Robert Burklund

Contact Information
Department of Mathematical Sciences
University of Copenhagen

Office: 04-4-15
rb@math.ku.dk

EMPLOYMENT

University of Copenhagen
Associate Professor, June 2024 –

University of Copenhagen
NSF Postdoc, July 2022 – May 2024

EDUCATION

Massachusetts Institute of Technology
Ph.D. Mathematics, May 2022

Massachusetts Institute of Technology
B.S. Mathematics, June 2017

Publications

Inertia groups in the metastable range,
with Jeremy Hahn and Andrew Senger.
To appear in American Journal of Mathematics.

The chromatic nullstellensatz,
with Tomer Schlank and Allen Yuan.
To appear in Annals of Mathematics.

On the high-dimensional geography problem,
with Andrew Senger.
To appear in Geometry & Topology.

On the K-theory of regular coconnective rings,
with Ishan Levy.
Selecta Math. (N.S.). 29 (2023), no. 2

Adams-type maps are not stable under composition.
with Ishan Levy and Piotr Pstragowski.
Proc. Amer. Math. Soc. Ser. B, vol. 9 (2022), 373-376

On the boundaries of highly connected, almost closed manifolds.
with Jeremy Hahn and Andrew Senger.
Acta Math., vol. 231 No. 2, 205–344.

An extension in the Adams spectral sequence in dimension 54 (2021).

Bull. Lond. Math. Soc., vol. 53, 404–407.

The trace of the local $\mathbb{A}^1$-degree (2021),
with Thomas Brazelton, Stephen McKean, Michael Montoro and Morgan Opie.
Homology, Homotopy and Appl., vol. 23 No. 1, 243–255.

Preprints

A note on the Segal conjecture for large objects,
with Vignesh Subramanian, arXiv:2403.06724.

$\mathbb{E}_\infty$-coalgebras and p-adic homotopy theory,
with Tom Bachmann, arXiv:2402.15850.

K-theoretic counterexamples to Ravenel's telescope conjecture,
with Jeremy Hahn, Ishan Levy and Tomer M. Schlank, arXiv:2310.17459.

Quivers and the Adams spectral sequence,
with Piotr Pstragowski, arXiv:2305.08231.

The Adams differentials on the classes h_j^3,
with Zhouli Xu, arXiv:2302.11869.

Multiplicative structures on Moore spectra,
arXiv:2203.14787.

How big are the stable homotopy groups of spheres?,
with an appendix joint with Andrew Senger, arXiv:2203.00670.

Galois reconstruction of Artin–Tate $\mathbb{R}$-motivic spectra,
with Jeremy Hahn and Andrew Senger, arXiv:2010.10325.

Invited Talks

Perfection in Chromatic Geometry,
Bonn topology seminar. (April 2024)
K-theory and the telescope conjecture,
British topology meeting, Aberdeen. (August 2024)
Seminaire de Mathematique, IHES. (October 2023)
MIT topology seminar. (September 2023)
SPP 1786 Abschlusstagung. (August 2023)
Transatlantic Transchromatic Homotopy Theory II. (August 2023)
A Panorama of Homotopy Theory. (June 2023)
Spectral representations of C_p,
Masterclass: higher representation theory (3 lecture series). (March 2023)
Nilpotence and periodicity revisited,
Topology intercity seminar, Utrecht–Nijmegen. (March 2023)
Muenster topology seminar. (November 2022)

Stockholm university topology seminar. (November 2022)
The Balmer spectrum of cellular $\mathbb{C}$-motivic spectra,
Spectral methods in equivariant mathematics. (October 2022)
The Chromatic Nullstellensatz,
Algebraic K-theory and redshift fall school (4 lecture series). (September 2023)
Bergen topology seminar. (February 2023)
Chromatic homotopy, K-theory and functors. (January 2023)
Copenhagen algebra/topology seminar. (September 2022)
Motivic Geometry Conference. (August 2022)
Multiplicative structures on Moore spectra,
eCHT research seminar. (August 2022)
Motivic stable stems over a field,
NRW Topology Meeting. (April 2024)
Copenhagen algebra/topology seminar. (November 2021)
Chicagoland topology seminar. (October 2021)
UCLA topology seminar. (October 2021)
How big are the stable homotopy groups of spheres?,
Rochester topology seminar. (February 2021)
Classification of manifolds and the Adams spectral sequence,
Melbourne topology seminar. (April 2022)
MIT geometry and topology seminar. (October 2021)
UCSD topology seminar. (February 2021)

Conferences and Workshops organized

Masterclass: Arithmetic and Homotopy theory,
Copenhagen, Denmark. (June 2025)
Life after the telescope conjecture,
Berkeley, USA. (December 2024)
Arbeitsgemeinschaft: Algebraic K-Theory and the Telescope Conjecture,
Oberwolfach, Germany. (October 2024)
Yatsugatake Workshop: Chromatic homotopy theory,
Kobuchizawa, Japan. (September 2024)
Parametrized homotopy theory,
Copenhagen, Denmark. (September 2023)

Seminars organized

Babytop: *Deforming homotopy theory and synthetic spectra* (Fall 2021)
Babytop: *Bloch–Kato* (Spring 2021)
Babytop: *Deformation theory* (Spring 2020)

Conferences and Workshops Attended

British Topology Meeting,
Aberdeen, UK. (August 2024)
NRW Topology Meeting,
Wuppertal, Germany. (April 2024)
Algebraic K-theory and redshift fall school,

Mainz, Germany. (September 2023)
SPP 1786 Abschlusstagung,
Essen, Germany. (August 2023)
Transatlantic Transchromatic Homotopy Theory II,
Regensburg, Germany. (August 2023)
A Panorama of Homotopy Theory,
Oxford, UK. (June 2023)
Chromatic homotopy, K-theory and Functors,
CIRM, Luminy, France. (January 2023)
Workshop: Spectral methods in equivariant mathematics,
Hausdorff center for mathematics, Bonn, Germany. (October 2022)
Motivic Geometry Conference,
University of Oslo, Oslo, Norway. (August 2022)
Joint International Meeting of the AMS and the CMS,
Fudan University, Shanghai, China. (June 2018)
International Workshop on Algebraic Topology,
Southern University of Science and Technology, Shenzhen, China. (June 2018)

External funding

Villum Foundation, Villum Young Investigator,
7M DKK over 5 years (2024–2029).
NSF, Mathematical Sciences Postdoctoral Research Fellowship,
$170,000 (approx. 1.2M DKK) over 3 years (2022–2024).

Service

Advisor/co-Advisor for 5 PhD students, 5 current.
Advisor for 6 Master's students, 2 current.
MIT SPUR and UROP+: Mentored 8 undergraduate students on research projects (2017–2021).
RSI and MIT PRIMES: Mentored 4 high school students on research projects (2017–2020).
Referee work for Adv. Math., Camb. J. Math., Compositio, Homology Homotopy Appl., Inventiones, Proc. AMS., Quantum Topol.

Teaching Experience

Copenhagen
Geometric Topology, Instructor (Block 3, '24-'25)
Algebraic Topology, Instructor (Block 1, '24-'25)
Geometric Topology, Instructor (Block 3, '23-'24)
Algebraic Topology, co-Instructor (Block 1, '23-'24)
Fun with finite spectra, Instructor (Block 4, '22-'23)
MIT
18.821: Project lab, TA. (Fall 2021)
18.100P: Real Analysis, Recitation leader. (Spring 2021)
18.03: Differential equations, Recitation leader. (Fall 2020)
18.03: Differential equations, Recitation leader. (Spring 2020)
18.785: Number theory I, Grader. (Fall 2019)
18.100P: Real Analysis, Grader. (Spring 2019)

18.901: Topology, Grader. (Fall 2018)