

Dr. Martin Genzel

Curriculum Vitae

Helmholtz-Zentrum Berlin
für Materialien und Energie
Albert-Einstein-Str. 15
12489 Berlin, Germany
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Professional Experience

- Since Apr 22 **Scientific Employee, Helmholtz Zentrum Berlin für Materialien und Energie (Germany)**
 - ▶ Machine Learning Scientist in the department “Optics and Beamlines”
- Apr 20 – Mar 22 **Scientific Employee, Utrecht University (Netherlands), Mathematical Institute**
 - ▶ Postdoctoral researcher in the group of Prof. Dr. Sjoerd Dirksen
- Jul 15 – Mar 20 **Scientific Employee, Technische Universität Berlin (Germany), Department of Mathematics**
 - ▶ (Post-)doctoral researcher in the group “Applied Functional Analysis” of Prof. Dr. Gitta Kutyniok
- Jun 13 – Jun 15 **Student Research Assistant, Technische Universität Berlin, Department of Mathematics**
 - ▶ Student in the group “Applied Functional Analysis” of Prof. Dr. Gitta Kutyniok
- Feb 10 – May 13 **Student Research Assistant, Helmholtz Zentrum Berlin für Materialien und Energie**
 - ▶ Student in the group of Prof. Dr. Christoph Genzel

Education

- May 19 **Ph.D. in Mathematics, Technische Universität Berlin (Germany), Overall grade: Summa cum laude (winner of the BIMoS Ph.D. Award)**
- Jun 15 **M.Sc. in Mathematics, Technische Universität Berlin, Overall grade: 1.0**
- Sep 13 **B.Sc. in Mathematics, Technische Universität Berlin, Overall grade: 1.0**
- Oct 13 – May 19 **BMS Graduate Student, Berlin Mathematical School (Germany)**
- Apr 10 – Jun 15 **Studies in Mathematics, Technische Universität Berlin**
- Oct 09 – Mar 10 **Studies in Material Science, Technische Universität Berlin**
- Jul 09 **German Abitur, Friedrich-Wilhelm-Gymnasium, Königs Wusterhausen (Germany), Overall grade: 1.0**

Honors and Awards

- Nov 21 **Winner of the Helsinki Deblur Challenge 2021, Finnish Inverse Problems Society (FIPS).**
Jointly with team members Theophil Trippe, Jan Macdonald, and Maximilian März
- Jun 21 **Winner of the AAPM Grand Challenge “Deep Learning for Inverse Problems: Sparse-View Computed Tomography Image Reconstruction”, American Association of Physicists in Medicine (AAPM).**
Jointly with team members Jan Macdonald and Maximilian März
- Dec 20 **BIMoS Ph.D. Award, Technische Universität Berlin.**
Berlin International Graduate School in Model and Simulation based Research (BIMoS)
- Jan 17 **Election as GAMM Junior.**
Junior member of the International Association of Applied Mathematics and Mechanics (GAMM)
- Nov 15 **Award “Best Master’s Degree in Mathematics”, Technische Universität Berlin.**
Dies Mathematicus of the Department of Mathematics
- Oct 14 – Jun 15 **Scholarship “Deutschlandstipendium”, Technische Universität Berlin.**
German scholarship programme for talented students

- Nov 13 **Award “Best Bachelor’s Degree in Mathematics”, Technische Universität Berlin.**
Dies Mathematicus of the Department of Mathematics
- Oct 13 **Admission to Berlin Mathematical School.**
Joint graduate school of Berlin’s universities
- Jul – Aug 08 **Admission to Deutsche Schüler Akademie, Hilden (Germany).**
Participant in the course on “Mathematical Problems of Image Processing”

Teaching Experience and Supervision

Utrecht University

- Semester II 21/22 **Introduction to Machine Learning, Bachelor course,** Preparation of exercise material
- Semester II 20/21 **Machine Learning, Master seminar,** Co-organizer with Prof. Dr. Sjoerd Dirksen

Technische Universität Berlin

- Summer 19 **Functional Analysis I, Bachelor course,** Lecturer
- Summer 16 **Functional Analysis III, Master course,** Preparation of lecture notes
- Winter 15/16 **Analysis I for Engineers, Bachelor course,** Teaching assistant

Supervised Bachelor’s and Master’s Theses

- TU Berlin (co-supervised) Mark Cheng (B & M), Lukas Emmigner (M), Ansgar Freyer* (B), Julian Goede (B), Jannik Ifland (B), Christian Kipp* (B), Hendrik Petersen (M), Jonathan Sauder (M), Robert Seidel* (M), Theophil Trippe (M)

*Awarded the best degree in mathematics at the annual Dies Mathematicus of TU Berlin

Invited Research Visits

- Oct 19 **Johns Hopkins University, Baltimore (MD, USA).**
Invitation by Prof. Dr. Jeremias Sulam (1 week)
- Feb 18 **University College London, London (UK).**
Invitation by Prof. Dr. Miguel Rodrigues (1 week)
- Nov 17 **Technion – Israel Institute of Technology, Haifa (Israel).**
Invitation by Prof. Dr. Yonina Eldar (1 week)
- Jan 17 **University of Texas at Austin, Austin (TX, USA).**
Invitation by Prof. Dr. Chandrajit Bajaj (1 week)
- Mar 16 **Hausdorff Research Institute for Mathematics, Bonn (Germany).**
Trimester program “Mathematics of Signal Processing” (2 weeks)
- Nov 15 **University of Michigan, Ann Arbor (MI, USA).**
Invitation by Prof. Dr. Roman Vershynin (2 weeks)

Invited Talks

- 2022 **SIAM IS22 Minisymposium “Data-Driven Methods in Inverse Problems & Imaging”, SIAM Conference on Imaging Science 2022 (virtual event), March 22, 2022.**
Title: “Data-Driven Methods at the Noise-Free Limit: Near-Perfect Recovery Despite Undersampling?”
- SIAM IS22 Minisymposium “Deeply Learned Regularization for Inverse Imaging Problems”, SIAM Conference on Imaging Science 2022 (virtual event), March 21, 2022.**
Title: “Robustness of Deep End-to-End Methods for Inverse Problems”
- Computational Analysis Seminar, Vanderbilt University, Nashville (TN, USA), March 16, 2022.**
Title: “The Separation Capacity of Random Neural Networks”
- Applied Mathematics Seminar, KU Eichstätt-Ingolstadt, Eichstätt (Germany), January 11, 2022.**
Title: “The Separation Capacity of Random Neural Networks”

- 2021 **Conference “Inverse Days 2021”**, *Tampere University*, Tampere (Finland), December 15, 2021.
Title: “End-to-End CNN for Deblurring – Winning Contribution to the Helsinki Deblur Challenge 2021” (presentation by Theophil Trippe in Session “Helsinki Deblur Challenge 2021”)
FNRS Contact Group on “Wavelets and Applications” (virtual event), *UCLouvain*, Louvain-la-Neuve (Belgium), December 14, 2021.
Title: “Solving Inverse Problems With Deep Neural Networks – Robustness (and Accuracy) Included?” (invited guest speaker)
AAPM Annual Meeting (virtual event), *American Association of Physicists in Medicine (AAPM)*, July 28, 2021.
Title: “AAPM DL-sparse-view CT Challenge – Team name: robust-and-stable” (in Session “Grand Challenges: Deep Learning Sparse-View CT and DBTex”)
ICU Seminar, *Utrecht University*, Utrecht (Netherlands), March 1, 2021.
Title: “Robustness Included? – Solving Inverse Problems With Deep Neural Networks”
- 2020 **Post Graduate Seminar – Chair for Mathematics of Information Processing**, *RWTH Aachen*, Aachen (Germany), December 17, 2020.
Title: “Robust Solutions to (Non-)Linear Inverse Problems: From Compressed Sensing to Deep Learning”
Oberseminar Applied Algebra and Analysis, *Technische Universität Braunschweig*, Brunswick (Germany), February 4, 2020.
Title: “A Non-Uniform Perspective on Analysis Sparsity in Compressed Sensing”
- 2019 **MINDS/CIS Seminar Series**, *Johns Hopkins University*, Baltimore (MD, USA), October 29, 2019.
Title: “A Non-Uniform Perspective on Analysis Sparsity in Compressed Sensing”
Conference “ILAS 2019: Linear Algebra Without Borders”, *Fundação Getúlio Vargas*, Rio de Janeiro (Brazil), July 11, 2019.
Title: “A New Perspective on ℓ^1 -Analysis Recovery” (in Minisymposium “Frame Theory and Data Science”)
- 2017 **Conference “Applied Inverse Problems”**, *Zhejiang University*, Hangzhou (China), May 29, 2017.
Title: “Feature Selection From Real-World Data With Non-Linear Observations” (in Minisymposium “Deep Neural Networks: Theory and Application”)
ICES Seminar, *University of Texas at Austin*, Austin (TX, USA), January 17, 2017.
Title: “Feature Selection From Real-World Data With Non-Linear Observations”
- 2016 **Analysis Oberseminar**, *RWTH Aachen*, Aachen (Germany), November 29, 2016.
Title: “Feature Selection From Real-World Data With Non-Linear Observations”

Organization of Scientific Meetings

- 2022 **Minisymposium “Inverse Problems with Data-Driven Methods and Deep Learning”**, *10th International Conference “Inverse Problems: Modeling and Simulation”*, Malta, May 22–28, 2022.
Organized jointly with Tatiana Bubba, Andreas Hauptmann, and Maximilian März

Committees and Academic Self-Governance

Technische Universität Berlin

- 2018 Member of an appointment committee

Reviewer Activity

Referee for the following journals:

- ▶ Advances in Computational Mathematics
- ▶ Constructive Approximation
- ▶ Foundations of Computational Mathematics
- ▶ IEEE Transactions on Information Theory
- ▶ IEEE Transactions on Signal Processing
- ▶ Information and Inference

- ▶ International Journal of Wavelets, Multiresolution and Information Processing
- ▶ Journal of the American Statistical Association
- ▶ Journal of Fourier Analysis and Applications
- ▶ Journal of Machine Learning for Biomedical Imaging (MELBA)
- ▶ Linear Algebra and its Applications
- ▶ PLOS ONE
- ▶ Proceedings of Machine Learning Research (Conference on Learning Theory)
- ▶ Sampling Theory, Signal Processing, and Data Analysis
- ▶ SIAM Journal on Mathematics of Data Science

Berlin, June 8, 2022

List of Publications

Preprints

- 2022 [3] J. Sauder, M. Genzel, and P. Jung
Gradient-Based Learning of Discrete Structured Measurement Operators for Signal Recovery. *Preprint* (2022), preprint arXiv:2202.03391. <http://arxiv.org/abs/2202.03391>
- 2021 [2] S. Dirksen, M. Genzel, L. Jacques, and A. Stollenwerk
The Separation Capacity of Random Neural Networks. *Preprint* (2021), preprint arXiv:2108.00207. <https://arxiv.org/abs/2108.00207>
- 2020 [1] M. Genzel and Ch. Kipp
Generic Error Bounds for the Generalized Lasso with Sub-Exponential Data. *Submitted* (2020), preprint arXiv:2004.05361. <https://arxiv.org/abs/2004.05361>

Peer-Reviewed Journal Articles

- 2022 [12] M. Genzel and A. Stollenwerk
A Unified Approach to Uniform Signal Recovery From Nonlinear Observations. *Found. Comput. Math.* (2022), online. <https://link.springer.com/10.1007/s10208-022-09562-y>
- [11] M. Genzel, M. März, and R. Seidel
Compressed Sensing with 1D Total Variation: Breaking Sample Complexity Barriers via Non-Uniform Recovery. *Inf. Inference* 11.1 (2022), pp. 203–250. <https://dx.doi.org/10.1093/imaiai/iaab001>
- [10] M. Genzel, J. Macdonald, and M. März
Solving Inverse Problems With Deep Neural Networks – Robustness Included? *IEEE Trans. Pattern Anal. Mach. Intell.* (2022), online. <https://dx.doi.org/10.1109/TPAMI.2022.3148324>
- 2021 [9] M. Genzel, G. Kutyniok, and M. März
 ℓ^1 -Analysis Minimization and Generalized (Co-)Sparsity: When Does Recovery Succeed? *Appl. Comput. Harmon. Anal.* 52 (2021), pp. 82–140. <https://dx.doi.org/10.1016/j.acha.2020.01.002>
- 2020 [8] D. Apel, M. Genzel, M. Meixner, M. Boin, M. Klaus, and Ch. Genzel
EDDIDAT: a graphical user interface for the analysis of energy-dispersive diffraction data. *J. Appl. Cryst.* 53.4 (2020), pp. 1130–1137. <https://dx.doi.org/10.1107/S1600576720005506>
- [7] M. Genzel and A. Stollenwerk
Robust 1-Bit Compressed Sensing via Hinge Loss Minimization. *Inf. Inference* 9.2 (2020), pp. 361–422. <https://dx.doi.org/10.1093/imaiai/iaz010>
- [6] M. Genzel and P. Jung
Recovering Structured Data From Superimposed Non-Linear Measurements. *IEEE Trans. Inf. Theory* 66.1 (2020), pp. 453–477. <https://dx.doi.org/10.1109/TIT.2019.2932426>
- 2017 [5] T. Conrad, M. Genzel, N. Cvetkovic, N. Wulkow, A. Leichtle, J. Vybiral, G. Kutyniok, and Ch. Schütte
Sparse Proteomics Analysis – a compressed sensing-based approach for feature selection and classification of high-dimensional proteomics mass spectrometry data. *BMC Bioinform.* 18 (2017), p. 160. <https://dx.doi.org/10.1186/s12859-017-1565-4>
- [4] M. Genzel
High-Dimensional Estimation of Structured Signals From Non-Linear Observations With General Convex Loss Functions. *IEEE Trans. Inf. Theory* 63.3 (2017), pp. 1601–1619. <https://dx.doi.org/10.1109/TIT.2016.2642993>

- 2015 [3] M. Meixner, T. Fuss, M. Klaus, M. Genzel, and Ch. Genzel
Diffraction analysis of strongly inhomogeneous residual stress depth distributions by modification of the stress scanning method. II. Experimental implementation. *J. Appl. Cryst.* 48.5 (2015), pp. 1451–1461. <https://dx.doi.org/10.1107/S160057671501585X>
- 2014 [2] M. Genzel and G. Kutyniok
Asymptotic Analysis of Inpainting via Universal Shearlet Systems. *SIAM J. Imaging Sci.* 7.4 (2014), pp. 2301–2339. <https://dx.doi.org/10.1137/140969452>
- [1] D. Apel, M. Klaus, M. Genzel, and Ch. Genzel
Rietveld-based energy-dispersive residual stress evaluation: Analysis of complex stress fields $\sigma_{ij}(\mathbf{z})$. *J. Appl. Cryst.* 47.2 (2014), pp. 511–526. <https://dx.doi.org/10.1107/S1600576713034158>

Peer-Reviewed Conference and Workshop Articles

- 2021 [8] M. Genzel, I. Gühring, J. Macdonald, and M. März
Near-Exact Recovery for Sparse-View CT via Data-Driven Methods. *NeurIPS 2021 Workshop on Deep Learning and Inverse Problems*, December 2021. <https://openreview.net/forum?id=IhI3ZhtZGUo>
- [7] J. Sauder, M. Genzel, and P. Jung
Learning Structured Sparse Matrices for Signal Recovery via Unrolled Optimization. *NeurIPS 2021 Workshop on Deep Learning and Inverse Problems*, December 2021. <https://openreview.net/forum?id=IxKSq0q1TKQ>
- 2020 [6] M. Genzel, M. März, and R. Seidel
Compressed Sensing with 1D Total Variation: Breaking Sample Complexity Barriers via Non-Uniform Recovery (iTWIST'20). *Proceedings of the International Traveling Workshop on Interactions Between Low-Complexity Data Models and Sensing Techniques (iTWIST)*, December 2020. <https://arxiv.org/abs/2009.03694>
- 2019 [5] M. Genzel and A. Stollenwerk
Robust 1-Bit Compressed Sensing via Hinge Loss Minimization. *Proceedings of the 13th International Conference on Sampling Theory and Applications (SampTA)*, July 2019. <https://doi.org/10.1109/SampTA45681.2019.9030859>
- 2018 [4] M. Genzel, G. Kutyniok, and M. März
A New Perspective on the Sample Complexity of the Analysis Basis Pursuit. *5th International Workshop on Compressed Sensing applied to Radar, Multimodal Sensing, and Imaging (CoSeRa)*, September 2018. <https://www.eurasip.org/Proceedings/Ext/CoSeRa2018/papers/p-marz.pdf>
- [3] P. Jung and M. Genzel
Blind Sparse Recovery Using Imperfect Sensor Networks. *Proceedings of the 2018 IEEE Statistical Signal Processing Workshop (SSP)*, June 2018, pp. 598–602. <https://doi.org/10.1109/SSP.2018.8450719>
- 2017 [2] M. Genzel and P. Jung
Blind sparse recovery from superimposed non-linear sensor measurements. *Proceedings of the 12th International Conference on Sampling Theory and Applications (SampTA)*, July 2017, pp. 106–110. <https://doi.org/10.1109/SAMPPTA.2017.8024352>
- 2013 [1] Ch. Genzel, D. Apel, M. Klaus, M. Genzel, and D. Balzar
Keynote Lecture: Residual Stress Gradient Analysis by Multiple Diffraction Line Methods. *International Conference on Residual Stresses 9 (ICRS 9)*, September 2013, pp. 3–18. <https://doi.org/10.4028/www.scientific.net/MSF.768-769.3>

Other Publications

- 2019 [2] M. Genzel and G. Kutyniok
Artificial Neural Networks. *GAMM Rundbrief* 2019.2 (2019), pp. 12–18. https://www.gamm-ev.de/wp-content/uploads/2020/06/RB_2_19_web.pdf
- 2018 [1] M. Genzel
The Mismatch Principle: An Ignorant Approach to Non-Linear Compressed Sensing? (joint with G. Kutyniok and P. Jung). *Oberwolfach Rep.* 15.1 (2018), pp. 781–782. <https://www.doi.org/10.4171/OWR/2018/14>

Technical Reports

- 2021 [3] M. Genzel, J. Macdonald, and M. März
AAPM DL-Sparse-View CT Challenge Submission Report: Designing an Iterative Network for Fanbeam-CT with Unknown Geometry. *Technical report, arXiv:2106.00280* (2021). <https://arxiv.org/abs/2106.00280>
- 2018 [2] M. Genzel and G. Kutyniok
The Mismatch Principle: The Generalized Lasso Under Large Model Uncertainties. *Technical report, arXiv:1808.06329* (2018). <https://arxiv.org/abs/1808.06329>
- 2016 [1] M. Genzel and G. Kutyniok
A Mathematical Framework for Feature Selection from Real-World Data with Non-Linear Observations. *Technical report, arXiv:1608.08852* (2016). <http://arxiv.org/abs/1608.08852>

Monographs

- [3] **The Mismatch Principle and ℓ^1 -Analysis Compressed Sensing: A Unified Approach to Estimation Under Large Model Uncertainties and Structural Constraints**
Ph.D. Thesis, *Technische Universität Berlin*, March 2019, Advisor: Prof. Dr. Gitta Kutyniok. <http://dx.doi.org/10.14279/depositonce-8394>
- [2] **Sparse Proteomics Analysis: Toward a Mathematical Foundation of Feature Selection and Disease Classification**
Master's Thesis, *Technische Universität Berlin*, June 2015, Advisor: Prof. Dr. Gitta Kutyniok.
- [1] **Analysis von Inpainting mittels Hybrid-Shearlets und Clustered Sparsity**
Bachelor's Thesis (in German), *Technische Universität Berlin*, August 2013, Advisor: Prof. Dr. Gitta Kutyniok.

Research Activities

Research Visits (of at least one week length)

- Oct 19 **Johns Hopkins University**, Baltimore (MD, USA).
Invitation by Prof. Dr. Jeremias Sulam (1 week)
- Feb 18 **University College London**, London (UK).
Invitation by Prof. Dr. Miguel Rodrigues (1 week)
- Nov 17 **Technion – Israel Institute of Technology**, Haifa (Israel).
Invitation by Prof. Dr. Yonina Eldar (1 week)
- Jan 17 **University of Texas at Austin**, Austin (TX, USA).
Invitation by Prof. Dr. Chandrajit Bajaj (1 week)
- Mar 16 **Hausdorff Research Institute for Mathematics**, Bonn (Germany).
Trimester program “Mathematics of Signal Processing” (2 weeks)
- Nov 15 **University of Michigan**, Ann Arbor (MI, USA).
Invitation by Prof. Dr. Roman Vershynin (2 weeks)

Participation in Conferences, Workshops, etc.

- 2022 **10th International Conference “Inverse Problems: Modeling and Simulation” (IPMS)**, Malta, May 22–28, 2022.
Follow-up Workshop “Mathematics of Data Science”, *Hausdorff Research Institute for Mathematics*, Bonn (Germany), April 25–29, 2022.
SIAM Conference on Imaging Science 2022 (virtual event), March 21–25, 2022.
- 2021 **FNRS Contact Group on “Wavelets and Applications” (virtual event)**, *UCLouvain*, Louvain-la-Neuve (Belgium), December 14, 2021.
Conference “Inverse Days 2021”, *Tampere University*, Tampere (Finland), December 14–16, 2021.
Conference “NeurIPS” (virtual event), December 6–14, 2021.
Workshop “Applied Harmonic Analysis and Data Science”, *Mathematisches Forschungsinstitut Oberwolfach*, Oberwolfach (Germany), November 29–December 3, 2021.
Conference “DeepMath” (virtual event), November 4–5, 2021.
Conference “Online-ICCHA” (virtual event), September 13–17, 2021.
GAMM Annual Meeting (virtual event), Kassel (Germany), March 15–19, 2021.
- 2020 **Conference “iTWIST” (virtual event)**, Nantes (France), December 2–4, 2020.
SIAM Conference on Mathematics of Data Science (virtual event), Cincinnati (OH, USA), May 4–June 30, 2020.
- 2019 **Conference “NeurIPS”**, Vancouver (BC, Canada), December 8–14, 2019.
GAMM COMinDS Workshop “Computational and Mathematical Methods in Data Science”, *Zuse Institute Berlin*, Berlin (Germany), October 24–25, 2019.
Joint Workshop of BBDC, BZML, and AIP, *Technische Universität Berlin*, Berlin (Germany), September 9–10, 2019.
Conference “ILAS 2019: Linear Algebra Without Borders”, *Fundação Getúlio Vargas*, Rio de Janeiro (Brazil), July 8–12, 2019.
Conference “SPARS”, *Engineering School ENSEEIHT*, Toulouse (France), July 1–4, 2019.
GAMM Annual Meeting, Vienna (Austria), February 18–22, 2019.
- 2018 **Workshop “Optimization, Machine Learning, and Data Science”**, *Technische Universität Braunschweig*, Brunswick (Germany), April 12–13, 2018.
Workshop “Applied Harmonic Analysis and Data Processing”, *Mathematisches Forschungsinstitut Oberwolfach*, Oberwolfach (Germany), March 26–30, 2018.
GAMM Annual Meeting, *Technische Universität München*, Munich (Germany), March 19–23, 2018.

- 2017 **Matheon Conference “Compressed Sensing and its Applications”**, *Technische Universität Berlin*, Berlin (Germany), December 4–8, 2017.
GAMM Workshop “Mathematical Signal Processing and Data Analysis”, *Universität Bremen*, Bremen (Germany), September 18–20, 2017.
Conference “SPARS”, *Instituto Superior Técnico*, Lisbon (Portugal), June 5–8, 2017.
Conference “Applied Inverse Problems”, *Zhejiang University*, Hangzhou (China), May 29–June 2, 2017.
GAMM Annual Meeting, Weimar (Germany), March 6–10, 2017.
- 2016 **Conference “NIPS”**, Barcelona (Spain), December 5–10, 2016.
GAMM Workshop “Applied and Numerical Linear Algebra”, *Technische Universität Hamburg*, Hamburg (Germany), September 15–16, 2016.
Conference “Time-Frequency Analysis and Related Topics”, Strobl (Austria), June 6–10, 2016.
Workshop “Harmonic Analysis, Graphs and Learning”, *Hausdorff Research Institute for Mathematics*, Bonn (Germany), March 14–18, 2016.
Conference “Mathematical Image Analysis”, *Institut Henri Poincaré*, Paris(France), January 18–20, 2016.
- 2015 **Matheon Conference “Compressed Sensing and its Applications”**, *Technische Universität Berlin*, Berlin (Germany), December 7–11, 2015.
Conference “SPARS”, *University of Cambridge*, Cambridge (UK), July 6–9, 2015.
- 2014 **Conference “ICCHA”**, *Vanderbilt University*, Nashville (TN, USA), May 19–23, 2014.
Joint GAMM ANLA-MSIP Workshop “Matrix Computations for Sparse Recovery”, *Technische Universität Berlin*, Berlin (Germany), April 9–11, 2014.
Conference “Mathematical Image Analysis”, *Institut Henri Poincaré*, Paris(France), January 13–15, 2014.
- 2013 **Matheon Workshop “Compressed Sensing and its Applications”**, *Technische Universität Berlin*, Berlin (Germany), December 9–13, 2013.

Talks and Posters

- 2022 **SIAM IS22 Minisymposium “Data-Driven Methods in Inverse Problems & Imaging”**, *SIAM Conference on Imaging Science 2022 (virtual event)*, March 22, 2022.
 Title: “Data-Driven Methods at the Noise-Free Limit: Near-Perfect Recovery Despite Undersampling?”
SIAM IS22 Minisymposium “Deeply Learned Regularization for Inverse Imaging Problems”, *SIAM Conference on Imaging Science 2022 (virtual event)*, March 21, 2022.
 Title: “Robustness of Deep End-to-End Methods for Inverse Problems”
Computational Analysis Seminar, *Vanderbilt University*, Nashville (TN, USA), March 16, 2022.
 Title: “The Separation Capacity of Random Neural Networks”
Applied Mathematics Seminar, *KU Eichstätt-Ingolstadt*, Eichstätt (Germany), January 11, 2022.
 Title: “The Separation Capacity of Random Neural Networks”
- 2021 **Conference “Inverse Days 2021”**, *Tampere University*, Tampere (Finland), December 15, 2021.
 Title: “End-to-End CNN for Deblurring – Winning Contribution to the Helsinki Deblur Challenge 2021” (presentation by Theophil Trippe in Session “Helsinki Deblur Challenge 2021”)
Conference “NeurIPS” (virtual event), December 14, 2021.
 Title: “Near-Exact Recovery for Sparse-View CT via Data-Driven Methods” (poster in Workshop “Deep Learning and Inverse Problems”)
FNRS Contact Group on “Wavelets and Applications” (virtual event), *UCLouvain*, Louvain-la-Neuve (Belgium), December 14, 2021.
 Title: “Solving Inverse Problems With Deep Neural Networks – Robustness (and Accuracy) Included?” (invited guest speaker)
Workshop “Applied Harmonic Analysis and Data Science”, *Mathematisches Forschungsinstitut Oberwolfach*, Oberwolfach (Germany), December 2, 2021.
 Title: “Solving Inverse Problems With DeepNeural Networks – Robustness Included?”

- Conference “DeepMath” (virtual event)**, November 4, 2021.
Title: “The Separation Capacity of Random Neural Networks” (poster)
- Conference “Online-ICCHA” (virtual event)**, September 13, 2021.
Title: “A Unified Approach to Uniform Signal Recovery From Non-Linear Observations”
- AAPM Annual Meeting (virtual event)**, *American Association of Physicists in Medicine (AAPM)*, July 28, 2021.
Title: “AAPM DL-sparse-view CT Challenge – Team name: robust-and-stable” (in Session “Grand Challenges: Deep Learning Sparse-View CT and DBTex”)
- GAMM Annual Meeting (virtual event)**, Kassel (Germany), March 16, 2021.
Title: “Solving Inverse Problems With Deep Neural Networks – Robustness Included?” (in Contributed Session S21 “Mathematical Signal and Image Processing”)
- ICU Seminar**, *Utrecht University*, Utrecht (Netherlands), March 1, 2021.
Title: “Robustness Included? – Solving Inverse Problems With Deep Neural Networks”
- 2020 **Post Graduate Seminar – Chair for Mathematics of Information Processing**, *RWTH Aachen*, Aachen (Germany), December 17, 2020.
Title: “Robust Solutions to (Non-)Linear Inverse Problems: From Compressed Sensing to Deep Learning”
- Applied Mathematics Seminar**, *Utrecht University*, Utrecht (Netherlands), December 10, 2020.
Title: “Robustness Included? – Solving Inverse Problems With Deep Neural Networks”
- Conference “iTWIST” (virtual event)**, Nantes (France), December 3, 2020.
Title: “Compressed Sensing with 1D Total Variation: Breaking Sample Complexity Barriers via Non-Uniform Recovery”
- Oberseminar Applied Algebra and Analysis**, *Technische Universität Braunschweig*, Brunswick (Germany), February 4, 2020.
Title: “A Non-Uniform Perspective on Analysis Sparsity in Compressed Sensing”
- 2019 **MINDS/CIS Seminar Series**, *Johns Hopkins University*, Baltimore (MD, USA), October 29, 2019.
Title: “A Non-Uniform Perspective on Analysis Sparsity in Compressed Sensing”
- GAMM COMinDS Workshop “Computational and Mathematical Methods in Data Science”**, *Zuse Institute Berlin*, Berlin (Germany), October 24, 2019.
Title: “A New Perspective on ℓ^1 -Analysis Recovery” (poster)
- Conference “ILAS 2019: Linear Algebra Without Borders”**, *Fundação Getúlio Vargas*, Rio de Janeiro (Brazil), July 11, 2019.
Title: “A New Perspective on ℓ^1 -Analysis Recovery” (in Minisymposium “Frame Theory and Data Science”)
- Conference “SPARS”**, *Engineering School ENSEEIHT*, Toulouse (France), July 1, 2019.
Title: “A New Perspective on ℓ^1 -Analysis Recovery” (poster)
- GAMM Annual Meeting**, Vienna (Austria), February 21, 2019.
Title: “The Mismatch Principle: Statistical Learning Under Large Model Uncertainties” (in Contributed Session S21 “Mathematical Signal and Image Processing”)
- 2018 **Workshop “Optimization, Machine Learning, and Data Science”**, *Technische Universität Braunschweig*, Brunswick (Germany), April 12, 2018.
Title: “The Mismatch Principle: What Can the Lasso Learn About Non-Linear Observations?”
- Workshop “Applied Harmonic Analysis and Data Processing”**, *Mathematisches Forschungsinstitut Oberwolfach*, Oberwolfach (Germany), March 30, 2018.
Title: “The Mismatch Principle: An Ignorant Approach to Non-Linear Compressed Sensing?”
- GAMM Annual Meeting**, *Technische Universität München*, Munich (Germany), March 23, 2018.
Title: “Sparse Recovery From Superimposed Non-Linear Measurements” (in Contributed Session S21 “Mathematical Signal and Image Processing”)
- 2017 **Matheon Conference “Compressed Sensing and its Applications”**, *Technische Universität Berlin*, Berlin (Germany), December 5, 2017.
Title: “Recovering Structured Data From Superimposed Non-Linear Measurements” (poster)
- GAMM Workshop “Mathematical Signal Processing and Data Analysis”**, *Universität Bremen*, Bremen (Germany), September 19, 2017.
Title: “Sparse Recovery From Superimposed Non-Linear Measurements”
- Conference “SPARS”**, *Instituto Superior Técnico*, Lisbon (Portugal), June 8, 2017.
Title: “Sparse Recovery From Superimposed Non-Linear Sensor Measurements”

- Conference “Applied Inverse Problems”**, *Zhejiang University*, Hangzhou (China), May 29, 2017.
Title: “Feature Selection From Real-World Data With Non-Linear Observations” (in Minisymposium “Deep Neural Networks: Theory and Application”)
- GAMM Annual Meeting**, Weimar (Germany), March 7, 2017.
Title: “Feature Selection From Real-World Data With Non-Linear Observations” (poster)
- ICES Seminar**, *University of Texas at Austin*, Austin (TX, USA), January 17, 2017.
Title: “Feature Selection From Real-World Data With Non-Linear Observations”
- 2016 **Analysis Oberseminar**, *RWTH Aachen*, Aachen (Germany), November 29, 2016.
Title: “Feature Selection From Real-World Data With Non-Linear Observations”
- GAMM Workshop “Applied and Numerical Linear Algebra”**, *Technische Universität Hamburg*, Hamburg (Germany), September 15, 2016.
Title: “Towards a Mathematical Framework for Feature Selection From Real-World Data”
- Conference “Time-Frequency Analysis and Related Topics”**, Strobl (Austria), June 7, 2016.
Title: “Recovery of Structured Signals From Non-Linear Observations With General Convex Loss Functions” (poster)
- Workshop “Harmonic Analysis, Graphs and Learning”**, *Hausdorff Research Institute for Mathematics*, Bonn (Germany), March 15, 2016.
Title: “Recovery of Structured Signals From Non-Linear Observations With General Convex Loss Functions” (poster)
- Forschungsseminar Diskrete Mathematik/Geometrie**, *Technische Universität Berlin*, Berlin (Germany), March 2, 2016.
Title: “Convex Recovery of Structured Signals From Non-Linear Observations”
- 2015 **Matheon Conference “Compressed Sensing and its Applications”**, *Technische Universität Berlin*, Berlin (Germany), December 8, 2015.
Title: “Sparse Proteomics Analysis: Learning Forward Models via Compressed Sensing” (poster)
- Winter School on Compressed Sensing**, *Technische Universität Berlin*, Berlin (Germany), December 5, 2015.
Title: “Sparse Proteomics Analysis: Toward a Mathematical Theory for Feature Selection From Forward Models”
- Student AIM Seminar**, *University of Michigan*, Ann Arbor (MI, USA), November 6, 2015.
Title: “Sparse Proteomics Analysis: Toward a Mathematical Theory for Feature Selection From Forward Models”
- Conference “SPARS”**, *University of Cambridge*, Cambridge (UK), July 9, 2015.
Title: “Sparse Proteomics Analysis” (poster)
- 2014 **Conference “ICCHA”**, *Vanderbilt University*, Nashville (TN, USA), May 22, 2014.
Title: “Asymptotic Analysis of Inpainting via Universal Shearlet Systems and Clustered Sparsity” (talk and poster)