

MARIUS NIELSEN

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EDUCATION

Norwegian University of Science and Technology, Norway *August 2022 - August 2026*
PhD program in Mathematics
Topology group - Department of Mathematical Sciences
Supervisor: Drew Heard

University of Copenhagen, Denmark *June 2022*
Master's program in Mathematics *Grade point average 11.2*
Department of Mathematical Sciences
Master's thesis: *The Q -shaped derived category.* - Supervisor: Henrik Holm

University of Copenhagen, Denmark *June 2020*
Bachelor of Science *Grade point average 10.0*
Department of Mathematical Sciences
Bachelor's thesis: *On homotopy colimits.* - Supervisor: Piotr Pstrągowski

RESEARCH

Starting fall 2026 I will be postdoc at FU Berlin in the algebraic topology group.

I am broadly interested in stable homotopy theory, tensor-triangulated geometry and their interactions with geometry. I am particularly interested in interactions of synthetic spectra and spectral algebraic geometry.

Chromatic homotopy theory and synthetic spectra *Joint work with Torgeir Aambø and Sven Van Nigtevecht - In preparation.*

On the Geometrization of Synthetic Spectra - *In preparation.*

The picard group of $\text{Exc}(Sp^\omega, Sp)$ - *In preparation.*

The formal spectrum of a tensor-triangulated category *Joint work with Drew Heard. arXiv:2506.02598.*

The presentable stable envelope of an exact category. *Joint with Christoph Winges - Accepted for publication in Algebraic and Geometric Topology. arXiv:2602.20835.*

ORGANIZATION

Topology seminarXiv *Fall 2024 - Present*
Reading group on Ambidexterity *Fall 2024*
Reading group on Algebraic K-theory *Spring 2024*
Reading group on Higher Algebra *Fall 2020*
Reading group on simplicial homotopy theory *Summer 2020*
Breakfast lectures at MATH *Fall 2019 - Summer 2022*
Student colloquiums MATH *Fall 2019 - Summer 2022*
Mentor at MATH *2018 - Summer 2022*

TALKS GIVEN

On the Geometrization of Synthetic spectra. - *Young Homotopy-Theorist Meeting, ICMS University of Edinburgh - October 2025.*

On the Geometrization of Synthetic spectra. - *European Autumn School in Topology, Utrecht -*

September 2025.

On the Geometrization of Synthetic spectra. - *Research Seminar Homotopy Theory, University of Bonn - May 2025.*

On the Geometrization of Synthetic spectra. - *Algebraic Topology seminar, University of Oslo - December 2024.*

On the Geometrization of Synthetic Spectra. - *Norwegian Topology Meeting, Trondheim - August 2024.*

K(n)-local homotopy in synthetic spectra. - *Summer School Interactions between Algebra, Equivariance, and Homotopy Theory - June 2024.*

Trace methods in Algebraic K-theory. - *Reading seminar on Algebraic K-theory. Spring 2024 - NTNU.*

The universal property of K-theory. - *Reading seminar on Algebraic K-theory. Spring 2024 - NTNU.*

Nilpotence and descent in equivariant homotopy theory. - *Topics course in equivariant homotopy theory. Fall 2023 - NTNU.*

Chromatic homotopy theory, from the perspective of formal groups. - *Independent reading seminar. Spring 2023 - NTNU.*

Stable recollement and idempotent algebras. - *Topics in Algebraic Topology blok 2 - 2021 at UCPH.*

Combinatorial Species and Joyal's proof for Cayley's formula for counting trees. - *Invitation to Combinatorics Blok 2 - 2021 at UCPH.*

Symmetric monoidal categories & Group completion theorem using methods of T. Nikolaus. - *Reading group on Algebraic K-theory.*

Monadicity of the Bousfield-Kuhn functor. - *Topics in Algebraic Topology 2020/2021 at UCPH.*

Introduction to stable ∞ -categories and prestable ∞ -categories. - *Topics in Algebraic Topology 2020/2021 at UCPH.*

Stable ∞ -categories and the derived ∞ -category of a ring. - *Reading group on Higher Algebra 2020*

Adjunctions, (co)limits, Yoneda and Kan extensions. - *Reading group in simplicial homotopy theory Summer 2020*

String diagram formalism and symmetric fusion categories. - *Student colloquium at MATH 2019*

CONFERENCES ATTENDED

Young homotopy-theorist meeting - ICMS University of Edinburgh, October 2025.

European Autumn School in Topology - Utrecht, September 2025.

Abel Symposium 2025 - NTNU, June 2025.

Masterclass: Arithmetic and Homotopy Theory - UCPH, June 2025.

Masterclass on Elliptic cohomology - University of Wuppertal, April 2025.

Unstable homotopy theory - MPIM Bonn, December 2024.

Arbeitsgemeinschaft: Algebraic K-Theory and the Telescope Conjecture - Oberwolfach, October 2024.

Young Topologist Meeting - Münster July 2024.

Dualizable categories and continuous K-theory - UCPH, June 2024.

Parametrized homotopy theory - UCPH, September 2023.

Young Topologist Meeting - EPFL, July 2023.

Masterclass on Higher Representation Theory - UCPH, March 2023.

Topological Hochschild Homology and Zeta Values - UCPH, February 2023.

Spectra Triangles and Higher Structures - Bonn, December 2022.

Young Topologist Meeting - UCPH, July 2022.

Masterclass on 'High dimensional Cohomology of Moduli spaces' - UCPH, June 2021

Masterclass on Condensed Mathematics - 9th to 13th of November 2020 at UCPH.

TEACHING EXPERIENCE

Supervision: I co-supervised one Master's student while at NTNU.

TMA4110 (Linear Algebra for engineering students) as both a teaching assistant and lecturer. - *Fall semester 2022, 2023 and 2024.*

MA2401/MA6401 (Axiomatic geometry for teaching students and high-school teachers). As a teaching assistant. I also was the principle teacher for the high-school teacher for two two-day sessions in Trondheim. - *Spring semester 2023 and 2024.*

At the University of Copenhagen - I was a teaching assistant for various courses during my Master's at the University of Copenhagen. These include topics like group theory, linear algebra (both for math students and computer science students), real analysis and ring theory.