

# ANDREA GIORGINI

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## ACADEMIC POSITIONS

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- Zorn Postdoctoral Fellow** *August 2018-present*  
Department of Mathematics & Institute for Scientific Computing and Applied Mathematics  
Indiana University  
Mentor: Roger Temam
- Research Assistant** *September 2017-August 2018*  
Dipartimento di Matematica “F. Casorati”  
Università di Pavia

## EDUCATION

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- PhD in Mathematical Models and Methods in Engineering** *November 2014–October 2017*  
Politecnico di Milano, Italy  
Thesis: *Mathematical analysis of some diffuse interface models for binary fluids*  
Advisor: Prof. Maurizio Grasselli  
Discussion date: February 23, 2018
- MSc in Mathematical Engineering** *October 2012–October 2014*  
Politecnico di Milano, Italy  
Thesis: *On the Swift-Hohenberg equation with slow and fast dynamics: well-posedness and longtime behavior*  
Advisor: Prof. Maurizio Grasselli  
Final grade: 110/110 cum Laude
- BSc in Mathematical Engineering** *September 2009–September 2012*  
Politecnico di Milano, Italy  
Thesis: *Nonlinear oscillators and the Littlewood boundedness problem*  
Advisor: Prof. Gianmaria Verzini  
Final grade: 110/110 cum Laude

## AWARDS

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- Cuozzo Prize 2018** *December 2018*  
*Awarded for the Ph.D. thesis in Mathematics from Università degli Studi di Roma “Tor Vergata”*
- 2018 AIMS Student Paper Competition: first place** *June 2018*  
*Awarded at the 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications*
- Carlo Cercignani Prize 2014** *March 2015*  
*Awarded for the MSc thesis in Mathematical Engineering at Politecnico di Milano*

## GRANTS

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<b>AMS Simons Travel Grant</b>	June 2019-June 2022
<b>SIAM Travel Award</b>	July 2019
<b>Oberwolfach Leibniz Graduate Student</b>	April 2018
<b>PI of the GNAMPA-INdAM Project 2018 (€ 5000)</b> “Mathematical analysis of diffuse interface models for complex fluids”	March 2018
<b>LIA-LYSM AMU-CNRS-ECM-INdAM Travel grant</b>	February 2017
<b>PhD Scholarship - Politecnico di Milano</b>	November 2014-October 2017

## PUBLICATIONS

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15. A. Giorgini, K.F. Lam, E. Rocca, G. Schimperna, *On the existence of strong solutions to the Cahn-Hilliard-Darcy system with mass source*, arXiv:2009.13344, 2020.
14. A. Giorgini, M. Grasselli & H. Wu, *Diffuse interface models for incompressible binary fluids and the mass-conserving Allen-Cahn approximation*, arXiv:2005.07236, 2020.
13. A. Giorgini, *Well-posedness of the two-dimensional Abels-Garcke-Grün model for two-phase flows with unmatched densities*, Calc. Var. Partial Diff. Equ. **60**, 100 (2021).
12. A. Giorgini, R. Temam & X.-T. Vu, *The Navier-Stokes-Cahn-Hilliard equations for mildly compressible binary fluid mixtures*, Discret. Contin. Dyn. Syst. Ser. B **26** (2021), 337–366. Special issue for the 20 years anniversary of the journal.
11. A. Giorgini & R. Temam, *Weak and strong solutions to the nonhomogeneous incompressible Navier-Stokes-Cahn-Hilliard system*, J. Math. Pures Appl. **144** (2020), 194–249.
10. A. Giorgini, *Well-posedness for a diffuse interface model for two-phase Hele-Shaw flows*, J. Math. Fluid Mech. **22**:5 (2020).
9. M. Conti & A. Giorgini, *Well-posedness for the Brinkman-Cahn-Hilliard system with unmatched viscosities*, J. Differential Equations **268** (2020), 6350–6384.
8. A. Giorgini, A. Miranville & R. Temam, *Uniqueness and regularity for the Navier-Stokes-Cahn-Hilliard system*, SIAM J. Math. Anal. **51** (2019), 2535–2574.
7. F. Della Porta, A. Giorgini & M. Grasselli, *The nonlocal Cahn-Hilliard-Hele-Shaw system with logarithmic potential*, Nonlinearity **31** (2018), 4851–4881.
6. A. Giorgini, M. Grasselli & H. Wu, *The Cahn-Hilliard-Hele-Shaw system with singular potential*, Ann. Inst. H. Poincaré Anal. Non Linéaire **35** (2018), 1079–1118.
5. F. Di Plinio, A. Giorgini, V. Pata & R. Temam, *Navier-Stokes-Voigt equations with memory in 3D lacking instantaneous kinematic viscosity*, J. Nonlinear Sci. **28** (2018), 653–686.
4. A. Giorgini, M. Grasselli & A. Miranville, *The Cahn-Hilliard-Oono equation with singular potential*, Math. Models Methods Appl. Sci. **27** (2017), 2485–2510.
3. C.G. Gal, A. Giorgini & M. Grasselli, *The nonlocal Cahn-Hilliard equation with singular potential: well-posedness, regularity and strict separation property*, J. Differential Equations **263** (2017), 5253–5297.
2. M. Conti, A. Giorgini & M. Grasselli, *Phase-field crystal equation with memory*, J. Math. Anal. Appl. **436** (2016), 1297–1331.

1. A. Giorgini, *On the Swift-Hohenberg equation with slow and fast dynamics: well-posedness and longtime behavior*, Comm. Pure Appl. Anal. **15** (2016), 219–241.

## VISITING EXPERIENCE

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6. Department of Mathematics, Imperial College London, UK *June 24-28, 2019*
5. School of Mathematical Sciences, Fudan University, China *June 3-14, 2019*
4. Department of Mathematics, Florida International University, USA *June 5-29, 2017*
3. Laboratoire de Mathématiques et Applications, Université de Poitiers, France *March 12-20, 2017*
2. Department of Mathematics, City University of Hong Kong, Hong Kong *May 16-17, 2016*
1. School of Mathematical Sciences, Fudan University, China *March-June 2016*

## TALKS AT UNIVERSITY SEMINARS

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14. Applied Mathematics Seminar, Tulane University *March 26, 2021*
13. Multiscale Seminar, Illinois Institute of Technology *March 11, 2021*
12. PDE/Applied Math Seminar, Indiana University *March 8, 2021*
11. Analysis and PDE Seminar, University of Southern California *November 13, 2020*
10. Applied Math Seminar, University of Alabama *October 23, 2020*
9. PDE/Applied Math Seminar, Indiana University *November 11, 2019*
8. Multiscale Seminar, Illinois Institute of Technology *September 13, 2019*
7. Department Colloquium, University of Memphis *November 9, 2018*
6. PDE/Applied Math Seminar, Indiana University *October 22, 2018*
5. GRK 2339 IntComSin Seminar, University of Regensburg *April 27, 2018*
4. PDE Seminar, IMATI-CNR Università di Pavia *November 28, 2017*
3. PDE Seminar, Fudan University *June 16, 2016*
2. PDE Seminar, Fudan University *June 7, 2016*
1. PDE Seminar, City University of Hong Kong *May 16, 2016*

## TALKS AT CONFERENCES

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13. AMS Central Fall Virtual Sectional Meeting *September 13, 2020*  
*Theoretical and Computational Studies of PDEs Related to Fluid Mechanics*
12. 2019 SIAM Conference on Analysis of Partial Differential Equations *December 12, 2019*  
*Recent progress in Fluid Mechanics: classical flows, geophysical models and complex fluids*  
La Quinta, California
11. AMS Fall Western Sectional Meeting *November 9, 2019*  
*Fluids Dynamics: from Theory to Numerics*  
University of California, Riverside

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| 10. ICIAM 2019<br><i>Recent developments in nonlinear PDEs of hydrodynamics and mathematical biology</i><br>Valencia, Spain  | <i>July 15, 2019</i>      |
| 9. NSF-CBMS Conference<br><i>The Cahn-Hilliard Equation: Recent Advances and Applications</i><br>Burns, Tennessee  | <i>May 22, 2019</i>       |
| 8. AMS Fall Central Sectional Meeting<br><i>Analytical and Numerical Aspects of Turbulent Transport</i><br>University of Michigan, Ann Arbor   | <i>October 20, 2018</i>   |
| 7. 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications<br><i>Analytic properties and numerical approximation of differential models arising in applications</i><br>Taipei, Taiwan | <i>July 7, 2018</i>       |
| 6. 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications<br><i>Nonlinear Evolution PDEs, Interfaces and Applications</i><br>Taipei, Taiwan  | <i>July 6, 2018</i>       |
| 5. Workshop on Special Materials and Complex Systems- SMACS2018<br>Gargnano, Italy   | <i>June 18, 2018</i>      |
| 4. Conference on Mathematical Fluid Dynamics<br>Bad Boll, Germany  | <i>May 8, 2018</i>        |
| 3. Oberwolfach Workshop<br><i>Challenges in Optimal Control of Nonlinear PDE-Systems</i><br>Oberwolfach, Germany   | <i>April 10, 2018</i>     |
| 2. International Conference on Elliptic and Parabolic Problems<br><i>Nonlinear PDEs for multiphase materials and complex fluids</i><br>Gaeta, Italy  | <i>May 24, 2017</i>       |
| 1. SIMAI 2016<br><i>Modeling Dissipative Phenomena</i><br>Politecnico di Milano, Italy   | <i>September 13, 2016</i> |

## TEACHING EXPERIENCE

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### Indiana University

- M301 Linear Algebra and Applications (Online) *Spring 2021*
- M119 Brief Survey of Calculus 1 (Online) *Spring 2021*
- M441 Partial Differential Equations and Applications I (Online) *Fall 2020*
- M343 Introduction to Differential Equations with Applications I (Two sections) *Spring 2020*
- M441 Partial Differential Equations and Applications I *Fall 2019*
- M365 Introduction to Probability and Statistics *Spring 2019*
- M343 Introduction to Differential Equations with Applications I (Two sections) *Fall 2018*

### Università di Pavia

- Teaching Assistant, Advanced Mathematical Methods for Engineers *Fall 2017*

• Teaching Assistant, Mathematical Analysis 1 *Fall 2017*

**Università degli Studi di Milano**

• Teaching Assistant, Mathematics and Statistics *Fall 2016*

**Politecnico di Milano**

• Tutor, Mathematical Analysis 1 *Fall 2017*

• Tutor, Mathematical Analysis 1 *Fall 2016*

• Tutor, Mathematical Analysis 1 *Fall 2015*

• Teaching Assistant, Mathematical Analysis 1 and Geometry *Fall 2015*

• Teaching Assistant, Mathematical Analysis 1 and Geometry *Fall 2014*

**PROFESSIONAL SERVICE**

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◇ Member of the colloquium committee at Indiana University, Department of Mathematics in Fall 2019 and Spring 2020

◇ Co-organizer of mini symposium “*Recent progress in Fluid Mechanics: classical flows, geophysical models and complex fluids*” (3 sections) at the 2019 SIAM Conference on Analysis of Partial Differential Equations

◇ Reviewing activity since 2016: *Advances in Nonlinear Analysis, Asymptotic Analysis, Evolution Equations and Control Theory, Discrete and Continuous Dynamical System - Series A & B, Indiana University Mathematics Journal, Journal de Mathématiques Pures et Appliquées, Journal of Differential Equations, Journal of Evolution Equations, Mathematical Models in Applied Sciences, Nonlinear Analysis, Nonlinear Analysis: Real World Applications, Nonlinearity, Physica D, Proceedings A of the Royal Society of Edinburgh, Science China Mathematics.*

◇ Tutoring at College Camplus (Milano) from 2013 until 2017. Subjects: Calculus 1 and 2, Linear Algebra and Geometry, PDEs and Numerical Analysis.