

Jonas Bresch

academic CV

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Personal Data

25.06.1999 **Born**, in Salzwedel, Germany

Education

- 7/2026–now **Post Doc**, *Mathematisches Institut Ludwig–Maximilian Universität*, Bavarian, Munich
AG: Mathematical Data Science and Artificial Intelligence in Mathematische Grundlagen der Künstlichen Intelligenz,
Supervisor: Prof. Dr. Gitta Kutyniok
Field: Stochastic Algorithms for Neuronal Networks, Optimization on Manifolds, regularized Optimal Transport, Relaxation Theory.
- 12/2025– **Research Assistant**, *Fakultät II at the Technische Universität*, Berlin, Berlin
7/2026 AG: Modeling, Numeric, Differential Equation,
Supervisor: Prof. Dr. Gabriele Steidl, end of PhD in spring 2026
Field: Optimization on Manifolds, regularized Optimal Transport, Relaxation Theory, Stochastic Approaches.
- 12/2022– **Ph.D. student**, *Fakultät II at the Technische Universität*, Berlin, Berlin, (1.0)
12/2025 AG: Modeling, Numeric, Differential Equation,
Supervisor: Prof. Dr. Gabriele Steidl, end of PhD in spring 2026
Field: Optimization on Manifolds, regularized Optimal Transport, Relaxation Theory, Stochastic Approaches.
- 2020–2022 **M. Sc.**, *C.-F.-Gauß Fakultät at the Technische Universität*, Braunschweig, Niedersachsen, (1.4)
Field: Group Theory, Game Theory, Numerical Linear Algebra, Numeric Partial Differential Equations.
- 2017–2020 **B. Sc.**, *C.-F.-Gauß Fakultät at the Technische Universität*, Braunschweig, Niedersachsen, (1.6)
Field: Group Theory, Optimization (linear and non-linear), Graph Theory, Analysis, Algebra (linear and non-linear).
- 2009–2017 **Pre-university school**, *Gaußschule Gymnasium am Löwenwall*, Braunschweig, Niedersachsen, (2.3)
Math, Physics, Music, German, History.

Theses and Publications

Articles and Pre-print

- Title *A Discrete Radon Transform Based on the Area of Cube-Plane Intersection*,
03, 2026 R. Beinert, J. Bresch, M. Quellmalz, *submitted: IEEE Trans. Image Process*.
- Title *Generalization of the Normalized Radon Cumulative Distribution Transforms for limited Data Recognition*.
09, 2025 M. Beckmann, R. Beinert, J. Bresch, *submitted: J. Math. Imaging Vis*.

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- Title *Stochastic Zeroth-Order Method for Computing Generalized Rayleigh Quotients.*
 11, 2025 J. Bresch, O. Melnyk, M. Schoen, G. Steidl, *submitted: Linear Algebra Appl.*
- Title *Unsupervised Ground Metric Learning.*
 07, 2025 J. Auffenberg, J. Bresch, O. Melnyk, G. Steidl, *submitted: Constr. Approx.*
- Title *Denoising Multi-Color QR Codes and Stiefel-Valued Data by Relaxed Regularizations.*
 06, 2025 R. Beinert, J. Bresch, *published: PAMM.*
- Title *Normalized Radon Cumulative Distribution Transforms for Invariance and Robustness in Optimal Transport Based Image Classification.*
 06, 2025 M. Beckmann, R. Beinert, J. Bresch, *submitted: SIAM J. Imaging Sci.*
- Title *Computing adjoint mismatch of linear maps.*
 03, 2025 J. Bresch, D. A. Lorenz, F. Schneppe, M. Winkler, *submitted: J. Comput. Appl. Math.*
- Title *Max-Normalized Radon Cumulative Distribution Transform for Limited Data Classification.*
 11, 2024 M. Beckmann, R. Beinert, J. Bresch, *published: SSVM'25.*
- Title *Denoising Hyperbolic-Valued Data by Relaxed Regularizations.*
 10, 2024 R. Beinert, J. Bresch, *published: SSVM'25.*
- Title *Matrix-free stochastic calculation of operator norms without using adjoints.*
 10, 2024 J. Bresch, D. A. Lorenz, F. Schneppe, M. Winkler, *submitted: SIAM J. Matrix Anal. Appl.*
- Title *Interpolating between Optimal Transport and KL regularized Optimal Transport using Rényi Divergences.*
 04, 2024 J. Bresch, V. Stein, *published: Results Math.*
- Title *Denoising Sphere-Valued Data by Relaxed Total Variation Regularization.*
 04, 2024 R. Beinert, J. Bresch, *published: PAMM.*
- Title *Denoising of Sphere- and $SO(3)$ -Valued Data by Relaxed Tikhonov Regularization.*
 07, 2023 R. Beinert, J. Bresch, G. Steidl, *published: Inverse Probl. Imag.*
- Master thesis**
- Title *Finite p -groups with Cyclic Frattini Subgroup.*
 Supervisors Prof. Dr. Bettina Eick, Prof. Dr. Timo de Wolf
- Bachelor thesis**
- Title *Schur Multipliers of some Groups of Order p^7 .*
 Supervisors Prof. Dr. Bettina Eick, M. Sc. Alexander Cant

Experience

Technische Universität Berlin

2023-now **Reviewing**, *Bachelor Thesis*

- Schoen, Martin, Generalizations of matrix-free, stochastic approaches in linear algebra; ST25.
- Auffenberg, Janis, Unsupervised Ground Metric Learning ; WT25.

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2023-now **Assistant**, *Main Exercise of Lectures*

- Randomized Linear Algebra, Lecture: with Oleh Melnyk; *ST26*, 2 hours.
- Analysis I, Lecture: Prof. Ruming Zhang; *ST26*, 2 hours.
- Numerical Mathematics I, Lecture: Prof. Gabriele Steidl; *WT25*, 2 hours.
- Analysis III, Lecture: Prof. Gabriele Steidl; *ST25*, 2 hours.
- Analysis II, Lecture: Prof. Gabriele Steidl; *WT24*, 2 hours.
- Analysis I, Lecture: Prof. Gabriele Steidl; *ST24*, 2 hours.
- Numerical Mathematics I, Lecture: Prof. Gabriele Steidl; *WT23*, 2 hours.
- Convex Analysis, Lecture: Johannes Hertrich; *ST23*, 2 hours.

Technische Universität Braunschweig

2022 **Student Assistant**, *Main Exercise for a Lecture*

- Algebra for Computer Scientists, Lecture: Dr. Matthias Neumann-Brosig; *ST22*, 2 hours.

2019–2022 **Student Assistant**, *Exercises and Tutorials of several Lectures (Selection)*

- Computer oriented Mathematics II, Lecture: Prof. Matthias Bollhöfer; *ST22*, 2 hours.
- Computer oriented Mathematics I, Lecture: Prof. Matthias Bollhöfer; *WT21*, 2 hours.
- Linear Algebra II, Lecture: Prof. Bettina Eick; *ST21*, 2 hours.
- Function Theory, Lecture: Prof. Dirk Lorenz; *ST21*, 2 hours.
- Linear Algebra I, Lecture: Prof. Bettina Eick; *WT20*, 2 hours.
- Analysis III, Lecture: Prof. Dirk Lorenz; *WT20*, 2 hours.
- Analysis II, Lecture: Prof. Dirk Lorenz; *ST19*, 2 hours.
- Math III for Electrical Engineers, Lecture: Prof. Volker Bach; *WT19*, 2 hours.

Conferences

- November 2026 **SIAM IS/DMS 26**, *Salt Lake City, Utah, USA*
Talks & Organization of mini-symposia.
- July 2026 **FoCM26**, *Vienna, Austria*
Talk.
- June 2026 **IPMS26**, *Malta, Malta*
Talk.
- May 2026 **ILAS26**, *Virginia Tech, Blacksburg, Virginia, USA*
Talk.
- March 2026 **Research Visiting at the group of Stephen Becker**, *CU Boulder, Colorado, USA*
Talk.
- December 2025 **Approximation of Manifold-Valued Functions**, *Oberwolfach, Germany*
Talk.
- Oktober 2025 **MLL25**, *TUHH, Hamburg, Germany*
Poster.
- June 2025 **ILAS25**, *NSYSU, Kaohsiung, Taiwan*
Talk.
- May 2025 **SSVM25**, *Dartington Hall - Totnes, Devon, South England*
Poster.
- April 2025 **GAMM25**, *Poznan University of Technology, Poznan, Poland*
Talk.
- September 2024 **UQIPI24**, *ICMS Bayes Centre Edinburgh, Scotland*
Poster.
- September 2024 **DWCAA24**, *Alba di Canazei, Italy*
Talks.

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- June 2024 **LOL**, *CIRM Luminy, France*
Poster.
- March 2024 **GAMM - 94th Annual Meeting**, *OVGU Magdeburg*
Talk.
- March 2024 **OT Workshop Berlin**, *Humboldt University Berlin*
Poster.
- February 2024 **Rhein-Rhur-Workshop**, *Fernuni zu Hagen*
Talk.
- September 2023 **Workshop and Summer School on Applied Analysis**, *TU Chemnitz, Germany*
Talk and Presentation.
- February 2023 **MIA**, *Berlin, Germany*
participated.

Scholarship

- WT25 **DAAD**
for the Inverse Problems: Modeling and Simulation Conference 2026.
- WT24 **DAAD**
for the International Linear Algebra Society Conference 2025.
- WT22 **Promotionsstipendium**
in cooperation with the Technische Universität Berlin at the chair of Prof. Dr. Steidl for applied and numerical mathematics.
- WT22–ST23 **Deutschland Stipendium**, *pronounced and declined*
in cooperation with the Technische Universität Braunschweig and Braunschweiger NordLB.
- WT21–ST22 **Deutschland Stipendium**, *pronounced and accepted*
in cooperation with the Technische Universität Braunschweig and HDI VVaG.

Languages

- German *mother tongue*
English *fluent*

Computer Skills

- mostly used C, GAP, Python, Latex, Matlab less used C++, R, Java, html, Julia

References

Prof. Dr. Gabriele Steidl
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Emory University

USA, Atlanta

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