Alexander Mieczyslaw Kasprzyk

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Employment

Associate Professor (Reader) in Geometry
University of Nottingham, UK — Aug 2015–present

Secondment to the Heilbronn Institute
Heilbronn Institute for Mathematical Research, UK — Sep 2017–Aug 2019

Research Fellow
Imperial College London, UK — Jan 2011–Jul 2015

Research Fellow
University of Sydney, Australia — Nov 2009–Dec 2010

Postdoctoral Research Associate
University of Kent, UK — Oct 2008–Oct 2009

Postdoctoral Research Fellow
University of New Brunswick, Canada — Sep 2006–Sep 2008

Consultancy

Centre for Emerging Technology & Security, ATI, UK — Jun 2023–present

Heilbronn Institute for Mathematical Research, UK — Sep 2019–present

Education

University of Bath, UK — 2002–2006
Ph.D. in Mathematics

University of Oxford, UK — 1998–2002
MMath in Mathematics

Keywords Algebraic Geometry; Computational Algebra; Machine Learning; Mirror Symmetry

Refereed Publications

Where relevant, the number of citations is indicated by [n] (data from Google Scholar). As of Feb 2024 my work, including preprints omitted here, has been cited almost 1600 times.

(42) Mirror symmetry, Laurent inversion and the classification of $\mathbb{Q}$-Fano threefolds. [4]
T. Coates, L. Heuberger, A. Kasprzyk, to appear in *Trans. LMS* (2024).

(41) On K-moduli of quartic threefolds. [1]
H. Abban, I. Cheltsov, A. Kasprzyk, Y. Liu, A. Petracci, to appear in *Alg. Geom.* (2024).

(40) Singularity content. [41]
M. Akhtar, A. Kasprzyk, to appear in *Kyoto J. Math.* (2024).

(39) The Rapid Rise of Generative AI: Assessing risks to safety and security.
A. Janjeva, A. Harris, S. Mercer, A. Kasprzyk, A. Gausen, *Centre for Emerging Technology and Security* Research Report (2023).

(38) Machine learning detects terminal singularities. [1]
T. Coates, A. Kasprzyk, S. Veneziale, *Neural Information Processing Systems (NeurIPS)* (2023).

(37) Machine learning the dimension of a Fano variety. [2]
T. Coates, A. Kasprzyk, S. Veneziale, *Nature Communications* **14**:5526 (2023).

(36) Computation and data in the classification of Fano varieties. [1]
G. Brown, T. Coates, A. Corti, T. Ducat, L. Heuberger, A. Kasprzyk, *Nankai Symposium on Mathematical Dialogues*, Springer, 2023.

(35) Toric Sarkisov links of toric Fano varieties. [1]
G. Brown, J. Buczyński, A. Kasprzyk, *Birational Geometry, Kähler–Einstein Metrics and Degenerations*, Springer, 2023, 129–144.

(34) Polytopes and machine learning. [27]
J. Bao, Y.-H. He, E. Hirst, J. Hofscheier, A. Kasprzyk, S. Majumder. *International Journal of Data Science in the Mathematical Sciences* **1**(2) (2023), 181–211.

(33) Machine learning the dimension of a polytope. [2]
T. Coates, J. Hofscheier, A. Kasprzyk, *Machine Learning in Pure Mathematics and Theoretical Physics*, World Scientific, 2023, 85–104.

(32) Databases of quantum periods for Fano manifolds. [3]
T. Coates, A. Kasprzyk, *Nature Sci. Data* **9**:163 (2022).

(31) On the maximum dual volume of a canonical Fano polytope. [11]
G. Balletti, A. Kasprzyk, B. Nill, *Forum of Math., Sigma* **10** (2022), e109.

(30) On the Fine interior of three-dimensional canonical Fano polytopes. [12]
V. Batyrev, A. Kasprzyk, K. Schaller, *Interactions with Lattice Polytopes*, Springer, 2022, 11–47.

(29) Gorenstein formats, canonical and Calabi–Yau threefolds. [23]
G. Brown, A. Kasprzyk, L. Zhu, *Exp. Math.* **31**(1) (2022), 146–164.

(28) Laurent polynomials in mirror symmetry: why and how?
A. Kasprzyk, V. Przyjalkowski, *Proyecciones J. Math.* **41**(2) (2022), 481–515.

(27) Hilbert series, machine learning, and applications to physics. [21]
J. Bao, Y.-H. He, E. Hirst, J. Hofscheier, A. Kasprzyk, S. Majumder, *Phys. Lett. B* **827**:136966 (2022).

(26) Maximally mutable Laurent polynomials. [30]
T. Coates, A. Kasprzyk, G. Pitton, K. Tveiten, *Proceedings of the Royal Society A* **477**:20210584 (2021).

(25) Quantum periods for certain four-dimensional Fano manifolds. [16]
T. Coates, S. Galkin, A. Kasprzyk, A. Strangeway, *Exp. Math.* **29**(2) (2020), 183–221.

(24) Laurent inversion. [31]
T. Coates, A. Kasprzyk, T. Prince, *Pure Appl. Math. Q.* **15**(4) (2019), 1135–1179.

(23) *Appendix to* Four dimensional Fano quiver flag zero loci. [19]
T. Coates, E. Kalashnikov, A. Kasprzyk, *Proceedings of the Royal Society A* **475**:20180791 (2019).

(22) Ehrhart polynomial roots of reflexive polytopes. [14]
G. Hegedüs, A. Higashitani, A. Kasprzyk, *Electron. J. Combin.* **26**(1) (2019), P1.38.

(21) Fano 3-folds in $\mathbb{P}^2 \times \mathbb{P}^2$ format, Tom and Jerry. [18]
G. Brown, A. Kasprzyk, M. Qureshi, *Eur. J. Math.* **4**(1) (2018), 57–72.

(20) Minimality and mutation-equivalence of polygons. [39]
A. Kasprzyk, B. Nill, T. Prince, *Forum of Math., Sigma* **5** (2017), e18.

(19) Mutations of fake weighted projective planes. [24]
M. Akhtar, A. Kasprzyk, *Proc. Edinburgh Math. Soc. (2)* **59**(2) (2016), 271–285.

(18) Quantum periods for 3-dimensional Fano manifolds. [123]
T. Coates, A. Corti, S. Galkin, A. Kasprzyk, *Geom. Topol.* **20**(1) (2016), 103–256.

(17) Mirror symmetry and the classification of orbifold del Pezzo surfaces. [79]
M. Akhtar, T. Coates, A. Corti, L. Heuberger, A. Kasprzyk, A. Oneto, A. Petracci, T. Prince, K. Tveiten, *Proc. Amer. Math. Soc.* **144** (2016), 513–527.

(16) Four-dimensional projective orbifold hypersurfaces. [28]
G. Brown, A. Kasprzyk, *Exp. Math.* **25**(2) (2016), 176–193.

(15) Four-dimensional Fano toric complete intersections. [39]
T. Coates, A. Kasprzyk, T. Prince, *Proceedings of the Royal Society A* **471**:20140704 (2015).

(14) Mutations of fake weighted projective spaces. [1]
T. Coates, S. Gonshaw, A. Kasprzyk, N. Nabijou, *Electron. J. Combin.* **21**(4) (2014), P4.14.

(13) Mirror symmetry and Fano manifolds. [139]
T. Coates, A. Corti, S. Galkin, V. Golyshev, A. Kasprzyk, *Proceedings of the 6th European Congress of Mathematics*, European Mathematical Society, 2013, 285–300.

(12) Seven new champion linear codes. [19]
G. Brown, A. Kasprzyk, *LMS J. Comput. Math.* **16** (2013), 109–117.

(11) Small polygons and toric codes. [20]
G. Brown, A. Kasprzyk, *J. Symbolic Comput.* **51** (2013), 55–62.

(10) Fano polytopes. [43]
A. Kasprzyk, B. Nill, *Strings, Gauge Fields, and the Geometry Behind – The Legacy of Maximilian Kreuzer*, World Scientific, 2012, 349–364.

(9) Minkowski polynomials and mutations. [115]
M. Akhtar, T. Coates, S. Galkin, A. Kasprzyk, *SIGMA Symmetry Integrability Geom. Methods Appl.* **8** (2012), 094, pp. 707.

(8) Reflexive polytopes of higher index and the number 12. [21]
A. Kasprzyk, B. Nill, *Electron. J. Combin.* **19**(3) (2012), P9.

(7) The boundary volume of a lattice polytope. [10]
G. Hegedüs, A. Kasprzyk, *Bull. Aust. Math. Soc.* **85** (2012), 84–104.

(6) Roots of Ehrhart polynomials of smooth Fano polytopes. [10]
G. Hegedüs, A. Kasprzyk, *Discrete Comput. Geom.* **46**(3) (2011), 488–499.

(5) Canonical toric Fano threefolds. [102]
A. Kasprzyk, *Canad. J. Math.* **62**(6) (2010), 1293–1309.

(4) On the combinatorial classification of toric log del Pezzo surfaces. [42]
A. Kasprzyk, M. Kreuzer, B. Nill, *LMS J. Comput. Math.* **13** (2010), 33–46.

(3) Bounds on fake weighted projective space. [62]
A. Kasprzyk, *Kodai Math. J.* **32** (2009), 197–208.

(2) A note on palindromic δ-vectors for certain rational polytopes. [38]
M. Fiset, A. Kasprzyk, *Electron. J. Combin.* **15**(1) (2008), N18.

(1) Toric Fano three-folds with terminal singularities. [78]
A. Kasprzyk, *Tohoku Math. J.* **58**(1) (2006), 101–121.

Scientific Software & Databases

(7) The Fano 3-fold database. [6] doi:10.5281/zenodo.5820338
G. Brown, A. Kasprzyk, *Zenodo* (2022).

(6) Quantum periods for four-dimensional Fano manifolds. doi:10.5281/zenodo.5708307
T. Coates, A. Kasprzyk, *Zenodo* (2021).

(5) PCAS: A Parallel Computational Algebra System. https://www.pcas.xyz
T. Coates, A. Kasprzyk, 2017–present.

(4) The classification of toric canonical Fano 3-folds. [3] doi:10.5281/zenodo.5866330
A. Kasprzyk, (2010).

(3) Convex polytopes and polyhedra. [3] https://tinyurl.com/2p9cmuk9
G. Brown, A. Kasprzyk, (2009).

(2) Toric geometry. https://tinyurl.com/bdww76mc
G. Brown, J. Buczyński, A. Kasprzyk, (2009).

(1) Graded Ring Database. [148] http://www.grdb.co.uk
G. Brown, A. Kasprzyk, 2007–present.

Edited Volumes

(3) Angles of Geometry: Proceedings of the Nottingham Geometry Seminar.
L. Campo, J. Hofscheier, and A. Kasprzyk (eds), World Scientific, 2024.

(2) Recent developments in Algebraic Geometry.
H. Abban, G. Brown, A. Kasprzyk, and S. Mori (eds), London Mathematical Society Lecture Note Series, **478**, Cambridge University Press, 2022.

(1) Interactions with lattice polytopes.
A. Kasprzyk and B. Nill (eds), Springer Proceedings in Mathematics & Statistics, **386**, Springer, 2022.

Journal Editor-in-Chief

Experimental Mathematics 2023–present
Publishes formal results in pure mathematics inspired by experimentation, conjectures suggested by experiments, and data supporting significant hypotheses.

Journal Editorial Board Member

Fundamental Journal of Mathematics and Applications 2023–present
Publishes original research articles, review articles, and survey articles with a focus on number theory, geometry, and topology.

International Journal of Data Science in the Mathematical Sciences 2022–present
A highly interdisciplinary journal aimed at experimental mathematicians, both pure and applied, physicists, and data scientists, with a focus on machine learning.

Enumerative Combinatorics and Applications 2021–present
Covers research in enumerative combinatorics, focussing on research resulting from the rich interplay between mathematics and theoretical physics.

Experimental Results 2021–2023
An open access, open peer review journal providing a venue to publish all valid experimental findings, from all disciplines across STEM.

Selected Grants

Since 2016 I have been awarded over £1M in external funding. As well as paying for PDRAs and an extensive visitor programme, these grants funded an average of 50% of my salary (at FEC rates). With the exception of the grant indicated by * below, all are externally funded.

Project title	Role	Funder	Dates	Value
Secondment Office of the Chief Scientific Adviser	PI	MoD	Apr 2024– Mar 2026	£80K
Computational Algebraic Geometry INI Network Grant	Co-I	INI	Apr 2023– Mar 2025	£15K
DANGER: Data, Numbers & Geometry INI Network Grant	PI	INI	Jan 2023– Dec 2024	£20K
PhD Sponsorship Four-year PhD studentship	PI	GCHQ	Oct 2020– Aug 2024	£45K
Constructing a Periodic Table for Geometry Tübingen–Nottingham seedcorn*	PI	Tübingen & Nottingham	Sep 2021– Sep 2023	€24K
Turing Network Development Award ATI Network Funding	Co-I	ATI	Feb– Sep 2022	£40K
The Combinatorics of Mirror Symmetry EPSRC Fellowship	PI	EPSRC	Jun 2016– Mar 2022	£551K
Algorithmic Methods in Algebraic Geometry Nottingham–Magma collaboration	PI	Simons Foundation	Apr 2018– Mar 2021	£240K
Secondment Heilbronn Institute	PI	GCHQ	Oct 2017– Sep 2019	£53K
Computing toric Fano varieties Atlantic Excellence Network Fellowship	PI	ACEnet	Oct 2007– Sep 2009	$80K

Policy Advice

Centre for Emerging Technology and Security (CETaS) 2024 Showcase Apr 2024
Institution for Engineering and Technology, London

Generative AI and National Security Dec 2023
Centre for Emerging Technology and Security

Global AI Safety Summit pre-Summit Royal Society Workshop Oct 2023
Science x AI Safety: Horizon-scanning AI safety risks across scientific disciplines

Global AI Safety Summit: AI for Innovation Oct 2023
Department for Science, Innovation and Technology

External Leadership Responsibilities

EPSRC Strategic Advisory Team (SAT) Jan 2022–present
One of 16 elected members of the EPSRC's Mathematical Sciences SAT, advising on future EPSRC strategy and shaping the research and training portfolios.

Convenor for the LMS Continuing Professional Development Panel Sessions for Early Career Researchers Aug 2023–present

ATI Topology and Geometry of Data Interest Group Member Jan 2023–present

External Examiner, University of East Anglia Oct 2022–present

External Examiner, University of Bath Oct 2021–present

EPSRC Prosperity Partnerships Prioritisation Panel Jul 2024

EPSRC Programme Grant Outline Panel Jun 2023

EPSRC Fellowship Interview Panel Jul 2022

EPSRC New Horizons Outline Panel Mar 2022

EPSRC Mathematics Prioritisation Panel Sep 2016, Nov 2020

Mentor for the Society of Research Software Engineering Oct 2021–present

German Research Foundation (DFG) Review Panel Mar 2021

Athena SWAN Assessment Panel Jan 2021

University Leadership Responsibilities

University level

Vice Chancellor's Mentoring Programme 2021/22
One of eight members of staff selected from across the university to be mentored by, and shadow, our Vice Chancellor over the year.

Task & Finish Group: Fellowships and Recruitment Feb 2024–present

Student Experience Committee of Senate Jan 2024–present

EPSRC DTP Executive Group Feb 2024–present

University Mentoring Pool Jan 2022–present

Faculty level

Researcher Academy Faculty Lead for Science Jan 2024–present
Responsibilities include: coordinating CDT and DTP training and funding across the Faculty of Science; designing PGRA training programmes; REF environment.

Faculty of Science Research Committee Jan 2024–present

Accelerating AI Research Working Group Dec 2023–present

School level

Head of Pure Mathematics Aug 2020–present
I lead a section of approximately 20 academic staff and PDRAs. Responsibilities include: curriculum review; allocation of teaching duties; research growth and supporting grant applications; REF submission; PhD recruitment; staff hiring, promotions, evaluation, and performance management.

Leadership Board Aug 2020–present

Research Board Aug 2020–present

Equality, Diversity, and Inclusion (EDI) Committee Aug 2018–present

Postdoc Supervision

Name	Dates
Johannes Hofscheier Progressed to Assistant Professor in Geometry at the University of Nottingham.	2020–2022
Livia Campo Progressed to a postdoc at the University of Birmingham with M. Mazzocco. Currently Research Fellow at the Korea Institute for Advanced Study (KIAS), Korea.	2020–2021
Giuseppe Pitton Progressed to a data science position at Deutsche Bank.	2018–2021
Michael Harrison Progressed to a software engineering position in industry.	2018–2021
Andrea Petracci Progressed to a postdoc at Freie Universität Berlin with K. Altmann. Currently Assistant Professor at the Università di Bologna, Italy.	2017–2019

PhD Supervision

Name	Role	Dates
Heath Pearson *Mirror symmetry for spherical Fano varieties*	Supervisor	2023–present
Sara Veneziale *Machine learning Fano varieties from the quantum period* Secured a Chapman–Schmidt Postdoc Fellowship in AI for Science, Imperial College.	Supervisor	2021–present
Girtrude Hamm *Mirror symmetry for terminal Fano threefolds* Part-funded by a HIMR studentship (£45K). Secured a postdoc at the University of Western Ontario, Canada, with G. Denham.	Supervisor	2020–present
Thomas Hall *Four dimensional Fano varieties in the mirror* Part-funded by a JSPS pre-doctoral research bursary (£42K).	Supervisor	2019–present
Christopher Hall *Investigations into local class field theory over general fields* Progressed to an LMS Postdoctoral Fellowship.	Second Supervisor	2019–2023
Daniel Cavey *Mirror symmetry for orbifold del Pezzo surfaces* Progressed to a postdoc at the University of Lancaster with J. Evans.	Supervisor	2016–2019
Paolo Dolce *Low dimensional Adelic geometry* Progressed to a postdoc at the University of Udine, Italy.	Second Supervisor	2015–2018
Mohammad Akhtar *Mutations of Laurent polynomials and lattice polytopes* Progressed to a Hodge Fellowship at the IHÉS, France, with M. Kontsevich.	Supervisor	2011–2015

Invited Summer Schools & Lecture Series

University of Oxford, UK — 3–7 Jul 2023
LMS Research School: Machine Learning in Mathematics and Theoretical Physics

Fraunhofer Institute for Industrial Mathematics, Germany — 28 Nov–1 Dec 2022
Computational Geometry

Kyoto University, Japan — 10–14 Dec 2018
Mirror Symmetry for Fano Manifolds and Related Topics

International Centre for Theoretical Physics (ICTP), Trieste, Italy — 1–12 Aug 2016
Advanced school on Moduli Spaces, Mirror Symmetry, and Enumerative Geometry

University of Catania, Italy — 16 Sep–4 Oct 2013
Pragmatic 2013*: Summer School on Mirror Symmetry and Fano Manifolds*

Organisation of Seminars & Conferences Since 2017

ICMS 2024: Machine Learning within Computer Algebra Systems — 22–25 Jul 2024
Durham University, UK

Computational Geometry — 23–28 Jun 2024
Banff international Research Station (BIRS), Canada

DANGER 3: Data, Numbers, & Geometry — 24–25 Aug 2023
London Institute for Mathematical Sciences, UK

Computational Algebraic Geometry Workshop — 27–31 Mar 2023
University of Warwick, UK

Online Machine Learning Seminar — Feb 2023–present
Online

Computational Geometry — 29 Aug–2 Sep 2022
University of Nottingham, UK

DANGER 2: Data, Numbers, & Geometry — 25–26 Aug 2022

DANGER: Data, Numbers, & Geometry — 25–26 Aug 2021
Online

Fano varieties and Birational Geometry — 23–26 Feb 2021
Online

Sanya Workshop on Machine Learning in Geometry and Physics — 26–28 Jan 2021
Tsinghua Sanya International Mathematics Forum, Shanghai

COW/EmSG/GLEN Joint Summer School — 7–11 Sep 2020
Online

ICMS 2020: Databases in Mathematics — 13–16 Jul 2020
Braunschweig, Germany

Machine Learning in Algebraic Geometry — Jun 2020
University of Nottingham, UK

Online Algebraic Geometry Seminar — Apr 2020–present
Online

Lucia Geometrica: A Celebration of Geometry — 9–13 Dec 2019
Stockholm University, Sweden

Lattice polytopes, with a view towards Geometry and Applications — 18–20 Sep 2019
ICMS, Edinburgh, UK

Mutations: Mirror Symmetry, Deformations, and Combinatorics — 11–16 Aug 2019
Banff international Research Station (BIRS), Canada

Cluster algebras and algebraic geometry — 11–14 Jul 2018
University of Nottingham, UK

Interactions with Lattice Polytopes — 14–16 Sep 2017
Otto-von-Guericke-Universität Magdeburg, Germany

Experimental Classification of Fano Varieties — 16–18 Aug 2017
Universität Tübingen, Germany

Workshop on Computational Algebra — 18–21 Apr 2017
King's College, University of Cambridge, UK

Selected Invited Talks Since 2010

Będlewo, Poland — Jul 2024
Fano and uniruled varieties

TU Berlin, Germany — Feb 2024
Discrete and Convex Geometry Seminar

New Orleans, USA — Dec 2023
Conference on Neural Information Processing Systems (NeurIPS)

Schloss Dagstuhl, Germany — Oct 2023
Automated mathematics: integrating proofs, algorithms and data

International Centre for Theoretical Physics (ICTP), Trieste, Italy — Sep 2023
Workshop on Deformation Theory II

Technische Universität Berlin, Germany — Nov 2022
MOM workshop on MaRDI, OSCAR and MATHREPO

San Diego, USA — Sep 2022
SIAM Conference on Mathematics of Data Science

Boston University, USA — May 2022
Big Data in Pure Mathematics

University of Connecticut, USA — Mar 2022
Department Colloquium

Texas, USA — Aug 2021
SIAM Conference on Algebraic Geometry

Chern Institute of Mathematics, China — Aug 2021
Nankai Symposium on Mathematical Dialogues

Steklov Mathematical Institute, Russia — May 2020
Iskovskikh Seminar Series

University of Torino, Italy — Feb 2020
Algebraic Geometry – Torino 2020

Chicheley Hall, UK — Sep 2019
3CinG Workshop

University of Warwick, UK — Oct 2018
Classification, Computation, and Construction, New Methods in Geometry

	London Mathematical Society, UK Mirror Symmetry and Fano Manifolds	Oct 2017
	Banach Center, Warsaw, Poland Periods and Ricci flat manifolds	Sep 2017
	Museum of Science and Industry, Manchester, UK Second Conference of Research Software Engineers	Sep 2017
	Universität Tübingen, Germany Experimental Classification of Fano Varieties	Aug 2017
	Johannes Gutenberg-Universität Mainz, Germany Cluster Algebras in Mathematical Physics	Mar 2017
	Freie Universität Berlin, Germany Einstein workshop on Lattice Polytopes	Dec 2016
	Banff International Research Station, Canada Homological Mirror Geometry	Mar 2016
	Hannover University, Germany Experimental Methods in Computational Algebra	May 2015
	University of Ulm, Germany Department Colloquium	Feb 2015
	Simons Center for Geometry and Physics, Stony Brook University, USA Wall Crossing, Quantum Integrable Systems, and TQFT	Nov 2014
	Max Planck Institute for Mathematics, Bonn, Germany Motivic Structures on Quantum Cohomology & Pencils of CY Motives	Sep 2014
	KTH Royal Institute of Technology, Stockholm, Sweden Algebra & Geometry Seminar	Aug 2014
	Freie Universität Berlin, Germany Combinatorics and Geometry Seminar	Jul 2014
	University of Vienna, Austria Geometry and Mathematical Physics Seminar	Jun 2014
	Miami University, USA Homological Mirror Symmetry	Jan 2014
	Colorado State University, USA SIAM Conference on Applied Algebraic Geometry	Aug 2013
	TU Berlin, Germany 21st International Symposium on Mathematical Programming	Aug 2012
	Kyoto University, Japan Convex Polytopes	Jul 2012
	British Mathematical Colloquium, UK British Mathematical Colloquium: Number Theory and Algebraic Geometry	Apr 2012
	University of Sydney, Australia Department Colloquium	Jan 2012
	Freie Universität Berlin, Germany Extremal Laurent Polynomials and Fano Varieties	Dec 2011
	RICAM, Austrian Academy of Sciences, Linz, Austria Colloquium	Apr 2011
	Freie Universität Berlin, Germany Combinatorics and Geometry Seminar	Jun 2010

PhD Thesis Examination	Daniel Hättig (Universität Tübingen, Germany)	Dec 2022
	Teresa Lüdenbach (King's College London, UK)	Sep 2022
	Alice Cuzzucoli (University of Warwick, UK)	Jan 2020
	Norbert Pintye (Loughborough University, UK)	Oct 2019
	Karin Schaller (Universität Tübingen, Germany)	Dec 2018
	Bach Tran (University of Edinburgh, UK)	Apr 2018
	Michele Nicolussi (Universität Tübingen, Germany)	Jun 2017

Lecture Courses

MAGIC

Computational Algebra (MAGIC112) 2022/23, 2023/24

Developed and taught a new advanced module taken by approximately 30 PhD students. Covers topics in computational algebra and geometry.

Delivered as part of the Mathematics Access Grid Instruction and Collaboration (MAGIC): a consortium of 22 university mathematics departments in the UK that share a wide range of online PhD-level Mathematics modules.

University of Nottingham

Linear Algebra (MATH1101) 2023/24

Developed and taught a new first-year module taken by approximately 250 students. Introduces elementary linear algebra, vector spaces, and inner product spaces

Group Projects: Pure Mathematics Stream (MATH4045) 2022/23, 2023/24

A third- and fourth-year module taken by approximately 80 students. The focus is on developing group collaboration, presentation, and writing skills.

Algebra & Number Theory (G12ALN) 2021/22, 2022/23

A second-year module taken by approximately 200 students. Introduces group theory, ring theory, and elementary number theory.

Coding & Cryptography (G13CCR) 2020/21, 2021/22

A third-year module taken by approximately 100 students. Covers elementary coding theory and cryptography, including modern crytosystems.

Algebraic Geometry (G14AGE) 2016/17, 2017/18, 2018/19, 2019/20, 2020/21

Developed and taught a new fourth-year module taken by approximately 20 students. Introduces students to the basic concepts in algebraic geometry.

Elliptic Curves (G13ELL) 2016/17, 2017/18, 2018/19, 2019/20

Developed and taught a new third-year module taken by approximately 20 students. Covers elliptic curves from the view-point of algebraic geometry.

Rings & Modules (G13RIM/G14FRM) 2015/16

A third- and fourth-year module taken by approximately 30 students. Introduces modules and related topics such as Noetherian rings, tensor product, localisation.

Algebraic Number Theory (G14ALN) 2015/16

A fourth-year module taken by approximately 15 students. Introduces basic ideas from algebraic number theory, such as quadratic number fields and p-adic numbers.

Imperial College London

Computational Algebra & Geometry (M3P24) 2012/13, 2013/14, 2014/15

Developed and taught a new third- and fourth-year module taken by approximately 30 students. Commutative algebra and geometry from a computational viewpoint.

University of New Brunswick

Calculus (Math1003) 2006/07, 2007/08

First-year elementary calculus module for approximately 150 students. Taught three times.

Computational Commutative Algebra (Math3353) 2007/08

Developed and taught a new third-year module for approximately 15 students. Introduces ideals, affine varieties, and Gröbner bases; emphasis on computations.

Schemes and Geometry (Math6991) 2006/07

Developed and taught a new postgraduate module introducing schemes and more advanced topics in algebraic geometry.

Outreach & Public Engagement

New Scientist Oct 2023

AI is helping mathematicians build a periodic table of shapes: "Mathematicians attempting to build a 'periodic table' of shapes have turned to artificial intelligence for help…"

Popular Mechanics Oct 2023

Mathematicians are close to building the perfect periodic table of shapes: "Just as molecules can be broken down into atoms, so too can mathematical shapes be broken down into more basic components…"

Pint of Science May 2022

Helped organise Nottingham's contribution to the global Pint of Science festival.

A periodic table of shapes 2012–2015

Collaborated with artist-in-residence Gemma Anderson-Tempini interpreting the mathematics of Fano varieties through print-making and sculpture.

Physics World Mar 2011

Nature's building blocks brought to life: "The scientists are looking for shapes, known as 'Fano varieties', which are basic building blocks and cannot be broken down into simpler shapes…"

New Scientist Feb 2011

Atoms ripple in the periodic table of shapes: "This rippling structure may look like a piece of origami, or an intricate scarf. In fact, it is geometry's answer to the atom…"

Science Feb 2011

Elementary mathematics: "An international group of mathematicians hopes to do for math what Dmitri Mendeleev's periodic table did for chemistry…"

CMS Math Camp Jun 2007, Jun 2008

Teaching at the Canadian Mathematical Society summer camp for High School students.