

# Lorenzo Dello Schiavo

## Contact Information

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🏢 Institute of Science and Technology Austria  
Am Campus 1  
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## Curriculum Vitæ

## Academic appointments

- 09/22–present **FWF ESPRIT Fellowship** <sup>↗</sup>, *Institute of Science and Technology Austria*, Klosterneuburg, AT.
- 09/20–06/22 **PostDoc**, *Institute of Science and Technology Austria*, Klosterneuburg, AT.
- Spezialforschungsbereich (Special Research Center) 65: *Taming Complexity in Partial Differential Systems*, Project P3: *Structure preserving variational discretisation via optimal transport* <sup>↗</sup>, PI: Prof. Dr. J. Maas
- 11/15–08/20 **Scientific collaboration**, *IAM* <sup>↗</sup> @ *HCM* <sup>↗</sup>, Bonn, DE.
- 09/16–08/20 ◦ Sonderforschungsbereich (Collaborative Research Center) 1060: *The mathematics of emergent effect*, Project B03: *Optimal transport and random measures* <sup>↗</sup>, PI's: Prof. Dr. K.-T. Sturm, Dr. M. Huesmann.
- 11/15–09/16 ◦ Hausdorff Center for Mathematics.

## Education

- 11/15–11/19 🎓 **Ph.D. in Mathematics (Dr. rer. nat.)**, *BIGS* <sup>↗</sup> @ *University of Bonn*, Bonn.
- **Thesis:** Diffusions on Wasserstein Spaces (supervisor: K.-T. Sturm)
  - **Defense:** viva in English, November 26, 2019, *magna cum laude*
- 10/15 **Visiting studentship**, *IAM* <sup>↗</sup> @ *HCM* <sup>↗</sup>, Bonn, 🏛️ Group of Stochastic Analysis.
- 10/13–09/15 🎓 **M.Sc. in Mathematics (Laurea Magistrale)**, *Sapienza – Università di Roma* <sup>↗</sup>, Rome.
- **Thesis:** Heat equation on metric measure spaces (in English, supervisor: A. Pisante)
  - **Defense:** viva in Italian, September 21, 2015, with honors (*con lode*)
- 10/10–10/13 🎓 **B.Sc. in Mathematics (Laurea Triennale)**, *Sapienza – Università di Roma* <sup>↗</sup>, Rome.
- **Thesis:** Misure di probabilità e spazi di Wasserstein (in Italian, supervisor: A. Pisante)
  - **Defense:** viva in Italian, October 29, 2013, with honors (*con lode*)
- 09/05–06/10 🎓 **High school diploma (Diploma di Liceo Scientifico)**, *Liceo Scientifico Statale Augusto Righi*, with honors (*con lode*).

## Teaching experience

- Lecturer**, *Institute of Science and Technology Austria*, Klosterneuburg, AT.
- 04/22–06/22 graduate lecture course, *Fractional Gaussian Fields*, joint with F. Sau.
- 11/20–01/21 graduate lecture course, *Maths for quantitative life scientists: Probability and Statistical Inference*.

**Teaching assistant, University of Bonn, Bonn, DE.**

- 04/19–07/19 undergraduate lecture course, *Algorithmische Mathematik II*, lecturer: Prof. Dr. P. Ferrari.  
10/18–12/18 graduate lecture course, *Advanced Topics in Stochastic Analysis – Functional inequalities and stochastic analysis on manifolds*, lecturer: Prof. Dr. K. Kuwada.  
04/18–09/18 graduate lecture course, *Stochastic Analysis*, lecturer: Prof. Dr. K. Kuwada.  
10/16–03/17 graduate lecture course, *Introduction to Stochastic Analysis*, lecturer: Dr. M. Erbar.

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## Research papers

- (1) L. Dello Schiavo, E. Kopfer, and K.-T. Sturm. A Discovery Tour in Random Riemannian Geometry. *Potential Anal. (to appear)*, 2020. arXiv:2012.06796
- (2) L. Dello Schiavo, L. Portinale, and F. Sau. Scaling Limits of Random Walks, Harmonic Profiles, and Stationary Non-Equilibrium States in Lipschitz Domains. *Ann. Appl. Probab.*, 2023+. 57 pp.
- (3) L. Dello Schiavo and E. W. Lytvynov. A Mecke-type Characterization of the Dirichlet–Ferguson Measure. *Electron. Commun. Probab.*, 28:1–12, 2023. doi:10.1214/23-ECP528
- (4) L. Dello Schiavo and M. Wirth. Ergodic Decompositions of Dirichlet Forms under Order Isomorphisms. *J. Evol. Equ.*, 23(9), 2023. 22 pp. doi:10.1007/s00028-022-00859-7
- (5) T. Cremaschi and L. Dello Schiavo. Effective Contraction of Skinning Maps. *Proc. Amer. Math. Soc. B*, 9:445–459, 2022. doi:10.1090/bproc/134
- (6) L. Dello Schiavo. The Dirichlet–Ferguson Diffusion on the Space of Probability Measures over a Closed Riemannian Manifold. *Ann. Probab.*, 50(2):591–648, 2022. doi:10.1214/21-AOP1541
- (7) L. Dello Schiavo and K. Suzuki. Sobolev-to-Lipschitz Property on QCD-spaces and Applications. *Math. Ann.*, 384:1815–1832, 2022. 18 pp. doi:10.1007/s00208-021-02331-2
- (8) L. Dello Schiavo and K. Suzuki. Rademacher-type theorems and Sobolev-to-Lipschitz properties for strongly local Dirichlet spaces. *J. Funct. Anal.*, 281(11):109234, dec 2021. 63 pp. doi:10.1016/j.jfa.2021.109234
- (9) L. Dello Schiavo. Ergodic Decomposition of Dirichlet Forms via Direct Integrals and Applications. *Potential Anal.*, 58:573–615, 2023. 43 pp. doi:10.1007/s11118-021-09951-y
- (10) L. Dello Schiavo. A Rademacher-type theorem on  $L^2$ -Wasserstein spaces over closed Riemannian manifolds. *J. Funct. Anal.*, 278(6):108397, 2020. 51 pp. doi:10.1016/j.jfa.2019.108397
- (11) L. Dello Schiavo. Characteristic functionals of Dirichlet measures. *Electron. J. Probab.*, 24(115):1–38, 2019. doi:10.1214/19-EJP371
- (12) E. Agliari, A. Barra, L. Dello Schiavo, and A. Moro. Complete integrability of information processing by biochemical reactions. *Sci. Rep.*, 6:36314, 2016. doi:10.1038/srep36314
- (13) L. Dello Schiavo. Marcinkiewicz continuity estimates for infinite energy solutions of some second order elliptic Dirichlet problems. *B. Unione Mat. Ital.*, 8:97–112, September 2015. 16 pp. doi:https://doi.org/10.1007/s40574-015-0028-y
- (14) E. Agliari, M. Altavilla, A. Barra, L. Dello Schiavo, and E. Katz. Notes on stochastic (bio)-logic gates: computing with allosteric cooperativity. *Sci. Rep.*, 5:9415, 2015. doi:10.1038/srep09415

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## Preprints

- [15] L. Dello Schiavo and F. Quattrocchi. Multivariate Dirichlet Moments and a Polychromatic Ewens Sampling Formula. *arXiv:2309.11292*, 2023. doi:10.48550/ARXIV.2309.11292
- [16] L. Dello Schiavo and K. Suzuki. Persistence of Rademacher and Sobolev-to-Lipschitz Properties. *arXiv:2309.10733*, 2023

- [17] L. Dello Schiavo. A Characterization of Maps of Bounded Compression. *arXiv:2304.11348*, 2023. doi:10.48550/arXiv.2304.11348
- [18] L. Dello Schiavo, J. Maas, and F. Pedrotti. Local Conditions for Global Convergence of Gradient Flows and Proximal Point Sequences in Metric Spaces. *arXiv:2304.05239*, 2023. doi:10.48550/arXiv.2304.05239
- [19] L. Dello Schiavo, R. Herry, and K. Suzuki. Wasserstein geometry and Ricci curvature bounds for Poisson spaces. *arXiv:2303.00398*, 2023. doi:10.48550/arXiv.2303.00398
- [20] L. Dello Schiavo, R. Herry, E. Kopfer, and K.-T. Sturm. Polyharmonic fields and liouville quantum gravity measures on tori of arbitrary dimension: from discrete to continuous. *arXiv:2302.02963*, 2023. doi:10.48550/arXiv.2302.02963
- [21] L. Dello Schiavo and K. Suzuki. Configuration Spaces over Singular Spaces II – Curvature. *arXiv:2205.01379*, 2022
- [22] L. Dello Schiavo and K. Suzuki. Configuration Spaces over Singular Spaces I – Dirichlet-Form and Metric Measure Geometry. *arXiv:2109.03192*, 2021. 85 pp.
- [23] L. Dello Schiavo, R. Herry, E. Kopfer, and K.-T. Sturm. Conformally Invariant Random Fields, Quantum Liouville Measures, and Random Paneitz Operators on Riemannian Manifolds of Even Dimension. *arXiv:2105.13925*, 2021

## --- Proceedings & science popularization

- {24} L. Dello Schiavo. The Dirichlet–Ferguson Diffusion on the Space of Probability Measures over a Closed Riemannian Manifold. In M. Gordina, T. Kumagai, L. Saloff-Coste, and K.-T. Sturm, editors, *Heat Kernels, Stochastic Processes and Functional Inequalities*, volume 16 of *Oberwolfach Rep.*, pages 3348–3350. EMS Press, 2020. doi:10.4171/OWR/2019/54
- {25} L. Dello Schiavo and A. E. Baccaglini-Frank. La quantità del nulla. *Ithaca*, X, 2017. In Italian
- {26} G. Cecchetti and L. Dello Schiavo. Nature of language vs. language of nature – The limits of human languages in describing nature. In A. Altamore and G. Antonini, editors, *Galileo and the Renaissance Scientific Discourse, proceedings of the First Roma Workshop on Past and Present Perceptions of Science*, Rome, May 6, 2009. Ed. Nuova Cultura, 2010

## --- Research stays

- 11/23 **Università di Trento**, 3 days, invitation by A. Pinamonti
- 11/23 **Universität Münster**, 4 days, invitation by M. Huesmann
- 11/23 **Keiō University**, 4 days, invitation by H. Kawabi
- 10/23 **Bielefeld University**, 4 days, invitation by M. Röckner
- 05/23 **Swansea University**, 5 days, invitation by E. W. Lytvynov
- 03/23 **IAM Bonn**, 1 week, invitation by L. Portinale
- 02/23 **GSSI**, 1 day, invitation by S. Cenatiempo and A. Nota
- 01/23 **Sapienza – Università di Roma**, 3 days, invitation by A. Faggionato
- 07/22 **Swansea University**, 5 days, invitation by E. W. Lytvynov
- 04/22 **IAM Bonn**, 1 week, invitation by K.-T. Sturm
- 11-12/21 **MFO**, 4 weeks, MFO Research in Pairs programme with K. Suzuki
- 11/21 **IAM Bonn**, 1 week, invitation by K.-T. Sturm
- 10/19 **Institute of Science and Technology Austria**, 2 weeks, invitation by J. Maas
- 05/19 **Sapienza – Università di Roma**, 5 days, invitation by L. Bertini & A. Faggionato
- 02/18 **Università degli Studi di Pavia**, 3 days, invitation by F. Bassetti
- 11/17 **Sapienza – Università di Roma**, 5 days, invitation by A. Faggionato
- 12/16 **Swansea University**, 5 days, invitation by E. W. Lytvynov.

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## Invited talks

- 20/12/23 Conference *Mean field interactions with singular kernels and their approximations*<sup>↗</sup>, IHP, Paris
- 28/11/23 **Seminario di Analisi**<sup>↗</sup>, Trento
- 22/11/23 **Oberseminar Mathematische Stochastik**<sup>↗</sup>, Münster
- 9/11/23 Conference *Stochastic Analysis*<sup>↗</sup>, RIMS, Kyōto
- 30/10/23 **Tōkyō Probability Seminar**<sup>↗</sup>, Tōkyō
- 12/10/23 **Bielefeld Stochastic Afternoon**<sup>↗</sup>, Bielefeld
- 22/09/23 Bielefeld University
- 8/09/23 XXII Congress of the Unione Matematica Italiana, Pisa
- 25/05/23 **Probability Seminar**<sup>↗</sup>, Swansea University
- 21/03/23 **Stochastic Analysis & Geometry Seminar**, IAM Bonn
- 20/02/23 **SMAQ – Seminario di Matematica L'Aquila**, GSSI
- 10/01/23 **Seminario di probabilità**, Sapienza – Università di Roma
- 1/12/22 MFO mini-workshop *A Geometric Fairytale full of Spectral Gaps and Random Fruit*, MFO
- 4/11/22 MFO workshop *Heat Kernels, Stochastic Processes and Functional Inequalities*, MFO
- 24/10/22 *Optimal Transportation and Applications*, Centro di Ricerca Matematica E. De Giorgi, Pisa
- 02/08/22 Three research days on “random geometries and interacting processes”, HIM Bonn
- 28/07/22 **Probability Seminar**<sup>↗</sup>, Swansea University
- 16/06/22 Third Italian Meeting on Probability and Mathematical Statistics, Università di Bologna
- 21/04/22 **Stochastic Analysis & Geometry Seminar**, IAM Bonn
- 17/03/22 **SPDE Seminar**, TU Berlin, virtual
- 19/01/22 **PDE Afternoon**, University of Vienna, virtual
- 10/12/21 MFO mini-workshop *Variable Curvature Bounds, Analysis and Topology on Dirichlet Spaces*
- 21/09/21 **Seminario di probabilità**, Sapienza – Università di Roma
- 9/02/21 **Pisa Online Seminar**, virtual
- 12/01/21 **Vienna Probability Seminar**, virtual
- 21/11/19 MFO workshop *Heat Kernels, Stochastic Processes and Functional Inequalities*, MFO
- 31/10/19 Institute of Science and Technology Austria
- 05/09/19 JAP-GER Conference on Stochastic Analysis 2019, Fukuoka University
- 06/05/19 **Seminario di probabilità**<sup>↗</sup>, Sapienza – Università di Roma
- 11/03/19 Collaborative Research Center 1060 Retreat 2019, Project B03
- 28/02/18 Università degli Studi di Pavia
- 28/11/17 **Seminario di probabilità**<sup>↗</sup>, Sapienza – Università di Roma
- 01/12/16 **Probability Seminar**<sup>↗</sup>, Swansea University

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## Funding Information

- 09/22 **FWF ESPRIT Fellow**<sup>↗</sup>, *Institute of Science and Technology Austria*, Klosterneuburg, AT.  
◦ Project: *Configuration Spaces over Non-Smooth Spaces*  
◦ Funding: € 294.015,98
- 07/22 **APART-MINT**<sup>↗</sup> **Fellow** of the Austrian Academy of Sciences (**declined**).  
◦ Project: *Multi-dimensional Wasserstein Diffusions*  
◦ Funding: € 70.000,00

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## Memberships, honors, and awards

- 2023–present Member of the *Unione Matematica Italiana* (UMI)

- 2020–present Member of the *Schwerpunktprogramm (Priority Programme) 2265 Random Geometric Systems* of the Deutsche Forschungsgemeinschaft (German Research Foundation)
- 2018–2019 participation in Bonn Graduate Center's *Doctorate Plus Training Program*<sup>↗</sup>  
Access to a series of soft skills training workshops.
- 2016–2018 Member of the Italian *National Research Group in Mathematical Physics* of the *National Institute of Advanced Mathematics* (GNFM – INdAM)
- 2014–2015 M.Sc. Honor classes (*Percorso d'Eccellenza*), Sapienza – Università di Roma.  
Access to one PhD course, reserved to the most proficient students (about 5% of the total), with a final supervised dissertation.  
**Dissertation:** *Takesaki's proof of a Tannaka–Stinespring–Tatsuuma-type Pre-duality for Commutative Measured Involutive Hopf–von Neumann Algebras*<sup>↗</sup> (in English, supervisor: C. Pinzari)
- 2011–2013 B.Sc. Honor classes (*Percorso d'Eccellenza*), Sapienza – Università di Roma.  
Access to supplementary courses on advanced topics reserved to the most proficient students (about 10% of the total), each with a final test to pass.

## Other Projects

- WDP Wolfram Demonstration Project<sup>↗</sup>  
◦ *Zonotope Construction via Shephard's Theorem*<sup>↗</sup> ◦ *Homogeneous Splines*<sup>↗</sup> ◦ *Asymmetric Simple Exclusion Processes*<sup>↗</sup> (with A. Occelli)

## Refereeing activity

- 2016–present ◦ *Scientific Reports*<sup>↗</sup> ◦ *Electronic Journal of Probability*<sup>↗</sup> ◦ *Journal of Functional Analysis*<sup>↗</sup>  
◦ *Electronic Communications in Probability*<sup>↗</sup> ◦ *Demonstratio Mathematica*<sup>↗</sup> ◦ *Probability Theory and Related Fields*<sup>↗</sup> ◦ *Manuscripta Mathematica*<sup>↗</sup> ◦ *Stochastic and Partial Differential Equations*  
◦ *Stochastic Processes and Applications*

## Selected attended schools, conferences, seminars, talks

- 18-22/12/23 Conference *Mean field interactions with singular kernels and their approximations*<sup>↗</sup>, IHP, Paris
- 6-10/11/23 Conference *Stochastic Analysis*<sup>↗</sup>, RIMS, Kyōto
- 23-26/10/23 21<sup>st</sup> Symposium *Stochastic Analysis on Large Scale Interacting Systems*, RIMS, Kyōto
- 4-9/09/23 XXII Congress of the Unione Matematica Italiana, Pisa
- 24-28/7/23 *Stochastic Processes and Applications*, Lisbon, PT
- 17-21/7/23 SPP2265 Summer School *Probability and Geometry on Configuration Spaces*, Harnack-Haus, Berlin, DE
- 27-30/3/23 SPP 2265 *Random Geometric Structures* Second Annual Conference, DLR, Cologne, DE
- 27/11-3/12/22 MFO 2248b *A Geometric Fairytale full of Spectral Gaps & Random Fruit*, Oberwolfach, DE
- 30/10-5/11/19 MFO 2244 *Heat Kernels, Stochastic Processes and Functional Ineq.s*, Oberwolfach, DE
- 24-28/10/22 10<sup>th</sup> conference on *Optimal Transportation and Applications*, CRM E. De Giorgi, Pisa, IT
- 7-9/9/22 Austrian Stochastic Days, Vienna, AT
- 29/8-3/7/22 Joint conferences: *New Trends in Dirichlet Forms and Optimal Transport & From Dirichlet Forms to Wasserstein Geometry*, HCM, Bonn, DE
- 1-3/8/22 Three research days on “random geometries and interacting processes”, HIM, Bonn, DE
- 13-16/6/22 Third Italian Meeting on Probability and Mathematical Statistics, Bologna, IT
- 11-14/4/22 SPP 2265 *Random Geometric Structures* First Annual Conference, Harnack-Haus, Berlin, DE
- 7-12/3/21 BIRS 5184 *Stochastics and Geometry (Online)*, Banff, CA (virtual)
- 17-23/11/19 MFO 1947 *Heat Kernels, Stochastic Processes and Functional Ineq.s*, Oberwolfach, DE
- 2-6/7/19 9<sup>th</sup> Japanese-German Open Conference on *Stochastic Analysis*, Fukuoka, JP
- 7-12/7/19 5<sup>th</sup> School on *Stochastic and Geometric Analysis*<sup>↗</sup>, Piz Buin, AT

11–13/3/19 Retreat 2019 of the Collaborative Research Center 1060, Weilburg, DE  
12–16/11/18 9<sup>th</sup> conference on *Optimal Transportation and Applications*, SNS, Pisa, IT  
12–14/3/18 Retreat 2018 of the Collaborative Research Center 1060, Bad Neuenahr-Ahrweiler, DE  
4–29/9/17 *Metric Measure Spaces and Ricci Curvature* - Intense Activity Period, MPIM, Bonn, DE  
7–11/11/16 8<sup>th</sup> conference on *Optimal Transportation and Applications*, SNS, Pisa, IT  
10–14/10/16 *Stochastic Partial Differential Equations and Related Fields*, Bielefeld U, Bielefeld, DE  
29/8–2/9/16 Follow-up Workshop to JTP *Optimal Transportation*<sup>↗</sup>, HIM, Bonn, DE  
4–8/04/16 4<sup>th</sup> School on *Stochastic and Geometric Analysis*<sup>↗</sup>, Vlieland, NE  
21–23/10/15 *Panorama of Mathematics*<sup>↗</sup>, HCM, Bonn, DE

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## Languages

Italian (native), English (proficient), German (proficient)