William Mead

Hausdorff Postdoc
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Summary

I am a postdoctoral researcher at the Hausdorff Center for Mathematics at the University of Bonn in the group of Patrik Ferrari. I submitted my PhD in mathematics at the University of Melbourne in December 2025, where I was supervised by Jan de Gier and Michael Wheeler. My main research interests are in integrable probability, non-equilibrium statistical mechanics and solvable lattice models.

Personal Details

- Citizenship: Australian
- Language: English (native)

Employment

Institute for Applied Mathematics, University of Bonn

- Hausdorff Postdoc 2026-
  - Member of Interacting Random Systems Group
  - Mentored by Patrik Ferrari
  - Associate member of Hausdorff Center for Mathematics

Education

The University of Melbourne

- Doctor of Philosophy (Science), Mathematics and Statistics, 2021-25
  - Supervised by Jan de Gier and Michael Wheeler.
  - Supported by the Research Training Program by the Australian Federal Government.
- Master of Science (Mathematics and Statistics), Applied Mathematics and Mathematical Physics, 2019-21
  - Graduated with first class honours.
  - Thesis supervised by Jan de Gier.
- Bachelor of Science, Physics, 2016-18
- Diploma in Mathematical Sciences, Applied Mathematics, 2017-18

Publications

3. Jan de Gier, William Mead, Daniel Remenik, and Michael Wheeler. Pfaffian Transition Probability and Correlation Kernel of TASEP in Half-space, December 2025. arXiv:2512.02286
2. Alexandr Garbali, Jan de Gier, William Mead, and Michael Wheeler. Symmetric Functions from the Six-Vertex Model in Half-Space. *Ann. Henri Poincaré*, 26(7):2557–2624, July 2025. arXiv:2312.14348
1. Jan de Gier, William Mead, and Michael Wheeler. Transition probability and total crossing events in the multi-species asymmetric exclusion process. *J. Phys. A: Math. Theor.*, 56(25):255204, June 2023. arXiv:2109.14232

Student Supervision

- Ainsley Nicoll (2024-25 AMSI Summer Research Project, University of Melbourne) co-supervised with Jan de Gier
- Aidan Petrowski (2024-25 AMSI Summer Research Project, University of Melbourne) co-supervised with Jan de Gier

Conference Organisation

- Mathematical Physics Special Session, Annual Meeting of the Australian Mathematical Society, 9-12 December 2025, at La Trobe University (Melbourne, Australia)

- PhD Student Symposium: ”Mathematical Structures in Statistical Mechanics”, 31 March-4 April 2025, at MATRIX Institute (Creswick, Australia)

Talks

- Pfaffian Point Processes from the Half-space Exclusion Process, AustMS 2025, La Trobe University, 9 December 2025
- Pfaffian Point Processes from Integrability in Half-space, MATRIX Institute (Online), Integrable systems with respect to geometry and quantum mechanics, 23 September 2025
- Spectral Theory for the Open-boundary Six-vertex Model, Algebraic Combinatorics, Special Functions and Representation Theory, in honour of Prof. Ole Warnaar, University of Queensland, Brisbane, Australia, 15 July 2025
- Spectral Theory for the Open-boundary Six-vertex Model, ANZAMP 2025, Bendigo, Australia, 11 February 2025
- Markov Processes, Hamiltonians and Commuting Transfer Matrices, Sasamoto Lab, Institute of Science Tokyo (formerly Tokyo Institute of Technology) (Japan), 4 October 2024
- Half-space TASEP and its Bi-orthogonalization Problem, Yukawa Institute for Theoretical Physics (Kyoto, Japan), Recent Developments in Kardar-Parisi-Zhang Universality, 27 September 2024
- The Half-space Exclusion Process, MATRIX Institute (Creswick, Australia), Mathematics and Physics of Integrability, 17 July 2024
- The Half-space Six-vertex Model, Institute for Pure and Applied Mathematics, (UCLA, California, United States), Geometry, Statistical Mechanics, and Integrability, 14 May 2024
- Integrable Half-space Six-vertex Model and Exclusion Process, ANZAMP 2024, Katoomba, 7 February 2024
- Integrable Half-Space Exclusion Process and Diagonally Symmetric Alternating Sign Matrices, AustMS 2023, Brisbane, 5 December 2023
- Symmetric Functions from Half-space Six-vertex Model, Mathematical Physics Seminar, Univeristy of Melbourne, 12 September 2023
- Exclusion Process Dualities from Integrable Vertex Models, ANZAMP 2023, 7 February 2022

- ASEP Dualities from Integrable Vertex Models, Eurandom (Eindhoven, Netherlands), Recent Developments in Stochastic Duality, 12 December 2022
- Transition Probabilities in the Multi-species Asymmetric Exclusion Process, Galileo Galilie Institute (Florence, Italy), Randomness, Integrability and Universality, 4 May 2022
- Transition Probabilities in the Multi-species Asymmetric Exclusion Process, ANZAMP 2022, 9 February 2022
- The Two-species Totally Asymmetric Simple Exclusion Process, MATRIX Institute (Creswick, Australia), Integrable Probability at Finite Temperature, 17 June 2021
- The Two-species Totally Asymmetric Simple Exclusion Process, ANZAMP Seminar Series, 16 March 2021

Poster Presentations

- Half-space Six-vertex Model and Symmetric Functions, Institute for Pure and Applied Mathematics, (UCLA, California, United States), Geometry, Statistical Mechanics, and Integrability, April-May 2024