

# Dr. Martin Genzel

## List of Publications

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### 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  
 **$\ell^1$ -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>

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## 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=ThI3ZhtZGUo>
- [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/SAMP.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>

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## 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](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>

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## 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>

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## Monographs

- [3] **The Mismatch Principle and  $\ell^1$ -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.

Berlin, June 8, 2022