of water waves” - MAT1950H (Summer 2023, 1 student)
- Reading course “Nonlinear Dynamics in Quantum Mechanics” - MAT1951H (Summer 2023, 1 student)
- Reading course “Introduction to Harmonic Analysis and applications” - MAT1091H (Winter 2023)
- Partial Differential Equations I - MAT1061H (Fall 2022)
- Introduction to nonlinear evolution equations - MAT1062H (Fall 2021)  
(Designed the course)
- The mathematics of Water Waves - MAT1063H (Fall 2020)  
(Designed the course)
- Reading course “Nonlinear dispersive equations” - MAT1091H (Winter 2020)
- Harmonic Analysis and Applications to PDEs - MAT1034H (Fall 2019)  
(Designed the course)
- Partial Differential Equations I - MAT1061H (Fall 2018)

## PRINCETON UNIVERSITY

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- Multivariable Calculus - MAT201 (Spring 2018)
- Multivariable Calculus - MAT201 (Fall 2017 - 2 sections)
- Differential Equations - MAT320 (Spring 2017)
- Multivariable Calculus - MAT201 (Fall 2016 - 2 sections, Course Head)
- Multivariable Calculus - MAT201 (Spring 2016 - 2 sections, Course Head)
- Reading course on Singular Integrals and Applications - MAT91 (Spring 2016)
- Pseudo Differential Operators and the Nash-Moser Theorem - MAT984 (Fall 2015)
- Differential Equations - MAT322 (Spring 2015)
- Multivariable Calculus - MAT201 (Fall 2014 - 2 sections, Course Head)
- Real Analysis - MAT320 (Fall 2013)
- Multivariable Calculus - MAT201 (Fall 2012 - 2 sections)

## OTHER UNIVERSITIES

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### i. New York University

- Calculus 1, Instructor (Fall 2009)

- ODE, TA (Spring 2009)
- Calculus for Social Sciences, Instructor (Fall 2008)
- Analysis 1, TA (Spring 2008)
- Math patterns in Nature, Instructor (Fall 2007, Spring 2010, Spring 2011)
- Intro to Math Analysis, TA (Spring 2006)

## ii. University “Roma Tre”

Teaching assistant for the following courses:

- Analysis II (Fall 2005)
- Introduction to Galois Theory (Spring 2005)
- Calculus of several variables (Spring 2004, Fall 2006)
- Theory of Integration (Spring 2004)
- Analysis I (Fall 2003, Fall 2005)
- Introduction to Computer Science (Fall 2003)

## SUPERVISIONS

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- Master student: Kevin Dembski (University of Toronto ‘21)  
On the well-posedness and blow-up for the Boussinesq and Porous medium equation  
05/2021 – 08/2021
- PhD student: Adam Morgan (University of Toronto)  
Scattering for a generalized Benjamin-Bona-Mahoney equation  
01/2019 – present (expected completion 09/2023)
- PhD student: Oliver Trevett (University of Toronto)  
Modulation theory for Water Waves with vorticity  
09/2022 – present (expected completion 05/2027)
- PhD student: Dominic Shillingford (University of Toronto, URM)  
Long-time dynamics in Density Functional Theory  
09/2022 – present (expected completion 05/2027)
- Supervision of Senior Thesis (2016/2017) - Stan Palasek  
(Princeton University ‘17, PhD candidate at UCLA)
- Supervision of Junior Thesis (Spring 2016) - Allen Fang  
(Princeton University ‘17, PhD candidate at Sorbonne)
- Postdoctoral Fellow: Gong Chen (currently Assistant Professor at Georgia Tech)  
Nonlinear Schrödinger equations, Kinks in fields theories  
09/2018 – 12/2021
- Postdoctoral Fellow: Adilbek Kairzhan  
Nonlinear Klein-Gordon equations, stability of solitons  
09/2020 – present
- Postdoctoral Fellow: Jack Arbunich (currently PDF at University of Oklahoma)  
Schrödinger equations, quantum propagation  
09/2019 – 07/2022
- Postdoctoral Fellow: Logan Stokols (currently PDF at Duke)  
Fluids, Water Waves  
09/2020 – 06/2021
- Postdoctoral Fellow: José Manuel Palacios (University of Toronto)  
09/2022 – present



- Postdoctoral Fellow: Gael Yomgne Diebou (University of Toronto, URM)  
07/2023 – present

### **Administrative positions (at University of Toronto)**

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- Chair of the Awards Committee - AY 2023-2024
- Department of Mathematics Council Member - AY 2022-2023
- Department of Mathematics Council Member - AY 2022-2023
- Mathematics Department Annual Review Committee member - AY 2021-2022
- Mathematics Department Annual Review Committee member - AY 2020-2021
- Mathematics Department Annual Review Committee member - AY 2019-2020
- Mathematics Department Colloquium co-organizer - AY 2022-2023
- Mathematics Department Colloquium co-organizer - AY 2019-2020
- Mathematics Department Colloquium co-organizer - AY 2018-2019
- Mathematics Department Hiring Committee member - AY 2019-2020
- Mathematics Department Hiring Committee member - AY 2018-2019

### **Other Professional Experience**

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- Editorial Board Member *Nonlinear Analysis* - 04/2021–present
- Organizer of the CMS session “Recent advances in nonlinear evolution equations” at the Annual CMS meeting, Winter 2022 ([link](#))
- Co-founder and co-organizer of the ONEPAS online seminar series, 2020-2021
- Organizer of the Program “Mathematical hydrodynamics: Analysis of fluid motion and its applications” at the Fields Institute - 07/2020 – 12/2020
- Ph.D. Thesis Committee Member for E. Miller (adviser R. McCann), N. Carruth (adviser S. Alexakis), A. Talidou (advisers A. Burchard and M. Sigal), A. Gardner (adviser M. Sigal), C. Kennedy (adviser C. Sulem), C. Clark (A. Burchard)
- Ph.D. advisory Committee Member for T. Zhou (adviser C. Sulem) and A. Geevechi (adviser B. Jerrard)
- Chair of Ph.D. defense for Department of Biomedical Engineering.
- Lead organizer of the Fields Colloquium in Applied Mathematics, AY 2019-2020 and 2022-present
- Co-organizer of the Analysis Seminar at Princeton University (2012–2017)
- Co-organizer of the seminar “Analysis of Fluids and related topics” at Princeton University (2013–2017)
- Reviewer for international journals, including: *Inventiones Mathematicae*, *Annals of Mathematics*, *Memoirs of the AMS*, *Duke Math Journal*, *Communications in Pure and Applied Math*, *Annals of PDE*, *Archive for rational mechanical analysis*, *International Mathematics Research Notices*, *Communication in Mathematical Physics*, *SIAM Journal on Mathematical Analysis*, *Cambridge Journal of Mathematics*, *Analysis & PDE*, *Journal of Functional Analysis*, *Advances in Mathematics*, *Nonlinearity*, *Indiana University Mathematics Journal*, *Nonlinearity*, *Journal of Differential Equations*, *Nonlinear Analysis: Theory, Methods and Applications*, *Mathematical Methods in the Applied Sciences*.
- Reviewer for grants proposals of NSERC (Canada), FONDECYT (Chile), ERC (European Research Council).