

Andreas Habring

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Education

PhD in applied mathematics , University of Graz, Austria	2020 - 2023
• Promotio sub auspiciis Praesidentis rei publicae (highest distinction for a doctorate in Austria: summa cum laude in high school, GPA 1.0 for all of University including the doctorate) • Advisor: Prof. Martin Holler • Thesis: Mathematical analysis and application of data-driven methods for inverse imaging problems	
Law degree , University of Graz, Austria	2022 - today
• Out of personal interest	
MSc and BSc in applied mathematics , Graz University of Technology, Austria	2015 - 2020
• GPA 1.0 (highest possible score)	
A-levels technical high school , HTBLuVA Salzburg, Austria	2009 - 2014

Professional positions

Associate professor (Maître de conférences, permanent) , Ecole polytechnique Paris, France	11/2026 - today
• Center for applied mathematics (CMAP) • Research on probabilistic machine learning, mathematical image processing, Bayesian imaging • Teaching and supervision of PhD students, BSc and MSc theses	
Postdoctoral researcher , Graz University of Technology, Austria	2024 - today
• Vision, Learning, and Optimization group of Prof. Thomas Pock • Research on mathematical image processing, Bayesian imaging, machine learning in particular for training of energy-based models, development of sampling algorithms etc. • Teaching and supervision of BSc and MSc theses	
Data scientist , AVL List GmbH Graz, Austria	2024 - 2024
• Battery health estimation and failure prediction	
University Assistant , University of Graz, Austria	2020 - 2023
• Research in mathematical image processing, inverse problems, machine learning, data science • Teaching computational math, advanced analysis, stochastics etc.	
Teaching assistant , Graz University of Technology, Austria	2016 - 2020
• Teaching several math exercise classes for engineering students	

Publications

- Christoph Griesbacher, Lea Bogensperger, et al. *Generating Physically Consistent Molecules with Energy-Based Models*. 2026. arXiv: 2605.18381 [cs.LG]. URL: <https://arxiv.org/abs/2605.18381>
- Alexander Falk, Laurenz Nagler, et al. *Time-Inhomogeneous Preconditioned Langevin Dynamics*. 2026. arXiv: 2605.06091 [math.ST]. URL: <https://arxiv.org/abs/2605.06091>
- Andreas Habring and Martin Zach. *Forward-KL Convergence of Time-Inhomogeneous Langevin Diffusions*. 2026. eprint: 2601.22349 (math.NA). URL: <https://arxiv.org/abs/2601.22349> (**accepted at ICML 2026**)
- Josef Simbrunner, Clemens Krenn, et al. *Computation of a Consistent System Matrix for Cone-beam Computed Tomography*. 2025. arXiv: 2511.12235 [math.OA]. URL: <https://arxiv.org/abs/2511.12235>
- Andreas Habring. *On the Time Derivative of the KL Divergence for a Generalized Langevin Annealing Scheme*. 2025. arXiv: 2511.11956 [math.OA]. URL: <https://arxiv.org/abs/2511.11956>

- Alexander Falk, Andreas Habring, et al. *An Inertial Langevin Algorithm*. 2025. arXiv: 2510.06723 [math.NA]. URL: <https://arxiv.org/abs/2510.06723>
- Andreas Habring, Martin Holler, et al. “Chapter 1 - Energy-based models for inverse imaging problems”. In: *Machine Learning Solutions for Inverse Problems: Part A*. ed. by Andreas Hauptmann, Bangti Jin, and Carola-Bibiane Schönlieb. Vol. 26. Handbook of Numerical Analysis. Elsevier, 2025, pp. 1–76. DOI: <https://doi.org/10.1016/bs.hna.2025.09.001>
- Muhamed Kuric, Martin Zach, et al. *The Gaussian Latent Machine: Efficient Prior and Posterior Sampling for Inverse Problems*. 2025. arXiv: 2505.12836 [eess.IV]. URL: <https://arxiv.org/abs/2505.12836> (accepted at **SIAM Journal on Imaging Sciences**)
- Andreas Habring, Alexander Falk, et al. “Diffusion at Absolute Zero: Langevin Sampling Using Successive Moreau Envelopes”. In: *SIAM Journal on Imaging Sciences* 19.1 (2026), pp. 35–77. DOI: 10.1137/25M1745830
- Andreas Habring, Alexander Falk, and Thomas Pock. “Diffusion at Absolute Zero: Langevin Sampling Using Successive Moreau Envelopes [conference paper]”. In: *2025 IEEE Statistical Signal Processing Workshop (SSP)*. IEEE. 2025, pp. 61–65
- Lorenz Fruehwirth and Andreas Habring. *Ergodicity of Langevin Dynamics and its Discretizations for Non-smooth Potentials*. 2024. arXiv: 2411.12051 [math.NA]. URL: <https://arxiv.org/abs/2411.12051> (accepted at **SIAM Journal on Mathematics of Data Science**)
- Andreas Habring and Martin Holler. “Neural-network-based regularization methods for inverse problems in imaging”. In: *GAMM-Mitteilungen* 47.4 (2024), e202470004
- Andreas Habring, Martin Holler, and Thomas Pock. “Subgradient Langevin Methods for Sampling from Nonsmooth Potentials”. In: *SIAM Journal on Mathematics of Data Science* 6.4 (2024), pp. 897–925
- Dominik Narnhofer, Andreas Habring, et al. “Posterior-Variance-Based Error Quantification for Inverse Problems in Imaging”. In: *SIAM Journal on Imaging Sciences* 17.1 (2024), pp. 301–333
- Andreas Habring and Martin Holler. “A note on the regularity of images generated by convolutional neural networks”. In: *SIAM Journal on Mathematics of Data Science* 5.3 (2023), pp. 670–692
- Christian Aarset, Andreas Habring, et al. “Unsupervised energy disaggregation via convolutional sparse coding”. In: *IEEE Transactions on Consumer Electronics* 70.1 (2023), pp. 4303–4310
- Andreas Habring and Martin Holler. “A generative variational model for inverse problems in imaging”. In: *SIAM Journal on Mathematics of Data Science* 4.1 (2022), pp. 306–335

Teaching experience

Courses

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| • Stochastic processes and Monte Carlo simulation | W 2026 |
| • Online learning | W 2026 |
| • Convex optimization (Graz University of Technology) | S 2026 |
| • Image processing and pattern recognition (Graz University of Technology) | W 2025 |
| • Introduction to scientific writing (Graz University of Technology) | W 2025 |
| • Convex optimization (Graz University of Technology) | S 2025 |
| • Stochastik 1 (University of Graz) | W 2023 |
| • Analysis 3 (University of Graz) | W 2022 |
| • Computer mathematics (University of Graz) | W 2022 |
| • Advanced analysis (University of Graz) | W 2021 |
| • Mathematical training for biologists (University of Graz) | W 2020 |
| • Analysis T1 (TU Graz) | W 2019 |
| • Exercise problems mathematics C (TU Graz) | W 2018 |

Supervision

- PhD students
 - Thomas Knoll
 - Clemens Krenn
- Bachelor’s and master’s theses on the following topics: Markov chains, Bayesian imaging, medical imaging, generative modeling, variational inverse problems.

Selected conferences

Invited talks

- ESI Workshop on "Applications of Tomographic Methods" 2026

Other talks

- EUROPT Conference on Advances in Continuous Optimization 2026
- I³ Italian Inverse problems & Imaging meeting 2026
- Minisymposium organizer at ENUMATH 2025 2025
- IEEE Statistical Signal Processing Workshop 2025
- BASP Frontiers 2025
- GAMM Annual Meeting 2023
- GAMM Workshop on Computational and Mathematical Methods in Data Science 2022
- IMA Conference on Inverse Problems from Theory to Application 2022
- SIAM Conference on Imaging Science 2022
- 2nd Alps-Adriatic Inverse Problems Workshop 2021
- International Conference on Computational Harmonic Analysis 2021
- Minisymposium organizer at IFIP TC7 Conference on System Modelling and Optimization 2021

Third party funding

- FWF principal investigator project Bayes-CT: Bayesian Computed Tomography Imaging 2026 - 2030
~€450.000 (Grant DOI: 10.55776/PAT4839425)

Awards and honors

- **Best Paper Award** IEEE SSP 2025, first place 2025
- **Promotio sub auspiciis Praesidentis rei publicae** Grant of € 9.000 2025
- **Scholarship** 2021 Gene Golub SIAM Summer School, full travel and accommodation expenses 2021
- **Best Paper Award** Doctoral School Mathematics and Scientific Computing Graz 2021
- **Early Student Award** Österreichische Mathematische Gesellschaft 2018

Research interests

Probabilistic machine learning, mathematical imaging, (Bayesian) inverse problems, sampling algorithms, variational regularization, optimization, stochastic differential equations, functional analysis, partial differential equations.

Academic services

Reviews for ICML, SIAM Journal on Imaging Sciences (SIIMS), Bernoulli Journal, IEEE Transactions on Computational Imaging, and Springer Signal, Image and Video Processing.

Miscellaneous

- **Languages:** German (native), English
- **Programming:** Python, Matlab, C++ (basics)
- **Other technical skills:** Solid technical and physical knowledge due to attending a technical school with engineering bias and successful completion of university courses about theoretical mechanics, thermodynamics, quantum physics, and experimental physics
- **Hobbies:** Weightlifting, gymnastics, CrossFit, politics, concerts