Thomas Britz

Personal Data

Nationalities: Australian, Danish (dual citizenships)

Date of Birth: 3 April 1974

Education

M.Sc. in Mathematics, University of Aarhus, Denmark, 2000

Ph.D. in Mathematics, University of Aarhus, Denmark, 2003

Academic Appointments

Massachusetts Institute of Technology, Cambridge, MA, USA – Department of Mathematics
- Visiting Scholar (Host/supervisor: Gian-Carlo Rota), September 1998 - July 1999

Queen Mary and Westfield College, University of London, UK – School of Mathematical Sciences
- Visitor (Host/supervisor: Peter J. Cameron), September 1999
- Visiting Postgraduate Student (Host/supervisor: Peter J. Cameron), September 2000 – January 2001

Queen Mary, University of London, UK – School of Mathematical Sciences
- Visiting Postgraduate Student (Host/supervisor: Peter J. Cameron), September – December 2001.

University of Oxford, UK – Department of Statistics
- Visitor (Host: Prof. Jotun Hein), December 2002

University of Victoria, BC, Canada – Department of Mathematics and Statistics
- Postdoctoral Fellow (Employers: D. Olesky and P. van den Driessche), January – June 2003
- PIMS Postdoctoral Fellow (Supervisors: D. Olesky and P. van den Driessche), July 2003 – June 2004
  - Financed by a PIMS Postdoctoral Fellowship grant

Technical University of Denmark – Department of Mathematics
- Assistant Professor (Supervisor: Carsten Thomassen), September 2004 – August 2005
  - Financed by a Villum Kann Rasmussen postdoctoral grant

University of New South Wales, Australia – School of Mathematics and Statistics
- Visiting Research Fellow (Host/supervisor: Catherine Greenhill), January – December 2006
  - Financed by a Carlsberg Foundation postdoctoral grant
- Australian Postdoctoral Fellow, January 2007 – January 2010
  - Financed by an ARC Discovery Project grant (Chief/Sole Investigator)
- Casual Lecturer, January – June 2010
- Lecturer, July 2010 – June 2016
- Senior Lecturer, July 2016 –

Aichi Prefectural University and Nagoya University, Japan – Department of Information Systems
- Visiting Fellow (Host: Keisuke Shiromoto), June 2006

Victoria University, New Zealand – Department of Mathematics, Statistics and Computer Science
- Visitor (Host: Geoff Whittle), October 2006

University of Western Australia – Department of Mathematics and Statistics
- Visitor (Host: Gordon Royle), November 2008

University of South Australia – Institute for Telecommunications Research
- Visitor (Host: Alex Grant and Terence Chan), October 2009

Kumamoto University, Japan – Department of Mathematics and Engineering
- Visiting Professor (Host: Keisuke Shiromoto), January 2011

Monash University, Australia – Clayton School of Information Technology
- Visitor (Host: Graham Farr), February–March 2017

University of Copenhagen, Denmark – Department of Science Education
- Visitor Professor (Host: Henrik Kragh Sørensen), March–April, May–July 2017

Aalto University, Finland – Department of Mathematics and Systems Analysis
- Visitor Professor AScI (Host: Camilla Hollanti), April–May 2017

Deakin University, Australia – School of Information Technology
- Visitor (Host: Kerri Morgan), June 2018

Awards

Vice-Chancellor's Award for Contributions to Student Learning, UNSW (2015)

UNSW Faculty of Science Research Grant (FRG): AUD 5,000 (2014), AUD 5,000 (2015), AUD 5,000 (2017)

UNSW Faculty of Science Silverstar Award: AUD 25,000 (2013)

UNSW SPF02: AUD 3,742 (2011), AUD 2,506 (2012), AUD 429 (2014), AUD 600 (2016), AUD 706 (2017)

UNSW Start-Up Grant: AUD 10,000 (2010–2011)

ARC Discovery Grant: T. Britz, "Chromatic polynomials, random graphs, and error-correcting codes: a unified approach to graph colouring problems", AUD 242,066 (2007 - 2009)

Carlsberg Foundation Postdoctoral Fellowship, DKK 350,000 (2006)

Villum Kann Rasmussen Postdoctoral Fellowship, DKK 350,000 (2004–2005)

PIMS Postdoctoral Fellowship, CAD 20,000 (2003–2004)

Consultancy

NSW Education Standards Authority: design, consulting & editorial work on NSW high school curriculum (2016–2017)

ANSTO, Australia (March – July 2010)

MASCOS, Australia (March – July 2010)

Cochlear, Australia (March – May 2010)

Red Square Productions, Australia (April 2010)

Victoria Hospitals Foundation, Canada (March 2009)

Qantas Airways Limited, Australia (June 2007)

Lene Højland Grafisk Design, Denmark (April 2007)

Aasted-Mikroverk, Denmark (Dec 2004 – Aug 2005)

Administration

Editor of *Parabola* (November 2015 –)

Managing Editor for the *Australasian Journal of Combinatorics* (August 2011 –)

Area Editor for the *Journal of Algebra, Combinatorics, Discrete Structures and its Applications* (April 2014 –)

Member of the Education Excellence Committee, Science Faculty, UNSW (March 2018 –)

First Responder, UNSW (July 2018 –)

Academic Advisor, MATH, UNSW (August 2010 –)

School liaison for the UNSW MathSoc, MATH, UNSW (Jan 2012 –)

Chair of the Publicity Committee, MATH, UNSW (July 2014 – September 2018)

Lecturer's Representative for the School Standing Committee, UNSW (June 2011 –)

Manager of Web and Social Media, MATH, UNSW (November 2017 – August 2018)

Member of the Computing Committee, MATH, UNSW (February 2018 – August 2018)

Member of the Research Committee, MATH, UNSW (October 2015 – July 2017)

Pure Representative on the Postgraduate Committee, MATH, UNSW (September 2013 – September 2017)

Chair of the School Standing Committee, MATH, UNSW (February 2014 – April 2015)

Member of the Policy and Resources Committee, MATH, UNSW (February – December 2014)

Organiser of Pure Departmental Seminar, School of Mathematics & Statistics, UNSW (Aug 2010 – Jan 2013)

Co-organiser of the Joint Colloquium, School of Mathematics and Statistics, UNSW (Aug 2010 – Jan 2013)

Co-organiser of the 36th Australasian Conference on Combinatorial Mathematics and Combinatorial Computing, UNSW, December 2012 (March 2011 – December 2012)

Life member of the Combinatorial Mathematics Society of Australasia (CMSA)

Member of the Australasian Mathematical Society (AustMS)

Supervision

PhD thesis
- Adam Mammoliti, UNSW, 2015–2019
- John Fitzgerald, UNSW (joint supervision with Lyria Bennet Moses, UNSW Law), 2015–
- Haya Saeed Aldosari, UNSW (secondary supervisor; primary supervisor: Catherine Greenhill), 2016–
- Peter Ayre, UNSW (secondary supervisor; primary supervisor: Catherine Greenhill), 2016–
- Vicki Likourezos, UNSW (secondary supervisor; primary supervisor: Slava Kalyuga, UNSW Arts), 2016–2017
- Ali Hussian Alkhaldi, UNSW (secondary supervisor; primary supervisor: Norman Wildberger), 2010–2014

Masters by research thesis
- Ziyu Li, UNSW, 2019–
- Sin Keong Tong, UNSW, 2017–
- Zhi Yee Chng, UNSW, 2017
- Maria Fischer, UNSW, 2015
- Marie-Louise Højlund Rasmussen, Technical University of Denmark, 2005

Honours thesis
- Daniel Tanios, UNSW, 2019
- Nelson Chen, UNSW, 2019
- Jessica Dai, UNSW, 2018
- Tyson Churcher, UNSW, 2016
- Duncan Crowley, UNSW, 2016
- Adam Mammoliti, UNSW, 2014
- Elizabeth Alford, UNSW, 2012

Masters by coursework thesis
- Xin Hu, UNSW, 2018–
- Salha Ahmed Alshaikey, UNSW, 2012
- Dalal Alanazi, UNSW, 2012
- Saad Althobaiti, UNSW, 2012
- Doug Han Yang, UNSW, 2009
- Ali Alkhaldi, UNSW, 2009

Research Course Project
- James Ross, UNSW, 2014

Summer Research Project
- Charlie Stinson, UNSW, 2019
- Zijian Gao, UNSW, 2019
- Rui Tong, UNSW, 2018
- Jacky Huang, UNSW, 2018
- Gary Liang, UNSW, 2015
- Adam Mammoliti, UNSW, 2014
- Steve Sui, UNSW, 2013
- Kirsten Vo-Phuoc, UNSW, 2012
- Sen Lin, UNSW, 2011

Teaching

Lecturer
- Algebraic Methods in Number Theory (MATH3521): wrote course notes, slides, tests, and exams
  UNSW (students: 2008: 28 2009: 19 2010: 36 2011: 20 2012: 27)
- An Introduction to Combinatorics (Graduate course): course design and authority; wrote slides, notes, assignment
  Aalto University (2017: 7 students, 7 other participants)
- Aspects of Combinatorial Optimisation (Graduate course): course design and authority; wrote slides, notes, exams
  Kumamoto University (2010: 8 students)
  AMSI Summer School @ UNSW (2012: 16 students)
- Combinatorics (MATH5505, graduate course): course design, authority; wrote slides, notes, assignments, exams
  UNSW (students: 2016S1: 24 2018S1: 32)
- Discrete Mathematics (MATH1081): wrote slides, notes, exams; YouTube lectures, tutorials
  UNSW (students: 2008S2: 89 2009S2: 112 2010S2: 143 2015S1: 297 2016S1: 346 2019T1: 400)
- Finite Mathematics (MATH 151): designed course content, lectures, and midterm exams
  University of Victoria, BC, Canada, (Autumn 2003: 120 students)
- Higher Mathematics 1B (MATH1241, Algebra): wrote slides, exams, and Chap. 9 of course notes
  UNSW (students: 2010S2: 94 2011S2: 65 2012S2: 85 2013S2: 95)
- Information, Codes and Ciphers (MATH3411): course authority; wrote slides, tests, exams; YouTube tutorials
  UNSW (students: 2013S2: 77 2014S2: 102 2015S2: 117 2016S2: 126 2017S2: 144 2018S2: 191)
- Mathematics 1A (MATH1131, Algebra): wrote slides, notes, exams
  UNSW (students: 2011S1: 345 2011S2: 287 2012S1: 474 2012S2: 286 2013S1: 381 2014S1: 391 2015S2: 354)

  In total, approx. 5000 students

Tutor
- 48 classes in various subjects, approx. 1500 students

Outreach activity
- 2004 – : Many and various contributions

Private coach and tutor
- 1989 – 2003: On numerous occasions

Peer-reviewed Publications

1. T. Britz, A. Mammoliti and K. Shiromoto, Wei-type duality theorems for rank metric codes, submitted.
2. T. Britz and P.J. Cameron, The Tutte polynomial and error-correcting codes, chapter in upcoming CRC handbook, to appear.
3. T. Britz, On the betweenness centrality of trees, forests and cycles, to appear in *Sustainable Forestry*.
4. H. Bojanic et al., *MATHBRIDGES Calendar*, University of Münster, Münster, 2018.
5. A. Mammoliti and T. Britz, On Mubayi's Conjecture and conditionally intersecting sets, *SIAM J. Discrete Math.* **32** (2018), 2361–2380.
6. B. Tran, P. Straka, M. Falster, K. Douglas, T. Britz and L. Gorm, Overcoming the data drought: exploring general practice in Australia by network analysis of big data, *Medical Journal of Australia* **209** (2018), 68–73.
7. D. Bright, C. Greenhill, T. Britz, A. Ritter and C. Morselli, Criminal network vulnerabilities and adaptations, *Global Crime* **18** (2017), 424–441.
8. T. Britz and K. Shiromoto, On the covering dimension of a linear code, *IEEE Trans. Inform. Theory* **62** (2016), 2694–2701.
9. D.O. Hunter, T. Britz, M. Jones, and M. Letnic, Reintroduction of Tasmanian devils to mainland Australia can restore top-down control in ecosystems where dingoes have been extirpated: A response to Baker et al. 2016 and Fancourt & Mooney 2016, *Conservation Biology* **196** (2016), 20–21.
10. D.O. Hunter, T. Britz, M. Jones, and M. Letnic, Reintroduction of Tasmanian devils to mainland Australia can restore top-down control in ecosystems where dingoes have been extirpated, *Conservation Biology* **191** (2015), 428–435.
11. T. Britz, K. Shiromoto, and T. Westerbäck, Demi-matroids from codes over finite Frobenius rings, *Des. Codes Cryptogr.* **75** (2015), 97–107.
12. T. Britz, N. Cavenagh, and H.K. Sørensen, Maximal partial Latin cubes, *Electron. J. Combin.* **22**(1) (2015), #P1.81.
13. T. Britz, T. Johnson, and J. Martin, Chains, demi-matroids, and profiles, *IEEE Trans. Inform. Theory* **60** (2014), 986–991.
14. T. Britz, A. Mammoliti and H.K. Sørensen, Proof by picture: A selection of nice picture proofs, *Parabola* **50** (3) (2014), 5–15.
15. T.H. Chan, A. Grant, and T. Britz, Quasi-uniform codes and their applications, *IEEE Trans. Inform. Theory* **59** (2013), 7915–7926.
16. T. Britz, T. Johnson, D. Mayhew, and K. Shiromoto, Wei-type duality theorems for matroids, *Des. Codes Cryptogr.* **62** (2012), 331–341.
17. T. Britz, Code enumerators and Tutte polynomials, *IEEE Trans. Inform. Theory* **56** (2010), 4350–4358.
18. T.H. Chan, A. Grant, and T. Britz, Properties of quasi-uniform codes, In *Proceedings of the 2010 IEEE International Symposium on Information Theory*, pp. 1153–1157, ISIT 10, Austin, USA, June 2010.
19. T. Britz, G. Royle, and K. Shiromoto, Designs from matroids, *SIAM J. Discrete Math.* **23** (2009), 1082–1099.
20. T. Britz and K. Shiromoto, Designs from subcode supports of linear codes, *Des. Codes Cryptogr.* **46** (2008), 175–189.
21. T. Britz and K. Shiromoto, A MacWilliams type identity for matroids, *Discrete Math.* **308** (2008), 4551–4559.
22. T. Britz, Higher support matroids, *Discrete Math.* **307** (2007), 2300–2308.
23. T. Britz, The Moore-Penrose inverse of a free matrix, *Electron. J. Linear Algebra* **16** (2007), 208–215.
24. D. Britz, T. Britz, K. Shiromoto, and H.K. Sørensen, The higher weight enumerators of the doubly-even, self-dual $[48, 24, 12]$ code, *IEEE Trans. Inform. Theory* **53** (2007), 2567–2571.
25. T. Britz, On P-weight and P-distance inequalities, *Discrete Math.* **306** (2006), 598–599.
26. T. Britz, D.D. Olesky, and P. van den Driessche, Schur complements of matrices with acyclic bipartite graphs, *Electron. J. Linear Algebra* **14** (2005), 2–11.
27. T. Britz and C.G. Rutherford, Covering radii are not matroid invariants, *Discrete Math.* **296** (2005), 117–120.
28. T. Britz, Extensions of the Critical Theorem, *Discrete Math.* **305** (2005), 55–73.
29. T. Britz, D.D. Olesky, and P. van den Driessche, Matrix inversion and digraphs: the one factor case, *Electron. J. Linear Algebra* **11** (2004), 115–131.
30. T. Britz, D.D. Olesky, and P. van den Driessche, The Moore-Penrose inverse of matrices with an acyclic bipartite graph, *Linear Algebra Appl.* **390** (2004), 47–60.
31. T. Britz, J.J. McDonald, D.D. Olesky, and P. van den Driessche, Minimal spectrally arbitrary sign patterns, *SIAM J. Matrix Anal. Appl.* **26** (2004), 257–271.
32. T.J. Britz and D. Britz, Mathematical proof of the consistency of Feldberg's simple BDF start in electrochemical digital simulation, *J. Electroanal. Chem.* **546** (2003), 123–125.
33. T. Britz, *Matroids, Codes and Relations*, Ph.D. thesis, University of Aarhus, 2002.
34. T. Britz, MacWilliams identities and matroid polynomials, *Electron. J. Combin.* **9** (2002), R19, 17 pp.
35. T. Britz, The inverse of a non-singular free matrix, *Linear Algebra Appl.* **338** (2001), 245–249.
36. T. Britz and S. Fomin, Finite posets and Ferrers shapes, *Advances in Mathematics* **158** (2001), 86–127.
37. T. Britz, M. Mainetti, and L. Pezzoli, Some operations on the family of equivalence relations, in *Algebraic Combinatorics and Computer Science. A Tribute to Gian-Carlo Rota* (eds. H. Crapo and D. Senato), pp. 445–460, Springer-Verlag, Milano, 2001.

Refereeing and Reviewing

Referee on > 100 articles submitted to

- Advances in Applied Mathematics
- Advances in Mathematics of Communications
- Annales de l'Institut Henri Poincaré D (AIHPD), Combinatorics, Physics and their Interactions
- Annals of Combinatorics
- Applicable Algebra in Engineering, Communication and Computing
- Arabian Journal of Mathematics
- Ars Combinatoria
- Australasian Journal of Combinatorics
- Bulletin of the Australian Mathematical Society
- Bulletin of the Malaysian Mathematical Sciences Society
- Central European Journal of Mathematics
- Designs, Codes and Cryptography
- Discrete Applied Mathematics
- Discrete Mathematics
- Electronic Journal of Combinatorics
- EURASIP Journal on Wireless Communications and Networking
- European Journal of Combinatorics
- Graphs and Combinatorics
- Hacettepe Journal of Mathematics and Statistics
- IEEE Transactions on Information Theory
- International Journal of Mathematics and Mathematical Sciences
- Issues in Education Research
- Journal of Algebra Combinatorics Discrete Structures and Applications
- Journal of Algebraic Combinatorics
- Journal of Applied Mathematics and Computing
- Journal of Combinatorial Theory Series A
- Journal of Pure and Applied Algebra
- Journal of Symbolic Computation
- Linear Algebra and Applications
- Linear and Multilinear Algebra
- Mathematics in Computer Science
- Moscow Mathematical Journal
- Proceedings of the London Mathematical Society
- Recent Patents on Computer Science
- SIAM Journal on Discrete Mathematics
- SIAM Journal on Matrix Analysis and Applications
- Special Matrices
- SpringerPlus
- Transactions of the American Mathematical Society
- Turkish Journal of Mathematics

Reviewer for Mathematical Reviews and Zentralblatt MATH (> 175 article and book reviews).

ARC Grant Assessor (15 reports)