Curriculum Vitae

Irakli Patchkoria

Personal Data:

First Name:	Irakli
Last Name:	Patchkoria
Place of Birth:	Tbilisi, Georgia
Date of Birth:	20.08.1987
Nationality:	Georgian
Residence:	UK (indefinite leave to remain)
Affiliation:	Department of Mathematics, University of Aberdeen, Fraser Noble Building, Office 161, Aberdeen AB24 3UE, Scotland, UK
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Employment:

01/2026 – :	Senior Lecturer at the Department of Mathematics of the University of Aberdeen
01/2019 – 12/2025 :	Lecturer at the Department of Mathematics of the University of Aberdeen
09/2016 – 12/2018:	Postdoctoral researcher at the Department of Mathematics of the University of Bonn, Germany (Funded by the German Research Foundation Schwerpunktprogramm 1786 "Homotopy Theory and Algebraic Geometry")
09/2013 – 08/2016:	Postdoctoral researcher at the Department of Mathematical Sciences of the University of Copenhagen, Denmark (within the Centre for Symmetry and Deformation)

Education:

10/2010 – 07/2013:	PhD studies at the Department of Mathematics of the University of Bonn, Doctoral fellow of the German Research Foundation Graduiertenkolleg 1150 "Homotopy and Cohomology"
July 2013:	Graduation: Dr. rer. nat. Thesis Title: *Rigidity in equivariant stable homotopy theory*

10/2008 – 09/2010:	Studies in Mathematics at the University of Bonn, Qualifying fellow of the German Research Foundation Graduiertenkolleg 1150 "Homotopy and Cohomology"
09/2004 – 08/2008:	Studies in Mathematics at the I. Javakhishvili Tbilisi state University (Georgia)
July 2008:	Graduation: Bachelor of Mathematics Bachelor thesis: *Cubical resolutions and derived functors*

Publications:

• *Adams spectral sequences and Franke's algebraicity conjecture*, (with P. Pstrągowski), arXiv:2110.03669, to appear in Memoirs of the American Mathematical Society.
• *Witt vectors with coefficients and* TR, (with E. Dotto, A. Krause and T. Nikolaus), Proceedings of the London Mathematical Society **130** (2025), no. 5, e70047, 62 pp.
• *On the cyclic homology of certain universal differential graded algebras*, (with C. Davis and J. Frank), Homology, Homotopy and Applications **27** (2025), no. 2, pp. 25-51.
• *Comparison of equivariant cohomological dimensions*, (with M. Grant, K. Li and E. Meir), arXiv:2302.08574, to appear in Israel Journal of Mathematics.
• *On the geometric fixed-points of real topological cyclic homology*, (with E. Dotto and K. Moi), Journal of the London Mathematical Society **109** (2024), no. 2, e12862, 68 pp.
• *Proper equivariant stable homotopy theory*, (with D. Degrijse, M. Hausmann, W. Lück and S. Schwede), Memoirs of the American Mathematical Society **288** (2023), no. 1432, vi+142 pp.
• *Witt vectors with coefficients and characteristic polynomials over noncommutative rings*, (with E. Dotto, A. Krause and T. Nikolaus), Compositio Mathematica **158** (2022), 366-408.
• *The spectrum of derived Mackey functors*, (with B. Sanders and C. Wimmer), Transactions of the American Mathematical Society, **375** (2022), 4057-4105.
• *On the de Rham-Witt complex over perfectoid rings*, (with C. Davis), International Mathematics Research Notices, **2022** (2022), 13897-13983.
• *Equivariant dimensions of groups with operators*, (with M. Grant and E. Meir), Groups, Geometry, and Dynamics, **16**, (2022), 1049-1075.
• *Witt Vectors, Polynomial Maps, and Real Topological Hochschild Homology*, (with E. Dotto and K. Moi), Annales Scientifiques de l'École Normale Supérieure **55** (2022), 473-535.
• *Real topological Hochschild homology*, (with E. Dotto, K. Moi and S. Reeh), Journal of the European Mathematical Society **23** (2021), 63-152.

• *Rigidity and exotic models for v_1-local G-equivariant stable homotopy*, (with C. Roitzheim), Mathematische Zeitschrift **295** (2020), 839-875.
• *Comparing cyclotomic structures on different models for topological Hochschild homology*, (with E. Dotto, C. Malkiewich, S. Sagave and C. Woo), Journal of Topology **12** (2019), 1146-1173.
• *Stable finiteness properties of infinite discrete groups*, (with N. Bárcenas and D. Degrijse), Journal of Topology **10** (2017), 1169-1196.
• *On exotic equivalences and a theorem of Franke*, Bulletin of the London Mathematical Society, **49** (2017), 1085-1099.
• *The derived category of complex periodic K-theory localized at an odd prime*, Advances in Mathematics **309** (2017), 392-435.
• *Topological Hochschild homology and the cyclic bar construction in symmetric spectra*, (with S. Sagave), Proceedings of the American Mathematical Society **144** (2016), 4099-4106.
• *Rigidity in equivariant stable homotopy theory*, Algebraic & Geometric Topology **16** (2016), 2159-2227.
• *On the algebraic classification of module spectra*, Algebraic & Geometric Topology **12** (2012), 2329-2388.
• *Cubical approach to derived functors*, Homology, Homotopy and Applications, **14** (2012), no. 1, pp.133-158.

Preprints:

• *On the Farrell–Tate K-theory of* $\mathrm{Out}(F_n)$, (with N. Andrew) arXiv:2505.21803.
• *Character theory and Euler characteristic for orbispaces and infinite groups*, (with W. Lück and S. Schwede) arXiv:2410.14510.
• *Chromatic congruences and Bernoulli numbers*, arXiv:2406.17705.

Conferences and workshops organized:

August 2024:	37. British Topology Meeting, University of Aberdeen, UK
May 2023:	23. Scottish Topology Seminar, University of Aberdeen, UK
September 2022:	Follow-up Workshop to JTP "Topology", Hausdorff Research Institute for Mathematics, Bonn, Germany
April 2021:	British Mathematical Colloquium Topology Section, online
September 2020:	22. Scottish Topology Seminar, online

April 2018:	29. NRW Topology Meeting, University of Bonn, Germany
November 2016:	Hermitian K-theory and Trace Methods, Hausdorff Research Institute for Mathematics, Bonn, Germany
June / July 2014:	Young Topologists Meeting 2014, University of Copenhagen, Denmark

Grants, funding, and awards:

2025:	Giorgi Nikoladze prize of the Georgian Mathematical Union
2023-2026:	EPSRC New Investigator Award, EP/X038424/1, UKRI, “Classifying spaces, proper actions and stable homotopy theory"
2019-2022:	German Research Foundation SPP 1786 Postdoctoral funding “New computations in (real) topological Hochschild and cyclic homology and in proper equivariant stable homotopy theory" (did not use because left Germany for the position in Aberdeen)
2017-2019:	Shota Rustaveli Georgian National Science Foundation grant Ref. 217-614, “On homotopy invariants related to cobordisms, K-theory and loop space cohomology"
2013-2015:	Shota Rustaveli Georgian National Science Foundation grant DI/27/5-103/12, “Homological and categorical methods in topology, algebra and theory of stacks"

Teaching:

Aberdeen:

- SMSTC graduate course Homotopy Theory (Winter term 2025)
- Metric and Topological Spaces (Winter term 2025)
- Analysis IV (Spring term 2025)
- Metric and Topological Spaces (Winter term 2024)
- Differential Equations (Spring term 2024)
- Metric and Topological Spaces (Winter term 2023)
- Differential Equations (Spring term 2023)
- Combinatorics (Spring term 2023)
- Metric and Topological Spaces (Winter term 2022)
- Differential Equations (Spring term 2022)
- Combinatorics (Spring term 2022)
- Metric and Topological Spaces (Winter term 2021)
- Differential Equations (Spring term 2021)
- Combinatorics (Spring term 2021)

	• Metric and Topological Spaces (Winter term 2020) • Exercises Probability (Winter term 2020) • Combinatorics (Spring term 2020) • Metric and Topological Spaces (Winter term 2019) • Combinatorics (Spring term 2019) • Combinatorics (Spring term 2019)
Copenhagen:	• Exercises in Formal groups and cohomology theories (Topics in Topology II) (Block 3, 2016) • Stable homotopy theory (Topics in Topology) (Block 2, 2015/16) • Exercises Categories & Topology (Block 1, 2015) • K-theory (Block 4, 2015) • Exercises Categories & Topology (Block 1, 2014) • K-theory (Block 4, 2014) • Exercises Categories & Topology (Block 1, 2013)
Bonn:	• Topology II (Summer term 2018) • GRK 1150 graduate student seminar: Unstable homotopy theory (Summer term 2012) • Reading course on spectral sequences (Summer term 2011) • Exercises Algebraic Topology I (Winter term 2010/2011) • Exercises Topology II (Summer term 2010) • Exercises Topology I (Winter term 2009/2010)

Supervision:

PhD Students:	Ludovico Dziecielski (Aberdeen, expected 2027) Matthew Sutton (Aberdeen, expected 2027) James Fleming (Aberdeen, expected 2026) Julius Frank (Aberdeen, defended 2024)
Aberdeen:	8 Undergraduate theses, 4 Undergraduate summer projects
Kutaisi:	1 Bachelor thesis
Tbilisi:	1 Bachelor thesis
Copenhagen:	2 Master theses, 2 Master projects
Bonn:	4 Bachelor theses, 2 Master theses

Selected talks and lecture series:

June 2025:	*On the $K(n)$-local duality and chromatic Euler characteristics for infinite groups* Abel symposium 2025, NTNU Trondheim, Norway
April 2025:	*On the $K(n)$-local duality for infinite groups* Recent Developments in Algebraic K-Theory, University of Warwick, UK
October 2024:	*Chromatic congruences and Bernoulli numbers* Combinatorial Algebraic Topology and Applications II, CRM Pisa, Italy
June 2024:	*Chromatic congruences and Bernoulli numbers* Topology, representation theory and higher structures, Isle of Skye, UK
May 2024:	*On the geometric fixed points of the real topological cyclic homology* Real algebraic K-theory and trace methods, Paris Nord, France
November 2023:	*Chromatic Euler characteristics of infinite groups* Combinatorial Algebraic Topology and Applications, CRM Pisa, Italy
September 2023:	*Morava K-theory of infinite groups and Euler characteristic* XIII Annual International Conference of the Georgian Mathematical Union, Batumi Shota Rustaveli State University, Georgia
June 2023:	*Morava K-theory of infinite groups and Euler characteristic* Homotopy Theory in Trondheim, NTNU Trondheim, Norway
June 2023:	*Morava K-theory of infinite groups and Euler characteristic* Homotopy Harnessing Higher Structures follow on, University of Cambridge, UK
May 2023:	*Morava K-theory of infinite groups and Euler characteristic* Conference on Motivic and Equivariant Topology, Swansea University, UK
September 2022 :	*Morava K-theory of infinite groups and Euler characteristic* Classifying spaces in homotopy theory: in honour of Ran Levi's 60th Birthday, ICMS Edinburgh, UK
April 2022 :	*Algebraic models for homotopy theories* British Topology Meeting, University of Durham, UK
July 2021 :	*Derived Mackey functors* Homotopy theory and group theory (online), CRM Barcelona, Spain

June 2021:	*Classification of module spectra and Franke's algebraicity conjecture* TopFlavours 2021 (online), University of Warwick, UK
February 2021:	*Classification of module spectra and Franke's algebraicity conjecture* Opening workshop of the CRM Intensive Research Program on Higher Homotopical Structures (online), CRM Barcelona, Spain
July 2019:	*On polynomial maps and Witt vectors* Geometry and quantum theory, Den Dolder, Netherlands
June 2019:	*On Witt vectors with coefficients* Conference: SYM 10 years, University of Copenhagen, Denmark
June 2019:	*On Witt vectors with coefficients* Topology workshop LIGAT CRM RP 2019, UA Barcelona, Spain
April 2019:	*Quadratic forms and real trace invariants* Scottish Topology Seminar, University of Glasgow, UK
April 2019:	*The derived category of complex periodic K-theory localized at an odd prime* Workshop on derivators, University of Regensburg, Germany
November 2018:	*Polynomial maps, Witt vectors and Real THH* 30th NRW Topology Meeting, University of Münster, Germany
April 2018:	*On equivariant rigidity* Masterclass on rigidity and algebraic models in stable homotopy theory, University of Copenhagen, Denmark
October 2017:	*Lecture series on equivariant homotopy theory* Workshop on motivic and equivariant homotopy theory, University of Osnabrück, Germany
August 2015:	*Geometric meaning of the virtual cohomological dimension of a group* Nordic Topology Meeting, KTH/University of Stockholm, Sweden
March 2015:	*Proper equivariant stable homotopy and virtual cohomological dimension* Homotopy theory conference, Mathematisches Forschungsinstitut Oberwolfach, Germany
November 2014:	*What is the geometric meaning of the virtual cohomological dimension of a group?* 22th NRW Topology Meeting, University of Bonn, Germany
April 2013:	*Rigidity in equivariant stable homotopy theory* 19th NRW Topology Meeting, University of Osnabrück, Germany
June 2011:	*Mini course on Model categories* Algebra, Topology and Fjords, Summer School, Nordfjordeid, Norway

Language Skills:

Georgian (native language), English (fluent), German (fluent), Russian (fluent), Danish (basic).