

Dominic Bunnett

Information

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Education

- **Freie Universität Berlin**

Doctor of Philosophy in Mathematics

October 2015-July 2019 .

Thesis: Moduli of hypersurfaces in toric orbifolds

Advisor: Prof. Victoria Hoskins.

- **University of Warwick**

BSc and MMath, 2011-2015, 1st class.

Thesis: Hodge theory and the Torelli theorem for curves

Advisor: Prof. Miles Reid.

Employment

- **Technische Universität Berlin** October 2019 - present

Postdoc in Einstein Fellowship

Mentor: Michael Joswig and Bernd Sturmfels.

- **Technische Universität Berlin** August 2019 - September 2019

Scholarship of the Einstein fellowship

Mentor: Bernd Sturmfels

Papers and Preprints

- Moduli of hypersurfaces in toric orbifolds (preprint - submitted)

- Determinantal representations of the cubic discriminant - *joint with Hanieh Keneshlou*. *Le Matematiche*, Vol. 75, 2020.

- Geometry of moduli spaces of Bridgeland semistable quiver sheaves *joint with Alejandro Rinco-Hidalgo*. (In preparation).

- Symmetric crosscuts and tropical moduli *joint with Michael Joswig*. (In preparation).
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Research Visits

- University of Oxford *visiting* Frances Kirwan, April - June 2019
 - International Centre of Theoretical Physics, Trieste *visiting* Alejandra Rincon, February 2020
 - AIMS Ghana, Lecture course: Introduction to algebraic geometry, November-December 2020
 - Mathematisches Forschungsinstitut Oberwolfach, Reseach in Pairs, February 2021
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Invited talks

- Abram Gannibal Project, *Polyhedral geometry and polymake*, 2020
 - TU Berlin Discrete Geometry seminar, *Geometric discriminants and moduli*, TU Berlin, 2020
 - `polymake` developers meeting, MPI MiS Leipzig, 2020
 - ASGARD Math 2019, The 4th Scandinavian Gathering Around Remarkable Discrete Mathematics, University of Oslo, 2019
 - Mathematics seminar, International Centre of Theoretical Physics, Trieste, 2019
 - Workshop on non-reductive geometric invariant theory, Centre for Quantum Geometry of Moduli Spaces, Aarhus University, 2018
 - Northen German Algebraic Geometry Seminar, University of Leipzig, 2018
 - EAUMP-ICTP Workshop on Homological Methods in Algebra and Geometry, University of Dar-es-Salaam, 2018
 - Group actions and quotients in algebraic geometry, American University Cairo, 2017
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Software

- Automorphism group of a projective toric orbifold, `polymake`
- Non-normal simplices and weighted projective spaces, `polymake`

The `polymake` scripts are available upon request.

Organisational Work

- Organiser: CliMath; Mathematics and Climate science, tbd
 - Organiser: Workshop on Nonlinear algebra, TU Berlin, 2020
 - Group Leader: Cubic surfaces workshop, University of Oslo, 2019
 - Facilitator: EAUMP-ICTP Summer school on Homological Methods in Algebra and Geometry, University of Dar-es-Salaam, 2018
 - Research seminar: Further topics in geometric invariant theory, Freie Universität Berlin, summer semester 2016,
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Selected seminar talks

- Seminar: Defections in toric linear systems.

- Seminar: What is $\overline{\mathcal{M}}_{g,n}$?
- Seminar: Derived categories and variation of GIT.
- Talk: Semi-orthogonal decompositions coming from VGIT
- Seminar: Derived categories and variation of GIT.
- Talk: Factorisation categories
- Seminar: Counting indecomposable quiver representations after Crawley-Boevey and Van den Bergh.
- Talk: Kac-Moody algebras
- Seminar: Further topics in GIT.
- Talk: VGIT: The local description of the morphism to the wall
- Seminar: Derived categories and Fourier-Mukai Transforms.
- Talk: The McKay correspondence and non-commutative crepant resolutions
- Seminar: Derived categories and Fourier-Mukai Transforms.
- Talk: Fourier-Mukai transforms
- Seminar: The minimal model program.
- Talk: Contracting curves.

Teaching

- Polyhedral geometry and polymake workshop, 2020
- Derived categories in algebraic geometry, Makerere University, Summer semester 2020
- Singularities of affine hypersurfaces, Macaulay2 workshop, 2020
- Winter semester 2017/18, Linear Algebra I (in german)
- Summer semester 2017, Linear Algebra II (in german)
- Winter semester 2016/17, Differential Geometry I (Berlin mathematics school)
- Summer of 2014, St. Peters Kubatana High School, Harare, Zimbabwe. Advanced level mathematics
- 2014-2015, Tutor for undergraduates - analysis, linear algebra, abstract algebra, calculus, Warwick university
- 2012-2015, Private tutor for a number of A-level and GCSE students, Warwick university

Languages

- English (native)
- German (advanced)