

# Lukas Kühne

## *Curriculum Vitae*

Hebrew University of Jerusalem  
Einstein Institute of Mathematics  
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### Education

**Ph.D. in Mathematics**, *The Hebrew University Jerusalem*, 2017–present.

Advisor: Karim Adiprasito.

**M.S. in Mathematics**, *University of Bonn*, 2014–2017.

Specialization in algebra, discrete mathematics and topology.

**B.S. in Mathematics**, *TU Kaiserslautern*, 2011–2014.

Specialization in algebra and optimization with a minor in computer science.

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### Visiting

**Research Stay**, *Kyoto University*, 08/2015–09/2015.

Research on the freeness of hyperplane arrangements with Takuro Abe.

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### Honors

**Studienstiftung des deutschen Volkes**, 2018–present.

Ph.D. Scholarship by the German national academic foundation.

**Minerva Fellowship**, 2018–present.

Ph.D. Scholarship by the Minerva Stiftung associated with the Max Planck Society.

**Studienstiftung des deutschen Volkes**, 2012–2017.

Scholarship by the German national academic foundation.

**Felix-Klein-Scholarship**, 2011–2014.

Scholarship awarded by the TU Kaiserslautern and the Fraunhofer Institute ITWM.

**International Summer Science Institut**,

*Weizmann Institute of Science*, Rehovot, Israel, 2011.

Project: “Huffman’s Algorithm for Data Compression – from Theory to Practice”.

**Prizes in the 2nd round of the Bundeswettbewerb Mathematik**,  
2008, 2009, 2010.

National competition in mathematics for students.

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### Teaching

**Instructor**, *Deutsche Schüler Akademie*, 2016, 2018, 2019.

Two week summer courses on linear optimization and topological data analysis.

**Teaching Assistant**, *University of Bonn*, 2014–2015.

Lectures: Analysis 1, Linear Algebra 2.

**Teaching Assistant**, *TU Kaiserslautern*, 2012–2014.

Lectures: Fundamentals of mathematics, Algebraic Structures, Number Theory.

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## Publications

### In Preparation

**On the Comparison of Skew-linear and Multilinear Matroids**, with Rudi Pendavingh and Geva Yashfe.

**The Universality of the All-Subsets Arrangement and its Lower Betti Numbers.**

### Preprints

**Representability of Matroids by  $c$ -Arrangements is Undecidable**, with Geva Yashfe.

arXiv:1912.06123. Accepted as poster at FPSAC 2020.

**On the Generation of Rank 3 Simple Matroids with an Application to Terao's Freeness Conjecture**, with Mohamed Barakat, Reimer Behrends, Christopher Jefferson and Martin Leuner.

arXiv:1907.01073.

**Locally Heavy Hyperplanes in Multiarrangements**, with Takuro Abe.

arXiv:1906.02188.

### Published

**Heavy Hyperplanes in Multiarrangements and their Freeness**, with Takuro Abe.

Journal of Algebraic Combinatorics 48 (2018), 581–606.

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## Presentations

- May '20 **Combinatorics Seminar**, Hebrew University Jerusalem, Online Presentation.
- April '20 **Nonlinear Algebra Seminar Online**, Max Planck Institute for Mathematics in the Sciences, Invited presentation.
- March '20 **Combinatorial Coworkspace**, Contributed presentation.
- January '20 **GRK "Facets of Complexity" – Colloquium**, FU Berlin, Invited presentation.
- September '19 **Hyperplane Arrangements and Reflection Groups**, Leibniz University Hannover, Invited Presentation.
- September '18 **Combinatorial Geometries: Matroids, Oriented Matroids and Applications**, Centre International de Rencontres Mathématiques (CIRM), Luminy, France, Contributed Presentation.
- August '17 **Advances in Hyperplane Arrangements**, University of Bremen, Invited presentation.
- Januar '17 **Algebra Seminar**, University of Bochum, Invited presentation.
- August '16 **Summer Conference on Hyperplane Arrangements**, Hokkaido University, Sapporo, Poster presentation.

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## Conferences Attended

- May '19 **CanaDAM: Canadian Discrete and Algorithmic Mathematics Conference**, *Simon Fraser University, Vancouver*.
- May '19 **Arrangements at Western**, *Western University, London ON*.
- September '18 **Summer School – New Perspectives in Hyperplane Arrangements**, *University of Bochum*.
- April '18 **High-Dimensional Combinatorics**, *IIAS Jerusalem*.
- March '18 **Einstein Workshop Discrete Geometry and Topology**, *FU Berlin*.
- October '17 **Geometric and topological combinatorics: Modern techniques and methods**, *Mathematical Sciences Research Institut, Berkeley*.
- June '17 **Arrangements and beyond: Combinatorics, geometry, topology and applications**, *Centro di Ricerca Matematica Ennio De Giorgi, Pisa*.
- May '17 **ET'n'A 2017**, *Encounter in Topology 'n Algebra, Scuola Superiore di Catania*.
- May '17 **Chow Lectures**, *Max-Planck-Institute for Mathematics in the Sciences, Leipzig*.
- August '14 **GAP Days 2014**, *RWTH Aachen*.

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## Employment

**Scientific Assistant**, *Institute for Discrete Mathematics*, 2016–2017.

Development and implementation of algorithms for the design of computer chips.

**Industrial Internship**, *Deutsche Bahn AG, Frankfurt*, 10/2015–03/2016.

Development of optimization software for the scheduling of freight trains.

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## Organizational Activities

**Co-Organization of an excursion for 20 students to Armenia**, 2018.

Topic: Memory and Transformation in Armenia, funded by the Studienstiftung des deutschen Volkes.

**Co-Organization of a conference and workshop for 80 participants at the Center for interdisciplinary research (ZiF)**, *Bielefeld*, 2016.

Topic: FOMUS - Foundations of mathematics, Univalent Foundations and Set Theory, Budget ~ 30k EUR, speakers included Vladimir Voevodsky (IAS).

**Co-Organization of a seminar for 80 students**, *Bonn*, 2015.

Topic: Infallibility through formalism, funded by Studienstiftung des deutschen Volkes, speakers included Georges Gonthier (Microsoft research).

Jerusalem, July 13, 2020