Kemal Rose

Curriculum vitae

KTH Royal Institute of Technology
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Education

01/2024–today	**Postdoctoreal Researcher**, *KTH Royal Institute of Technology* , Stockholm Supervised by: Sandra di Rocco
01/2021–01/2024	**PhD Student**, *Max Planck Institute for Mathematics in the Sciences*, Leipzig Research group: nonlinear algebra Supervised by: Bernd Sturmfels, Simon Telen
10/2018–12/2020	**M.Sc. in Mathematics**, *Technische Universität Berlin* Thesis title: The non-Gorenstein locus of toric varieties Supervised by: Peter Bürgisser and Christian Haase
10/2015–09/2018	**B.Sc.**, *Technische Universität Berlin* Thesis title: Semi-invariants of quiver representations in characteristic 0 Supervised by: Peter Bürgisser and Mario Kummer

Publications

[10] Kemal Rose and Máté L. Telek. "Computing positive tropical varieties and lower bounds on the number of positive roots". In: *Journal of Symbolic Computation* 132 (2026), p. 102477.

[9] Sandra Di Rocco, Kemal Rose, and Luca Sodomaco. *Osculating Geometry and Higher-Order Distance Loci*. 2025. arXiv: 2507.02823.

[8] Kemal Rose. "Toric non-Gorenstein loci". In: *To appear in the volume Varieties, polyhedra, computation of EMS Series of Congress Reports* (2025).

[7] Kemal Rose, Bernd Sturmfels, and Simon Telen. "Tropical Implicitization Revisited". In: *The Computer Algebra System OSCAR: Algorithms and Examples*. Ed. by Wolfram Decker et al. Cham: Springer Nature Switzerland, 2025, pp. 429–450.

[6] Boulos El Hilany and Kemal Rose. *The polyhedral type of a polynomial map on the plane*. 2024. arXiv: 2402.08993.

[5] Paul Breiding, Kemal Rose, and Sascha Timme. "Certifying Zeros of Polynomial Systems Using Interval Arithmetic". In: *ACM Trans. Math. Softw.* 49.1 (Mar. 2023).

[4] Mareike Dressler et al. "Algebraic Optimization of Sequential Decision Problems". In: *Journal of Symbolic Computation* 121 (July 2023), p. 102241.

[3] Julia Lindberg, Leonid Monin, and Kemal Rose. "A polyhedral homotopy algorithm for computing critical points of polynomial programs". In: *arXiv:2302.04117* (2023).

[2] Julia Lindberg, Leonid Monin, and Kemal Rose. "The algebraic degree of sparse polynomial optimization". In: *to appear in SIAM Journal on Applied Algebra and Geometry* (2023).

[1] Rida Ait El Manssour et al. "Lines on p-adic and real cubic surfaces". In: *Abh. Math. Semin. Univ. Hambg. (2023)* 93 (2023), pp. 149–162.

Presentations

Talks

01/2025   **Positive Solutions to Polynomial Systems via Tropical Geometry** , *Algebra & Geometry Seminar* , SMC Stockholm ,

10/2024   **Positive Solutions to Polynomial Systems via Tropical Geometry** , *Mathematisches Forschungskolloquium*, Universität Rostock ,

02/2024   **Signed tropical discriminants and steady state varieties** , *Applied CATS seminar*, KTH Royal Institute of Technology , Stockholm

01/2024   **Signed tropical discriminants and steady state varieties** , *Nonlinear algebra seminar*, Max Planck Institute for Mathematics in the Sciences, Leipzig

01/2024   **Signed tropical discriminants and steady state varieties** , *Joint algebra seminar*, RWTH AAchen university, Aachen

07/2023   **Certifying Zeros of Polynomial Systems Using Interval Arithmetic** , *SIAM AG 2023*, Eindhoven University of Technology, Eindhoven

05/2023   **The algebraic degree of sparse polynomial optimization** , *Research seminar in the department of Mathematical Sciences*, Copenhagen

03/2023   **What is a tropical discriminant?** , *Workshop algebra, geometry and computation at CWI*, Centrum Wiskunde & Informatica (CWI), Amsterdam

01/2023   **What is a tropical discriminant?**, *Nonlinear algebra seminar* , Max Planck Institute for Mathematics in the Sciences, Leipzig ,

11/2022   **The geometry of sequential decision problems with state uncertainty**, *Research seminar at the institute of analysis and algebra* , Technische Universität Braunschweig

08/2022   **Algebraic optimization of decision rules**, *N & O seminar* , Centrum Wiskunde & Informatica (CWI), Amsterdam

07/2022   **Algebraic optimization of decision rules**, *MEGA - Effective Methods in Algebraic Geometry* , Krakow

02/2020   **The non Gorenstein locus of hibi rings**, *Milestone conference of the thematic Einstein semester Algebraic Geometry*, Freie Universität Berlin

Poster

10/2022   **Quadratically constrained polynomial optimisation in statistics**, *Workshop on solving polynomial equations and applications* , Centrum Wiskunde & Informatica (CWI), Amsterdam

Organized events

07/2025   **Minisymposium on real and tropical Geometry** , SIAM AG, Madison, Wisconsin

05/2024   **Altogelis 2024** , Technische Universität Dresden

04/2023   **Workshop on solving hard polynomial systems** , Max Planck Institute for Mathematics in the Sciences, Leipzig

Other activities

06/2024	**Research visit**, University of Copenhagen, Hostet by Máté Telek, Copenhagen
03/2023	**Applications of Tropical Geometry in Leipzig-Berlin** , Max Planck Institute for Mathematics in the Sciences, Leipzig
03/2023	**Algebra, geometry and computation at CWI** , Centrum Wiskunde & Informatica (CWI), Amsterdam
02/2023	**North german algebraic geometry seminar (NOGAGS)** , Humboldt Universität Berlin,
11/2022	**Research visit**, Technische Universität Braunschweig, hosted by Boulos el Hilany
10/2022	**Workshop on solving polynomial equations and applications** , Centrum Wiskunde & Informatica (CWI), Amsterdam
08/2022	**Research visit**, Centrum Wiskunde & Informatica (CWI), Amsterdam
02/2022	**OSCAR developer meeting - tropical geometry** , Technische Universität Kaiserslautern
08/2021	**Branching from number theory: p-adics in the sciences** , Max Planck Institute for Mathematics in the Sciences, Leipzig
07/2021	**Workshop on Frobenius structures and operads** , Centre international de rencontres mathematiques (CIRM), Marseille
07/2021	**Minicourse on convex geometry** , Max Planck Institute for Mathematics in the Sciences, Leipzig
07/2018	**Einstein workshop geometric and topological combinatorics** , Freie Universität
09/2018– 09/2020	**Student-assistant at TU Berlin**, Developer for a certification method implemented in HomotopyContinuation.jl

Programming languages

- Julia
- Python
- Java

Teaching experience

09/2017– 03/2018	**TA for Analysis for engineers I at TU Berlin**, Grading of homework and exams; weekly classes for 20-40 engineering students
03/2018– 09/2018	**TA for Algebra I at TU Berlin** Grading of homework and exams; weekly classes for ~20 math students
02/2024– 08/2024	**TA for Discrete Mathematics at KTH Stockholm** Weekly classes ~20 students in Information and Communication Technology
7/2024– 11/2025	**TA for Basic Math and Discrete Geometry** Weekly classes ~20 students in engineering