Elia Bisi, PhD

Assistant professor (non-tenured), Technische Universität Wien

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Work experience

Sep 2020 - present	Assistant Professor (non-tenured), **Technische Universität Wien**, Institut für Stochastik und Wirtschaftsmathematik *Research unit*: Mathematical Stochastics
Jul 2018 - Aug 2020	Research Scientist (postdoctoral fellow), **University College Dublin**, School of Mathematics and Statistics *Funding*: ERC grant "Integrable random structures" *Supervisor*: Neil O'Connell
Mar 2014 - Sep 2014	Research intern, **STMicroelectronics**, Agrate Brianza (Italy) Advanced System Technology, Security Lab, Cryptography group

Higher education

Oct 2014 - Jul 2018	Ph.D. in Statistics, **University of Warwick** *Thesis*: "Random polymers via orthogonal Whittaker and symplectic Schur functions" (http://wrap.warwick.ac.uk/121448/) *Defense date*: 3 October 2018 *Supervisor*: Prof. Nikos Zygouras
Oct 2011 - Nov 2013	MSc. in Mathematics, **Università di Milano-Bicocca** *Erasmus* exchange year, **Universidad Autónoma de Madrid**, 2012-2013 *Final mark*: 110/110 *cum laude*
Oct 2008 - Nov 2011	BSc. in Mathematics, **Università di Milano-Bicocca** *Final mark*: 110/110 *cum laude*

Publications and preprints

[1] J. Arista, E. Bisi, and N. O'Connell. **Matrix Whittaker processes** (2022). arXiv: 2203.14868.

[2] J. Arista, E. Bisi, and N. O'Connell. **Matsumoto-Yor and Dufresne type theorems for a random walk on positive definite matrices** (2021). arXiv: 2112.12558.

[3] E. Bisi, N. O'Connell, and N. Zygouras. **The geometric Burge correspondence and the partition function of polymer replicas**. *Selecta Mathematica New Series* 27 (2021), #100. URL: https://doi.org/10.1007/s00029-021-00712-8.

[4] E. Bisi, F. D. Cunden, S. Gibbons, and D. Romik. **The oriented swap process and last**

passage percolation. *Random Structures and Algorithms* (2021). URL: https://doi.org/10.1002/rsa.21055.

[5] E. Bisi, F. D. Cunden, S. Gibbons, and D. Romik. **Sorting networks, staircase Young tableaux and last passage percolation**. *Séminaire Lotharingien de Combinatoire 84B (2020), Proceedings of the 32nd Conference on Formal Power Series and Algebraic Combinatorics*, #3. URL: https://www.mat.univie.ac.at/~slc/wpapers/FPSAC2020/3.html.

[6] E. Bisi and N. Zygouras. **Transition between characters of classical groups, decomposition of Gelfand-Tsetlin patterns and last passage percolation** (2019). arXiv: 1905.09756.

[7] E. Bisi and N. Zygouras. **GOE and** $\text{Airy}_{2\to 1}$ **marginal distribution via symplectic Schur functions**. *Probability and Analysis in Interacting Physical Systems: In Honor of S.R.S. Varadhan*. Ed. by P. Friz, W. Konig, C. Mukherjee, and O. Stefano. Berlin: Springer, 2019. URL: https://doi.org/10.1007/978-3-030-15338-0_7.

[8] E. Bisi and N. Zygouras. **Point-to-line polymers and orthogonal Whittaker functions**. *Transactions of the American Mathematical Society* 371.12 (2019), pp. 8339–8379. URL: https://doi.org/10.1090/tran/7423.

[9] E. Bisi, F. Melzani, and V. Zaccaria. **Symbolic analysis of higher-order side channel countermeasures**. *IEEE Transactions on Computers* 666.6 (2017), pp. 1099–1105. URL: https://doi.org/10.1109/TC.2016.2635650s.

Awards and grants

2017	Prize *Giving to Warwick*, **University of Warwick** Awarded for an "outstanding contribution by PhD students to the Statistics's Department's teaching programme".
Oct 2014 - Mar 2018	EPSRC scholarship, **University of Warwick** Covering PhD fees. Awarded by the Engineering and Physical Sciences Research Council (EPSRC).
Oct 2014 - Mar 2018	PhD maintenance bursary, **University of Warwick** Awarded by the Department of Statistics at Warwick.

Selected talks

Invited talks

06 Apr 2022	UniBA Mathematical Physics Seminar, **online** *Matsumoto-Yor and Dufresne type theorems for a random walk on positive definite matrices*
29 Nov 2021	PIICQ ("Integrable Probability, Classical and Quantum Integrability") meeting, **online** *Polymer models, geometric RSK and Whittaker functions*

20 Apr 2021 | Vienna Discrete Mathematics Seminar (Arbeitsgemeinschaft "Diskrete Mathematik"), **online**
Sorting networks, staircase Young tableaux and last passage percolation

10 Mar 2021 | Workshop on Enumerative Combinatorics 2021, University College Dublin, **online**
Sorting networks and staircase Young tableaux

6 Oct 2020 | Vienna Probability Seminar, **Technische Universität Wien**
The oriented swap process and last passage percolation

18 Jun 2020 | Junior Integrable Probability Seminar, **online**
Random sorting networks and last passage percolation

10 Jan 2020 | Dipartimento di Matematica e Fisica, **Università Roma Tre**
Random sorting networks and last passage percolation

25 Jun 2019 | "Advances in Last Passage Percolation" workshop, **University of Sussex**
Transition between characters of classical groups, decomposition of Gelfand-Tsetlin patterns, and last passage percolation

7 Jun 2019 | "Virginia Integrable Probability Summer School 2019", **University of Virginia**
Transition between characters of classical groups, decomposition of Gelfand-Tsetlin patterns, and last passage percolation

14 May 2019 | Integrable probability seminar, **Massachusetts Institute of Technology**, Department of Mathematics
Transition between characters of classical groups, decomposition of Gelfand-Tsetlin patterns, and last passage percolation

5 Oct 2018 | "Insalate di Matematica" seminar, **Università di Milano-Bicocca**, Dipartimento di Matematica e Applicazioni
How long does it take to go through a series of N queues?

21 Jun 2018 | "Randomness and Symmetry" workshop, **University College Dublin**
Point-to-line polymers via orthogonal Whittaker and symplectic Schur functions

28 Nov 2017 | School of Mathematics and Statistics, **University College Dublin**
Point-to-line log-gamma polymers

Contributed talks

26 Aug 2020 | "Bernoulli-IMS One World Symposium 2020", **online** (prerecorded talk and live discussion)
The geometric Burge correspondence and the partition function of polymer replicas

17 Jun 2019 | "Second Italian Meeting on Probability and Mathematical Statistics", **Salerno**
Corner growth model, symplectic characters, and KPZ universality

8 May 2018 | "Young researchers' meeting" seminar, **University of Warwick**, Dep. of Statistics
A central limit theorem for point-to-line last passage percolation

13 Apr 2018 | "2018 UK Easter Probability meeting", **University of Sheffield**
Point-to-line last passage percolation via symplectic Schur functions

7 Nov 2017 | Mathematical physics and probability seminar, **University of Warwick**
Point-to-line polymers and orthogonal Whittaker functions

29 Nov 2016 | Statistics PhD open day, **University of Warwick**
A few probabilistic models in the KPZ universality class

Posters

9 Apr 2019 | "Integrability and Randomness in Mathematical Physics and Geometry" workshop, **CIRM Marseille**
Transition between characters of classical groups, decomposition of Gelfand-Tsetlin patterns, and last passage percolation

Teaching and mentoring experience

2020 - Present | Module leader, **Technische Universität Wien**
Seminar in Probability Theory on: longest increasing subsequences in random permutations (2020-2021, sem. 2)

2020 - Present | Teaching assistant, **Technische Universität Wien**
Theory of Stochastic Processes (2020-2021, sem. 2; 2021-2022, sem. 2)
Mathematical Statistics (2021-2022, sem. 1)

2019 | Substitute lecturer, **University College Dublin**
Probability Theory (2019-2020, sem. 1)

2019 | Research project supervisor, **University College Dublin**
Undergraduate summer research project: "Interacting Particle Systems, Last Passage Percolation, and Random Matrices"
Supervised student: Shane Gibbons
Cosupervisor: Fabio Deelan Cunden

2015 - 2018 | Teaching assistant, **University of Warwick**
Probability Theory (2016-2017, term 2; 2017-2018, term 2)
Mathematical Methods (2017-2018, term 1)
Mathematics of Random Events (2016-2017, term 1)
Stochastic Processes (2015-2016, term 2)
Mathematical Techniques (2015-2016, term 1)
Probability A & B (2014-2015, term 2)

Service activities

2014 - Present	Referee for scientific journals and conference proceedings *Annals of Applied Probability* *Formal Power Series and Algebraic Combinatorics* *International Mathematical Research Notices* *Probability Surveys* *Probability Theory and Related Fields*
Jun 2019	Organiser of the session "Random interfaces and universality", Second Italian Meeting on Probability and Mathematical Statistics, Salerno.
Jul 2017	Seminar leader, *Science and survival* program, **University of Warwick** Interactive seminars called "Probability in Statistical Physics" in a higher education outreach program for secondary school students.

Other skills

Languages	Italian (native speaker) English (fluent) Spanish (fluent) German (basic) French (basic)
Software	LaTeX Matlab Mathematica