

Milena Hering

University Address

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Employment

September 2019 – now	60% part time.
August 2018 – now	Edinburgh University, Edinburgh, Reader.
September 2016 – May 2017, August 2014 – April 2015	Career breaks due to maternity leave.
August 2012 – July 2018	Edinburgh University, Edinburgh, Lecturer.
August 2009 – July 2012	University of Connecticut, Storrs, Assistant Professor (tenure track).
August 2008 – June 2009	University of Utah, Salt Lake City, Post Doc.
September 2006 – August 2008	Institute of Mathematics and its Applications, Minneapolis, Post Doc.
April–August 2006	Freie Universität Berlin, Wissenschaftliche Angestellte.
January–March 2006	University of Michigan, Ann Arbor, Research Fellow.

Education

2000–2005	<i>University of Michigan at Ann Arbor, USA.</i> Ph.D. supervised by William Fulton. Thesis title: <i>Szygies of toric varieties.</i>
1999–2000	<i>Cambridge University, England.</i> Certificate of Advanced Study in Mathematics (Part III), (with distinction).
1998–1999	<i>University of California at Berkeley, USA.</i> Transfer undergraduate student.
1996–1998	<i>Eberhard–Karls–Universität Tübingen, Germany.</i> Vordiplom.

Visiting Positions

January – May 2021	ICERM (Brown University, Online).
January – May 2019	MSRI at UC Berkeley, California.
February 2018	Mittag-Leffler Institut, Stockholm.
July – September 2016	Fields Institute Toronto.
October 2012	MSRI at UC Berkeley, California.
May – August 2012	Max-Planck-Institut für Mathematik, Bonn.
February – May 2011	Mittag-Leffler Institut, Stockholm.
June, August 2010	Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach Leibniz Fellow.
June – July 2009	Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach Leibniz Fellow.
January – May 2009	MSRI at UC Berkeley, California.
June–August 2007	Max-Planck-Institut für Mathematik, Bonn.

Grants

October 2021 – October 2027	EPSRC Fellowship EP/T018836/1 “Toric vector bundles: Stability, Cohomology, and Applications.” £939180.
August 2020 – August 2023 2019	London Mathematical Society Emmy Noether Fellowship. £9940. London Mathematical Society for Workshop on Polytopes with a view towards Geometry and Applications. £5000.
June 2015	International Center of Mathematical Sciences Workshop with Frank Schreyer £19000 (EPSRC), £1500 (LMS), £1200, Glasgow Mathematical Journal £1000.
January 2014 – December 2016	EPSRC First Grant EP/K041002/1 “Positivity properties of toric line bundles and tropical divisors”, £126276.
June 2012 – July 2012	Supplement to support two REU students, \$17 000.
April 2011 – March 2014	NSF grant on “Collaborative Research: AGNES - Algebraic Geometry Northeastern Series,” \$20 000.
July 2010 – June 2013	NSF grant on “Varieties with torus actions: algebra and combinatorics,” \$120 000.
April 2010 – March 2011	NSF grant (Co-PI) NSF grant on “SM: Collaborative Proposal. AGNES - Algebraic Geometry Northeastern Series,” \$27900.

Teaching

Projects/Dissertation organiser 2018-2021.
Introduced Piazza to the University of Edinburgh, it is now used university wide, 2014.
Accelerated Proofs and Problem Solving, Fall 2018, Fall 2019, Fall 2020.
Introduction to Number Theory, University of Edinburgh, Spring 2018.
Honours Algebra, University of Edinburgh, Spring 2016.
Commutative Algebra, University of Edinburgh, Fall 2015 (designed course).
Calculus and its Applications, University of Edinburgh, Spring 2013, Spring 2014.
Algebraic Geometry II, University of Connecticut, Spring 2012.
Advanced Calculus II, University of Connecticut, Spring 2012.
Introduction to Topology and Geometry, University of Connecticut, Fall 2011.
Advanced Calculus I, University of Connecticut, Fall 2011.
Algebra I, University of Connecticut, Fall 2010.
Applied Linear Algebra, University of Connecticut, Fall 2010.
Probability, University of Connecticut, Spring 2010.
Transition to advanced mathematics, University of Connecticut, Spring 2010.
Algebraic Geometry I, University of Connecticut, Fall 2009.
Multivariable Calculus, University of Connecticut, Fall 2009.
Business algebra, University of Utah, Fall 2008.
Class on “Funktionentheorie” at Freie Universität Berlin, 2006.
Graduate student instructor at the University of Michigan in Calculus 105, 115 and 116 for seven terms 2000–2005.
Advised final year project on “Toric surfaces,” 2020-2021.
Advised final year project on “Mathematical cryptography,” 2020-2021.
Advised dissertation of Dora Puljic on “Cohen-Maculay rings,” 2019-2020.
Advised two 4-person group projects and 1 individual project on “Mathematical cryptography,” 2019-2020.
Advised vacation project of Jonathan Ng “Modules in the decomposition of an affine seminormal semigroup ring,” Summer 2020.
Advised dissertation of Poyi Law, “Combinatorial Algebraic Geometry,” University of Edinburgh, 2017-2018.
Advised 4 person group project on “Ideals associated to graphs,” University of Edinburgh, 2013-2014.
Advised dissertation of Francesca Gandini, University of Edinburgh, 2012-2013
Advised masters thesis of David Lindsay, University of Connecticut, 2011-2012
“Research Experience for Undergraduates”: Project with Jed Chou and Ben Whitney resulting in an article “Diagonal splittings of toric varieties and unimodularity,” 2012.

Publications and preprints

- Equations of toric vector bundles (with Diane Maclagan and Gregory G. Smith). *In preparation*.
- The F -splitting ratio of seminormal toric varieties (with Kevin Tucker). *In preparation*.
- On the instability of syzygy bundles on toric surfaces (with Lucie Devey, Katharina Jochemko, and Hendrik Süß). [arXiv:2409.04666 \[math.AG\]](#), submitted.
- Toric and tropical Bertini theorems in positive characteristic (with Francesca Gandini, Diane Maclagan, Fatemeh Mohammadi, Jenna Rajchgot, Ashley K. Wheeler, and Josephine Yu). [arXiv:2111.13214 \[math.AG\]](#)
- Stability of Tangent bundles on smooth toric Picard-rank-2 varieties and surfaces (with Benjamin Nill and Hendrik Süß). [arXiv:1910.08848 \[math.AG\]](#). *Facets of algebraic geometry. Vol. II, 1-25, London Math. Soc. Lecture Note Ser., 473, Cambridge Univ. Press, Cambridge, 2022.*
- Toric degenerations of $Gr(2, n)$ and $Gr(3, 6)$ via plabic graphs (with Lara Bossinger, Xin Fang, Ghislain Fourier, and Martina Lanini). [arXiv:1612.03838 \[math.CO\]](#), *Ann. Comb.* 22 (2018), no. 3, 491-512.
- Diagonal splittings of toric varieties and unimodularity (with Jed Chou, Sam Payne, Rebecca Tramel, and Ben Whiteney). [arXiv:1612.09208 \[math.AG\]](#), *Proc. Amer. Math. Soc.* 146 (2018), no. 5, 1911-1920.
- An algebraic characterization of injectivity in phase retrieval (with Aldo Conca, Dan Edidin, and Cythnia Vinzant). *Applied and Computational Harmonic Analysis: Volume 38, Issue 2* (2015), Pages 346-356. [arXiv:1312.0158](#).
- The ring of evenly weighted points on the line (with B. Howard). *Mathematische Zeitschrift: Volume 277, Issue 3* (2014), Page 691-708. [arXiv:1211.3941](#).
- The T -graph of a multigraded Hilbert scheme (with D. Maclagan). *Experimental Mathematics*, 21:3, 280-297. [arXiv:1110.1861](#).
- Few smooth d -Polytopes with n lattice points.* (with T. Bogart, C. Haase, B. Lorenz, B. Nill, A. Pfaffenholz, G. Rote, F. Santos, and H. Schenck). *Israel Journal of Mathematics*, Volume 207, Issue 1, pp. 301-329. 2015 [arXiv:1010.38870](#).
- Cox rings and pseudoeffective cones of projectivized toric vector bundles (with J. González, S. Payne and H. Süß). *Algebra and Number Theory*, Vol. 6 (2012), No. 5, 995-1017. [arXiv:1009.5238](#).
- Positivity for toric vector bundles* (with M. Mustață and S. Payne). *Annales de l'Institut Fourier (Grenoble)* 60 (2010), no. 2, 607-640. [arXiv:0805.4035](#).
- Multigraded regularity and the Koszul property. *Journal of Algebra* 323 (2010), no. 4, 1012-1017. [arXiv:0712.2251](#).
- Syzygies of toric varieties.* *Ph.D. thesis*, University of Michigan, 2006.
- Syzygies, multigraded regularity and toric varieties (with H.Schenck and G.Smith). *Compositio Mathematica* 142 (2006), no. 6, 1499-1506. [math.AG/0502240](#).
- Asymptotic cohomological functions of toric divisors (with A. Küronya and S. Payne). *Advances in Mathematics* 207 (2006), no. 2, 634-645. [math.AG/0501104](#).
- The Membrane Inclusion Curvature Equations (with J.C. Faugere and J. Phan). *Advances in Applied Mathematics* 31 (2003), no. 4, 643-658.

Postdocs mentored

- Lucie Devey, University of Edinburgh, 2024
Hendrik Süß (informally), University of Edinburgh, 2013-2015.
Adam Booche, University of Edinburgh, 2014-2015.
Kyungyong Lee, University of Connecticut, 2011-2012.

Graduate Students

- Adrian Cook, University of Edinburgh, since 2023.
Will Reynolds, University of Edinburgh, 2019 – 2023.
Bach Tran, University of Edinburgh, 2014 – 2018.

External examiner at KTH Stockholm, King's college London, KU Leuven, University of Oslo, L'Université de Bretagne Occidentale, Manchester University. Internal examiner at University of Edinburgh.

Equality, Diversity, and Inclusion

Co-organizer with Diane Maclagan, Alexander Shapiro, and Nick Sheridan of “[Count me in](#),” 2024.
Introduced and co-organized monthly lunch for gender minorities (graduate students and faculty), 2023-2024.
Founded and co-organized with David Jordan and Nick Sheridan “[Count me in](#),” a 6-week group summer research programme for underrepresented groups, 2023.
Mentor for the undergraduate course on toric varieties taught by Jessica Sidman at the “Program for Women in Mathematics,” IAS, 2007.

Editorial Work

Editor of [Advances in Geometry](#) since 2023.
“Facets of Algebraic Geometry” A Collection in Honor of William Fulton’s 80th Birthday. London Mathematical Society Lecture Note Series 473, Volume 1 and 2.

Invited Lecture Series

“Toric surfaces” at the *LMS Undergraduate Summer School 2023*, Sheffield, July 2023.
“Toric varieties: Positivity and Syzygies” at the *Graduate Summer School on Combinatorial Algebraic Geometry*, Fields Institute, July 2016.
“Tropische Kurven und torische Flächen”, with Hannah Markwig, *Sommeruniversität der Studienstiftung*, Rot an der Rot, August 2015.

Invited Presentations

Group actions, combinatorial methods, and Fano varieties, Innsbruck, October 2024.
Singularities and Torus actions, Oldenburg, September 2023.
Hodge and K-Theory meet Combinatorics, Lausanne, September 2023.
Algebraic Geometry seminar, Warwick University, May 2023.
Newton-Okounkov Bodies and Tropical Geometry, Frankfurt, November 2022.
Group actions in Algebraic Geometry, Cetraro, July 2022.
ICERM Workshop on Algebraic Geometry and Polyhedra, Online, April 2021.
EDGE 2020: Explicit K-Stability and moduli problems, Online, December 2020.
St. Andrews Pure Math Colloquium, Online, November 2020.
Bath Geometry Seminar, Bath, February 2020.
Oberwolfach Workshop on Toric varieties, Oberwolfach, September 2019.
SIAM Conference on Applied Algebraic Geometry, Bern, July 2019.
Ideals, Varieties, and Applications, Amherst College, June 2019.
Algebraic Geometry Seminar, Stanford, May 2019.
Number Theory/Algebraic Geometry Seminar, Simon Fraser University, Vancouver, March 2019.
Combinatorics Seminar, Nottingham, November 2018.
Algebra Seminar, Leeds, November 2018.
Varieties and Group actions, Impan, Warsaw, September 2018.
Algebraic Geometry seminar, Oxford, May 2018.
Celebrating new appointments, Loughborough, May 2018.
Instruments of Algebraic Geometry, Bucharest, September 2017.
Toric degenerations, Bristol, August 2017.
Emmy Noether Seminar, Erlangen, July 2017.

Plenary speaker at *Effective Methods in Algebraic Geometry (MEGA)*, Nice, June 2017.
Applied algebra and geometry, Edinburgh, Mai 2017.
Algebra Workshop at British Mathematical Colloquium, Durham, April 2017.
Colloquium, Mainz, February 2017.
Toric methods in algebra and geometry, Manchester, January 2017.
Colloquium, program in Combinatorial Algebraic Geometry at the Fields Institute Toronto, September 2016.
Introductory Workshop, program in Combinatorial Algebraic Geometry at the Fields Institute Toronto, August 2016.
Workshop on Classical Algebraic Geometry, Mathematisches Forschungsinstitut Oberwolfach, June 2016.
Homological and computational methods in Commutative Algebra, Cortona, June 2016.
Special Session on Commutative Algebra, AMS 2016 Spring Western Sectional Meeting at The University of Utah in Salt Lake City, April, 2016.
Workshop on Toric Geometry, Mathematisches Forschungsinstitut Oberwolfach, April 2016.
Cow at British Mathematics Colloquium, Cambridge, April 2015.
Oberseminar Algebraische Geometrie, Leibniz Universität Hannover, December 2014.
Tropical Dibbelabbes, Universität des Saarlandes, June 2014.
Warwick Tropical Day, Warwick University, February 2014.
Colloquium, Durham University, February 2014.
SIAM conference on Algebraic Geometry, Section on Toric Varieties, Colorado State University, Fort Collins, August 2013.
CIRM workshop on “Algèbre commutative et ses interactions avec la géométrie algébrique, Luminy, July 2013.
Oberseminar Algebraische Geometrie, Universität Tübingen, July 2013.
Bogomolov Lectures, Edinburgh, June 2013.
Szygies in Berlin, May 2013.
Workshop on Perspectives and emerging topics in Algebra and Combinatorics, Haus Bergkranz, Austria, March 2013.
Pure Maths Colloquium, Sheffield, March 2013,
MSRI opportunistic seminar, Berkeley, October 2012,
Geometry/Topology seminar, University of Edinburgh, September 2012,
Forschungsseminar Algebraische Geometrie, Freie Universität Berlin, Juli 2012,
Oberseminar Diskrete Mathematik, Universität Frankfurt, June 2012,
Seminar Algebra und Geometrie, Universität Basel, May 2012,
Harvard/MIT Algebraic Geometry seminar, MIT, May 2012,
Colloquium at Institute of Defense Analysis, Princeton, March 2012,
Algebra, Geometry, and Physics, SUNY Stony Brook, February 2012,
SIGMA seminar, University of Connecticut, February 2012,
Colloquium, University of Wisconsin, February 2012,
Algebraic Geometry Seminar, University of Illinois at Chicago, February 2012
Schwerpunktskolloquium Reelle Geometrie und Algebra, Universität Konstanz, Januar 2012,
Algebra Seminar, Georgia Tech, December 2011,
Western Algebraic Geometry Symposium, October 2011, Colorado State University,
Algebra Seminar, University of Connecticut, September 2011,
Oberseminar Algebraische Geometrie und Computeralgebra Kaiserslautern-Saarbrücken, Saarbrücken, July 7 2011.
Edinburgh-Glasgow-Aberdeen Algebraic Geometry Seminar, Glasgow, June 20 2011.
Kollegseminar der Algebra und Topologie, Universität Osnabrück, May 24 2011.
Oberseminar, Universität Tübingen, May 19 2011.
Seminar, Mittag-Leffler Institut, March 14 2011.
Algebraic Geometry seminar, Warwick, January 19 2011.
Workshop on components of Hilbert schemes, AIM, July 20 2010.
Workshop, Universität Cottbus, July 15 2010.
The Second CREST-SBM International Conference “Harmony of Gröbner bases and the modern industrial society”, Osaka, Japan, June–July 2010.

FRAGMENT seminar, Colorado State University, March 2010.
Valley Geometry seminar, UMass Amherst, February 12, 2010,
Geometry-Algebra-Singularities-Combinatorics seminar, Northeastern University, November 30, 2009.
UConn Math Club, University of Connecticut, November 11, 2009.
Algebra seminar, University of Connecticut, October 27, 2009.
Lunch seminar, Universität Göttingen, July 8, 2009.
Combinatorial challenges in toric varieties, American Institute of Mathematics, April 28, 2009.
AMS Western Sectional Meeting, Special Session on Algebra and Number Theory with Polyhedra, San Francisco State University, April 26, 2009.
Bay Area Discrete Math Day, UC Davis, April 4, 2009.
Reed Mathematics Colloquium, Reed College, February 19, 2009.
Algebraic Geometry Seminar, University of Utah, November 25, 2008.
Undergraduate Colloquium, University of Utah, November 5, 2008.
AG Algebraische Geometrie, Universität Tübingen, June 26, 2008.
Humboldt Algebraic Geometry Seminar, Humboldt Universität zu Berlin, June 18, 2008.
Combinatorics Seminar, University of Minnesota, May 6, 2008.
Algebraic Geometry Seminar, University of Iowa, April 4, 2008.
AMS Special Session on Algebraic Combinatorial Geometry, Spring Eastern Meeting, March 15, 2008.
Algebraic Geometry Seminar, University of Utah, February 26, 2008.
Algebraic Geometry Seminar, Stanford University, February 22, 2008.
Combinatorics and Geometry Seminar, Stanford University, February 20, 2008.
Colloquium, University of Connecticut, February 4, 2008.
Postdoc Seminar, Institute of Mathematics and its Applications, January 29, 2008.
Algebraic Geometry Seminar, Warwick University, January 14, 2008.
Seminar: Algebraische Geometrie, Freie Universität Berlin, December 20, 2007.
Mini workshop on Projective Normality of smooth toric varieties, Mathematisches Forschungsinstitut Oberwolfach, August 16, 2007.
Program for women in mathematics, IAS, May 22, 2007.
Algebra-Geometry-Combinatorics Seminar, San Francisco State Univ, April 27, 2007.
Algebra Seminar, University of Pennsylvania, February 26, 2007.
Algebra and Combinatorics Seminar, Texas A&M, February 9, 2007.
GADGET Seminar, University of Texas, Austin, February 6, 2007.
Postdoc Seminar, Institute of Mathematics and its Applications, January 30.
AMS Special Session on Computational Algebraic and Analytic Geometry for Low-Dimensional Varieties, Joint Meeting, New Orleans, January 8, 2007.
International conference on Toric Topology, Osaka City University, Osaka, May 2006.
Seminar: Algebraische Geometrie, Freie Universität Berlin, April 2006.
Undergraduate Math Club, University of Michigan, Ann Arbor, March 2006.
Valley Geometry Seminar, University of Massachusetts at Amherst, February 2006.
Convex and Algebraic Geometry, Mathematisches Forschungsinstitut Oberwolfach, January 2006.
AWM Workshop for Women Graduate Students and Recent Ph.D.'s, Joint meeting in San Antonio, Texas, January 2006. Posterpresentation.
Special session on Algebraic Geometry, Fall Central Section meeting, Lincoln, Nebraska, October 2005.
Queen's Algebraic Geometry Seminar, Queen's University, Kingston, Ontario, September 2005.
Special session on Algebraic Geometry, Second joint meeting of AMS, DMV and ÖMG at Mainz, June 2005.
AG Algebraische Geometrie, Eberhard-Karls-Universität Tübingen, June 2005.
Special session on Algebraic Geometry and Combinatorics, Spring Western Section meeting, Santa Barbara, California, April 2005.
Student Algebraic Geometry and Commutative Algebra Seminar, University of Michigan at Ann Arbor, several presentations, 2002–2005.
Solving systems of polynomial equations (CBMS), Texas A&M University, May 2002.

Effective Methods in Algebraic Geometry (MEGA), Bath, May 2000.

Service

Geometry seminar organiser 2023-2024.
Project officer, 2018-2021.
Hiring committee, 2015.
Colloquim organiser, 2013-14.
Examination editor, 2012-2013.
Graduate committee, 2011-2012.
Hiring committee, 2011-2012.
Colloquium committee, 2009-2012.
Sidney Professorship Committee, 2010-2011.
Postdoc Hiring committee, 2009-2010.

Organising

Co-organizer with Dan Erman, Nathan Ilten, and Hendrik Süß of “[Toric Geometry](#),” Oberwolfach, April 2025.
Co-organizer with Jürgen Hausen, Nathan Ilten, and Diane Maclagan of “[Toric Geometry](#)”, Oberwolfach, March 2022.
Co-organizer with Asher Auel, Melody Chan, and Tyler Foster of “New Facets”, Ann Arbor, October 2019.
Co-organizer with Paolo Aluffi, Dave Anderson, Mircea Mustata, and Sam Payne of “[Facets of Algebraic Geometry](#)”, Ann Arbor, October 2019.
Co-organizer with Al Kasprzyk of “[Lattice polytopes, with a view towards Geometry and Applications](#)”, Edinburgh, September 2019.
Co-organizer with Arend Bayer, Diane Maclagan, and Julius Ross of “[British Algebraic Geometry meeting](#)”, Edinburgh, April 2016.
Co-organizer with Frank-Olaf Schreyer of ICMS conference on “[Minimal free resolutions, Betti numbers, and combinatorics](#)” in Edinburgh, June 2015.
Co-founder with Arend Bayer, Diane Maclagan, and Balazs Szendroi of “[British Algebraic Geometry meeting](#)” in Warwick, September 2014.
Co-organizer with David Eisenbud of afternoon session on homological algebra, part of MSRI workshop on “Representation theory, homological algebra, and free resolutions”, February 2013.
Co-organizer with Arend Bayer of AGNES conference at UConn, September 2010.
<http://www.agneshome.org/fall10>.
Co-founder of the *Algebraic Geometry Northeastern Series*, <http://www.agneshome.org/>, 2010.
Co-organizer with Jessica Sidman of Poster session at AGNES in Amherst, April 2010.
Co-organizer with Arend Bayer and Aaron Bertram of the Western Algebraic Geometry Seminar, November 8-9, 2008, <http://www.math.utah.edu/~wags08/>.
Co-organizer with Diane Maclagan for a Special Session on “Toric varieties” at the Fall Eastern Section Meeting of the AMS at Rutgers University, October 6-7 2007.
Co-organizer of the Student Algebraic Geometry and Commutative Algebra Seminar at the University of Michigan, 2004–5.

Refereeing

Refereeing/quick opinions for Algebra and Number Theory, Crelle, Journal of Algebra, Journal of Algebraic Statistics, Journal of Commutative Algebra, Journal of the London Mathematical Society, Journal of Pure and Applied Algebra, Michigan Mathematical Journal, Transactions of the AMS, Algebraic Combinatorics.
Reviewer for grant applications to EPSRC, DAAD, NSA.