

# Thomas Powell

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Languages: English (native), German (fluent), Welsh (formerly fluent)

## Research area

Proof theory • Functional analysis • Computability theory • Program semantics

## Current position

May 20 - *Lecturer (Assistant Professor)*  
Department of Computer Science, University of Bath

## Past positions

Oct 16 - Apr 20 *Postdoctoral Researcher*  
Department of Mathematics, Technische Universität Darmstadt

Oct 14 - Sep 16 *Postdoctoral Researcher*  
Institute of Computer Science, University of Innsbruck

Oct 13 - Sep 14 *CARMIN Postdoctoral Research Fellow*  
Institute des Hautes Études Scientifiques (combined visit at Institut Henri Poincaré)

## Education

Oct 09 - May 13 *PhD in Theoretical Computer Science*  
Queen Mary University of London

Oct 08 - Jun 09 *Certificate of Advanced Study in Mathematics (Part III)*  
University of Cambridge

Oct 05 - Jun 08 *BA in Mathematics*  
University of Cambridge

## Papers

PREPRINTS (SUBMITTED)

preprint Thomas Powell. *Sequential algorithms and the computational content of classical proofs*

PUBLICATIONS (PEER REVIEWED)

- accepted Thomas Powell and Franziskus Wiesnet. *Rates of convergence for asymptotically weakly contractive mappings in normed spaces*  
To appear in **Numerical Functional Analysis and Optimization**.
- accepted Thomas Powell, Peter Schuster and Franziskus Wiesnet. *A universal algorithm for Krull's theorem*  
To appear in **Information and Computation**.
- 2020 Thomas Powell. *A note on the finitization of Abelian and Tauberian theorems*  
**Mathematical Logic Quarterly**, 66(3): 300–310
- 2020 Thomas Powell. *A unifying framework for continuity and complexity in higher types*  
**Logical Methods in Computer Science**, 16(3): 17:1–17:28.
- 2020 Thomas Powell. *A computational interpretation of Zorn's lemma*  
**Proceedings of Logic in Computer Science (LICS '20)**, pp. 768–781, ACM.
- 2020 Ulrich Kohlenbach and Thomas Powell. *Rates of convergence for iterative solutions of equations involving set-valued accretive operators*  
**Computers and Mathematics with Applications**, 80(3): 490–503.
- 2020 Thomas Powell. *Dependent choice as a termination principle*  
**Archive for Mathematical Logic**, 59(3–4): 503–516.
- 2020 Thomas Powell. *Well quasi-orders and the functional interpretation*  
Chapter in **Well Quasi-Orders in Computational Logic, Language and Reasoning**, Trends in Logic 53: 221–269, Springer.
- 2019 Thomas Powell. *A proof theoretic study of abstract termination principles*  
**Journal of Logic and Computation** 29(8): 1345–1366.
- 2019 Thomas Powell. *Computational interpretations of classical reasoning: From the epsilon calculus to stateful programs*  
Chapter in **Mathesis Universalis, Computability and Proof**, Synthese Library 412: 255–290, Springer.
- 2019 Thomas Powell. *A new metastable convergence criterion and an application in the theory of uniformly convex Banach spaces*  
**Journal of Mathematical Analysis and Applications** 478(2): 790–805.
- 2019 Thomas Powell. *Parametrised bar recursion: A unifying framework for realizability interpretations of classical dependent choice*  
**Journal of Logic and Computation** 29(4): 519–554.
- 2019 Thomas Powell, Peter Schuster and Franziskus Wiesnet. *An algorithmic approach to the existence of ideal objects in commutative algebra*  
**Proceedings of Workshop on Logic, Language, Information, and Computation (WoLLIC '19)**, LNCS 11541: 533–549.
- 2018 Thomas Powell. *A functional interpretation with state*  
**Proceedings of Logic in Computer Science (LICS '18)** pp. 839–848, ACM.
- 2017 Paulo Oliva and Thomas Powell. *Bar recursion over finite partial functions*  
**Annals of Pure and Applied Logic** 168(5): 887–921.
- 2016 Thomas Powell. *Gödel's functional interpretation and the concept of learning*  
**Proceedings of Logic in Computer Science (LICS '16)** pp. 136–145, ACM.
- 2015 Georg Moser and Thomas Powell. *On the computational content of termination proofs*

**Proceedings of Computability in Europe (CiE '15)**, LNCS 9136: 276–285.

2015 Paulo Oliva and Thomas Powell. *A game-theoretic computational interpretation of proofs in classical analysis*  
Chapter in **Gentzen's Centenary: The Quest for Consistency** pp. 501–531, Springer.

2015 Paulo Oliva and Thomas Powell. *A constructive interpretation of Ramsey's theorem via the product of selection functions*  
**Mathematical Structures in Computer Science** 25(8): 1755–1778.

2014 Thomas Powell. *The equivalence of bar recursion and open recursion*  
**Annals of Pure and Applied Logic** 165(11): 1727–1754.

2012 Thomas Powell. *Applying Gödel's Dialectica interpretation to obtain a constructive proof of Higman's lemma*  
**Proceedings of Classical Logic and Computation (CL+C '12)**, EPTCS 97: 49–62.

2012 Paulo Oliva and Thomas Powell. *On Spector's bar recursion*  
**Mathematical Logic Quarterly** 58(4-5): 356–365.

2011 Martín Escardó, Paulo Oliva and Thomas Powell. *System T and the product of selection functions*  
**Proceedings of Computer Science Logic (CSL '11)**, LIPIcs 12: 233–247.

#### PHD THESIS

2013 Thomas Powell. *On Bar Recursive Interpretations of Analysis*  
Supervised by Paulo Oliva and Edmund Robinson  
**Queen Mary University of London**, xii+174pp.

## Talks

#### SELECTED INVITED TALKS

13/09/21 New Frontiers in Proofs and Computation, Banff International Research Station (held online).  
22/07/21 Logic Colloquium: (Special Session on Proofs and Programs), Poznań (held online).  
11/11/20 Oberwolfach Workshop on Mathematical Logic: Proof Theory, Constructive Mathematics, MFO (held online).  
16/08/19 Logic Colloquium: Special Session on Proof Theory and Proof Complexity, Prague.  
05/11/17 Oberwolfach Workshop on Mathematical Logic: Proof Theory, Constructive Mathematics, MFO.  
25/07/17 Humboldt-Kolleg: Proof Theory as Mathesis Universalis, Villa Vigoni, Como.  
22/01/16 Dagstuhl Seminar 16031: Well Quasi-Orders in Computer Science, Schloss Dagstuhl.  
15/09/15 Continuity, Computability, Constructivity (CCC '15), Kochel.

#### RESEARCH LEVEL LECTURE SERIES

summer 19 Higher order computability theory. TU Darmstadt.  
Mar 19 Proof interpretations: A modern perspective. Short lecture course, University of Verona.  
Sep 18 Proof mining. Autumn School on Proof and Computation, Fischbachau.  
Aug 18 Introduction to proof theory (co-lectured with Anupam Das). ESSLLI, Sofia University.  
Jun 18 Proof interpretations: A modern perspective (co-lectured with Anupam Das). NASSLLI, Carnegie Mellon University.

## CONFERENCE AND SEMINAR TALKS

16/04/21	Computer Science Colloquium, Augusta University.
25/11/20	Logic and Verification Seminar, Laboratoire d'Informatique de Paris Nord.
14/09/20	Minisymposium on Proof and Computation in Mathematics, DMV Annual Meeting, Chemnitz.
23/07/20	EECS Theory Seminar, Queen Mary University of London.
09/07/20	Logic in Computer Science (LICS '20), Saarland Informatics Campus, Saarbrücken.
12/06/20	Theoretical Computer Science Seminar, University of Birmingham.
12/05/20	Mathematical Foundations Seminar, University of Bath.
04/02/20	Algebra and Algorithms, Djerba, Tunisia.
12/12/19	Logik-Arbeitstagung Bern, München und Verona, LMU Munich.
20/03/19	Computer Science Seminar, University of Verona.
12/07/18	Logic in Computer Science (LICS '18), University of Oxford.
05/07/18	Workshop on Proofs and Computation, Hausdorff Research Institute for Mathematics, Bonn.
13/04/18	Workshop on Computational Approaches to the Foundations of Mathematics, LMU Munich.
14/09/17	Minisymposium on Applied Proof Theory and the Computational Content of Mathematics, Joint ÖMG and DMV Congress, Salzburg.
12/07/17	Mathematical Logic Seminar, LMU Munich.
27/10/16	Logic Research Seminar, University of Bern.
05/09/16	Logic, Complexity and Automation, part of CLA 2016, Obergurgl.
05/07/16	Logic in Computer Science (LICS '16), Columbia University.
23/06/16	Classical Logic and Computation (CL&C '16), Porto.
12/05/16	Mathematics for Computation, Niederalteich.
06/05/16	Proof, Computation, Complexity (PCC '16) LMU Munich.
16/12/15	Workshop on Efficient and Natural Proof Systems, University of Bath.
04/11/15	Mathematical Logic Seminar, LMU Munich.
02/07/15	Computability in Europe (CiE '15), Bucharest.
11/06/15	Epsilon 2015, University of Montpellier.
04/12/14	Proof, Complexity and Verification Seminar, Swansea University.
12/07/14	Second Workshop on the Two Faces of Complexity, part of Vienna Summer of Logic.
14/01/14	Séminaire de Mathématiques, Institut des Hautes Études Scientifiques.
09/01/14	PLUME Seminar, ENS Lyon.
18/12/13	Proof, Complexity and Verification Seminar, Swansea University.
12/11/13	Semantics Seminar, PPS lab, Université Paris Diderot.
08/07/13	Classical Logic and Computation (CL&C '12), University of Warwick.
03/07/13	Theoretical Computer Science Seminar, University of Birmingham.
12/09/11	Computer Science Logic (CSL '11), Bergen.

## PhD Supervision

2021–	Morenikeji Neri (University of Bath)
2016–2021	<p>Franziskus Wiesnet (LMU Munich, University of Trento &amp; University of Verona)</p> <p>Thesis: <i>The Computational Content of Abstract Algebra and Analysis</i> (defended August 2021)</p> <p>Unofficial supervisor, joint with Peter Schuster and Helmut Schwichtenberg</p>

## Academic grants

- 2020 (declined) (€186,167.04) Marie Skłodowska-Curie Individual Fellowship, to be carried out at TU Vienna with Agata Ciabattoni (passed evaluation phase but declined offer due to taking up lectureship at Bath)
- 2013 One of two postdoctoral fellowships of the CARMIN programme.
- 2009 EPSRC Doctoral Training Grant (full PhD funding for 3.5 years).

## Academic service

### ORGANISATION

- 2017 Minisymposium on Applied Proof Theory and the Computational Content of Mathematics (co-organised with Sam Sanders), part of the joint annual conference of the Austrian Mathematical Society (ÖMG) and German Mathematical Society (DMV), Salzburg.
- 2016 Workshop on Logic, Complexity and Automation (co-organised with Georg Moser), part of Computational Logic in the Alps, Obergurgl.

### REFEREEING

Annals of Pure and Applied Logic • Archive for Mathematical Logic • CSR • FSCD • LICS • Logic Journal of the IGPL • MFCS • Notre Dame Journal of Formal Logic • RTA • TYPES • Theoretical Computer Science