Tim Burness

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Employment

2021-	**Professor of Pure Mathematics**, *University of Bristol*.
2018-21	**Reader in Pure Mathematics**, *University of Bristol*.
2014-18	**Senior Lecturer in Pure Mathematics**, *University of Bristol*.
2013-14	**Lecturer in Pure Mathematics**, *University of Bristol*.
2008-13	**Lecturer in Pure Mathematics**, *University of Southampton*.
2007-08	**Visiting Research Fellow**, *EPFL, UWA, Auckland, Caltech*.
2006-07	**Lady Davis Fellow**, *Hebrew University of Jerusalem*.
2004-07	**Junior Research Fellow**, *St John's College, University of Oxford*.

Education

2001-05	**PhD Mathematics**, *Imperial College London*.
	Supervisor: Professor Martin W. Liebeck
	Thesis: *Fixed point spaces in actions of finite and algebraic simple groups*
2000-01	**MSc Mathematics (Distinction)**, *University of Warwick*.
1997-00	**BSc Mathematics (First Class)**, *University of Warwick*.

Distinctions

2022-	**Director of the Institute for Pure Mathematics**, *University of Bristol*.
2024	**Morning speaker**, *British Mathematical Colloquium, University of Manchester*.
2021-22	**University Research Fellowship**, *University of Bristol*.
2018-21	**Associate Chair**, *Heilbronn Institute for Mathematical Research*.
2017	**Plenary speaker**, *Groups St Andrews, University of Birmingham*.
2015	**Kalman Visiting Fellowship**, *University of Auckland*.
2000	**Academic Prize**, *University of Warwick*.

Editorial positions

2021-	**Editor**, *Journal of Algebra*.
2018-	**Associate Editor**, *London Mathematical Society Student Texts*.
2022-25	**Co-Editor-in-Chief**, *Journal of Group Theory*.
2019-22	**Managing Editor**, *Journal of Group Theory*.
2015-19	**Editor**, *Journal of Group Theory*.

Books & monographs

[3] T.C. Burness and M. Giudici, *Classical groups, derangements and primes*, **Australian Mathematical Society Lecture Series**, vol. 25, Cambridge University Press, 2016, xviii+346, ISBN: 978-1-1076-2944-8

[2] T.C. Burness, S. Ghandour and D.M. Testerman, *Irreducible geometric subgroups of classical algebraic groups*, **Memoirs of the American Mathematical Society** 239 (2016), no.1130, vi+88, ISBN: 978-1-4704-1494-8

[1] T.C. Burness, S. Ghandour, C. Marion and D.M. Testerman, *Irreducible almost simple subgroups of classical algebraic groups*, **Memoirs of the American Mathematical Society** 236 (2015), no.1114, vi+110, ISBN: 978-1-4704-1046-9

Journal publications & preprints

[67] T.C. Burness and M. Fusari, *On derangements in simple permutation groups*, submitted, 58 pages (arXiv:2409.01043), 2024.

[66] T.C. Burness, S. Gerhardt and R.M. Guralnick, *Topological generation of simple algebraic groups*, **Journal of the European Mathematical Society (JEMS)**, to appear, 87 pages

[65] T.C. Burness, *On the topological generation of exceptional groups by unipotent elements*, **Transformation Groups**, to appear, 30 pages

[64] M. Anagnostopoulou-Merkouri and T.C. Burness, *On the regularity number of a finite group and other base-related invariants*, **Journal of the London Mathematical Society** 110 (2024), e70035, 65 pp.

[63] T.C. Burness and R.M. Guralnick, *On the generation of simple groups by Sylow subgroups*, **Contemporary Mathematics** (Amitsur Centennial Symposium), vol. 800 (2024), 81–100, Amer. Math. Soc. Providence, RI.

[62] B. Baumeister, T.C. Burness, R.M. Guralnick and H.P. Tong-Viet, *On the maximal over-groups of Sylow subgroups of finite groups*, **Advances in Mathematics** 444 (2024), 109632, 65 pp.

[61] T.C. Burness and R.M. Guralnick, *Strongly base-two groups*, **Vietnam Journal of Mathematics** 51 (2023), 657–683.

[60] T.C. Burness and M. Lee, *On the classification of extremely primitive affine groups*, **Israel Journal of Mathematics** 255 (2023), 265–282.

[59] T.C. Burness, R.M. Guralnick, A. Moretó and G. Navarro, *On the commuting probability of p-elements in a finite group*, **Algebra and Number Theory** 17 (2023), 1209–1229.

[58] T.C. Burness, *On soluble subgroups of sporadic groups*, **Israel Journal of Mathematics** 254 (2023), 313–340.

[57] T.C. Burness and A.R. Thomas, *Normalisers of maximal tori and a conjecture of Vdovin*, **Journal of Algebra** 619 (2023), 459–504.

[56] T.C. Burness, A. Lucchini and D. Nemmi, *On the soluble graph of a finite group*, **Journal of Combinatorial Theory, Series A** 194 (2023), 105708, 39 pp.

[55] T.C. Burness and H.Y. Huang, *On base sizes for primitive groups of product type*, **Journal of Pure and Applied Algebra** 227 (2023), 107228, 43 pp.

[54] T.C. Burness and R.M. Guralnick, *Fixed point ratios for finite primitive groups and applications*, **Advances in Mathematics** 411 (2022), 108778, 90 pp.

[53] T.C. Burness and H.Y. Huang, *On the Saxl graphs of primitive groups with soluble stabilisers*, **Algebraic Combinatorics** 5 (2022), 1053–1087.

[52] T.C. Burness and A.R. Thomas, *The classification of extremely primitive groups*, **International Mathematics Research Notices IMRN** (2022), no.13, 10148–10248.

[51] T.C. Burness, M. Garonzi and A. Lucchini, *Finite groups, minimal bases and the intersection number*, **Transactions of the London Mathematical Society** 9 (2022), 20–55.

[50] T.C. Burness and A. Shalev, *Permutation groups with restricted stabilizers*, **Journal of Algebra** 607 (2022), 160–185.

[49] T.C. Burness and E.V. Hall, *Almost elusive permutation groups*, **Journal of Algebra** 594 (2022), 519–543.

[48] T.C. Burness, *Base sizes for primitive groups with soluble stabilisers*, **Algebra and Number Theory** 15 (2021), 1755–1807.

[47] T.C. Burness and E. Covato, *On the involution fixity of simple groups*, **Proceedings of the Edinburgh Mathematical Society** 64 (2021), 408–426

[46] T.C. Burness, R.M. Guralnick and S. Harper, *The spread of a finite group*, **Annals of Mathematics** 193 (2021), 619–687

[45] T.C. Burness and A.R. Thomas, *A note on extremely primitive affine groups*, **Archiv der Mathematik** 116 (2021), 141–152

[44] T.C. Burness and C.H. Li, *On solvable factors of almost simple groups*, **Advances in Mathematics** 377 (2021), 107499, 36pp.

[43] T.C. Burness and S. Harper, *Finite groups, 2-generation and the uniform domination number*, **Israel Journal of Mathematics** 239 (2020), 271–367

[42] T.C. Burness, S. Gerhardt and R.M. Guralnick, *Topological generation of exceptional algebraic groups*, **Advances in Mathematics** 369 (2020), 107177, 50 pp.

[41] T.C. Burness, M. Garonzi and A. Lucchini, *On the minimal dimension of a finite simple group* (with an appendix by T.C. Burness and R.M. Guralnick), **Journal of Combinatorial Theory Series A** 171 (2020), 105175, 32 pp.

[40] T.C. Burness, M.W. Liebeck and A. Shalev, *The length and depth of compact Lie groups*, **Mathematische Zeitschrift** 294 (2020), 1457–1476

[39] T.C. Burness and M. Giudici, *On the Saxl graph of a permutation group*, **Mathematical Proceedings of the Cambridge Philosophical Society** 168 (2020), 219–248

[38] T.C. Burness, M.W. Liebeck and A. Shalev, *On the length and depth of finite groups* (with an appendix by D.R. Heath-Brown), **Proceedings of the London Mathematical Society** 119 (2019), 1464–1492

[37] T.C. Burness, *Simple groups, generation and probabilistic methods*, **London Mathematical Society Lecture Note Series** 455 (Groups St Andrews 2017 in Birmingham), Cambridge University Press, pp. 200–229, 2019

[36] T.C. Burness and D.M. Testerman, *Irreducible subgroups of simple algebraic groups – a survey*, **London Mathematical Society Lecture Note Series** 455 (Groups St Andrews 2017 in Birmingham), Cambridge University Press, pp. 230–260, 2019

[35] T.C. Burness and D.M. Testerman, *A_1-type subgroups containing regular unipotent elements*, **Forum of Mathematics, Sigma** 7 (2019), e12, 61 pp.

[34] T.C. Burness and S. Harper, *On the uniform domination number of a finite simple group*, **Transactions of the American Mathematical Society** 372 (2019), 545–583

[33] T.C. Burness, M.W. Liebeck and A. Shalev, *The length and depth of algebraic groups*, **Mathematische Zeitschrift** 291 (2019), 741–760

[32] T.C. Burness, *On base sizes for almost simple primitive groups*, **Journal of Algebra** 516 (2018), 38–74

[31] T.C. Burness and A.R. Thomas, *On the involution fixity of exceptional groups of Lie type*, **International Journal of Algebra and Computation** 28 (2018), 411–466

[30] T.C. Burness and M. Giudici, *Locally elusive classical groups*, **Israel Journal of Mathematics** 225 (2018), 343–402

[29] T.C. Burness, *Simple groups, fixed point ratios and applications*, **EMS Series of Lectures in Mathematics** (Local Representation Theory and Simple Groups), European Mathematical Society, pp. 267–322, 2018

[28] T.C. Burness, M.W. Liebeck and A. Shalev, *The depth of a finite simple group*, **Proceedings of the American Mathematical Society** 146 (2018), 2343–2358

[27] T.C. Burness, M.W. Liebeck and A. Shalev, *Generation of second maximal subgroups and the existence of special primes*, **Forum of Mathematics, Sigma** 5 (2017), e25, 41 pp.

[26] T.C. Burness, R.M. Guralnick and J. Saxl, *On base sizes for algebraic groups*, **Journal of the European Mathematical Society (JEMS)** 19 (2017), 2269–2341

[25] T.C. Burness and M. Giudici, *Permutation groups and derangements of odd prime order*, **Journal of Combinatorial Theory Series A** 151 (2017), 102–130

[24] T.C. Burness, C. Marion and D.M. Testerman, *On irreducible subgroups of simple algebraic groups*, **Mathematische Annalen** 367 (2017), 1259–1309

[23] T.C. Burness and H.P. Tong-Viet, *Primitive permutation groups and derangements of prime power order*, **Manuscripta Mathematica** 150 (2016), 255–291

[22] T.C. Burness and Á. Seress, *On Pyber's base size conjecture*, **Transactions of the American Mathematical Society** 367 (2015), 5633–5651

[21] T.C. Burness and H.P. Tong-Viet, *Derangements in primitive permutation groups, with an application to character theory*, **Quarterly Journal of Mathematics** 66 (2015), 63–96

[20] T.C. Burness and E. Covato, *On the prime graph of simple groups*, **Bulletin of the Australian Mathematical Society** 91 (2015), 227–240

[19] S.H. Alavi and T.C. Burness, *Large subgroups of simple groups*, **Journal of Algebra** 421 (2015), 187–233

[18] T.C. Burness, R.M. Guralnick and J. Saxl, *Base sizes for $\mathcal{S}$-actions of finite classical groups*, **Israel Journal of Mathematics** 199 (2014), 711–756

[17] T.C. Burness, M.W. Liebeck and A. Shalev, *Generation and random generation: from simple groups to maximal subgroups*, **Advances in Mathematics** 248 (2013), 59–95

[16] T.C. Burness and E. Crestani, *On the generating graph of direct powers of a simple group*, **Journal of Algebraic Combinatorics** 38 (2013), 329–350

[15] T.C. Burness and S. Guest, *On the uniform spread of almost simple linear groups*, **Nagoya Mathematical Journal** 209 (2013), 35–109

[14] T.C. Burness, C.E. Praeger and Á. Seress, *Extremely primitive sporadic and alternating groups*, **Bulletin of the London Mathematical Society** 44 (2012), 1147–1154

[13] T.C. Burness, C.E. Praeger and Á. Seress, *Extremely primitive classical groups*, **Journal of Pure and Applied Algebra** 216 (2012), 1580–1610

[12] T.C. Burness, M. Giudici and R.A. Wilson, *Prime order derangements in primitive permutation groups*, **Journal of Algebra** 341 (2011), 158–178

[11] T.C. Burness, R.M. Guralnick and J. Saxl, *On base sizes for symmetric groups*, **Bulletin of the London Mathematical Society** 43 (2011), 386–391

[10] T.C. Burness, E.A. O'Brien and R.A. Wilson, *Base sizes for sporadic simple groups*, **Israel Journal of Mathematics** 177 (2010), 307–334

[9] T.C. Burness and S.D. Scott, *On the number of prime order subgroups of finite groups*, **Journal of the Australian Mathematical Society** 87 (2009), 329–357

[8] T.C. Burness, M.W. Liebeck and A. Shalev, *Base sizes for simple groups and a conjecture of Cameron*, **Proceedings of the London Mathematical Society** 98 (2009), 116–162

[7] T.C. Burness, *On base sizes for actions of finite classical groups*, **Journal of the London Mathematical Society** 75 (2007), 545–562

[6] T.C. Burness, *Fixed point ratios in actions of finite classical groups, IV*, **Journal of Algebra** 314 (2007), 749–788

[5] T.C. Burness, *Fixed point ratios in actions of finite classical groups, III*, **Journal of Algebra** 314 (2007), 693–748

[4] T.C. Burness, *Fixed point ratios in actions of finite classical groups, II*, **Journal of Algebra** 309 (2007), 80–138

[3] T.C. Burness, *Fixed point ratios in actions of finite classical groups, I*, **Journal of Algebra** 309 (2007), 69–79

[2] T.C. Burness, *Fixed point spaces in actions of classical algebraic groups*, **Journal of Group Theory** 7 (2004), 311–346

[1] T.C. Burness, *Fixed point spaces in primitive actions of simple algebraic groups*, **Journal of Algebra** 265 (2003), 744–771

Theses

2005 **PhD thesis:** *Fixed point spaces in actions of finite and algebraic simple groups*, Imperial College London

2001 **MSc thesis:** *Reductive algebraic groups and Tits systems*, University of Warwick

Research visits

2025 SUSTech, Shenzhen, China (3 weeks)

2022 Caltech, USA (2 months); EPFL, Switzerland (2 months)
Isaac Newton Institute, Cambridge (1 month)

2021 University of Padua, Italy (3 months)

2020 Isaac Newton Institute, Cambridge (6 weeks)

2019 SUSTech, Shenzhen, China (3 weeks); EPFL, Switzerland (1 week)

2017 EPFL, Switzerland (1 week)

2016 Bernoulli Center (EPFL), Switzerland (2 months)

2015 University of Auckland, New Zealand (3 weeks); EPFL, Switzerland (2 weeks)

2014 Universität Bielefeld, Germany (1 week); EPFL, Switzerland (3 weeks)

2013 EPFL, Switzerland (2 weeks); UWA, Australia (2 weeks)

2012 Ohio State University, USA (2 weeks); EPFL, Switzerland (1 week)

2011 Università degli Studi di Padova, Italy (1 week); UWA, Australia (3 weeks)

2010 EPFL, Switzerland (2 weeks)

2009 ETHZ, Switzerland (1 week); Isaac Newton Institute, Cambridge (1 month)

2008 University of Auckland, NZ (4 months); University of Canterbury, NZ (2 weeks)
Caltech, USA (1 month); UWA, Australia (3 months); University of Helsinki (1 week)

2007 EPFL, Switzerland (3 months)

2005 EPFL, Switzerland (2 months)

Conference organisation

2023   *CMI-HIMR Summer School: Probabilistic Group Theory*, University of Bristol

2014-19   LMS Triangle meetings: *Groups and their applications*

2018   *Simple Groups: New Perspectives and Applications*, University of Bristol

2017   *Permutation groups and related topics*, Universität Bielefeld, Germany

2016   Branching problems for reductive groups, Institut Mittag-Leffler, Stockholm

      British Mathematical Colloquium, University of Bristol (Algebra Workshop)

2015   *Simple groups, representations and related topics*, University of Cambridge

Conference invitations

2024   *Groups and Representation Theory in Lausanne*, EPFL, Switzerland

      Topics in Group Theory, University of Padua, Italy

      Groups in Florence IV, University of Florence, Italy

      New Perspectives in Computational Group Theory, University of Warwick

      British Mathematical Colloquium, University of Manchester

2023   *Group Theory and Number Theory: Interactions*, Princeton University, USA

      Northern Group Theory conference, Bielefeld University, Germany

2022   *Simple Groups, Representations and Applications*, Isaac Newton Institute, Cambridge

      14th Iranian Group Theory Conference, Tehran, Iran [online]

2021   *Totally Disconnected Locally Compact Groups via Group Actions*, Banff, Canada [online]

      Graphs and Groups, Geometries and GAP, Rogla, Slovenia [online]

2020   *Interactions between group theory, number theory, combinatorics and geometry*, Isaac Newton Institute, Cambridge

2019   *Groups and Geometries*, BIRS, Banff, Canada

2018   *Groups, Geometry and Representations*, Oxford

      British Mathematical Colloquium, University of St Andrews

2017   *Topics on Groups and their Representations*, Lake Garda, Italy

      Groups St Andrews, University of Birmingham

      Groups and Combinatorics, Sobolev Institute, Novosibirsk, Russia

2016   *Permutation Groups*, BIRS, Banff, Canada

      Some Problems in the Theory of Finite Simple Groups, EPFL, Switzerland

      Algebraic Combinatorics and Group Actions, Herstmonceux Castle, Sussex

      Postgraduate Group Theory Conference, Imperial College

2015   *Groups and Geometries*, BIRS, Banff, Canada

2014   *Young Algebraists' Conference*, EPFL, Switzerland

      British Mathematical Colloquium, QMUL, London

2013   *Permutation Groups*, BIRS, Banff, Canada

      International Conference on Group Theory, Novosibirsk, Russia

2012   *Groups and Geometries*, BIRS, Banff, Canada

2009   *Permutation groups*, BIRS, Banff, Canada

      Algebraic Lie theory, Isaac Newton Institute, Cambridge

2008   *Infinite Groups and Related Topics*, University of Edinburgh

2007   *Nikolaus Conference*, RWTH Aachen, Germany

      Permutation groups, Oberwolfach, Germany

2004   *Groups and Representations*, University of Oregon, USA

Seminars

Postdoctoral mentoring

Jack Saunders, since 10/2023

Justin McInroy, 10/2013–08/2022

Dan Fretwell, 07/2021–04/2022

Alex Malcolm, 10/2017–06/2021

James Williams, 10/2019–05/2021

Adam Thomas, 10/2015–08/2018

Jason Semeraro, 10/2013–08/2016

Simon Guest, 02/2012–07/2013

Eleonora Crestani, 02/2012–08/2012

PhD supervision

Current Marina Anagnostopoulou-Merkouri, since 08/2023

Hongyi Huang, since 01/2021

Former Emily Hall, since 10/2019–08/2023, *Almost elusive permutation groups*

Scott Harper, 10/2015–05/2019, *On the spread of classical groups*

Elisa Covato, 10/2013–05/2018, *The involution fixity of simple groups*

Raffaele Rainone, 10/2010–03/2014, *Geometric actions of classical algebraic groups*

Teaching (last five years)

2024/25 *Algebra 2*: Year 2, 36 lectures

MSci project student: J. Gidney

3rd year project students: K. Chen, R. de Caires, K. Stone

2023/24 *Algebra 2*: Year 2, 36 lectures

Introduction to Group Theory: Year 1, 18 tutorials

3rd year project students: N. Bhamrah Harley, W. Cleeves, S. Roach

2022/23 *Representation Theory*: Year 4, 36 lectures

Algebra 2: Year 2, 36 lectures

MSci project student: M. Saflekos

MSc thesis supervision: Juliet Treip

2021/22 Sabbatical

2020/21 *Representation Theory*: Year 4, 36 lectures

MSci project students: J. Delitroz, O. Desbruslais, S. Gates, M. Turner

Professional activities

Editor, *Journal of Algebra* (since 08/2021)

Associate Editor, *London Mathematical Society Student Texts* (since 10/2017)

Co-Editor-in-Chief, *Journal of Group Theory* (08/2022 - 01/2025)

Managing Editor, *Journal of Group Theory* (01/2020–07/2022)

Editor, *Journal of Group Theory* (01/2015–12/2019)

Referee for dozens of journals, publishers and research funders (since 2003)

Reviewer for AMS *Mathematical Reviews* (100 reviews, 2003–2020)

Member of the *London Mathematical Society* (since 01/2009)

Fellow of the *UK Higher Education Academy* (since 01/2012)

External PhD examiner: Auckland (2021); Imperial College (2020); Warwick (2017); EPFL (2015); Birmingham (2013); Padua (2013)

MSc Mathematical Sciences external assessor (York, 2017)

University service (last five years)

Director of the Institute for Pure Mathematics (since 08/2022)

Associate Chair of the Heilbronn Institute for Mathematical Research (08/2018–07/2021)

University Research Staff Working Party (2019/20)

Postgraduate Admissions Tutor (01/2015–07/2018)

University Open Day presentations (2016–2019; 2023–2024)

2023 Chair of Pure Mathematics Curriculum Review Committee

Interview panel member, Lectureship in Mathematics

Interview panel member, Heilbronn Research Professorship

Interview panel member, Professorship in Pure Mathematics

Interview panel member, Lectureship in Mathematics

2020 Interview panel member, Heilbronn Chair in Data Science

Interview panel member, Lectureship in Pure Mathematics

2019 Chair of Search Committee (Chair of HIMR)

Search Committee member (Head of School of Mathematics)

2018 EPSRC CDT bid team member

2016 Curriculum Review Committee

2014 Two *Numberphile* videos on the Monster group (May 2014; ∼850,000 views)

     `www.youtube.com/watch?v=jsSeoGpiWsw`

     `www.youtube.com/watch?v=MXKiih4JJvQ`