

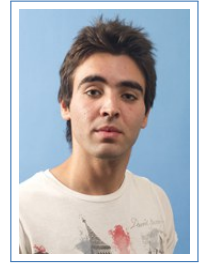
Tomás Aquino

Curriculum Vitæ

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Current Position

2016–Present **Postdoctoral Researcher**, Spanish National Research Council (IDAEA – CSIC), 08034 Barcelona, Spain (supervisor: Prof. Marco Dentz).

Education

2012–2016 **PhD**, *University of Notre Dame du Lac*, IN, USA, *Course GPA: 4.00/4.00.*
Department of Civil and Environmental Engineering and Earth Sciences

2009–2011 **MSc in Physics**, *University of Lisbon*, Portugal, *GPA: 19/20.*
Specialization in Computational and Nonlinear Physics

2006–2009 **Undergraduate Degree in Physics**, *University of Lisbon*, *GPA: 19/20.*

PhD Thesis

title *Lagrangian Random Walk Methods in Hydrologic Settings*
supervisor Dr. Diogo Bolster

Master Thesis

title *Physical Modeling of Cellular Processes: Stochastic Gene Expression in Embryonic Stem Cells*
supervisor Dr. Ana Nunes

Research Interests

I am interested in modeling physical processes with recourse to stochastic methods, both by analytical and computational means. I am currently developing models of transport, mixing and reaction for surface and subsurface hydrological systems that aim to capture heterogeneity through the use of stochastic descriptions. I have also worked on applying probabilistic techniques to gene expression in biological cells, epidemic spread on adaptive networks, and the dynamics of multi-strain diseases such as Influenza.

Publications in International Peer-reviewed Journals

12. Aquino, Tomás, and Marco Dentz. "Chemical continuous time random walks." *Physical Review Letters* 119 (2017): 230601.
11. Aquino, Tomás, Kevin Roche, Antoine Aubeneau, Aaron Packman, and Diogo Bolster. "A process-based model for bioturbation-induced mixing." *Scientific Reports* 7.1 (2017):14287.
10. Aquino, Tomás, and Diogo Bolster. "Localized point mixing rate potential in heterogeneous velocity fields." *Transport in Porous Media* 119.2 (2017): 391–402.
9. Aquino, Tomás, Antoine Aubeneau, Gavan McGrath, Diogo Bolster, and Suresh Rao. "Noise-driven return statistics: scaling and truncation in stochastic storage processes." *Scientific Reports* 7.302 (2017).
8. Benson, David A., Tomás Aquino, Diogo Bolster, Nicholas Engdahl, Christopher V. Henri, and Daniel Fernández-García. "A comparison of Eulerian and Lagrangian transport and non-linear reaction algorithms." *Advances in Water Resources* 99 (2017): 15–37.
7. Roche, Kevin R., Antoine F. Aubeneau, Minwei Xie, Tomás Aquino, Diogo Bolster, and Aaron I. Packman. "An integrated experimental and modeling approach to predict sediment mixing from benthic burrowing behavior." *Environmental Science & Technology* 50.18 (2016): 10047–10054.
6. Aquino, Tomás, and Ana Nunes. "Host immunity and pathogen diversity: a computational study." *Virulence* 7.2 (2016): 121–128.
5. Paster, Amir, Tomás Aquino, and Diogo Bolster. "Incomplete mixing and reactions in laminar shear flow." *Physical Review E* 92.1 (2015): 012922.
4. Aquino, Tomás, Antoine Aubeneau, and Diogo Bolster. "Peak and tail scaling of breakthrough curves in hydrologic tracer tests." *Advances in Water Resources* 78 (2015): 1–8.
3. Aquino, Tomás, Diogo Bolster, and Ana Nunes. "Characterization of the endemic equilibrium and response to mutant injection in a multi-strain disease model." *Journal of Theoretical Biology* 368 (2015): 27–36.
2. Aquino, Tomás, Elsa Abranches, and Ana Nunes. "Stochastic single-gene autoregulation." *Physical Review E* 85.6 (2012): 061913.
1. Wieland, Stefan, Tomás Aquino, and Ana Nunes. "The structure of coevolving infection networks." *Europhysics Letters* 97.1 (2012): 18003.

Chapters in Collective Volumes

- Accepted Sund, Nicole, Tomás Aquino, and Diogo Bolster. "Effective Models for Anomalous Transport in Complex Heterogeneous Hydrologic Systems." In: *Encyclopedia of Water: Science, Technology, and Society* (2017).

Communications at Major International Conferences:

- Talk Aquino, Tomás, and Marco Dentz. "Chemical continuous time random walks." AGU 2017.

- Poster Aquino, Tomás, and Marco Dentz. "Increasing the order of collocation methods – equivalence between Lagrangian and Eulerian formulations of multicomponent reactive systems." Interpore 2017.
- Talk Aquino, Tomás, Kevin R. Roche, Antoine F. Aubeneau, Aaron I. Packman and Diogo Bolster. "A Process-Based Model for Bioturbation-Induced Mixing." AGU 2016.
- Talk Aquino, Tomás, and Diogo Bolster. "Point mixing rate potential in heterogeneous velocity fields." Interpore 2016.
- Talk Aquino, Tomás, Antoine Aubeneau, and Diogo Bolster. "Peak scaling of breakthrough curves in reactive flows." AGU Fall Meeting 2015.
- Poster Aquino, Tomás, and Diogo Bolster. "Point mixing rate potential in heterogeneous velocity fields." AGU Chapman MADE 2015.
- Poster Aquino, Tomás, Antoine Aubeneau, and Diogo Bolster. "Peak and tail scaling of breakthrough curves in hydrologic tracer tests." AGU Fall Meeting 2014
- Talk Aquino, Tomás, and Diogo Bolster. "Incomplete mixing in background flow fields." Interpore 2014
- Poster Aquino, Tomás, Amir Paster, David Benson, and Diogo Bolster. "Reactions in non-uniform flows." AGU Fall Meeting 2013

Research Experience, Grants, and Awards

- 2016–Present Contributing member on the project *MHetScale*, ERC.
- 2015–Present Contributing member on the project *INSPIRE Track 1: Earthcasting fluvial systems: Physical, ecological, and biogeochemical dynamics*, NSF.
- 2016 Contributing member on the project *Collaborative Research: A New Paradigm for Imperfectly-Mixed Chemical Reactions*, NSF.
- 2015 Contributing member on the project *CAREER: Connecting the Scales – Local to Global Scales of Mixing in Heterogeneous Porous Media*, NSF.
- 2014 Contributing member on the project *Mixing and Reactions in Highly Heterogeneous Media – Can Nonlocal Models handle them?* NSF.
- 2013–2016 PhD Grant, dissertation project: *Lagrangian Random Walk Methods In Hydrologic Settings*, Portuguese Foundation for Science and Technology (FCT), SFRH/BD/89488/2012.
- 2012–2013 Research Assistant at the University of Notre Dame du Lac.
- 2012 Stimulus to Research Award, project: *Phylodynamics of Influenza A: A Simple Model for a Complex System*, Centro de Física da Matéria Condensada, University of Lisbon. Fundação Calouste Gulbenkian, Portugal.
- 2011–2012 Research Grant, project: *Large Scale Parallel Simulations of Infectious Disease Propagation*, Centro de Física da Matéria Condensada. Portuguese Foundation for Science and Technology (FCT), PTDC/SAU-EPI/112179/2009.
- 2010–2011 Research Grant, project: *Modeling Complex Evolutionary Systems*, Centro de Matemática e Aplicações Fundamentais, University of Lisbon. Portuguese Foundation for Science and Technology (FCT), PTDC-FIS-70973-2006.

2009 Initiation to Research Grant, project: *Infection Dynamics on Adaptive Networks*, Centro de Física Teórica e Computacional, University of Lisbon. Portuguese Foundation for Science and Technology (FCT), CFTC-618-BII- 02/08.

Other Academic Distinctions

2010 Distinguished Undergraduate Student, University of Lisbon
2008,'09,'10 Merit Award, University of Lisbon
2008,2009 Merit Award, Faculty of Sciences of the University of Lisbon (FCUL)
2008 FCUL Foundation Award

Teaching Experience

2012–2016 Teaching Assistant for Groundwater Hydrology (one semester), Environmental Hydrology (two semesters) and Fluid Mechanics (two semesters), Department of Civil and Environmental Engineering and Earth Sciences of the University of Notre Dame du Lac.
2012 Invited Assistant for Numerical Methods (one semester), Department of Physics of the Faculty of Sciences of the University of Lisbon.
2011 Teaching Assistant for Numerical Methods (one semester), Department of Physics of the Faculty of Sciences of the University of Lisbon.

Languages

Native Portuguese
Fluent English
Advanced Spanish

Computer Skills

Scientific Computing C++, Matlab, Mathematica