

DANIEL REMENIK

✉dremenik@dim.uchile.cl
<http://www.dim.uchile.cl/~dremenik>

Education

Ph.D. in Applied Mathematics, Cornell University	Aug. 2009
Mathematical Engineer, Universidad de Chile	Nov. 2004
B.S. in Engineering Sciences, Mention in Mathematics, Universidad de Chile	Dec. 2002

Academic Employment

Professor, Dept. of Mathematical Engineering, Universidad de Chile	2022 – present
Associate Professor, Dept. of Mathematical Engineering, Universidad de Chile	2016 – 2021
Assistant Professor, Dept. of Mathematical Engineering, Universidad de Chile	2012 – 2015
Researcher, Center for Mathematical Modeling, Universidad de Chile	2012 – present
Fields-Ontario Postdoctoral Fellow, Fields Institute & University of Toronto	2010 – 2012
Visiting Assistant Professor of Mathematics, Cornell University	2009 – 2010

Publications

33. K. Matetski, D. Remenik. TASEP and generalizations: Method for exact solution. arXiv:2107.07894.
32. L. Fredes, A. Linker, D. Remenik. Coexistence for a spatial population model with forest fire epidemics. To appear in *Annals of Applied Probability*.
31. G. B. Nguyen, K. Liechty, D. Remenik. Airy process with wanderers, KPZ fluctuations, and a deformation of the Tracy–Widom GOE distribution. To appear in *Annales de l'Institut Henri Poincaré Probabilités et Statistiques*.
30. J. Quastel, D. Remenik. KP governs random growth off a one dimensional substrate. To appear in *Forum of Mathematics, Pi*.
29. K. Matetski, J. Quastel, D. Remenik. The KPZ fixed point. *Acta Mathematica* 227, 115-203 (2021).
28. F. Tobar, F. Bravo-Marquez, J. Dunstan, J. Fontbona, A. Maass, D. Remenik, J. Silva. Data Science for Engineers: A Teaching Ecosystem. *IEEE Signal Processing Magazine* 38, 144-153 (2021).
27. M. Nica, J. Quastel, D. Remenik. One-sided reflected Brownian motions and the KPZ fixed point. *Forum of Mathematics, Sigma* 8, e63 (2020).
26. M. Nica, J. Quastel, D. Remenik. Solution of the Kolmogorov equation for TASEP. *Annals of Probability* 46, 2344-2358 (2020).
25. A. Linker, D. Remenik. The contact process with dynamic edges on \mathbb{Z} . *Electronic Journal of Probability* Paper No. 80, 21pp (2020).
24. J. Quastel, D. Remenik. How flat is flat in random interface growth? *Transactions of the American Mathematical Society* 371, 6047-6085 (2019).
23. G. B. Nguyen, D. Remenik. Extreme statistics of non-intersecting Brownian paths. *Electronic Journal of Probability* Paper No. 102, 40pp (2017).
22. J. Ortmann, J. Quastel, D. Remenik. A Pfaffian representation for flat ASEP. *Communications on Pure and Applied Mathematics* 70, 3-89 (2017).
21. G. B. Nguyen, D. Remenik. Non-intersecting Brownian bridges and the Laguerre Orthogonal Ensemble. *Annales de l'Institut Henri Poincaré Probabilités et Statistiques* 53, 2005-2019 (2017).

20. J. Ortmann, J. Quastel, D. Remenik. Exact formulas for random growth with half-flat initial data. *Annals of Applied Probability* 16, 507-548 (2016).
19. P. Moisset de Espanés, I. Rapaport, D. Remenik, J. Urrutia. Robust reconstruction of Barabási-Albert networks in the broadcast congested clique model. *Networks*, DOI: 10.1002/net.21662 (2015).
18. A. Borodin, I. Corwin, D. Remenik. A classical limit of Noumi's q -integral operator. *Symmetry, Integrability and Geometry: Methods and Applications (SIGMA)* 098 (2015).
17. I. Corwin, J. Quastel, D. Remenik. Renormalization fixed point of the KPZ universality class. *Journal of Statistical Physics* 160, 815-834 (2015).
16. A. Borodin, I. Corwin, D. Remenik. Multiplicative functionals on ensembles of non-intersecting paths. *Annales de l'Institut Henri Poincaré Probabilités et Statistiques* 51, 28-58 (2015).
15. J. Quastel, D. Remenik. Tails of the endpoint distribution of directed polymers. *Annales de l'Institut Henri Poincaré Probabilités et Statistiques* 51, 1-15 (2015).
14. J. Quastel, D. Remenik. Airy processes and variational problems. Chapter in *Topics in Percolative and Disordered Systems*. Ed. by A. Ramírez, G. Ben Arous, P. A. Ferrari, C. Newman, V. Sidoravicius, and M. E. Vares. Springer Proceedings in Mathematics & Statistics, Vol. 69, pp. 121-171 (2014).
13. A. Borodin, I. Corwin, D. Remenik. Log-Gamma polymer free energy fluctuations via a Fredholm determinant identity. *Communications in Mathematical Physics* 324, 215-232 (2013).
12. J. Quastel, D. Remenik. Local behavior and hitting probabilities of the Airy_1 process. *Probability Theory and Related Fields* 157, 605-634 (2013).
11. J. Quastel, D. Remenik. Supremum of the Airy_2 process minus a parabola on a half line. *Journal of Statistical Physics* 150, 442-456 (2013).
10. G. Moreno Flores, J. Quastel, D. Remenik. Endpoint distribution of directed polymers in 1+1 dimensions. *Communications in Mathematical Physics* 317, 363-380 (2013).
9. I. Corwin, J. Quastel, D. Remenik. Continuum statistics of the Airy_2 process. *Communications in Mathematical Physics* 317, 347-362 (2013).
8. R. Durrett, D. Remenik. Evolution of dispersal distance. *Journal of Mathematical Biology* 64, 657-666 (2012).
7. J. Quastel, D. Remenik. Local Brownian property of the narrow wedge solution of the KPZ equation. *Electronic Communications in Probability* 16, 712-719 (2011).
6. R. Durrett, D. Remenik. Brunet-Derrida particle systems, free boundary problems and Wiener-Hopf equations. *Annals of Probability* 39, 2043-2078 (2011).
5. R. Durrett, D. Remenik. Chaos in a spatial epidemic model. *Annals of Applied Probability* 19, 1656-1685 (2009).
4. D. Remenik. Limit theorems for individual-based models in economics and finance. *Stochastic Processes and their Applications* 119, 2401-2435 (2009).
3. D. Remenik. The contact process in a dynamic random environment. *Annals of Applied Probability* 18, 2392-2420 (2008).
2. S. Martínez, D. Remenik, J. San Martín. Level-wise approximation of a Markov process associated to the boundary of an infinite tree. *Journal of Theoretical Probability* 20, 561-579 (2007).
1. E. Pécou, A. Maass, D. Remenik, J. Briche, M. González. A mathematical model for copper homeostasis in *Enterococcus hirae*. *Mathematical Biosciences* 203, 222-239 (2006).

Honors and Awards

- Invited speaker at the International Congress of Mathematicians, 2022
- Rollo Davidson Prize (2021)
- MCA Prize 2021, Mathematical Council of the Americas
- Member of the Frontier Science group of the Chilean Academy of Science (2019 – 2021)

- Fields-Ontario Postdoctoral Fellowship, Fields Institute & University of Toronto (2010 – 2012)
- Marcos Orrego Puelma Award. Awarded by the Institute of Engineers of Chile to the best engineering student and fellow graduated from Universidad de Chile (Dec. 2005)
- Academic excellence scholarship, Engineering School, Universidad de Chile (Mar. 1999)

Students and Postdoctoral Fellows Supervised

Postdoctoral Fellows

- Jonas Arista 2020 – 2021 Postdoc at CMM, U. de Chile
- Gia Bao Nguyen 2014 – 2017 Núcleo Milenio SMCDs Postdoc at CMM, U. de Chile

PhD Students

- Yamit Yalanda 2020 – present PhD, U. de Chile
- Amitai Linker 2014 – 2019 PhD, U. de Chile
- Nikolas Tapia 2014 – 2018 PhD, joint U. Chile - U. Paris VI, co-advised with L. Zambotti

Master Students

- Nicolás Zaldueño 2018 – 2019 Master in Applied Math
- Camila Brito 2014 – 2016 Master in Applied Math, co-advised with J. Fontbona
- Camilo Iturra 2014 – 2016 Master in Applied Math
- Felipe Muñoz 2014 – 2016 Master in Applied Math
- Luis Fredes 2014 – 2015 Master in Operations Research

Grants

- PI for the Probability Group in Proyecto Basal CMM-AFB FB210005, Center for Mathematical Modeling (2020 – 2024)
- PI for the Probability Group in Proyecto Basal CMM-AFB 170001, Center for Mathematical Modeling (2018 – 2020)
- Fondecyt grant 1201914 *Around the KPZ fixed point* (2020 – 2024)
- Fondecyt grant 1160174 *Exact formulas for models in the KPZ universality class* (2016 – 2020)
- Associate Investigator in Proyecto Basal PFB-03, Center for Mathematical Modeling (2012 – 2018)
- Iniciativa Científica Milenio grant NC130062 *Nucleus Millennium “Stochastic models of complex and disordered systems”* Associate Investigator, www.nucleoproba.cl (2014 – 2020)
- Fondecyt grant 1120309 *Interacting particle systems, growth models, and applications to statistical physics and biology* (2012 – 2016)
- MATH-AmSud Regional Program, *Large-scale behavior of stochastic systems*, Member (2015 – 2018)

Conference Lectures

- CLAM 2021, Session on Large Stochastic Systems, Montevideo, Uruguay (online). *Exact formulas for TASEP and generalizations*. (Sep. 2021)
- MCA Prize Lecture, Buenos Aires, Argentina (online). *The KPZ fixed point*. (Jul. 2021)
- MCA 2021, Session on Random Walks and Related Topics, Buenos Aires, Argentina (online). *Non-intersecting Brownian motions and random matrices*. (Jul. 2021)
- COMCA 2021, Sesión de Física Matemática y Análisis Estocástico, Copiapó Chile (online). *Non-intersecting Brownian motions and random matrices*.

- SPDEs and Friends, Berlin (online). *The KPZ fixed point, part II.* (Jun. 2021)
- EMALCA 2020 (online). *Universalidad, matrices aleatorias y crecimiento aleatorio.* (Dec. 2020).
- Pacific Rim Conference in Mathematics, Berkeley, California (online). *Non-intersecting Brownian motions with outliers, KPZ fluctuations and random matrices.* (Aug. 2020).
- Random Media and Random Structures, Lima, Peru. *KPZ and KP.* (Jan. 2020).
- FLACAM 2019, CMM, Santiago, Chile. *Coexistence for spatial population models with forest fire epidemics.* (Nov. 2019).
- Workshop “Universality in Interacting Particle Systems”, U. Cologne, Germany. *KP(Z).* (Sep. 2019).
- SUMA 2019, Mendoza, Argentina, Plenary Lecture. *The KPZ fixed point.* (Sep. 2019).
- Minicourse at ICTS program “Universality in Random Structures: Matrices, Interfaces, Sandpiles”, Bangalore, India. *The KPZ fixed point.* (Jan. 2019).
- Minicourse at conference “Random Physical Systems”, Puerto Natales, Chile. *The KPZ fixed point.* (Dec. 2018).
- Minicourse at 2nd Workshop on Random Perturbed Systems, CIMAT, Guanajuato, Mexico. *The KPZ fixed point.* (Nov. 2018).
- CIMPA School “Geometry and Scaling of Random Structures”, Buenos Aires, Argentina. *The KPZ fixed point.* (Jul. 2018).
- Minicourse at LXXXVI Encuentro SOMACHI 2017, U. Talca, Chile. *The KPZ fixed point.* (Nov. 2017).
- PCMI Research Program on Random Matrices, Park City, Utah. *Extreme statistics of non-intersecting Brownian paths and LOE.* (Jul. 2017).
- SouthEastern Probability Conference, Duke U. *The KPZ fixed point.* (May 2017).
- Minicourse at the Research School “Random Structures in Statistical Mechanics and Mathematical Physics”, CIRM, Marseille. *The KPZ fixed point.* (Mar. 2017).
- CIMPA School “Random processes and optimal configurations in analysis”, Buenos Aires. *Non-intersecting Brownian bridges and the Laguerre Orthogonal Ensemble.* (Jul. 2015).
- School on Information and Randomness, Puerto Varas, Chile. *Exact formulas for random growth off a flat interface* (Dec. 2014).
- 18th Brazilian School of Probability. *Exact formulas for random growth off a flat interface* (Aug. 2014).
- 37th Conference on Stochastic Processes and their Applications, Session on Random Polymers and Related Systems, Buenos Aires. *Some variational problems in the KPZ universality class* (Jul. 2014)
- 37th Conference on Stochastic Processes and their Applications, Session on Stochastic Integrable Systems, Buenos Aires. *Exact formulas for ASEP with periodic initial condition* (Jul. 2014)
- Oberwolfach Workshop “Around the KPZ Universality Class”, Oberwolfach, Germany. *Exact formulas for random growth off a flat interface* (Jun. 2014).
- LXXXI Encuentro SOMACHI 2012, Olmué, Chile (sub-plenary talk). *Endpoint distribution of directed polymers* (Nov. 2012)
- Workshop on Spatial Models of Micro and Macro Systems, Mathematical Biosciences Institute, Columbus, Ohio. *Voter model perturbations in two dimensions and the evolution of the dispersal distance* (Apr. 2012)
- Workshop on Interacting Particle Systems, Growth Models and Random Matrices, University of Warwick. *Variational problems for the Airy₂ process* (Mar. 2012)
- PASI 2012, Topics in Percolative and Disordered Systems, PUC Santiago *The endpoint distribution of directed polymers in 1+1 dimensions* (Jan. 2012).
- Canadian Mathematical Society 2011 Winter Meeting. *The endpoint distribution of directed polymers in 1+1 dimensions* (Dec. 2011).
- Workshop on the Kardar-Parisi-Zhang Equation and Universality Class, American Institute of Mathematics. *Continuum statistics for the Airy₂ process* (Oct. 2011).
- Workshop on Percolation and Related Topics, Cornell University. *Chaos in a spatial epidemic model* (Apr. 2009)

- Seventh Northeast Probability Seminar, Courant Institute. *Chaos in a spatial epidemic model* (Nov. 2008)
- Fifth World Congress in Probability and Statistics, Singapore. *The contact process on a dynamic random environment* (Jul. 2008)
- Fourth Cornell Probability Summer School. *Chaos in a spatial epidemic model* (Jun. 2008)

Seminars and Colloquia

- Zurich Seminar on Stochastic Processes (online). *Some recent progress on the KPZ fixed point* (Jun. 2021)
- U. Washington Probability Seminar (online). *Random growth in 1+1 dimensions, KPZ and KP* (May. 2021)
- Probability Seminar of The Americas (online). *Random growth in 1+1 dimensions, KPZ and KP* (Apr. 2021)
- U. Durham Probability Seminar (online). *Random growth in 1+1 dimensions, KPZ and KP* (Mar. 2021)
- U. Federal do Rio de Janeiro Probability Seminar (online). *Non-intersecting Brownian motions with outliers, KPZ fluctuations and random matrices* (Jan. 2021)
- U. Bonn Stochastics Seminar (online). *Non-intersecting Brownian motions with outliers, KPZ fluctuations and random matrices* (Jan. 2021)
- U. College Dublin Probability Seminar (online). *Non-intersecting Brownian motions with outliers, KPZ fluctuations and random matrices* (Dec. 2020)
- Chilean Online Probability Seminar. *Non-intersecting Brownian motions, KPZ, and random matrices* (Sep. 2020)
- Spanish-speaking Online Probability Seminar. *Crecimiento aleatorio en 1+1 dimensiones, KPZ y KP* (Jun. 2020)
- PUC Colloquium, P. U. Católica de Chile. *The KPZ fixed point* (Jun. 2018)
- U. de Chile / PUC Joint Probability Seminar. *The KPZ fixed point* (Oct. 2017)
- U. Concepción Colloquium. *Non-intersecting Brownian motions, KPZ, and random matrices* (Aug. 2017)
- U. Buenos Aires Probability Seminar. *How flat is flat in random interface growth?* (Sep. 2016).
- U. Toronto Colloquium. *Non-intersecting Brownian motions, KPZ, and random matrices* (Feb. 2016).
- Caltech/UCLA Analysis and PDE Seminar. *Exact formulas for random growth off a flat interface* (Jan. 2016).
- UCLA Colloquium. *Non-intersecting Brownian motions, KPZ, and random matrices* (Jan. 2016).
- UCLA Probability Seminar. *Non-intersecting Brownian motions and the Laguerre Orthogonal Ensemble* (Jan. 2016).
- Carnegie Mellon U. Colloquium. *Non-intersecting Brownian motions, KPZ, and random matrices* (Jan. 2016).
- UC San Diego Colloquium. *Non-intersecting Brownian motions and random matrices* (Dec. 2015).
- Toronto Probability Seminar. *Non-intersecting Brownian bridges and the Laguerre Orthogonal Ensemble* (Jul. 2015).
- U. de Chile (Ciencias), Colloquium. *Random matrices, random growth, and the KPZ universality class* (Jun. 2014)
- Institute for Advanced Study, Non-equilibrium Dynamics and Random Matrices Seminar. *Exact formulas for random growth off a flat substrate* (Jan. 2014)
- PUC Probability Seminar, Santiago. *Exact formulas for random growth off a flat substrate* (Nov. 2013)
- PUC General Colloquium, Santiago. *The KPZ universality class* (Nov. 2013)
- Toronto Probability Seminar. *Determinantal line ensembles* (Dec. 2012)
- U. de Chile, Probability Seminar. *Variational formulas for the Airy₂ process and related problems* (Sep. 2012)
- Montréal CRM-ISM Probability Seminar. *Variational formulas for the Airy₂ process and related problems* (Mar. 2012)
- Harvard Random Matrix Seminar. *Variational formulas for the Airy₂ process and related problems* (Feb. 2012)
- Toronto Probability Seminar. *Variational formulas for the Airy₂ process* (Feb. 2012)
- Toronto Probability Seminar. *Brunet-Derrida particle systems, free boundary problems, and Wiener-Hopf equations* (Oct. 2010)
- University of Wisconsin-Madison, Probability Seminar. *Brunet-Derrida particle systems, free boundary problems, and Wiener-Hopf equations* (Jan. 2010)

- University of Cambridge, Probability Seminar. *Brunet-Derrida particle systems, free boundary problems, and Wiener-Hopf equations* (Jan. 2010)
- U. de Chile, Probability Seminar. *Brunet-Derrida particle systems, free boundary problems, and Wiener-Hopf equations* (Dec. 2009)
- Cornell University, Probability Seminar. *Brunet-Derrida particle systems, free boundary problems, and Wiener-Hopf equations* (Nov. 2009)
- Cornell University, Probability Seminar. *Chaos in a spatial epidemic model* (Sep. 2008)
- U. de Chile, Mathematical Engineering Department Seminar. *Limit theorems for a class of particle systems with applications to models in finance* (Apr. 2008)
- Cornell University, Probability Seminar. *The contact process in a dynamic random environment* (Nov. 2007)

Organizer

- *KPZ Universality Invited Session at 2022 IMS Meeting* London, UK. (Jun. 2022)
- *Stochastic Processes and Applications Session at CLAM 2021* Montevideo, Uruguay. (Sep. 2021)
- *Stochastic Interacting Systems Session at MCA 2021* Buenos Aires, Argentina. (Jul. 2021)
- *Probability Session at FLACAM 2019* Santiago, Chile. (Nov. 2019)
- *Random Physical Systems* <http://eventos.cmm.uchile.cl/rps-patagonia2018> Puerto Natales, Chile. (Dec. 2018)
- *Third Mini Summer School in Probability and Stochastic Processes* <http://eventos.cmm.uchile.cl/escuelappe2018> Santiago, Chile. (Jan. 2018)
- *Random Media in Atacama (in honor of Francis Comets on his 60th birthday)* <http://eventos.cmm.uchile.cl/comets2016> San Pedro de Atacama, Chile. (Dec. 2016)
- *Random Media Session at XIV CLAPEM* San José, Costa Rica. (Dec. 2016)
- *Second Mini Summer School in Probability and Stochastic Processes* <http://eventos.cmm.uchile.cl/escuelappe2016> Santiago, Chile. (Jan. 2016)
- *Disordered Models of Mathematical Physics*, a satellite conference of the 2015 International Congress of Mathematical Physics. <http://eventos.cmm.uchile.cl/dmmp2015> Valparaíso, Chile. (Jul. 2015)
- *Mini Summer School in Probability and Stochastic Processes* <http://eventos.cmm.uchile.cl/escuelappe2015> Santiago, Chile. (Jan. 2015)
- Co-organizer of the Joint Santiago Probability Seminar <http://nm.cmm.uchile.cl/en/seminarios> (2014 – 2020)
- *LXXXII Encuentro de la Sociedad de Matemática de Chile, Sesión de Probabilidades*. Olmué, Chile. (Nov. 2013)

Teaching Experience

Dept. of Mathematical Eng., Universidad de Chile *Probability and Stochastic Processes, Linear Algebra, Calculus II, Real Analysis, Complex Analysis, Probability and Statistics, Particle Systems and Percolation, Stochastic Processes, Stochastic Calculus, Topics in Stochastic Calculus, Random Matrices and Related Processes* (2005, 2012 – present)

Dept. of Mathematics, University of Toronto *Advanced Ordinary Differential Equations* (2010 – 2011)

Dept. of Mathematics, Cornell University *Calculus II, Calculus for Engineers, Basic Probability* (2008 – 2010)

Service and other professional activities

Academic

- Editor-in-chief, ALEA (2022 – 2024)
- Associate editor, ALEA (2019 – 2021)
- Member of the Fondecyt Study Group in Mathematics, ANID (2018 – 2021)

- Undergraduate Chair, Dept. of Mathematical Engineering (Univ. de Chile) (2018 – 2020)
- Member of the Dept. of Mathematical Engineering directing committee (Univ. de Chile) (2014 – 2020)
- Scientific Board Member, XX Brazilian School of Probability (2016)
- Referee for the following journals: *Acta Math.*, *Forum Math. Pi*, *JEMS*, *Ann. Probab.*, *Prob. Theory. Relat. Fields*, *Ann. Appl. Probab.*, *Comm. Math. Phys.*, *Trans. Am. Math. Soc.*, *Ann. IHP Probab. Stat.*, *Electr. J. Probab.*, *Electr. Comm. Probab.*, *J. Stat. Phys.*, *Nonlinearity*, *MPAG*, *Finance Stoch.*, *Stoch. Systems*, *ALEA*, *JSTAT*, *Adv. Appl. Probab.*, *SciPost Phys.*
- Reviewer for the *Mathematical Reviews* of the American Mathematical Society (2009 – 2011)

Applied

- CMM-Data group director, Center for Mathematical Modeling, Univ. de Chile (2018 – present)
www.cmm.uchile.cl/data
- NoiseGrasp cofounder (marketing mix optimization modeling joint venture with CMM) (2014 – present)
www.noisegrasp.com
- Lab. of Bioinformatics and Mathematics of the Genome, Univ. de Chile (2004 – 2005)

Santiago, Chile, January 2022